2023
LEVEL 1

ECONOMICS

LECTURE SLIDES FOR CFA PROGRAM LEVEL 1 2023

SAPP Academy

MODULE 1: DEMAND AND SUPPLY ANALYSIS

Learning outcomes

Demand analysis: the consumer

1.a. Calculate and interpret price, income, and cross -price elasticity of demand and describe factors that affect each measure

1.b. Compare substitution and income effects

1.c. Contrast normal goods with inferior goods

Supply analysis: the firm

1.d. Describe the phenomenon of diminishing marginal returns

1.e. Determine and interpret breakeven and shutdown points of production

1.f. Describe how economies of scale and diseconomies of scale affect costs

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

Warm-up: Demand curve

A good's own price is important in determining consumers' willingness to purchase it, but other variables (Consumers' incomes, their tastes and preferences, and the prices of other goods that serve as substitutes or complements) also influence that decision. Equation:

$$Q_X^d = f(P_X, I, P_Y)$$

Q_X^d : Quantity demanded of good X
P_X : Price/unit of good X
I : Consumers' income
P_Y : Price of another good Y

- To concentrate on the relationship between the quantity demanded of the good and its own price, *Px*, we hold constant the values of income and the price of good *Y*, then we have this demand function:

$$Q_X^d = f(P_X)$$

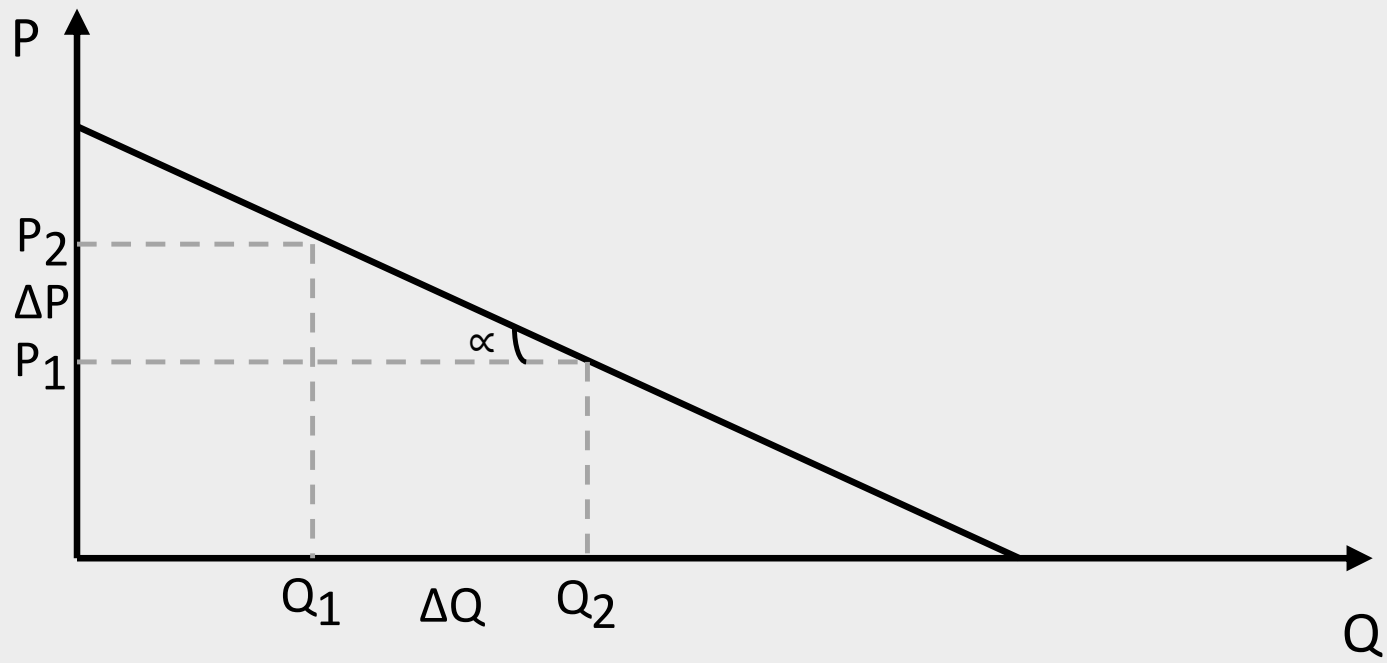
- Note that, demand curve is drawn over the inverse-demand function:

$P(x) = f(Q_X^d)$

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

Warm-up: Demand curve



- Slope of Demand curve $= \frac{\Delta P}{\Delta Q} = \tan(\propto)$
- Slope of demand function $=(Q_d)'_P = \frac{\Delta Q}{\Delta P} = \frac{1}{\text{Slope of Demand curve}}$

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

1. Own – price elasticity of demand

Own – price elastricity is a measure of **the responsiveness of the quantity** demanded to **a change in price.**

$$E^{d}_{P_0} = \frac{\%\,\Delta Q^{d}_{x}}{\%\,\Delta P_x}$$

→ **Own – price elasticity:** $E^{d}_{P_x} = \frac{\%\,\Delta Q^{d}_{x}}{\%\,\Delta P_X} = \frac{\Delta Q^{d}_{x}}{\Delta P_X} \times \frac{P_X}{Q^{d}_{x}} = (Q_d)'_P \times \frac{P_X}{Q^{d}_{x}}$

= slope of demand function x $\frac{P_X}{Q^{d}_{x}}$

With downward - sloping demand, an increase in price decreases quantity demanded

→ $\Delta P > 0$ and $\Delta Q < 0 \rightarrow (Q_d)'_P < 0$

→ Own – price elasticity is **negative**: $E^{d}_{Px} < 0$

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

1. Own – price elasticity of demand

Example for determining own - price elasticity of demand

Example 1: A demand is given by a function: Q = -2P + 120. Determine the elasticity of demand at P = 20, P = 30 and P = 40?

Answer:

Step 1: Use the demand function to determine the quantity demanded at each price:

P = 20 → Q = 80 ; P = 30 → Q = 60 and P = 40 → Q = 40

Step 2: Apply the demand elasticity equation: $E^{d}_{P_x} = (Q_d)'_P \times \frac{P_x}{Q^{d}_{x}}$

$E_{20} = -2 \times \frac{20}{80} = -0.5$

$E_{30} = -2 \times \frac{30}{60} = -1$

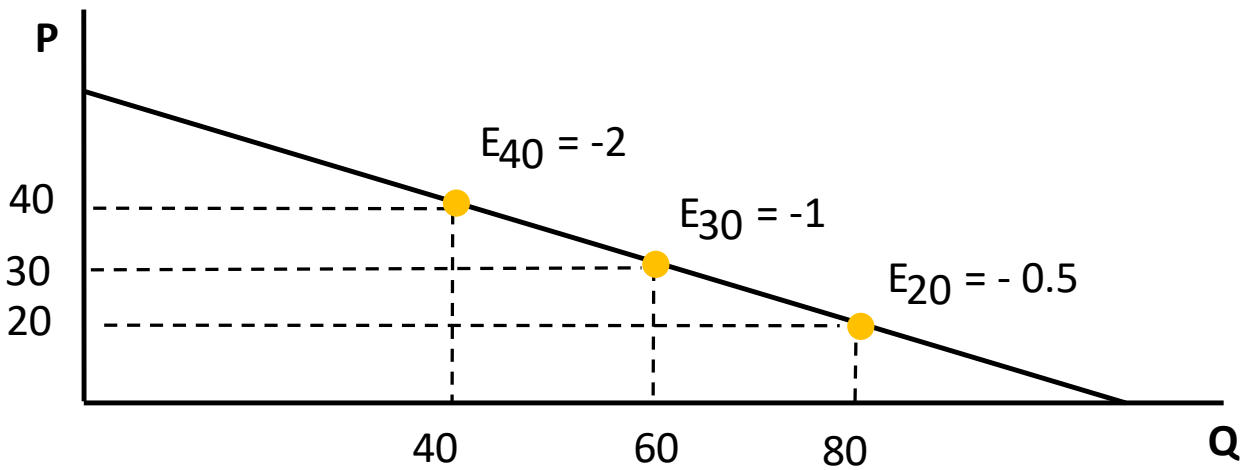
$E_{40} = -2 \times \frac{40}{40} = -2$

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

1. Own – price elasticity of demand

Example for determining own - price elasticity of demand



The example shows that the higher price level, the greater elasticity of demand.

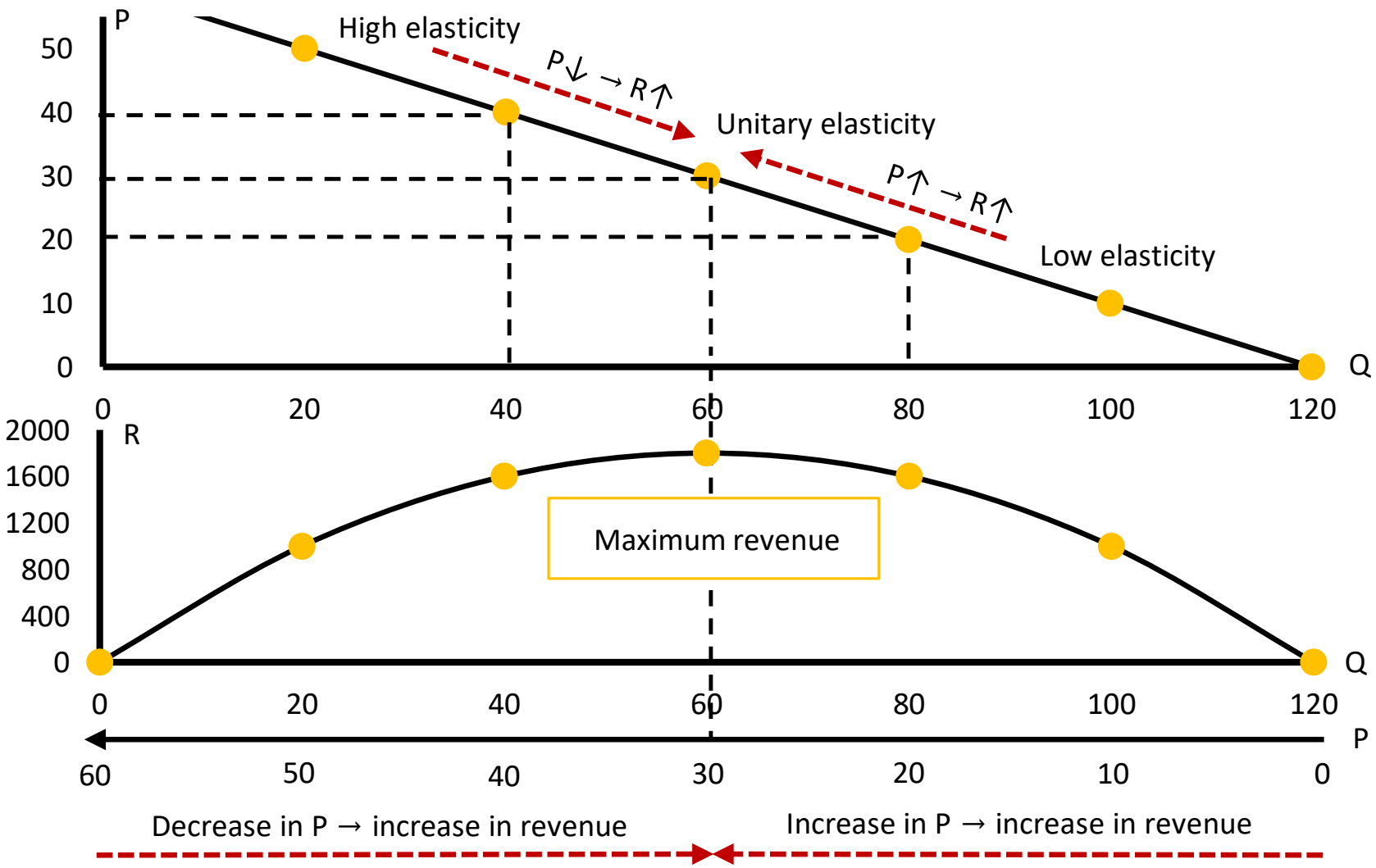
Range	Type of elasticity	Change in P and Q	Revenue (PxQ)	The firm needs to
P > 30 |E|>1	High elasticity	% decrease in P < % increase in Q	Increase when decrease P	Decrease P down to 30
P = 30 |E| = 1	unitary elasticity	A change in P = a change in Q	Maximum	Unchange P
P < 30 |E| < 1	Inelastic	% increase in P > % decrease in Q	Increase when increase P	Increase P up to 30

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

1. Own – price elasticity of demand

Price elasticity along a linear demand curve

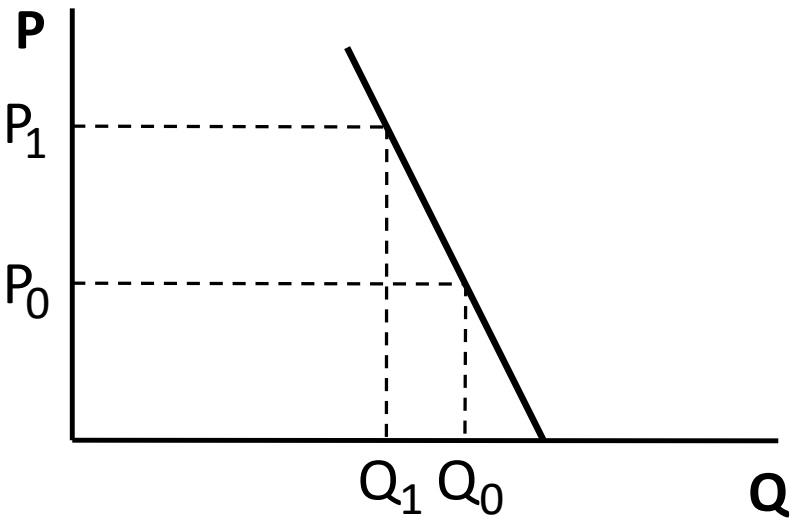


MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

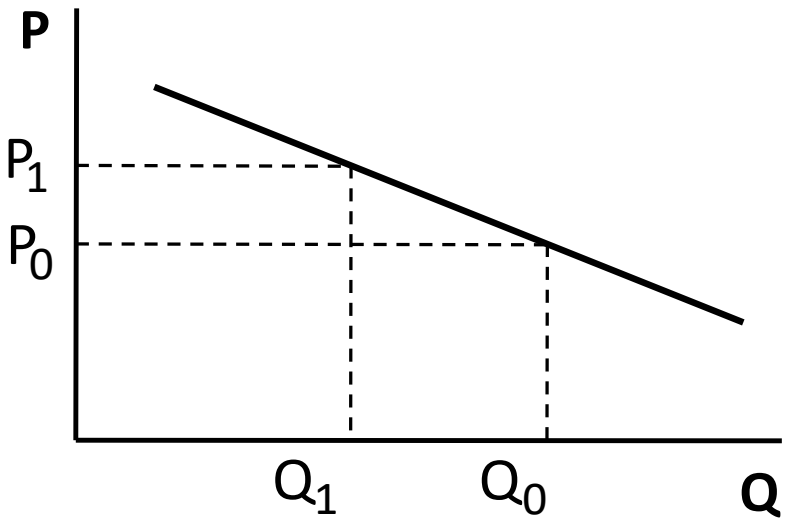
1. Own – price elasticity of demand

Cases of elasticity of demand



Inelastic demand
| Elasticity | < 1

Changes in price have no significant effect on quantity demanded.



Elastic demand
| Elasticity | > 1

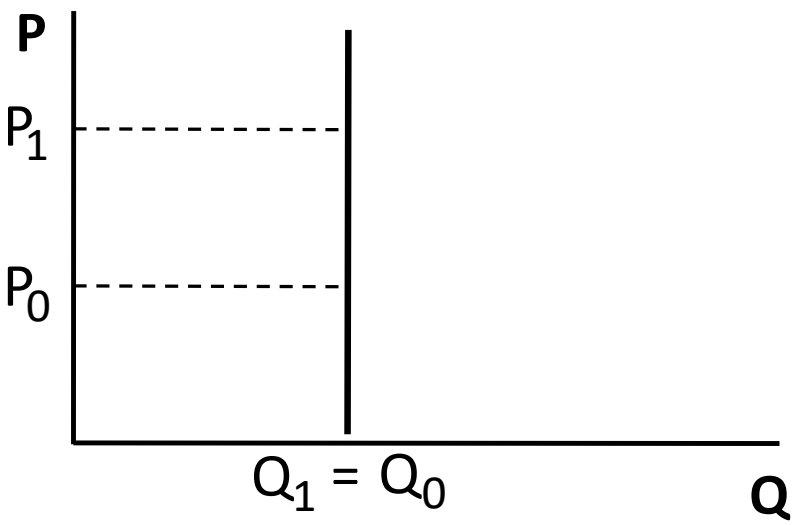
A small change in price causes a larger change in quantity demanded.

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

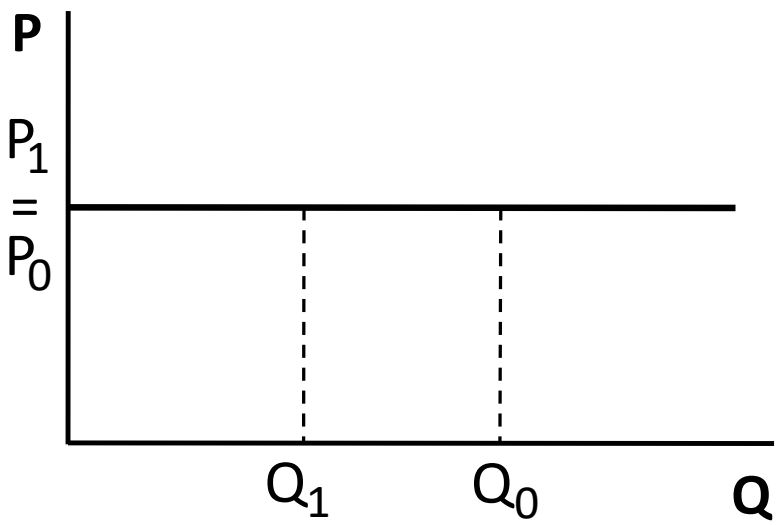
1. Own – price elasticity of demand

Perfectly inelastic and Perfectly elastic demand



Perfectly inelastic demand
Elasticity = 0

Quantity demanded is unchanged when price is up/down



Perfectly elastic demand
Elasticity = - ∞

Quantity demanded goes to zero when price is up/down

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

1. Own – price elasticity of demand

Factors affect demand elasticity

Quality and availability of substitute
Very few or no good substitutes → the buyers are unlikely to adjust consumption as the price changes → the demand is relatively inelastic. Opposite case → the demand is elastic.

Portion of income spent on a good
People spend a large portion of income on a good (ex: housing costs) → people are more likely to adjust consumption when the price changes → the demand for that good tends to be more elastic.

Time allowed to respond to change in price
The longer the time period since the price charge → consumers have enough time to find alternative goods → elasticity of demand tends to be greater.

Discretionary or non-discretionary
The more a good is seen as being necessary, the less elastic its demand is likely to be.

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

2. Income elasticity of demand

Income elasticity is the **sensitivity of quantity** demanded to **a change in income.**

Income elasticity: $$E_I^d = \frac{\%\Delta Q_x^d}{\%\Delta I}$$

Normal goods

An increase in income will lead to an increase in normal good consumption → quantity demanded increases

$\Delta I > 0 \rightarrow \Delta Q > 0$

Income elasticity > 0

Eg: clothes, expensive goods

Inferior goods

An increase in income will lead to a decrease in inferior good consumption in favor of its prefered substitutes → quantity demanded falls

$\Delta I > 0 \rightarrow \Delta Q < 0$

Income elasticity < 0

Eg: canned food, second-hand clothes

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.a] Calculate and interpret price, income and cross-price elasticity of demand and describe factors affect each measure

3. Cross – price elasticity of demand

Cross – price elasticity is the **sensitivity of quantity** demanded to **a change in the price of another good.**

Cross – price elasticity: $$E^{d}_{P_y} = \frac{\%\Delta Q^{d}_{x}}{\%\Delta P_y}$$

Substitute goods	Complement goods
As the price of good Y rises → consume more subsitutes (X) → quantity demanded of good X increases.	As the price of good Y rises → reduce good X consumption as the result of buying good Y less → quantity demanded of good X decreases.
$\Delta Py > 0 \rightarrow \Delta Qx > 0$	$\Delta Py > 0 \rightarrow \Delta Qx < 0$
Cross – price elasticity > 0	Cross – price elasticity < 0
Eg: two brands of beer	*Eg: houses and furniture*

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.b] Compare substitution and income effect

Basis		Substitution effect	Income effect
Meaning		Substitution effect is an effect on demand caused by a price change, leading buyers to replace higher priced goods with lower priced ones.	Income effect is an effect on demand caused by a change in consumer's **real income** (purchasing power).
Effect of		Relative price changes	Real income changes
If good's price falls	**Normal goods**	**Buy more** because it's less costly compared with other goods. (positive effect)	**Buy more** because the rise in real income raises the total consumption level. (positive effect)
	Inferior goods		**Buy less** because the rise in real income prompts the buyers to choose its preferred substitutes. (negative effect)

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.c] Normal goods and Inferior goods

If good's price falls	Normal goods	Inferior goods		Veblen goods
		Not Giffen goods	Giffen goods	
Substi-tution effect	Positive	Positive (stronger)	Positive (weaker)	Higher price means higher status, increases desirability Eg: Luxury goods
Income effect	Positive	Negative (weaker)	Negative (stronger)	
Total effect	Positive	Positive	Negative	
D – curve	Downward	Downward	Upward	Upward for some individuals

Positive effect: Price falls → Quantity demanded increases
Negative effect: Price falls → Quantity demanded decreases

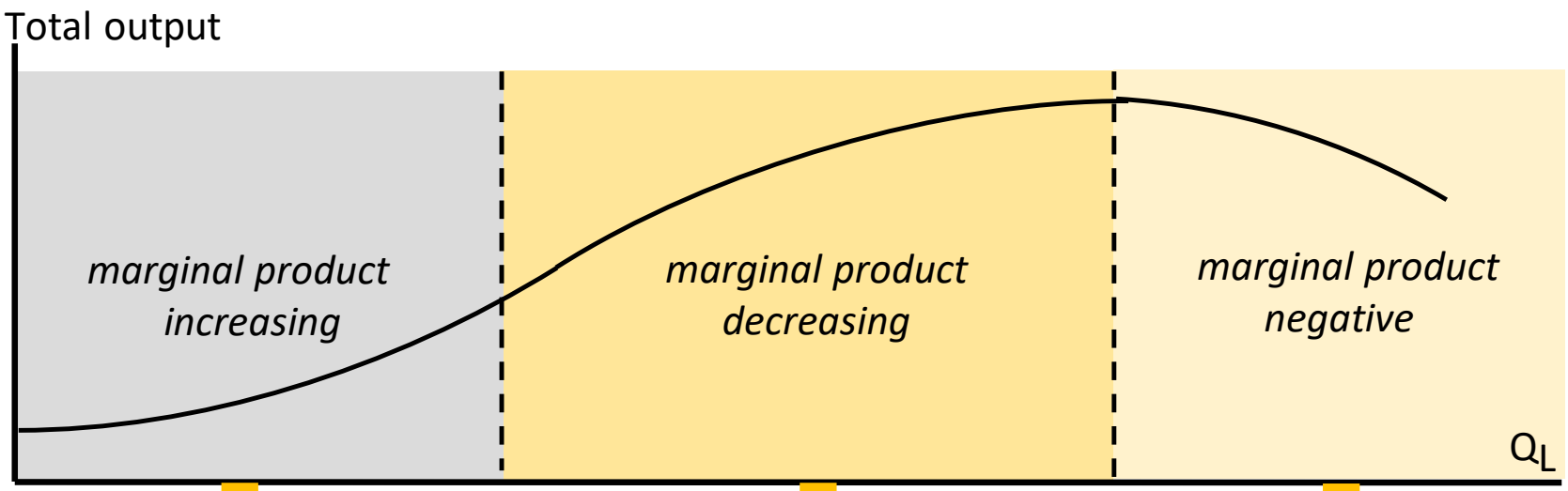
Follow the law of demand

Not follow the law of demand

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.d] Describe the phenomenon of diminishing marginal returns

- **Marginal product** is the amount of additional output for each addtional input, assuming other inputs remain constant.
- Marginal product of labor: $\frac{\Delta \text{ Total output}}{\Delta Q_L}$



At the low range of Q_L: teamwork and sepcialization of tasks → the marginal product of the second worker > of the first → the marginal product of labor will increase when increase Q_L.

At the point of **diminishing marginal productivity** of labor: adding more workers to a fixed capital base → restrict the output potential of additional worker → **the marginal product of labor starts to decline** although total output continues to increase.

Theoretically, there is some quantity of labor for which the **marginal product is actually negative** (total output decreases by one more worker).

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

1. Economic cost and Accounting cost

a payment to non – owner party for goods supplied to the firm and do not necessarily require a cash outlay → explicit cost.	**Accounting cost**
refers to the benefit forgone by not implementing the next best alternative → implicit cost	**Opportunity cost**

Accounting profit	Firm's net earnings on its income statement
Economic profit	Differences between revenue and the economic cost.

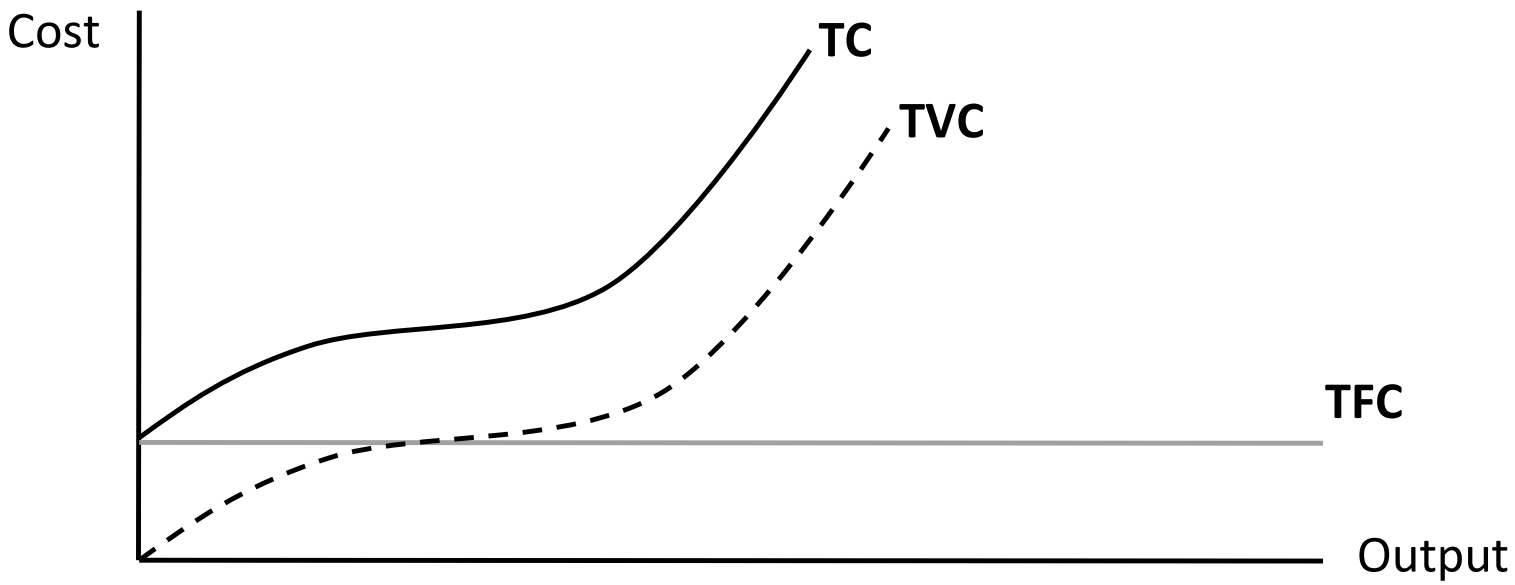
Total revenue	=	**Economic profit**	=	**Economic profit**	=	**Accounting profit**
		Economic cost		**Opportunity cost**		
				Accounting cost		**Accounting cost**

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

2. Total, average, marginal, fixed and variable costs

- **Total fixed cost (TFC)** is the summation of all expenses that **do not change as the level of production varies** and typically is incurred whether the firm produces anything or not.
- **Quasi – fixed cost** remains constant over some range of output but will rise if output increases beyond a specified quantity.
- **Total variable cost (TVC)** is the summation of all variable expenses and **rises with increased production and falls with decreased production.**
- **Total cost (TC)** is the summation of total fixed cost and total variable cost: TC = TFC + TVC



MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

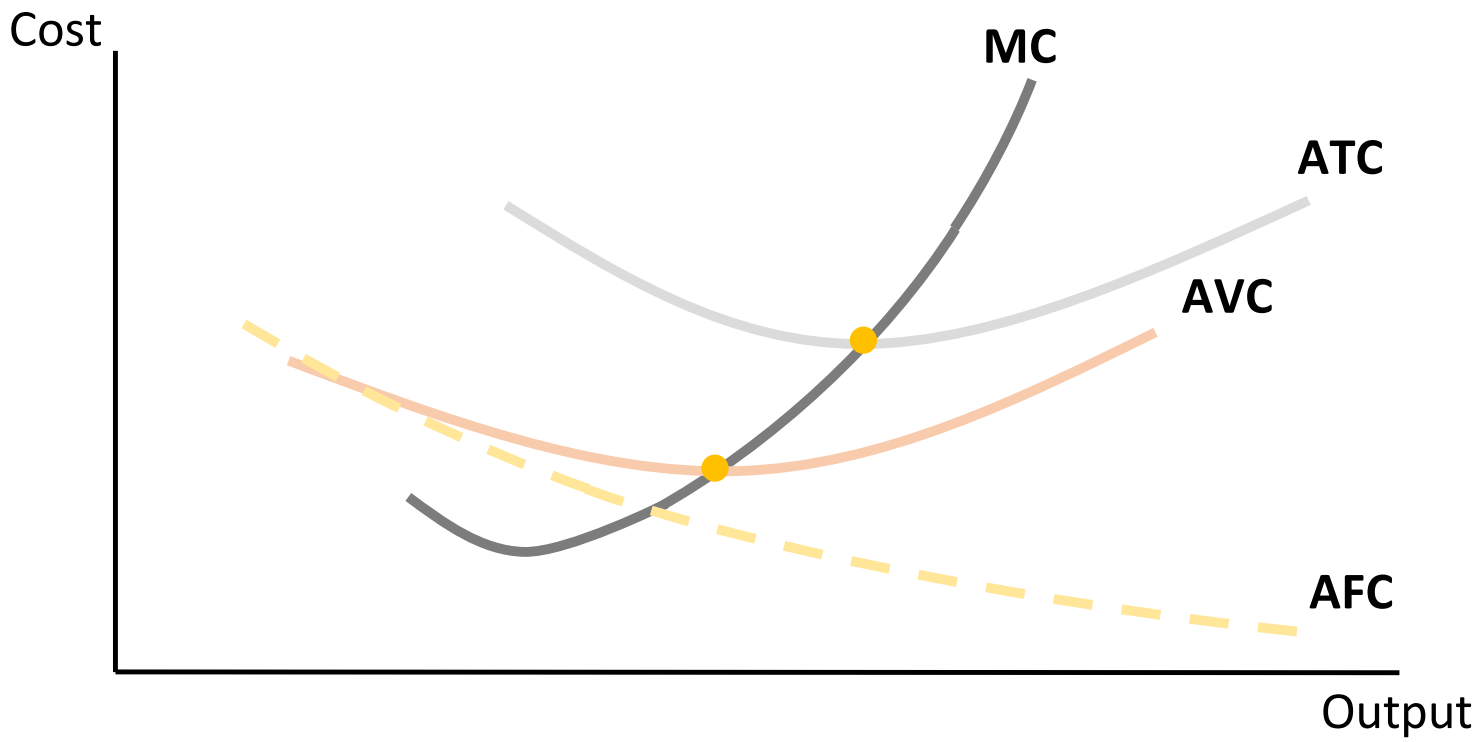
2. Total, average, marginal, fixed and variable costs

	Formula	Shape
Marginal cost (MC)	$\frac{\Delta TC}{\Delta Q}$	As Q rises → more units of labor needed → MC initially decreases due to specialization but eventually increases due to *diminishing marginal product* → **J-shaped MC curve.**
Average fixed cost (AFC)	$\frac{TFC}{Q}$	As Q rises → TFC are spread over more and more units → AFC falls at a decreasing rate → **downward sloping AFC curve**.
Average variable cost (AVC)	$\frac{TVC}{Q}$	Like MC, AVC is shaped like a **"U-curve"** due to *diminishing marginal product.*
Average total cost (ATC)	$\frac{TC}{Q}$	As Q rises, ATC initially declines due to the fall in AFC and AVC, but eventually increases due to the effect of falling AFC is offset by the increase in AVC → **U-shaped ATC curve.**

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

2. Total, average, marginal, fixed and variable costs



- MC intersects ATC and AVC from below at their **respective minimum points.**
- MC is below AVC/ATC → AVC/ATC falls.
- MC is above AVC/ATC → AVC/ATC rises.

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

3. Total, average and marginal revenue

	Definition	Formula
Total revenue (TR)	is equal to sum of individual units sold time their respective price	$\sum(P_i \times Q_i)$
Average revenue (AR)	is equal to total revenue divided by quantity	$\frac{TR}{Q} = \frac{\sum(P_i \times Q_i)}{Q}$
Marginal revenue (MR)	the increase in total revenue from selling one more unit	$MR = \frac{\Delta TR}{\Delta Q}$ $= \frac{(Q+\Delta Q)(\Delta P+P)-PQ}{\Delta Q}$ $= \frac{\Delta Q \times P + \Delta P \times Q + \Delta Q \times \Delta P}{\Delta Q}$ ★ $= P + \frac{\Delta P}{\Delta Q} \times Q$ $= P\left(1+\frac{\Delta P}{\Delta Q} \times \frac{Q}{P}\right)$ $= \mathbf{P\left(1+\frac{1}{elasticity}\right)}$

★ *In this calculation, we assumes that $\Delta Q \times \Delta P$ is close to zero.*

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

3. Total, average and marginal revenue

Relation between MR and D curve

- Demand function:

$$Q_D = a - bP \rightarrow P = \frac{a - Q_D}{b}$$

Slope of demand curve = -1/b

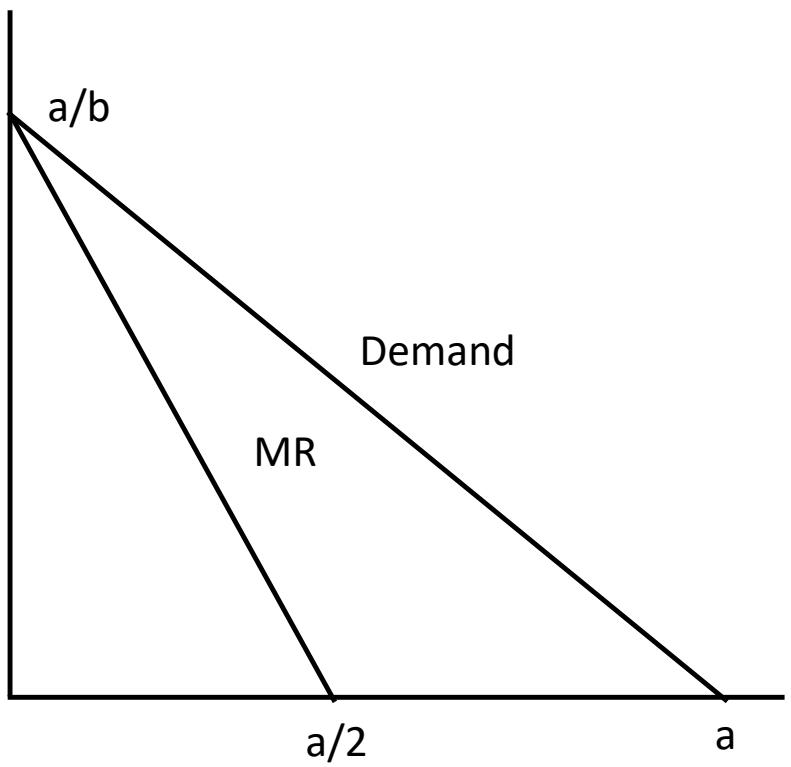
- TR function:

$$TR = Q_D P = \frac{aQ_D}{b} - \frac{Q_D^2}{b}$$

- MR function:

$$MR = \frac{\Delta TR}{\Delta Q} = \frac{a - 2Q_D}{b}$$

Slope of MR function = -2/b



- The MR and demand curve starts at the same point on the y-axis.
- Slope of the MR curve is two times as much as that of the demand curve.

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

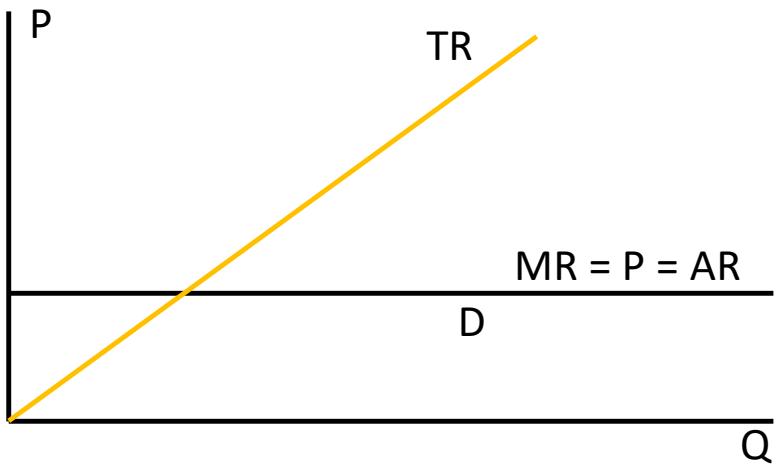
3. Total, average and marginal revenue

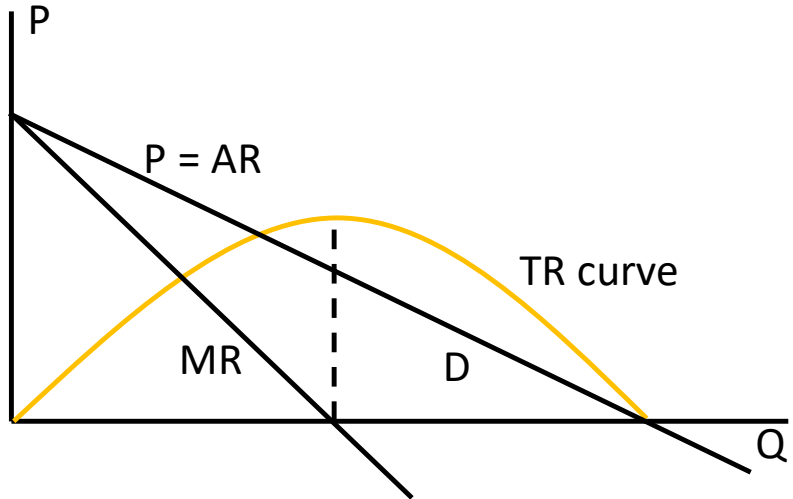
Under perfect competition

- The firm has no pricing power
  → accept market price for any level of output quantity
  → perfectly elastic demand curve for this firm → no need to lower P to sell more Q
- Elasticity = ∞ → $\frac{1}{\text{elasticity}} = 0$
  → **MR = P = AR**
- TR increases when increase Q

Under imperfect competition

- The firm has at least some control over price
  → downward sloping demand curve
- Elasticity < 0
  → $(1 + \frac{1}{\text{elasticity}}) < 1$
  → **MR < P = AR**
- **TR reaches its maximum** at the point demand elasticity = -1 (explained in Los1a) → **MR = 0**





MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

4. Profit maximization

Marginal revenue (MR)	Marginal cost (MC)
The total revenue increased resulting from selling one additional unit of output.	The total cost increased resulting from producing one additional unit of output.

Profit maximization rule

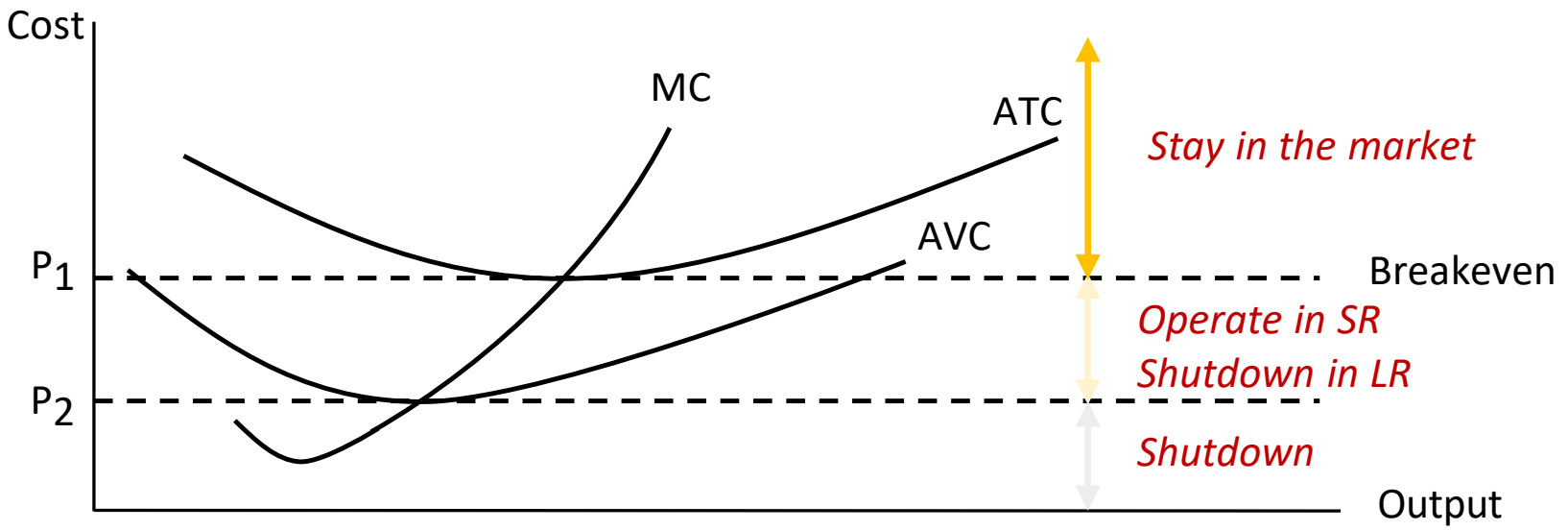
MR > MC	MR < MC
The additional revenue from the extra unit of output is greater than the additional cost → increase profit or reduce loss.	The additional revenue from the extra unit of output is less than the additional cost → decrease profit or increase loss.
↓	↓
Produce more	Produce less
↓	↓

Produce the quantity of output where **MR = MC → profit maximization**

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

5. Shutdown and Breakeven under perfect competition

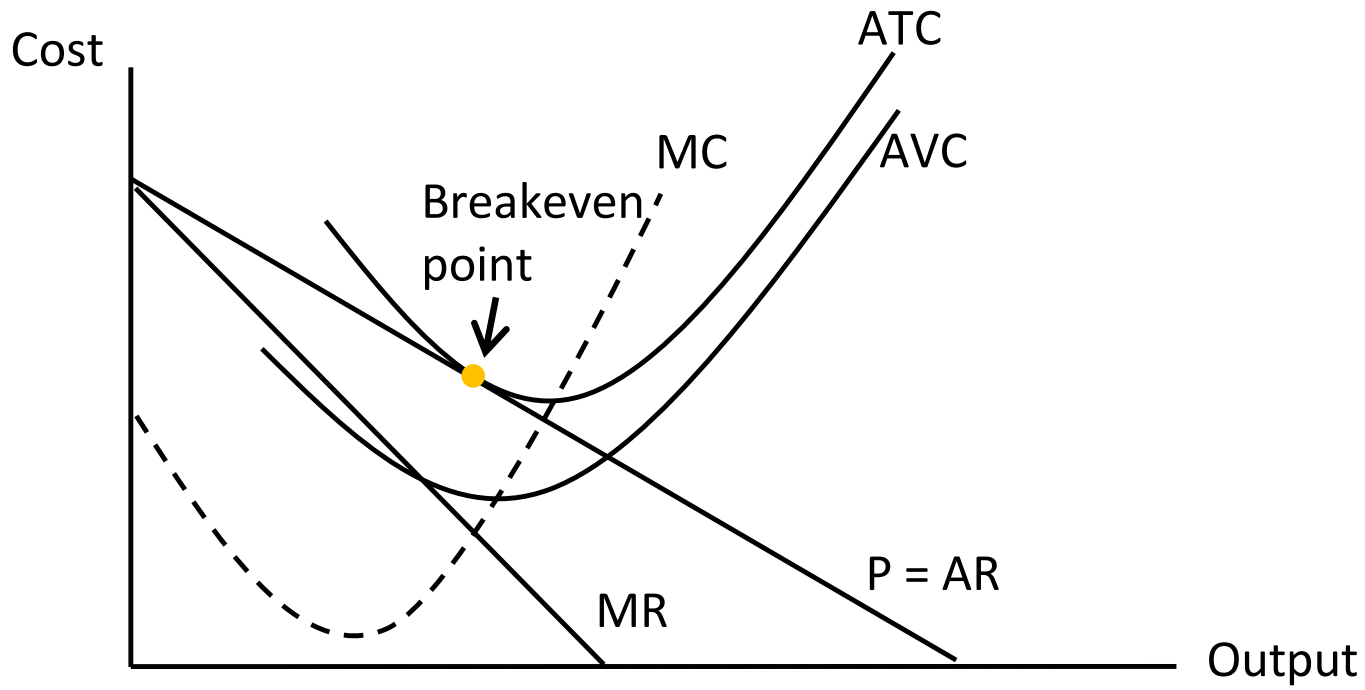


$P \geq P_1$	**$P \geq ATC$** → $AR \geq ATC$ → Profit ≥ 0 → **Stay in the market** ***(*) AR = ATC*** → *economic profit = 0* → ***breakeven point***	
$P_2 \leq P < P_1$	**$AVC \leq P < ATC$** → $AVC \leq AR < ATC$ → economic losses	**In the short run**: The losses < fixed costs → minimize its losses by continuing in business → **Stay in the market**
		In the long run: All costs are variable → shutdown to minimize losses → **Exit the market**
$P < P_2$	**$P < AVC$** → $AR < AVC$ → the losses > fixed costs → shutdown to minimize losses → **Exit the market**	

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.e] Determine and interpret breakeven and shutdown points of production

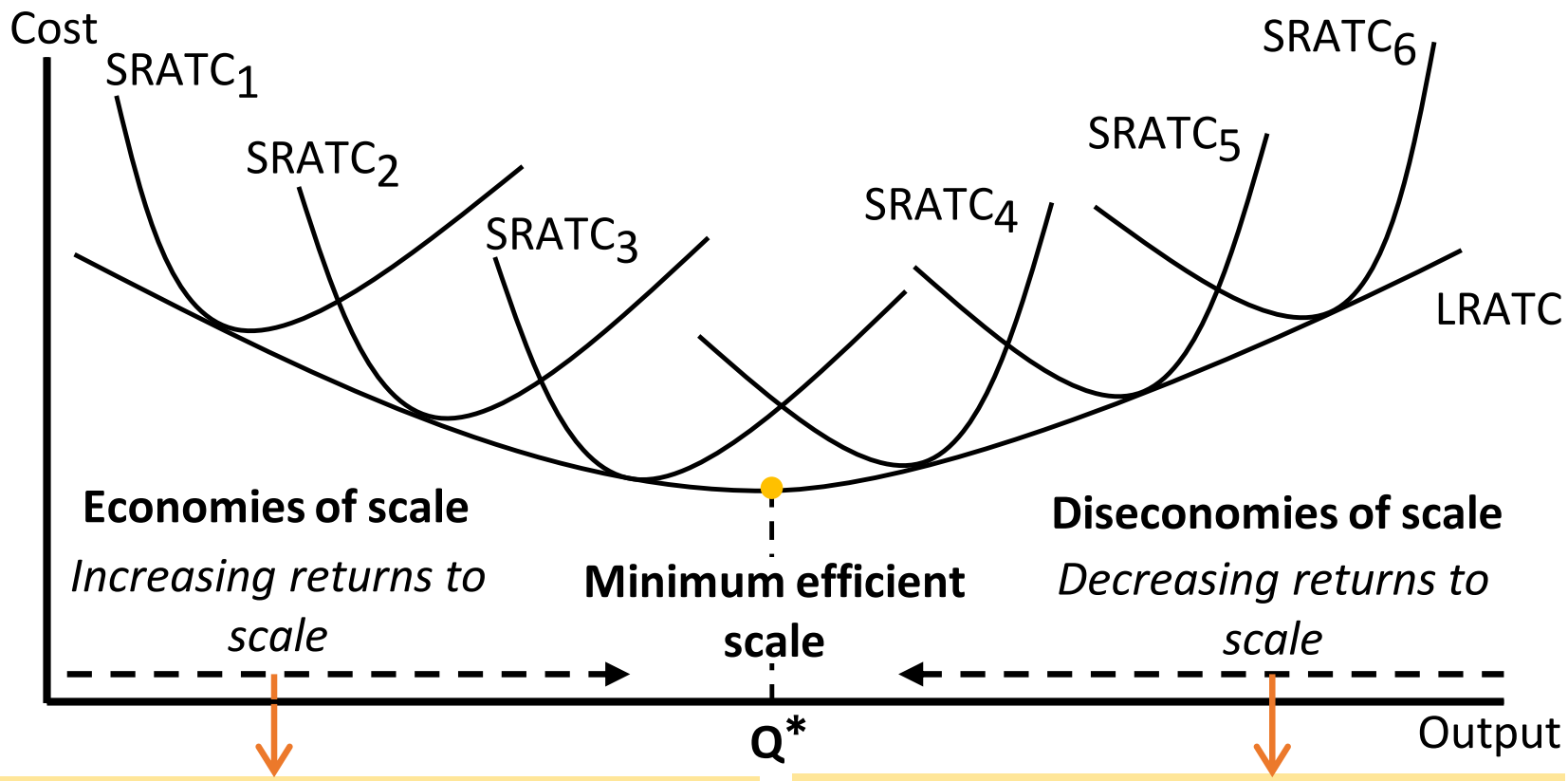
6. Shutdown and Breakeven under imperfect competition



	Short run	Long run
TR ≥ TC (AR ≥ ATC)	Stay in the market	Stay in the market
TVC ≤ TR < TC (AVC ≤ AR < AC)	Stay in the market	Exit the market
TR < TVC (AR < AVC)	Shut down production	Exit the market

MODULE 1: DEMAND AND SUPPLY ANALYSIS

[LOS 1.f] Describe how economies of scale and diseconomies of scale affect costs



- Expand production → reduce average costs
- Because mass production is more economical, labor specialization → improve producitvity and costs can be spread across more units of outputs
- Firms need to expand production to increase competitiveness

- Expand production → increase average costs
- Because larger firms → rise in bureaucracy → inefficiency in management, motivating a larger workforce...
- Firms aim to downsize toward the **minimum efficient scale Q^*** to increase competitiveness.

MODULE 2: THE FIRM AND MARKET STRUCTURES

Learning outcomes

2.a Describe characteristics of perfect competition, monopolistic competition, oligopoly, and pure monopoly

2.b Explain details about perfect competition

2.c Explain details about monopolistic competition

2.d Explain details about oligopoly

2.e Explain details about monopoly

2.f Describe the firm's supply function and pricing strategy under each market structure

2.g Describe the use and limitations of concentration measures in identifying market structure

MODULE 2: THE FIRM AND MARKET STRUCTURES

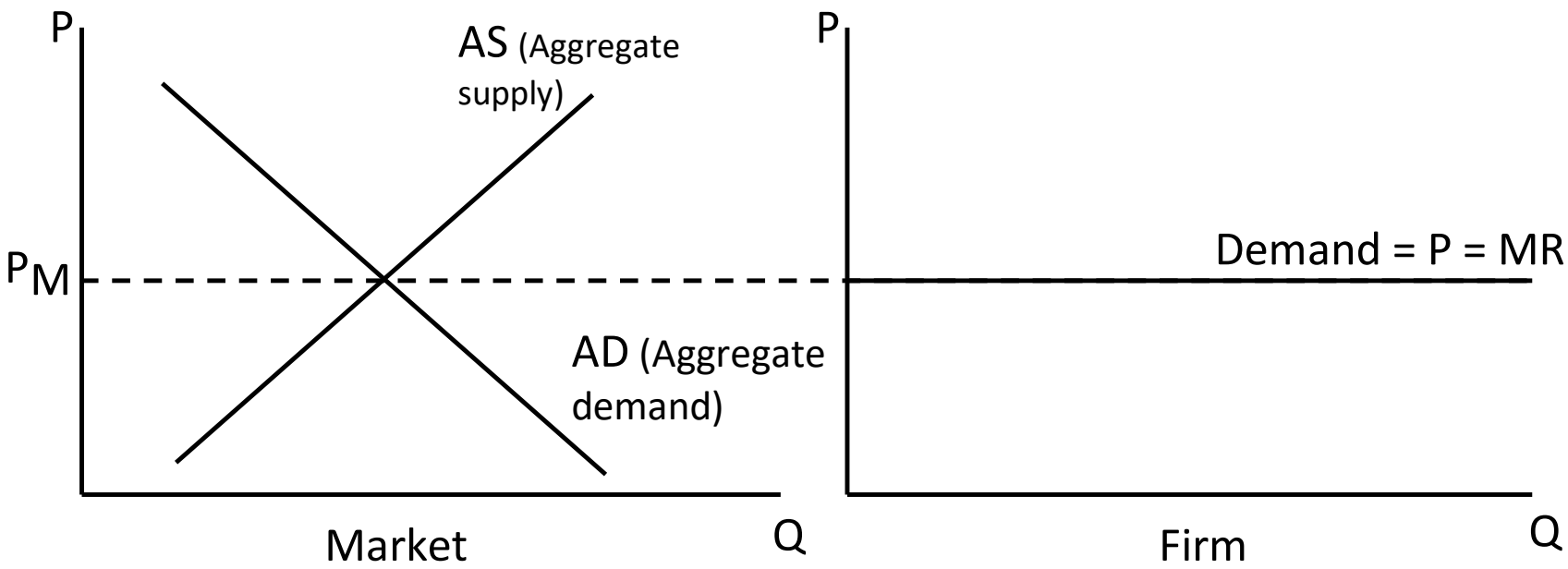
[LOS 2.a] Describe characteristics of perfect competition, monopolistic competition, oligopoly, and pure monopoly

	Perfect competition	Monopolistic competition	Oligopoly	Monopoly
Number of sellers	Many firms	Many firms	Few firms	Single firm
Barries to entry	Very low	Low	High	Very high
Nature of substitutes	Very good substitutes	Good substitutes but differentiated	Very good substitutes or differenti-ated	No good substitutes
Nature of competition	Price only	Price, marketing, features	Price, marketing, features	Advertising
Pricing power	None	Some	Some to significant	Significant
Example	Rice, sugar	Toothpaste, beverage	Cement, steel	Electricity

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

1. **Explain relationships between price, marginal revenue and the elasticity of demand**



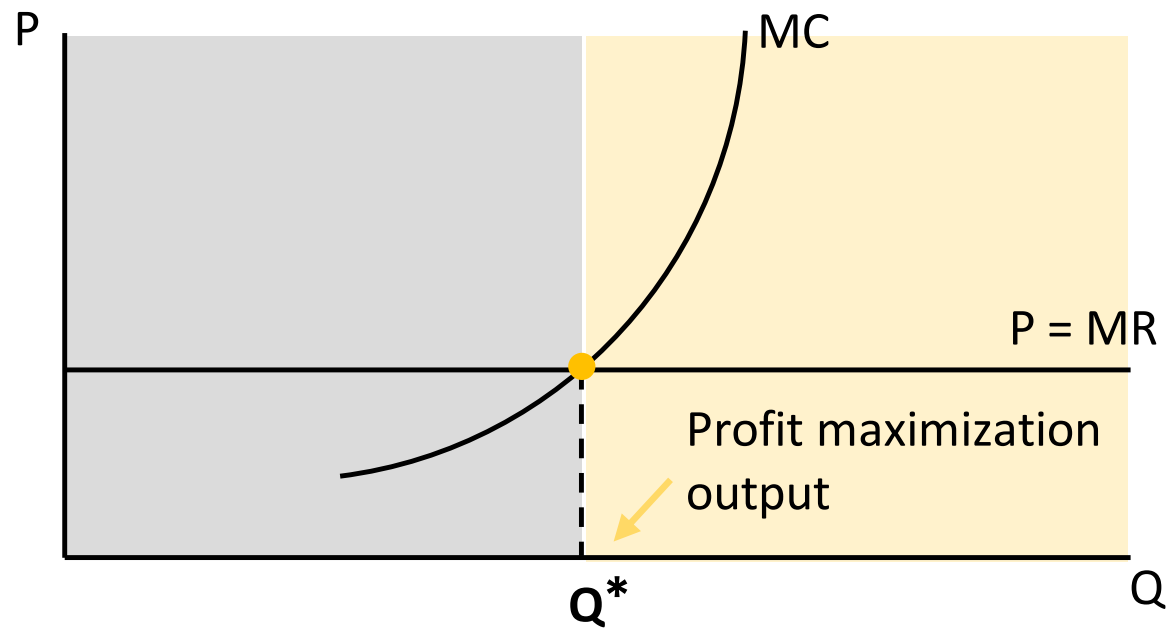
- As explained in Module 1, the market demand curve is downward sloping due to the income and substitution effects.
- Market price (P_M) is determined by the equilibrium of market demand and supply

- The firm has no pricing power → accept market price (P_M) for any level of output sold → **the demand curve faced by the firm is perfectly elastic (E = ∞)**
- Demand = P = MR = P_M *(Explanation presented in Los 1.e)*

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

2. The optimal price and output for firms



MR > MC	MR < MC
return increase > cost increase when produce one more unit of output → **expand** production up to Q^* to increase profit.	return increase < cost increase when produce one more unit of output→ **downsize** production down to Q^* to increase profit

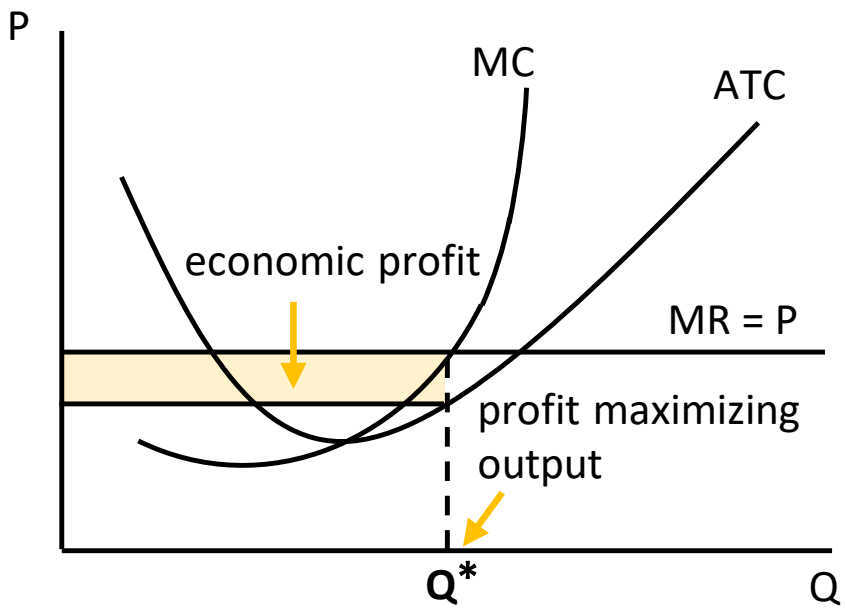
A firm maximizes profit by producing and selling the quantity $\mathbf{Q^*}$ for which **MR = MC** → short – run output decision for a firm is at MR = MC

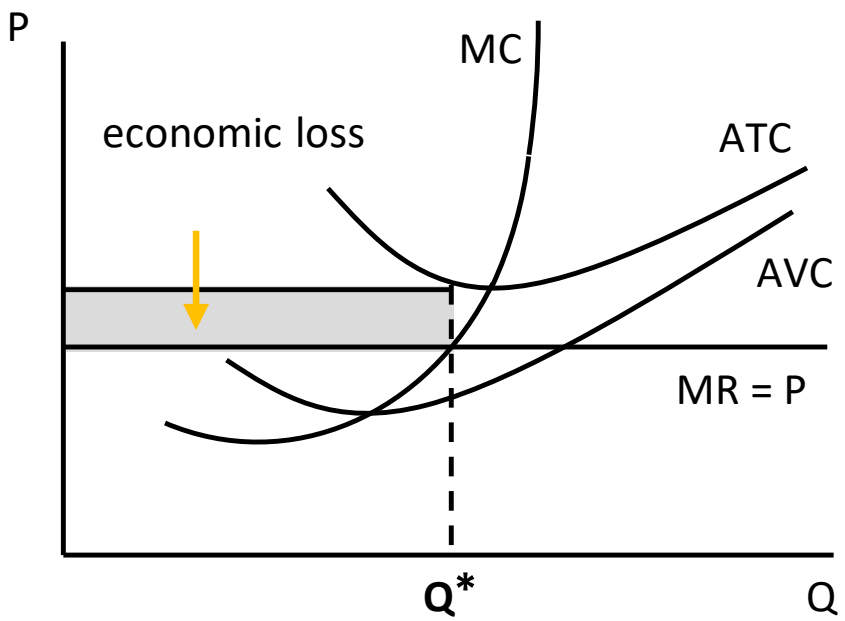
MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

2. The optimal price and output for firms

Short – run profit maximization and loss





In each scenario below, the firm always choose to produce at profit maximization output MR =MC.

P = AR = MR = MC > ATC
→ TR > TC
→ **economic profit**

P = AR = MR = MC = ATC
→ TR = TC
→ **normal profit**

P = MR = MC < ATC
→ TR < TC
→ **economic loss**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

2. The optimal price and output for firms

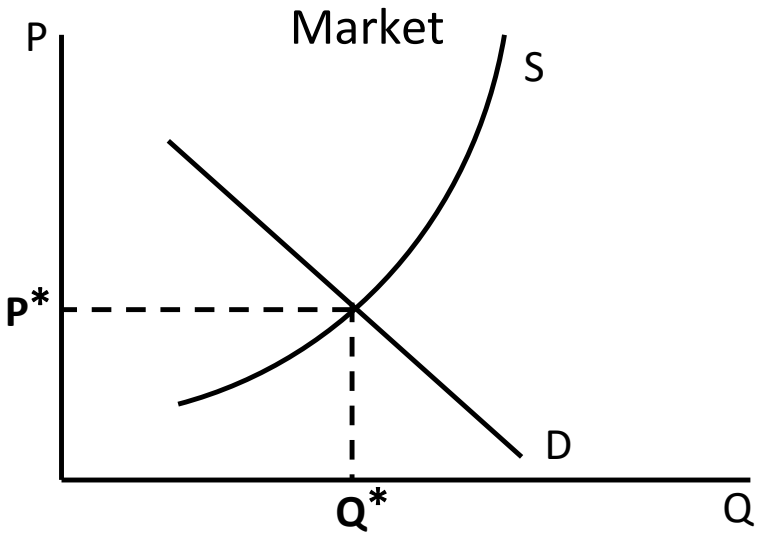
Long – run equilibrium

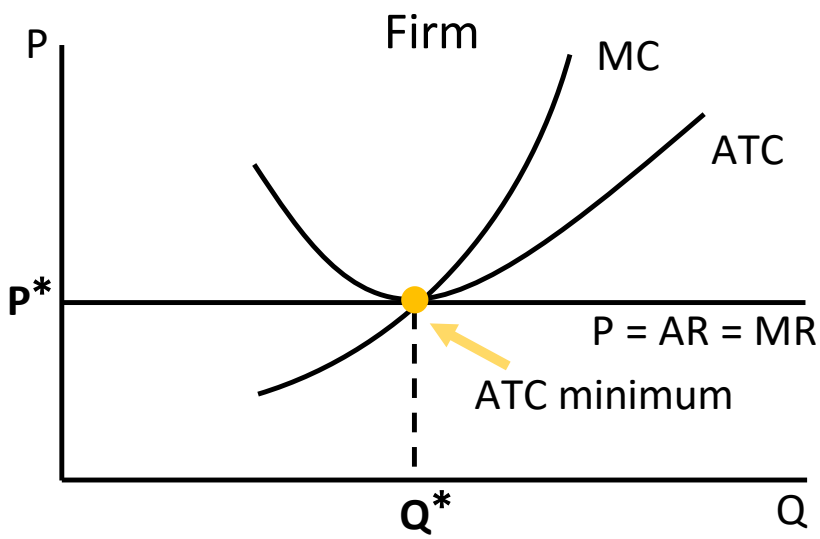
Economic profit → new firms enter the market → **increase in market supply** and **reduce market price down to firms' ATC**

Economic loss → some firms exit the market → **decrease in market supply** and **force market price up to firms' ATC**

In the long run, the perfectly competitive firm will operate at the point where entry is no longer profitable:

- **P = MR = MC = ATC** (**no economic profit** and **earn normal profit**)
- Each firm is producing the quantity for which **ATC is a minimum**

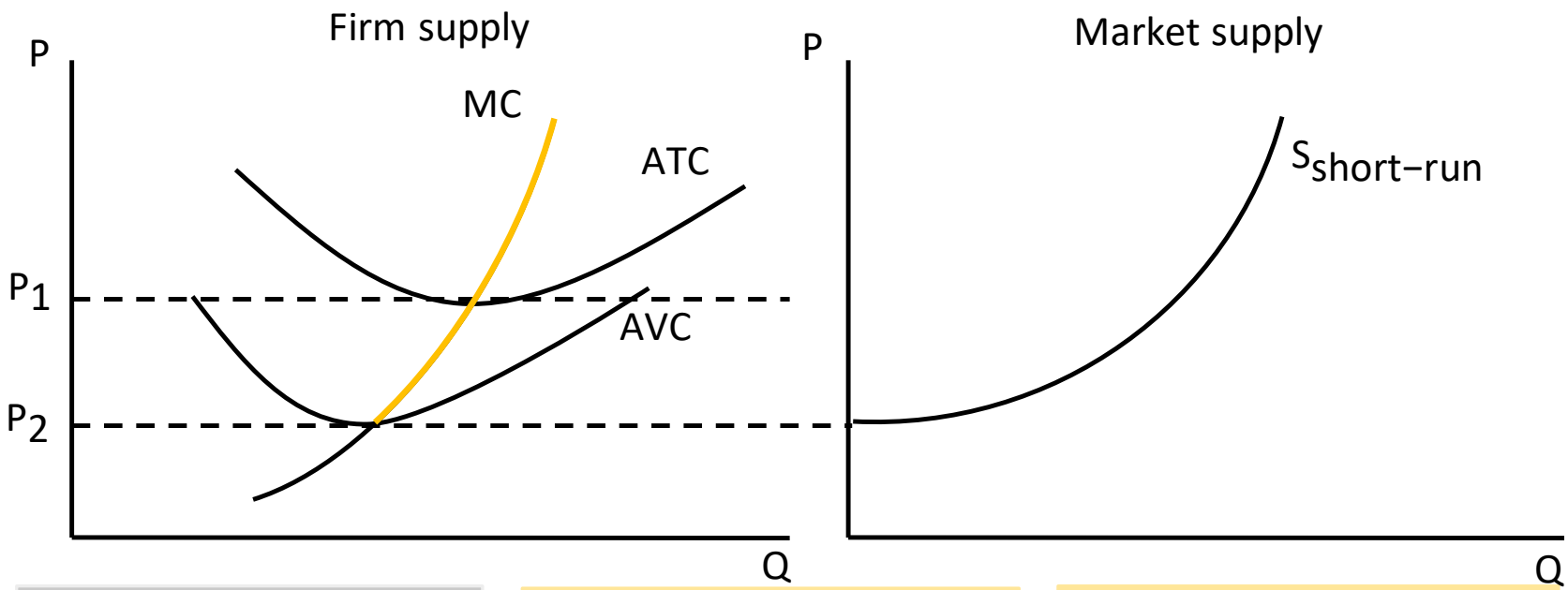




MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

3. Firm's supply function



P < AVC	AVC < P ≤ ATC	P > ATC
Shutdown	Operate in the short run at profit maximization point of P = MC	Expand its production at profit maximization point of P = MC

The firm will produce along the MC line (P = MR = MC) and above the AVC.

- **Short – run supply curve** for a firm is its **MC line above the AVC.**
- **Short – run market supply curve** is the **horizontal sum of the MC curves** of all firms in a industry.

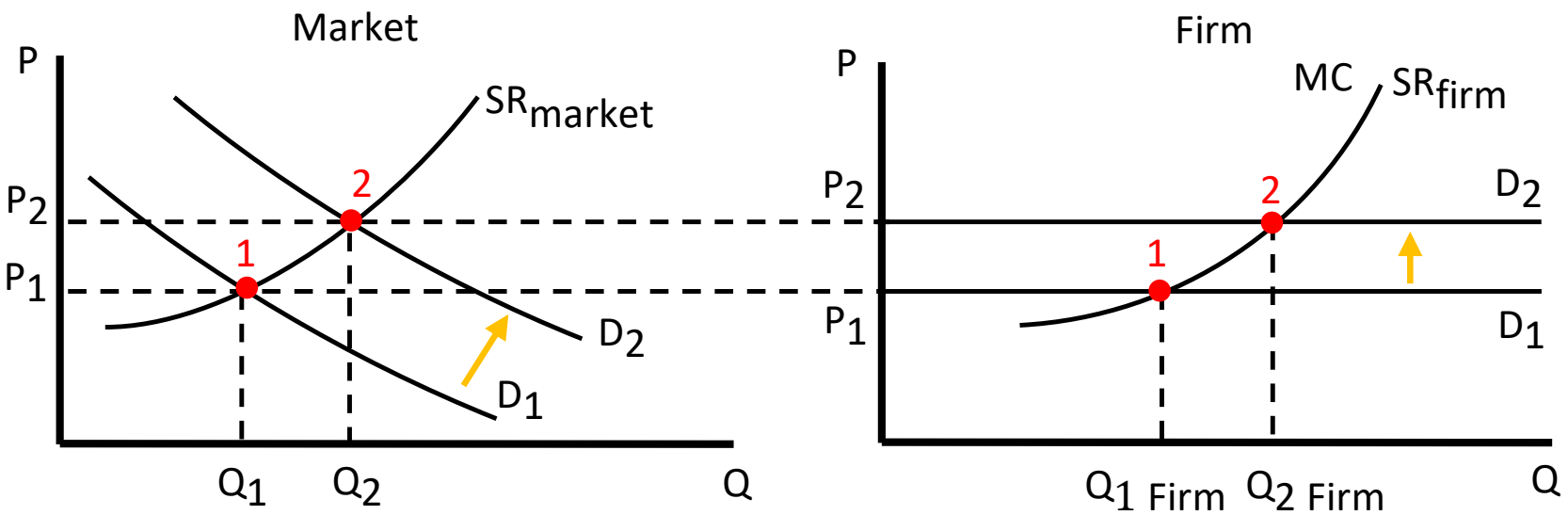
MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

4. Factors affecting long – run equilibrium

Short – run adjustment to an increase in demand

Increase market demand $D_1 \rightarrow D_2$: $P_1 \rightarrow P_2$ → Change the firm's demand curve: $D_1 \rightarrow D_2$ and $Q_{1\ Firm} \rightarrow Q_{2\ Firm}$



Short run

Long run

Market demand rises → Increase plant sizes to increase output

Positive economic profit → Attract new firms → industry supply increase → ↓ P_M → each firm produces less

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.b] Explain details about perfect competition

4. Factors affecting long – run equilibrium

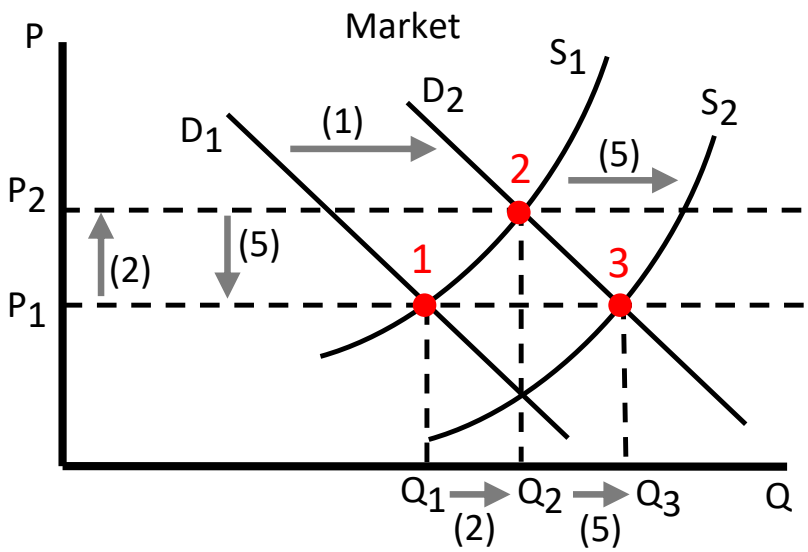
Effects of a permanent increase in demand

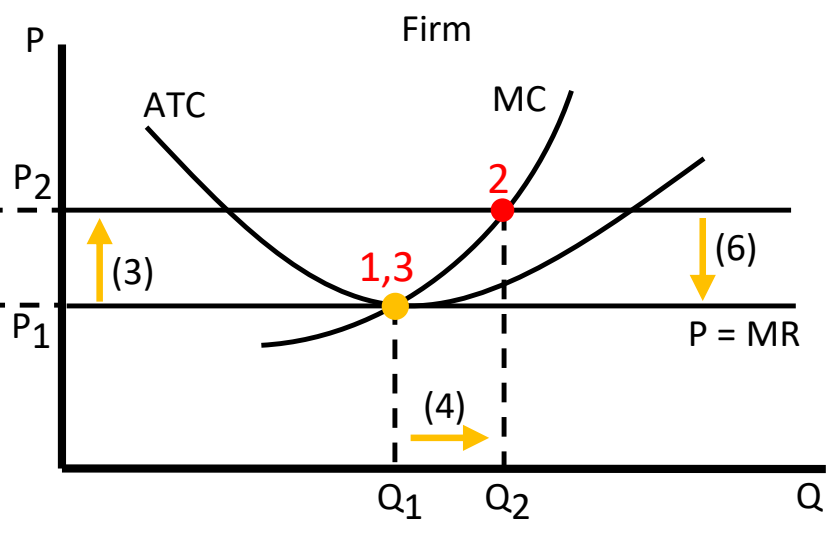
(1) Permanent increase in demand

(2) Rise in market price and quantity supplied due to increase in demand

(3) Each firm's demand rises

(4) The profit-maximizing quantity rises → positive economic profit → attract new firms entering the industry → increase total market supply





(5) Market supply curve shifts to S_2 → market price decline back to P_1 and market quantity rises to Q_3

(6) Demand /MR facing each firm decreases back to P_1 → P = MR = ATC → no economic profit and earns normal profit → long run equilibrium

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.c] Explain details about monopolistic competition

1. Market and demand characteristic

Large number of independent sellers	Each firm has a relatively small market share → no significant pricing power
	Firms need to focus on **average market price,** not the price of competitors
	Too many firms in the industry → no price fixing
Differentiated products	Products are slightly diferent over the firms → **close substitutes** for one another
Nature of competition	Price, quality and marketing → **quality is a significant product – differentiating characteristic**
Entry	**Low** barries to entry
Demand	Firms in monopolistic competition face **downward – sloping** and **highly elastic** demand curve.
Supply	There is no well – defined supply function.

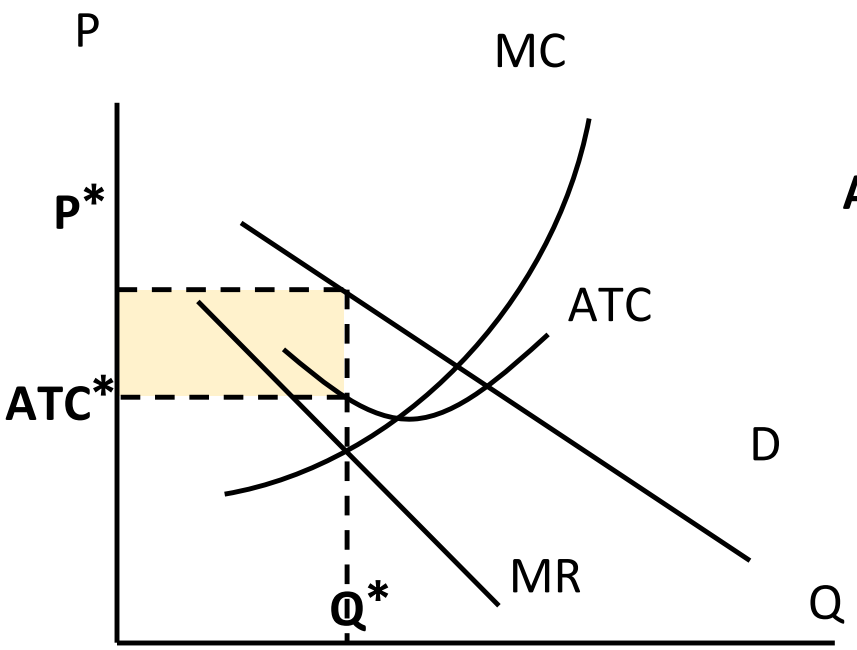
MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.c] Explain details about monopolistic competition

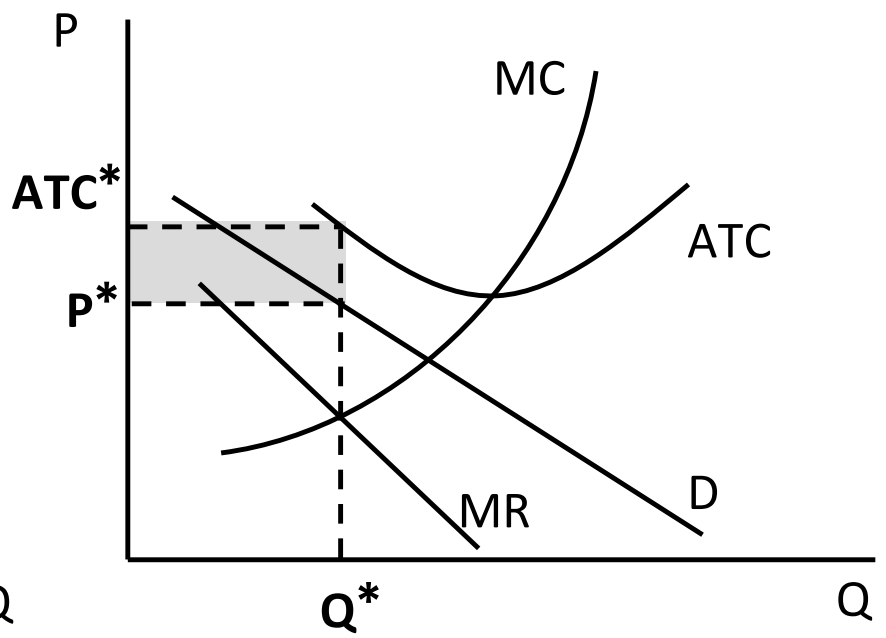
2. The optimal price and output for firms

Short – run profit maximization and loss

- Like perfect competition, firms under monopolistic competition maximize economic profits by producing the quantity for which **MR = MC** → short – run output decision for a firm MR = MC.
- Price is charged for that quantity from the demand curve.



P* > ATC → economic profits



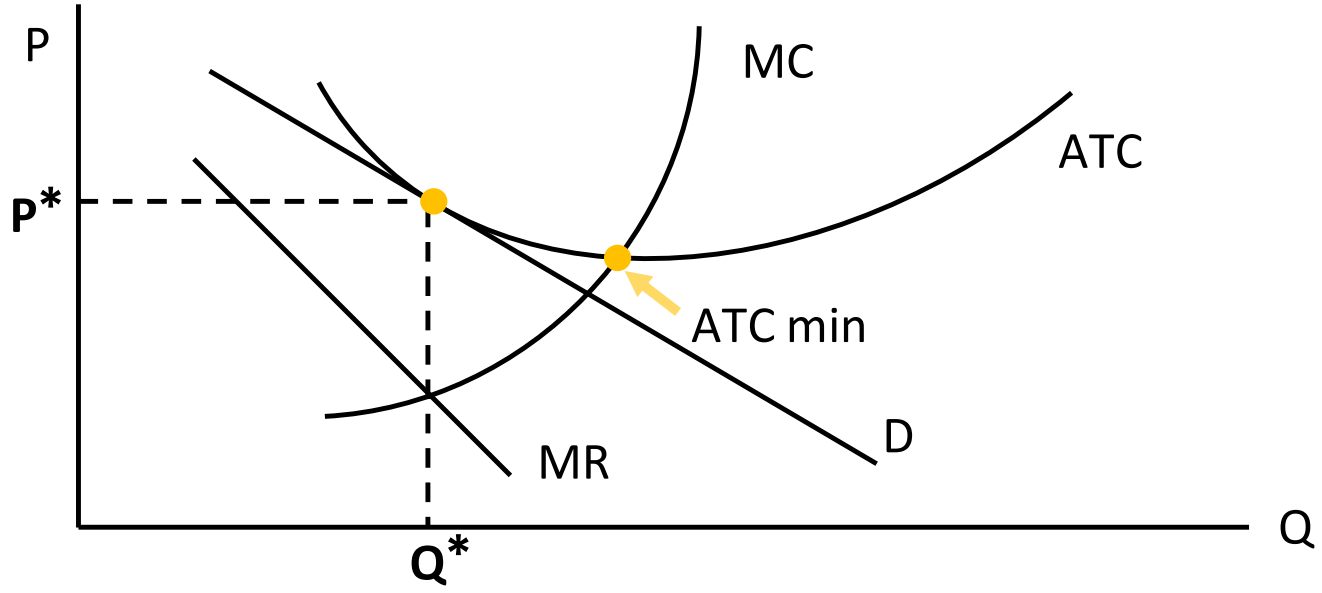
P* < ATC → economic losses

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.c] Explain details about monopolistic competition

2. The optimal price and output for firms

Long – run equilibrium



Economic profit → new firms enter the market → each firm's demand decreases down to the point where P = ATC

Economic loss → some firms exit the market → firm's demand increases up to the point where P = ATC

In the long run, the monopolistic competitive firm will operate at the point where entry is no longer profitable:

- **P = ATC → economic profit = 0 and earn normal profit**
- Each firm is producing the quantity for which ATC is **not** a minimum

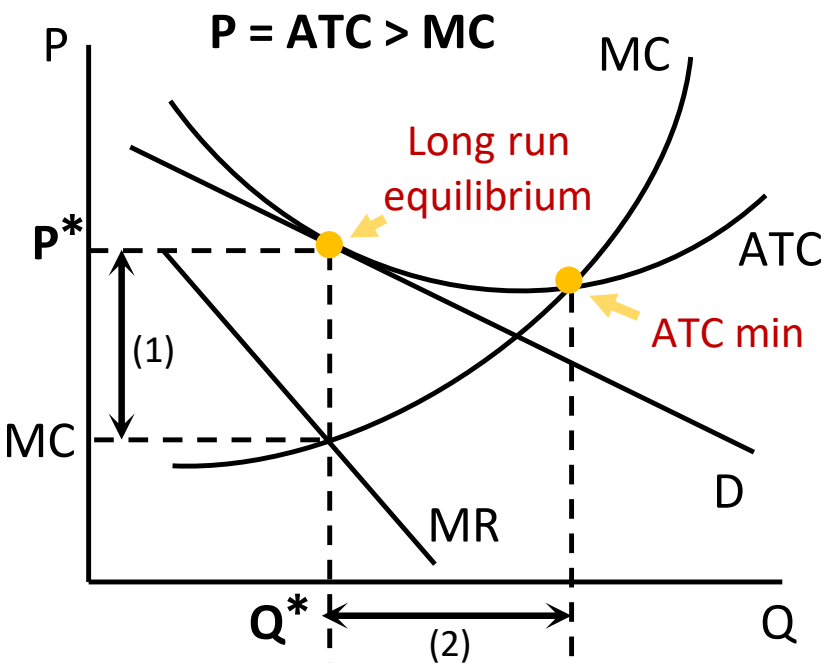
MODULE 2: THE FIRM AND MARKET STRUCTURES

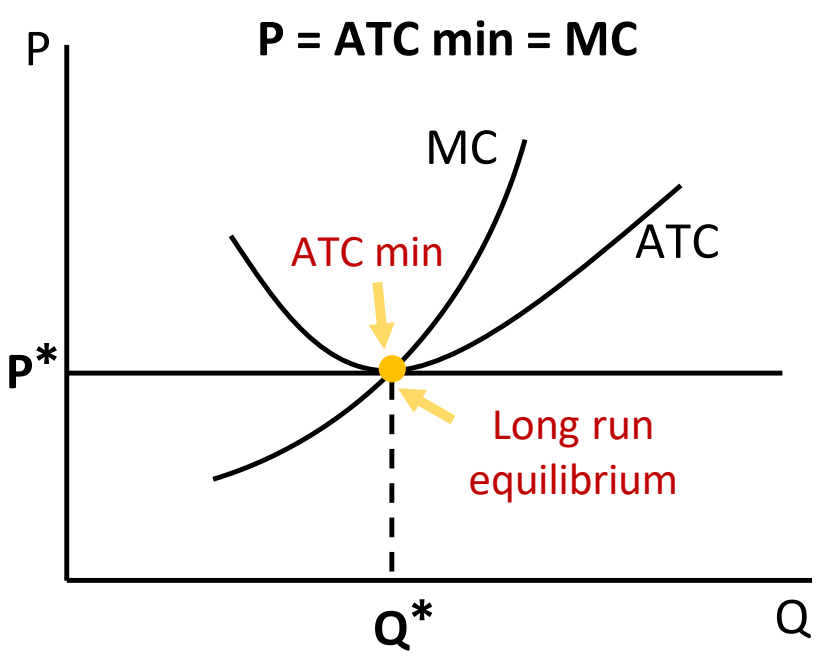
[LOS 2.c] Explain details about monopolistic competition

2. The optimal price and output for firms

Long – run equilibrium

Monopolistic competition	Perfect competition





Under monopolistic competition:

- A firm generally produces **lower output** and charges **higher price** than under perfect competition.
- P > MC, **(P – MC) = markup (1)**
- Each firm is producing the quantity for which ATC is not a minimum → **excess capacity (2)** or **inefficient scale of production.**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

1. Market and demand characteristic

Small number of independent sellers	Firms enjoy substantial pricing power
	A price change by one firm can be expected to be met by a price change by its competitors → firms' demand is interdependent.
Differentiated products	The products offered by sellers are **close substitutes** for each other.
Nature of competition	Price, quality and marketing and other nonprice strategies.
Entry	High barries to entry
Demand	Oligopoly markets' demand curves depend on the degree of pricing interdependence: kinked demand curve, collusion, dominant firm, nash equilibrium.
Supply	There is no well – defined supply function.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Kinked demand curve model

Definition

Kinked demand curve model is a model in which demand curve is not a straight line but has a different elasticity for higher and lower prices.

Assumption

The kinked demand curve model assumes that **an increase in a firm's product price will not be followed by its competitors but a decrease in price will:**

- If lowering its price to match a competitor's price reduction → its buyers' demand will not decrease.
- If not matching the price increase → will attract buyers due to its relatively lower price.

Result

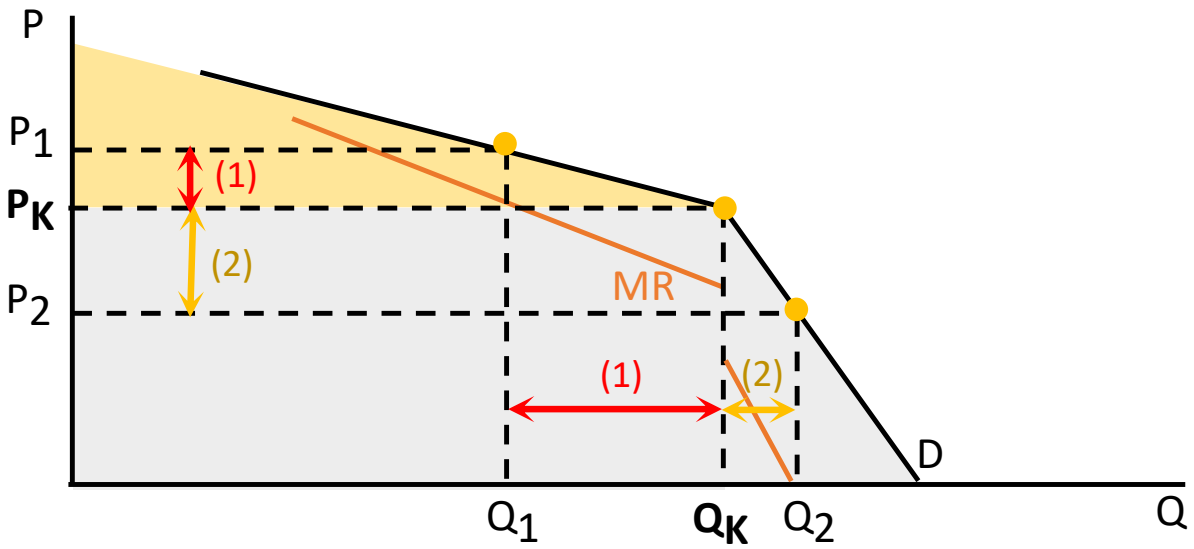
Firms will maximize profits at the quantity and price level where MC passes through the MR gap – (P_K, Q_K)

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Kinked demand curve model



Firm	Demand	Revenue	Needs to
Raises its price to $P_1 > P_K$	its competitors will remain at P_K → suffer a large decrease in demand due to its highest price → ↑P < ↓Q **(1)** → **elastic** demand	TR declines	lower P to P_K
Decrease its price to $P_2 < P_K$	its competitors will match the price cut → all firms only have a small increase in demand → ↓P > ↑Q **(2)** → **inelastic** demand	TR declines	Raise P to P_K

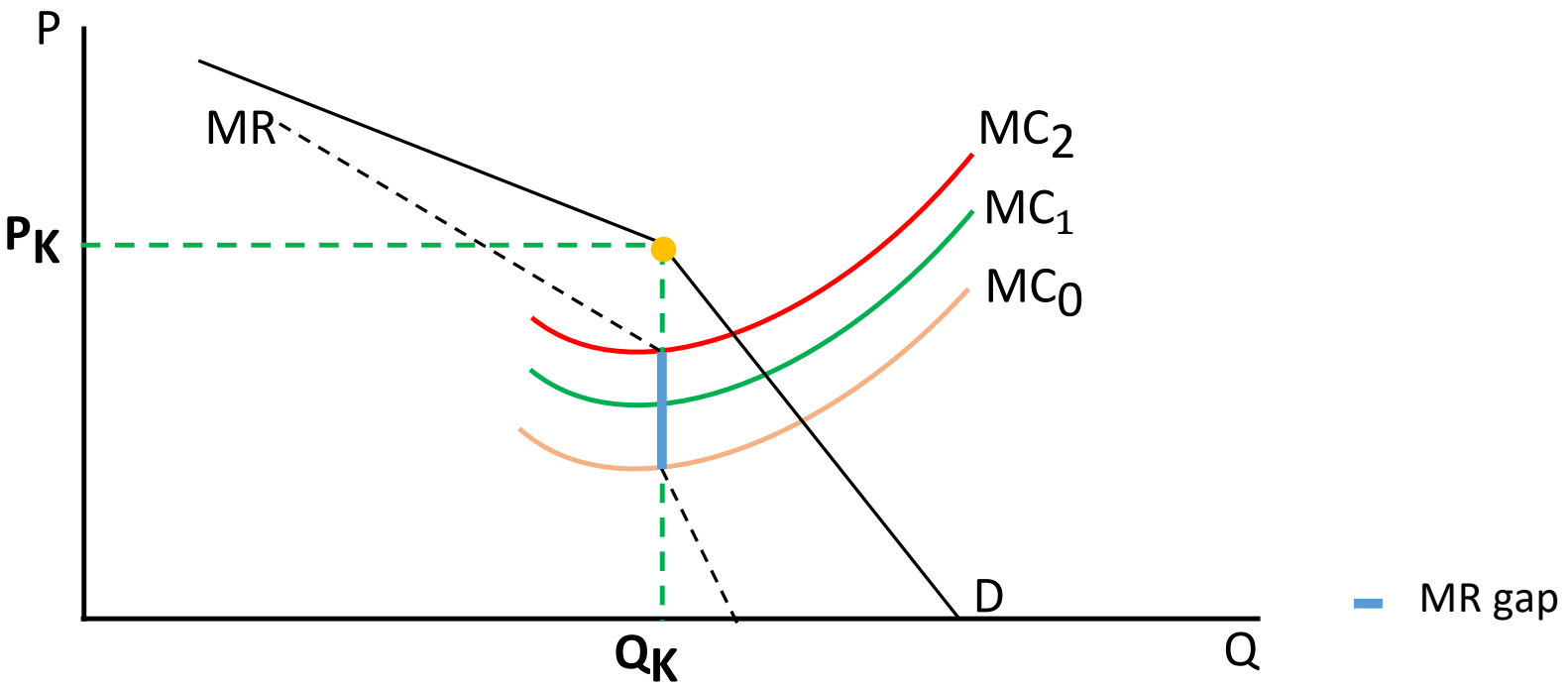
- **A kink in demand curve** → a **gap** in associated MR curve.
- Maximize revenue at **(P_K, Q_K)**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Kinked demand curve model



$MC_1 \cap MR = (Q_K, P_K)$

$MC_0 \cap MR = (Q_K, P_K)$

$MC_2 \cap MR = (Q_K, P_K)$

If the MC curve passes through the MR gap, the most profitable price and output combination **remains unchanged** (Q_K, P_K), even when the marginal cost increases from MC_0 to MC_2.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Cournot model

Definition

Cournot model is an economic model describing an industry structure in which rival companies offering an identical product compete on the amount of output they produce, independently and at the same time.

Assumption

- There are **only two firms** with **identical** and **constant MC** of production.
- In equilibrium, no firm has an incentive to change output.
- In the long run, prices and output are stable—there is no possible change in output or price that would make any firm better off.

Result

- Both firms sell the **same quantity of outputs,** splitting the market equally at the equilibrium price.
- $P_{perfect\ competition} < P_{equilibrium} < P_{monopoly}$

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Cournot model

Example 1: The market demand curve is given as: $Q_D = 400 - P$.
The supply function is represented by its constant MC = 40. Determine equilibrium price and output in the long run under Cournot's assumption.

Answer:
The Cournot strategy's solution: $Q_D = q_1 + q_2$ where q_1 and q_2 represent the output level of 2 firms

$\rightarrow P = 400 - q_1 - q_2$ and $MC = 40$

Total revenue and marginal revenue for each firm:

$TR_1 = P \times q_1 = 400\, q_1 - q_1^2 - q_1\, q_2 \rightarrow MR_1 = 400 - 2\, q_1 - q_2$

$TR_2 = P \times q_2 = 400\, q_2 - q_1\, q_2 - q_2^2 \rightarrow MR_2 = 400 - q_1 - 2\, q_2$

Each firm will maximize profit where MR = MC

$\rightarrow 400 - 2\, q_1 - q_2 = 400 - q_1 - 2\, q_2 = 40$

Because q2 = q1 under Cournot's assumption, insert this solution into the demand function and solve as

$\rightarrow 400 - 3\, q_1 = 400 - 3\, q_2 = 40$

$\rightarrow q_1 = q_2 = 120$

$\rightarrow$ Equilibrium: $Q_D = 240$ and $P = 160$

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Nash equilibrium model

Definition

Nash Equilibrium is a game theory concept that determines the optimal solution in a non-cooperative game in which each player lacks any incentive to change his/her initial strategy.

Assumption

- **A Nash equilibrium** is reached when the choices of all firms are such that **there is no other choice that makes any firm better off** (increase profit or decline loss).
- Each firm tries to maximize its own profits given the responses of its rivals: each firm anticipates how its rival will respond to a change in its strategy and tries to maximize its profits under the forecasted scenario.

Result

The firms in the market are **interdependent**, but their actions are noncooperative: firms do not collude to maximize profits.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Nash equilibrium model

Illustration of the Nash equilibrium

Case 1: Two firms both have advantaged strategy

A **collusion** agreement to charge a high price of 2 firms, but each firm may cheat by charging a low price, the profits of each firm are as shown:

	B honors	***B cheats***
A honors	A earns 150 B earns 150	A earns 50 B earns 200
A cheats	A earns 200 B earns 50	A earns 100 B earns 100

Firm A 's choice

	A honors	***A cheats***
B honors	A earns 150 ~~B earns 150~~	A earns 200 ~~B earns 50~~
B cheats	A earns 50 ~~B earns 200~~	A earns 100 ~~B earns 100~~

A choose to cheat

A choose to cheat

A has **an advantaged strategy to cheat**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Nash equilibrium model

Firm B 's choice

	B honors	*B cheats*
A honors	~~A earns 150~~ B earns 150	~~A earns 50~~ B earns 200
A cheats	~~A earns 200~~ B earns 50	~~A earns 100~~ B earns 100

B choose to cheat

B choose to cheat

B has **an advantaged strategy to cheat**

Nash equilibrium

Nash equilibrium when both firm A and B choose to **cheat** the agreement to charge a low price and each firm earns 100.

	B honors	***B cheats***
A honors	A earns 150 B earns 150	A earns 50 B earns 200
A cheats	A earns 200 B earns 50	A earns 100 B earns 100

The greatest joint profit is when 2 firms honor the collusion (each firm can get 150), but both firms unilaterally maximize profit by cheating → only get 100 per firm.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Nash equilibrium model

Case 2: Only one party has an advantaged strategy

A **collusion** agreement to charge a high price of 2 firms, but each firm may cheat by charging a low price, the profits of each firm are as shown:

	B honors	***B cheats***
A honors	A earns 150 B earns 150	A earns 50 B earns 200
A cheats	A earns 120 B earns 50	A earns 100 B earns 100

Firm A 's choice

	A honors	***A cheats***
B honors	A earns 150 ~~B earns 150~~	A earns 120 ~~B earns 50~~
B cheats	A earns 50 ~~B earns 200~~	A earns 100 ~~B earns 100~~

A choose to honor

A choose to cheat

A has no **advantaged strategy.**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Nash equilibrium model

Firm B 's choice

	B honors	***B cheats***
A honors	~~A earns 150~~ B earns 150	~~A earns 50~~ B earns 200
A cheats	~~A earns 120~~ B earns 50	~~A earns 100~~ B earns 100

B choose to cheat

B choose to cheat

B has **an advantaged strategy to cheat**

Nash equilibrium

Nash equilibrium when B chooses to **cheat** the agreement and A chooses to cheat in response.

	B honors	***B cheats***
A honors	A earns 150 B earns 150	A earns 50 B earns 200
A cheats	A earns 120 B earns 50	A earns 100 B earns 100

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Stackelberg dominant model

Definition

Stackelberg model is a leadership model that allows the firm dominant in the market to set its price first and subsequently, the follower firms optimize their production and price.

Assumption

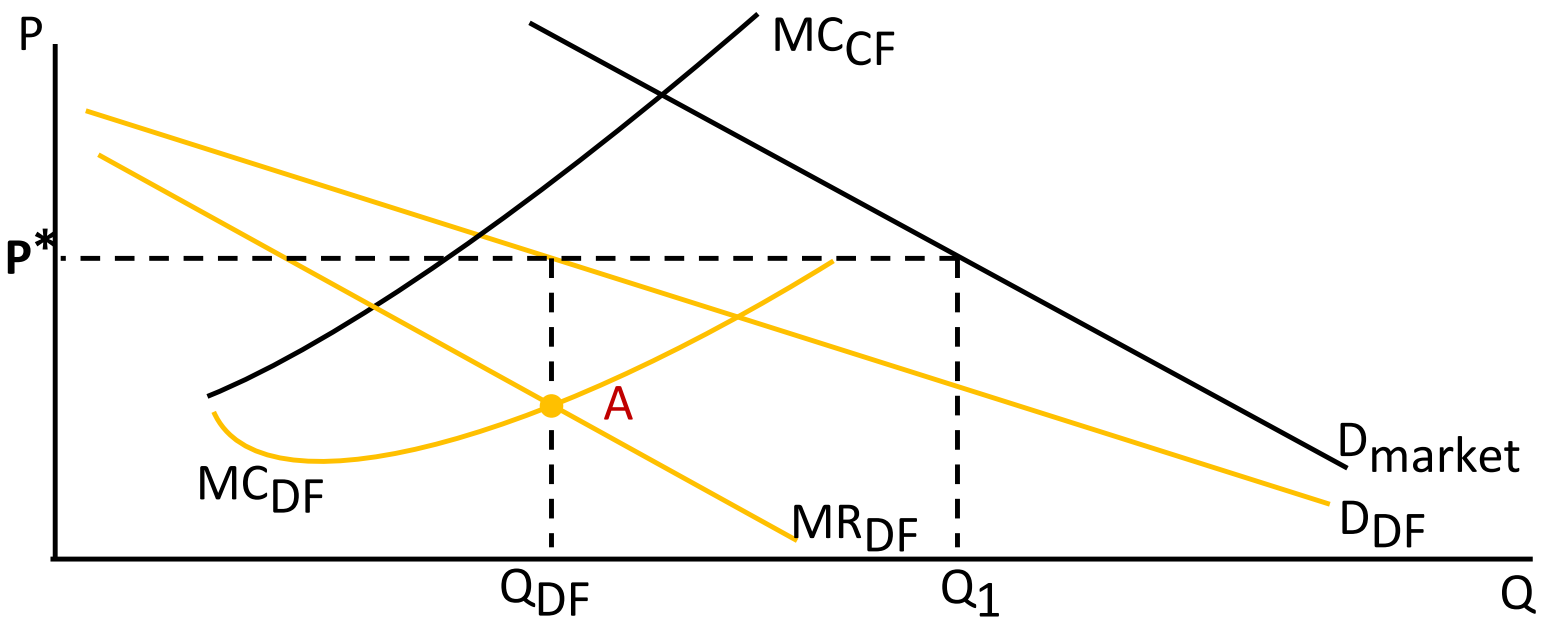
- There is a single firm that has a significantly large market share because of its greater scale and lower cost structure — the dominant firm (DF).
- Price is charged by the dominant firm and other competitors (CF) take this price.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Illustration of Stackelberg dominant model



Result

- The dominant firm determines its profit – maximizing output level Q_{DF} where $\mathbf{MC_{DF} = MR_{DF}}$ **(A)**
- The price charged by the dominant firm P^* is derived from the demand curve that it faces (D_{DF}) → CF must accept the selling price P^* → *CF under oligopoly acts like firms under perfect competition*.
- The other (smaller) firms in the industry will share the portion of market demand that is left unmet by the dominant firm ($Q_1 - Q_{DF}$)

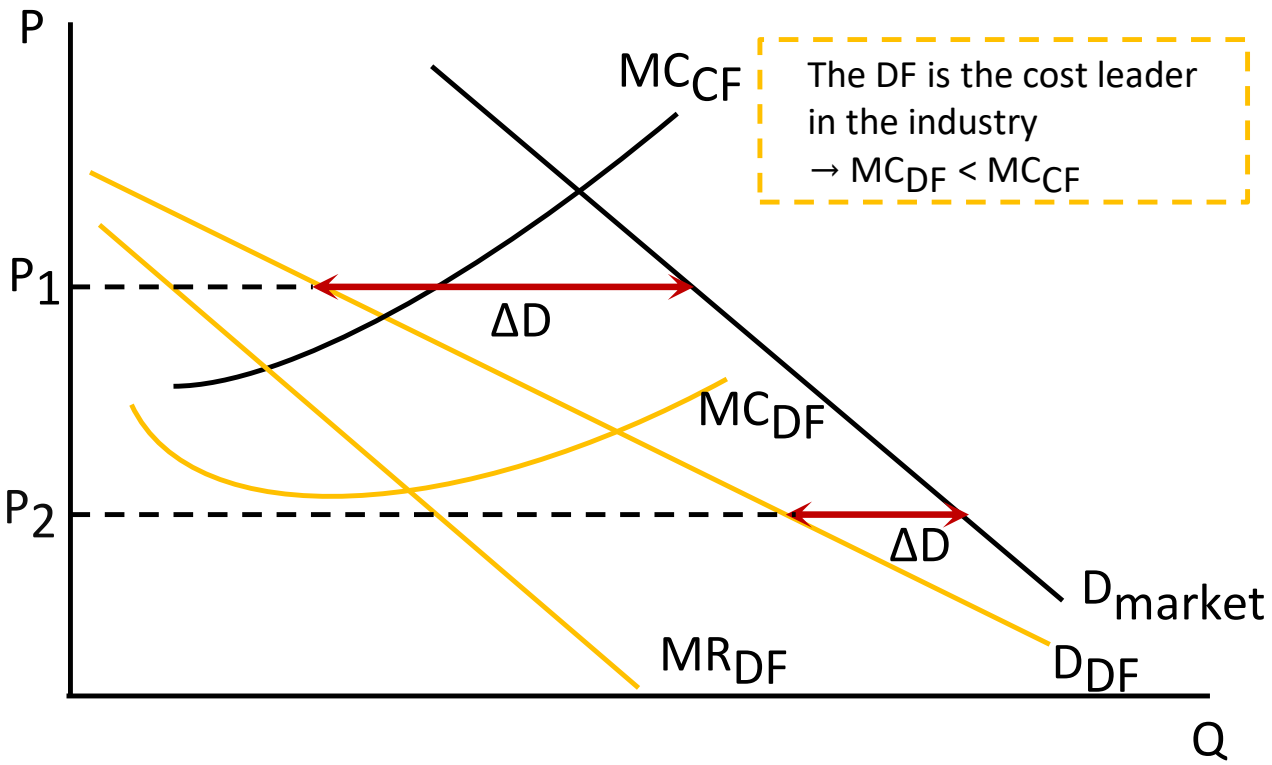
MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.d] Explain details about oligopoly

2. The optimal price and output for firms

Stackelberg dominant model

Result (cont)



The DF is the cost leader in the industry
→ $MC_{DF} < MC_{CF}$

At low prices, the smaller firms will not be able to sell at prices below cost (MC)
→ reduce ouput or exit the market
→ the difference between D_{market} and D_{DF} (ΔD) falls at lower price.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.e] Explain details about monopoly

1. Market characteristic

A single seller represents the market	Firms have **considerable pricing power**
Differentiated products	Highly differentiated products → **no close substitutes.**
Nature of competition	Non – price strategies such as advertising
Entry	Very high barries to entry with high cost.
Demand	Firm in monopoly faces a downward demand curve.
Supply	There is no well – defined supply function.

Sources of market power

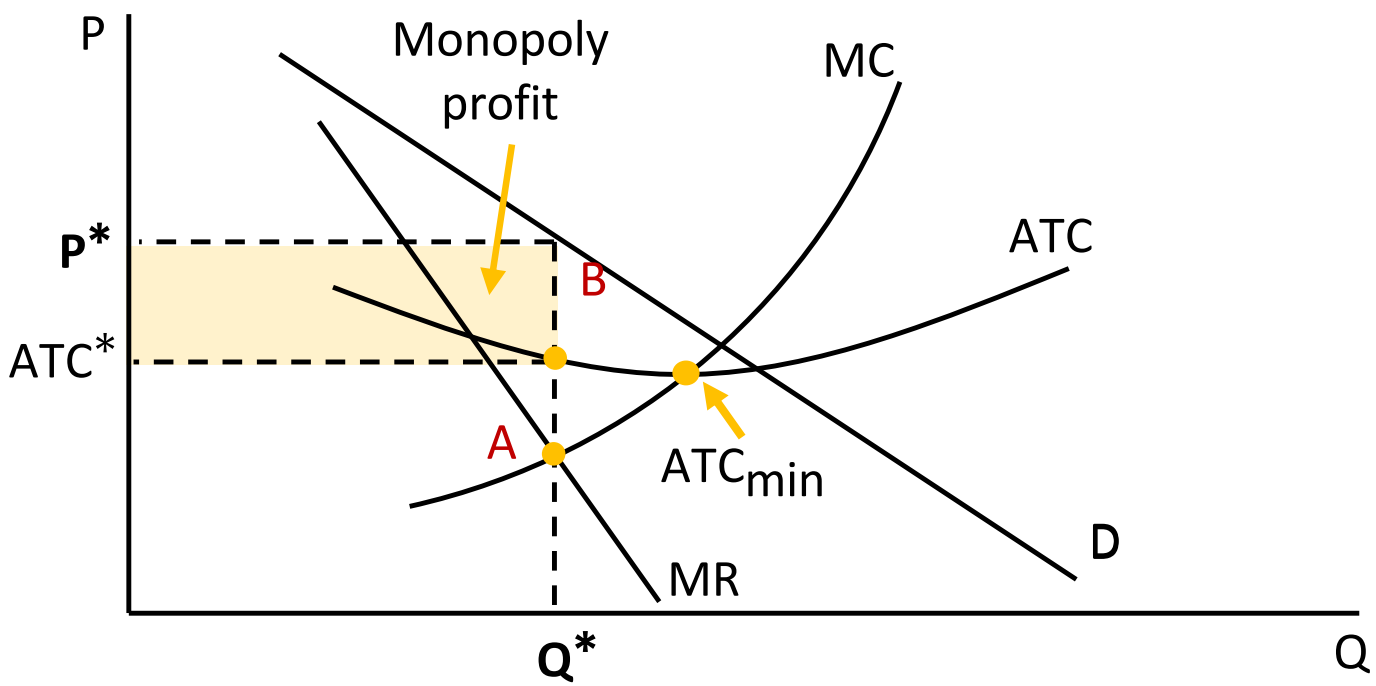
- Patent and copyringht
- Control over critical sources of production. E.g: Diamond mining industry
- Government-controlled authorization (natural monopoly)
- Non-price differentiation leading to pricing-power such as marketing or brand loyalty. E.g: Rolex watches
- Network effects, which result from synergies related to increasing market penetration. E.g: Microsoft

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.e] Explain details about monopoly

2. The optimal price and output for firms

Single – price strategy



- Monopoly determines its profit – maximizing level of quantity for which **MR = MC (A)**
- The price charged by monopoly is derived from demand curve (D).
- Economic profit = $Q^* \times (P^* - ATC^*) > 0$ even in the long run.
- Monopoly is producing the quantity for which ATC is not a minimum (B) → inefficient scale of production.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.e] Explain details about monopoly

2. The optimal price and output for firms

Price discrimination strategy

Definition

Price discrimination is the practice of charging different consumers different prices for the same product or service
→ *capture more consumer surplus as economic profit*.

Conditions

- Face a downward – sloping demand curve.
- Have at least 2 identifiable groups of customers of different price elasticity of demand for the product.
- Be able to prevent customers paying the lower price by reselling the product to the customers paying the higher price.

Classification

First – degree price discrimination
a monopolist is able to charge each buyer the highest price he/she is willing to pay.

Second – degree price discrimination
a monopolist offers a menu of quantity-based pricing options designed to induce buyers to self – select based on how highly they value the product.
E.g: volume discounts, volume surcharges, coupons...

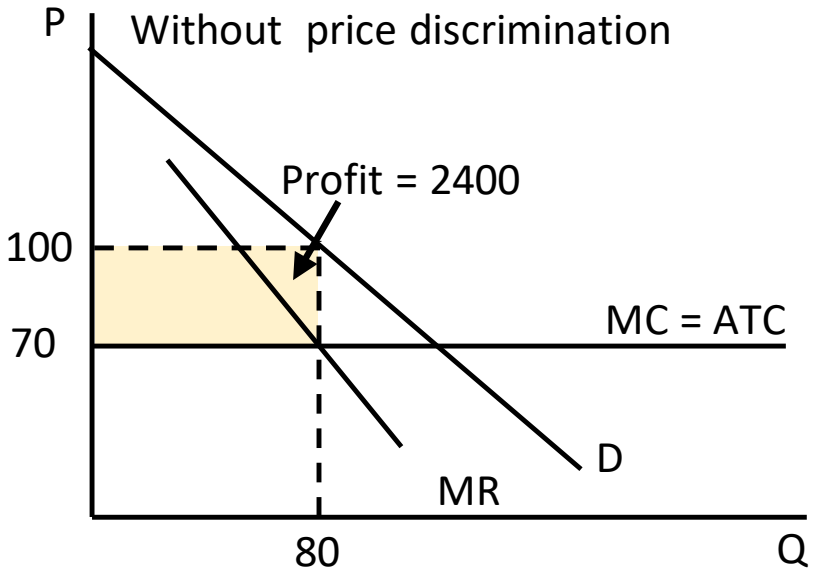
Third – degree price discrimination:
buyers are segregated by demographic or other traits.

MODULE 2: THE FIRM AND MARKET STRUCTURES

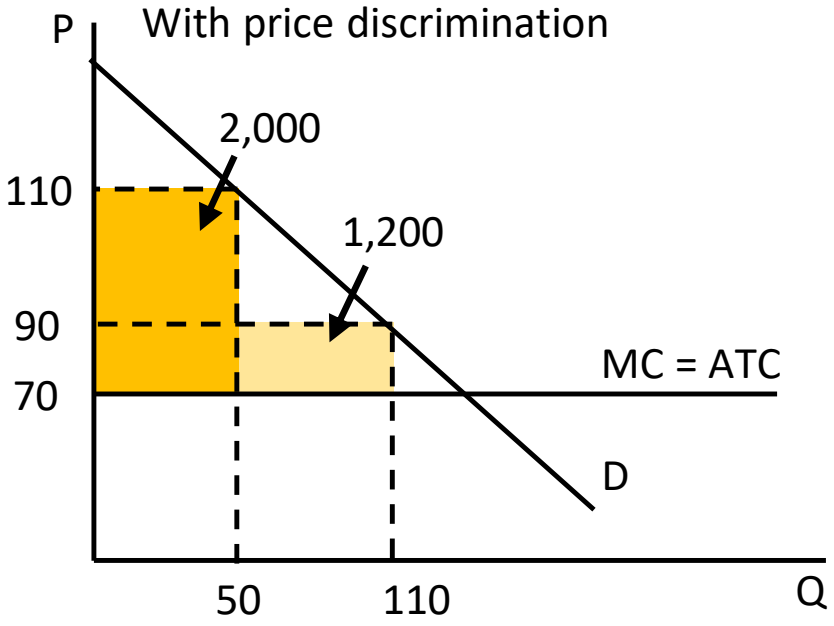
[LOS 2.e] Explain details about monopoly

2. The optimal price and output for firms

Price discrimination strategy



The single profit – maximizing price is 100 at a quantity of 80 (where MR = MC)
→ profit as shown
= 80(100 – 70) = 2,400



The groups of buyers are separated from each other:

Price	Units sold	Profits
110	50	2,000
90	60	1,200
Total profits		3,200
Total profits increase		**800**

Price discrimination increases profit

MODULE 2: THE FIRM AND MARKET STRUCTURES

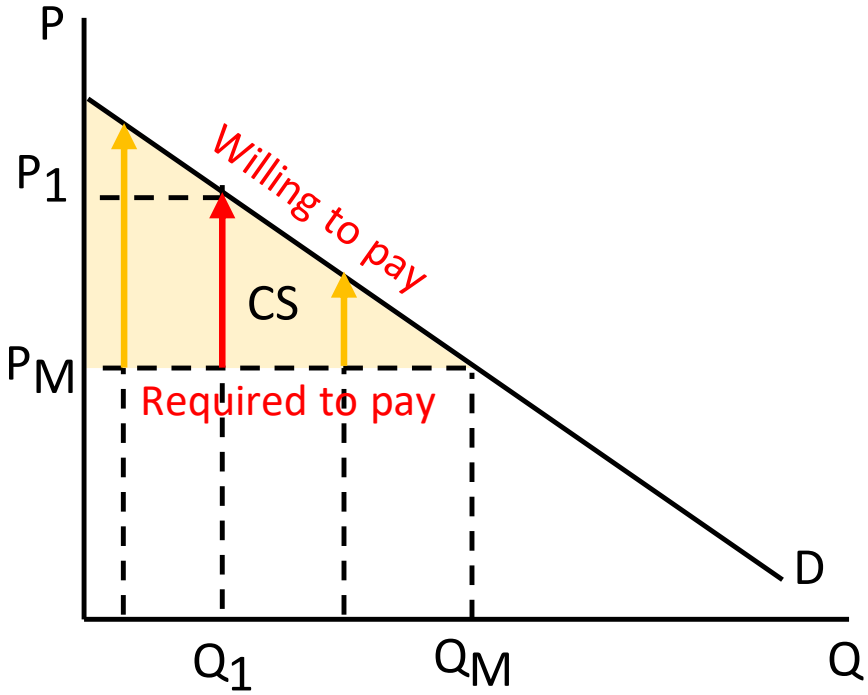
[LOS 2.e] Explain details about monopoly

2. The optimal price and output for firms

Price discrimination strategy

Basic knowledge of Consumer surplus and Producer surplus

- **Consumer surplus (CS)** is the consumer's gain from exchange, and it's **the difference** between the maximum price the consumer is **willing to pay** and the market price the consumer **actually has to pay** for a given quantity of goods.
- **Total consumer surplus** is the **sum** of consumer surplus of all buyers in the market.



At the quantity of Q_1:
P_1 is the maximum price consumer is willing to pay.
→ **CS = (P_1 - P_M)**

Adding up the CS of all consumers **over all units**
→ total CS is **the area beneath the demand curve and above the market price.**

MODULE 2: THE FIRM AND MARKET STRUCTURES

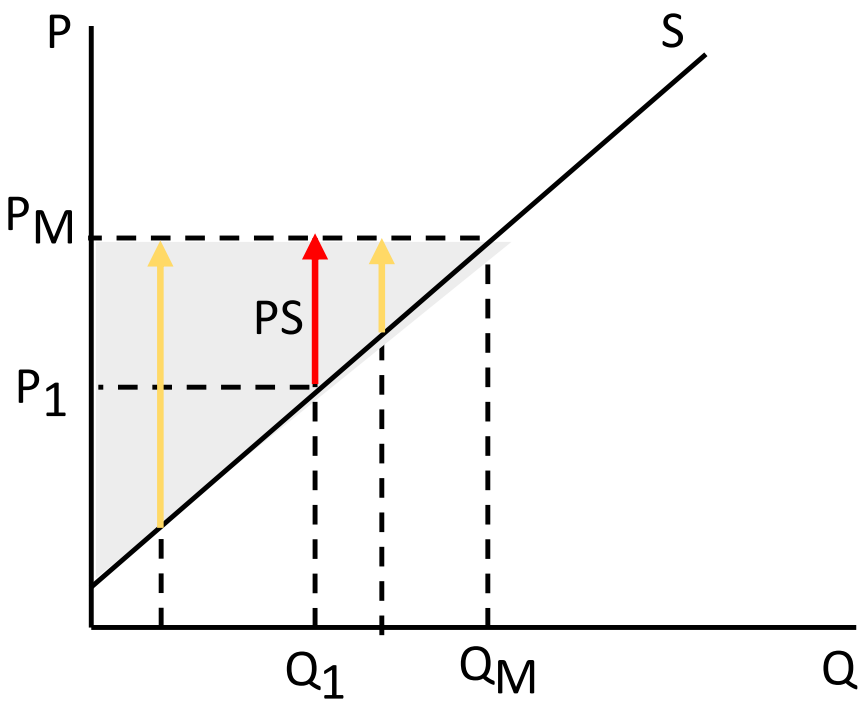
[LOS 2.e] Explain details about monopoly

2. The optimal price and output for firms

Price discrimination strategy

Basic knowledge of Consumer surplus and Producer surplus

- **Producer surplus (PS)** is the producer's gain from exchange, and it's **the difference** between **the market price** and **the minimum price** at which the producer is **willing to sell** a given quantity of goods.
- **Total producer surplus** is the **sum** of producer surplus of all sellers in the market.



At the quantity of Q_1:
P_1 is the price the producer is willing to sell.
→ **PS = (P_M - P_1)**

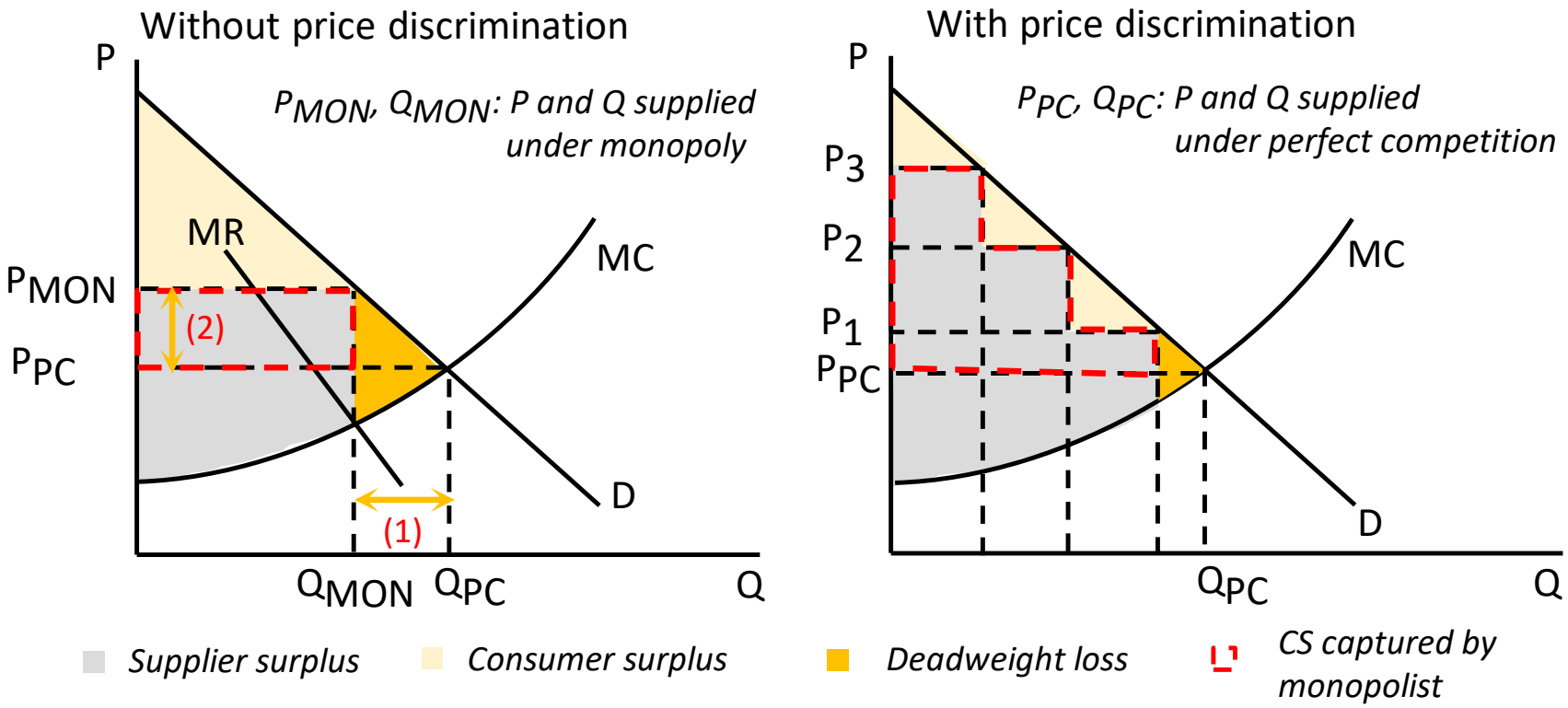
Adding up the PS of all sellers over all units → total PS is **the area beneath the market price and above the supply curve.**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.e] Explain details about monopoly

2. The optimal price and output for firms

Price discrimination strategy



Compare to perfect competition, monopoly produces **less outputs (1) and charges a higher price (2):**

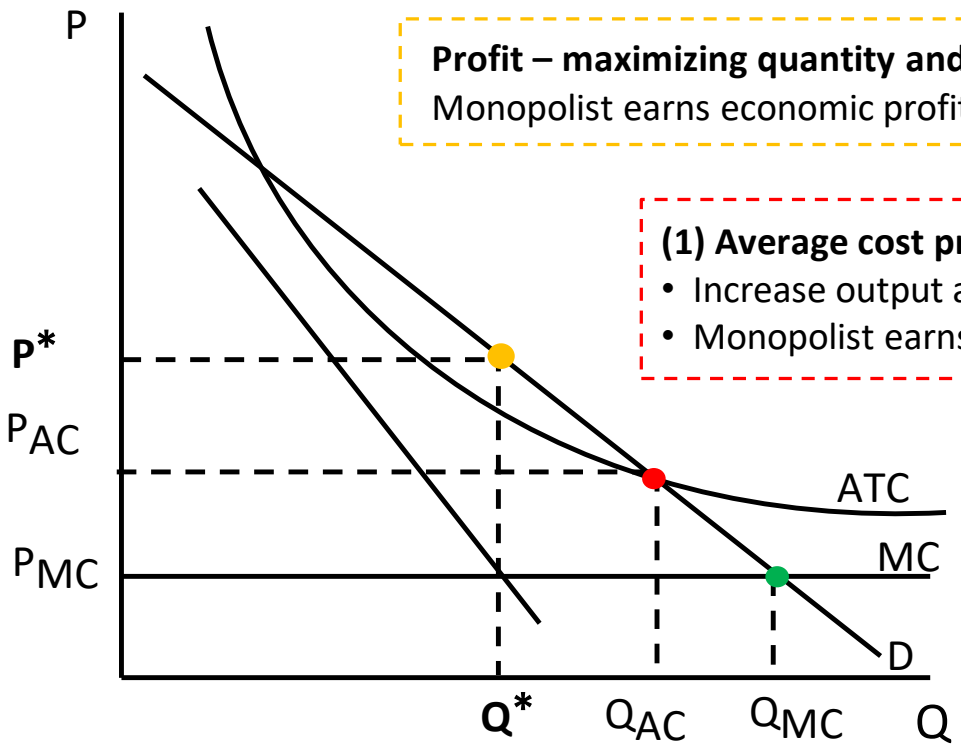
- Reduce sum of consumer and producer surplus → **deadweight loss (DWL)** → inefficient
- Monopolist **captures some consumer surplus as profit.**

- Monopolist **captures more consumer surplus** than charging a single price.
- If it were possible for monopolist to charge each buyer the maximum they are willing to buy → all consumer surplus would be captured → **perfect price discrimination.**

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.e] Explain details about monopoly

3. Natural monopoly and regulation



Profit – maximizing quantity and price: Q^* and P^*
Monopolist earns economic profit.

(1) Average cost pricing: P = AC ∩ D
- Increase output and reduce price (Q_{AC} and P_{AC})
- Monopolist earns a normal profit (P = ATC)

(2) Marginal cost pricing: P = MC ∩ D
Increase output and reduce price (Q_{MC} and P_{MC}) but incur a loss to monopolist → the government must subsidize the loss for the firm to stay in the market.

- **Natural monopoly**: in some industry, there is only a single firm supplying the entire market demand → large economies of scale → **average cost of production is falling and marginal cost is quite low.**
- If **two firms** were sharing the market → produce a lower output of each firm → incur **higher average costs** → **governments allow and regulate only one monopolist in the industry.**

Natural monopoly will maximize its profit by produce the quantity (Q^*) where MR = MC → less than the optimal quantity of the market → **average (1) and marginal (2) cost pricing** would be done to regulate monopolist's price and output.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.f] Describe a firm's supply function and pricing strategy under each market structure

A firm's supply function

- **Perfect competition**: As explained, the short – run supply function for a firm under perfect competition is **its marginal cost curve above its average variable cost**. The short – run market supply curve is constructed by summing the quantities supplied at each price across all firms in the market.
- **Imperfect competition**: there is no well – defined supply function because firms face downward demand curve, the quantity supplied is for which MR = MC and the price is determined by the demand curve.

A firm's pricing strategy

Perfect competition
Profit maximize: MC = P = AR = MR

Monopolistic competition
Profit maximize: MR = MC
The firm's demand curve is downward sloping → P > MR, MC

Monopoly
Profit maximize: MR = MC
The firm's demand curve is downward sloping → P > MR, MC

Oligopoly
The optimal pricing strategy depends on our assumptions about the reactions of other firms to each firm's actions: kinked demand curve, collusion, dominant firm, nash equilibrium

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.g] Describe the use and limitations of concentration measures in identifying market structure

Elasticity of demand is used to examine the pricing power of firms in an industry, but that is difficult → use **concentration measures** as an indicator of market power instead.

	N – firm concentration ratio	Herfindahl – Hirschman Index
Usage	• Calculated as the sum or the percentage market shares of the largest N firms in a market. • Simple to calculate and understand	• Calculated as the sum of the squares of the market shares of the largest firms in the market. • Reduce the problem of N-firm concentration ratio when mergers between occur.
Limi-tation	• Not directly measure market power or elasticity of demand • Relatively insensitive to mergers of two firms with large market shares. • Barriers to entry are not considered.	Barriers to entry are not considered.

MODULE 2: THE FIRM AND MARKET STRUCTURES

[LOS 2.g] Describe the use and limitations of concentration measures in identifying market structure

Example: 4-firm concentration ratios

Given the market shares of the following firms, calculate the 4-firm concentration ratio and 4-firm HHI, both before and after a merger of A and B.

Firm	A	B	C	D	E	F
Sales	25%	15%	15%	10%	5%	5%

Answer:

Before merger of A and B:

4-firm concentration ratio = 25 + 15 + 15 + 10 = 65%

4-firm HHI = $0.25^2 + 0.15^2 + 0.15^2 + 0.10^2 = 0.1175$

After merger of A and B:

4-firm concentration ratio = 40+ 15 + 10 + 5 = 70%

4-firm HHI = $0.40^2 + 0.15^2 + 0.10^2 + 0.05^2 = 0.1950$

As you can see, the 4-firm concentration ratio has only increased slightly from 65% to 70% although the market power of the largest firm has increased significantly from 25% to 40%. Meanwhile, 4-firm HHI has a significant increase from 11.75% to 19.5% after the merger.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

Learning outcomes

3.a. Calculate and explain gross domestic product (GDP) using expenditure and income approaches

3.b. Compare the sum-of-value-added and value-of-final-output methods of calculating GDP

3.c. Compare nominal and real GDP and calculate and interpret the GDP deflator

3.d. Compare GDP, national income, personal income, and personal disposable income

3.e. Explain the fundamental relationship among saving, investment, the fiscal balance, and the trade balance

3.f. Explain how the aggregate demand curve is generated

3.g. Explain the aggregate supply curve in the short run and long run

3.h. Explain causes of movements along and shifts in aggregate demand and supply curves

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

Learning outcomes

3.i. Describe how fluctuations in aggregate demand and aggregate supply cause short-run changes in the economy and the business cycle

3.j. Distinguish among the following types of macroeconomic equilibria: long-run full employment, short-run recessionary gap, short-run inflationary gap, and short-run stagflation

3.k. Explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment

3.l. Analyze the effect of combined changes in aggregate supply and demand on the economy

3.m. Describe sources, measurement, and sustainability of economic growth

3.n. Describe the production function approach to analyzing the sources of economic growth

3.o. Define and contrast input growth with growth of total factor productivity as components of economic growth.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.a] Calculate and explain gross domestic product (GDP) using expenditure and income approaches

1. Output, income and expenditure flow

Gross domestic product (GDP) is the **total market value** of the final goods and services **produced in a country** within a certain period.

GDP can be caculated as **the sum of all the spending on newly produced goods and services**, or as **the sum of the income received as result of producing these goods and services.**

Expenditure approach	=	Income approach
GDP is caculated by **summing the amounts spent on goods and services produced** during the period.		**GDP** is caculated by **summing the amounts earned by households and companies** including wage income, interest income, and business profits.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.a] Calculate and explain gross domestic product (GDP) using expenditure and income approaches

2. Criteria applied to calculate GDP

Criteria	Goods excluded
Only goods and services produced during the measurement period are included.	• Transfer payments from the government to individuals (e.g., unemployment compensation) • Income from capital gains
Only goods and services whose value can be determined by being sold in the market are included.	• The value of labor used in activities that are not sold in the market (e.g., gardening or cooking for one's own benefit) • By-products of production processes which have no explicit market value • Activities in the underground economy (e.g., illegal drug trading • Barter transactions (e.g., a person raking a neighbor's lawn in exchange for help in repairing her fence)
Only the value of final goods and services is included	The value of intermediate goods (that are resold to produce another good)

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.b] The sum-of-value-added and value-of-final-output methods of calculating GDP

Value-of-final-output	=	Sum-of-value-added
GDP is caculated by **summing the values of all final goods and services produced.**		GDP is caculated by **summing the additions to value** created at each stage of production and distribution.

Example

Stage of production	Selling price	Value added
Raw materials	100	100
Manufacturing	350	250
Final goods	400	50
	400 Value of final goods	**400** Sum of value added

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.c] Compare nominal and real GDP and calculate and interpret the GDP deflator

Nominal GDP	Real GDP
Nominal GDP is the total value of all goods and services produced by an economy, valued **at current market prices.**	**Real GDP** measures the total value of all goods and services produced by an economy using price of **a base year**, **removing the effect of changing price.**
$n\ GDP_t = \sum_{i=1}^{n} P_{i,t} \times Q_{i,t}$	$r\ GDP_t = \sum_{i=1}^{n} P_{i,base\ year} \times Q_{i,t}$

- **GDP deflator** is a price index that can be used to measures **the aggregate change in prices** across the overall economy.
- **GDP deflator for year t** $= \dfrac{n\ GDP_t}{r\ GDP_t} \times 100 = \dfrac{\sum_{i=1}^{n} P_{i,t} \times Q_{i,t}}{\sum_{i=1}^{n} P_{i,base\ year} \times Q_{i,t}}$

$\rightarrow r\ GDP_t = \dfrac{n\ GDP_t}{GDP\ deflator} \times 100$

→ the effects of changes in price can be removed from nominal GDP by dividing it by the GDP deflator.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.c] Compare nominal and real GDP and calculate and interpret the GDP deflator

Example 1: **Calculate nominal and real GDP, GDP deflator with 2007 as base year:**

	2007	2008	2009
Quantity	500	500	520
Price	20.5	22.14	23.247

Answer:

2007:
Nominal GDP = 500 × 20.5 = 10,250
Real GDP = 500 × 20.5 = 10,250
GDP deflator = 10250/10250 × 100 = 100
2008:
Nominal GDP = 500 × 22.14 = 11070
Real GDP = 500 × 20.5 = 10250
GDP deflator = 11070/10250 × 100 = 108 → inflation rate = 108/100 – 1 = 8%
2009:
Nominal GDP = 520 × 23.247 = 12088.44
Real GDP = 520 × 20.5 = 10660
GDP deflator = 12088.44/10660 × 100 = 113.4 → inflation rate = 113.4/108 – 1 =5%

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.c] Compare nominal and real GDP and calculate and interpret the GDP deflator

Example 2: **Calculate the compounded annual real growth rate**

Nominal GDP was $213 billion in 2016 and $150 billion in 2011. The 2016 GDP deflator relative to the base year 2011 is 122.3. Calculate real GDP for 2016 and the compounded annual real growth rate of economic output from 2011 to 2016

Answer:

$$\text{Real GDP}_{2016} = \frac{\text{Nominal GDP}_{2016}}{\text{GDP deflator}} \times 100 = \frac{213}{122.3} \times 100 = \$174.16 \text{ billion}$$

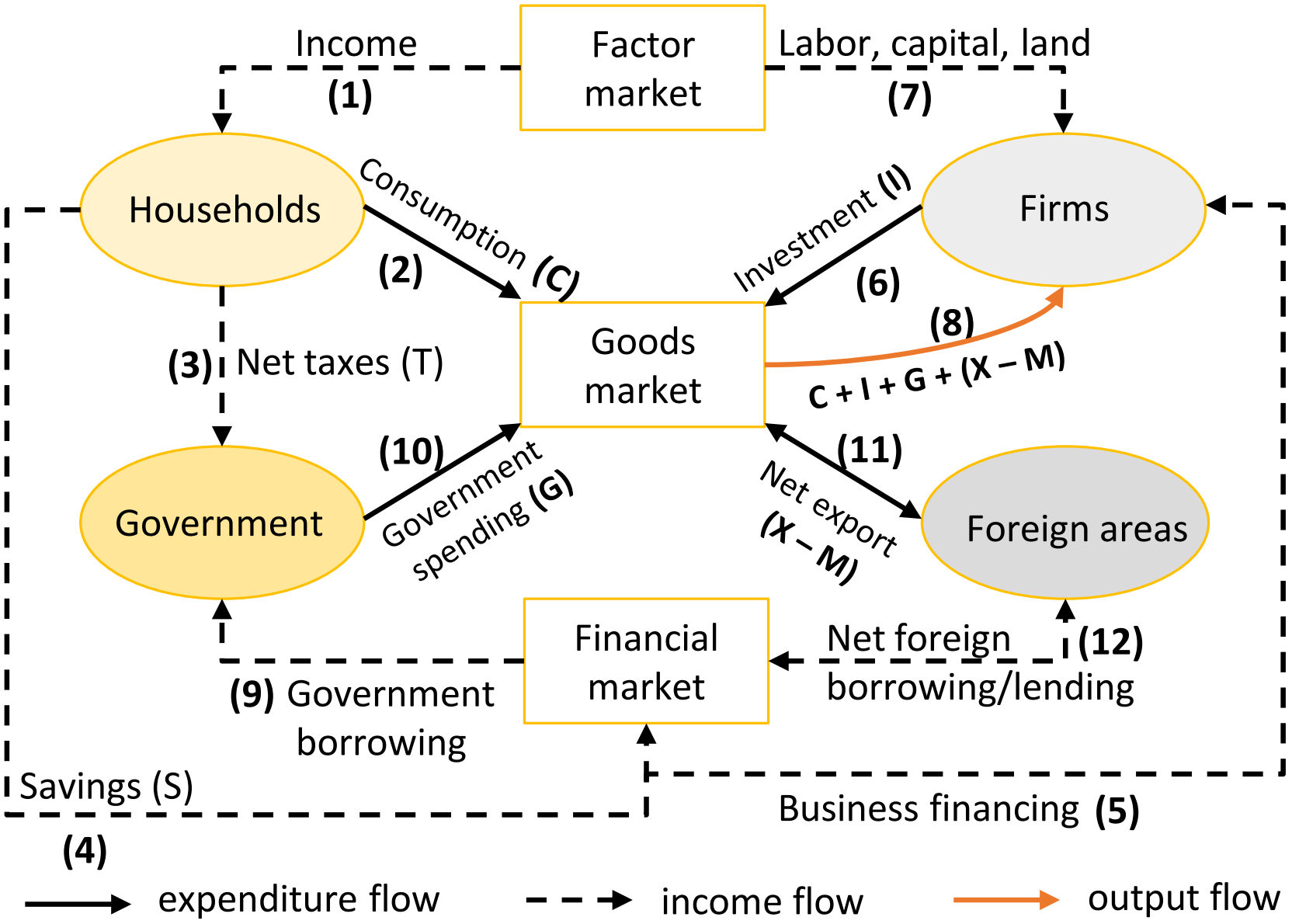
$$\text{Real GDP}_{2011} = \text{Nominal GDP}_{2011} = \$150 \text{ billion}$$

$$\text{Growth of real GDP} = \left(\frac{\text{Real GDP}_{2016}}{\text{Real GDP}_{2011}}\right)^{1/5} - 1 = \left(\frac{174.16}{150}\right)^{1/5} - 1 = 3.03\%$$

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.d] Compare GDP, national income, personal income, and personal disposable income

1. Output, income and expenditure flow



MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.d] Compare GDP, national income, personal income, and personal disposable income

1. Output, income and expenditure flow

Households
(1): Income flow from businesses to households through factor market.
(2): Spend on consumption **(C)** in the goods market.
(3): Pay taxes **(T)** to the government.
(4): Save **(S)** for future consumption → go to businesses **(5)** or the government **(9)** through the financial market.

Firms
(6): Use funds to make investments **(I) (purchase capital goods)** from the goods market for production.
(7): Services of labor, land, and capital flow to businesses for production.
(8): Total output produced.

Government
Receives tax revenues from households (3) and businesses as well as funds from financial market (9) to:
(10): spend money (G) to purchase goods and services in the good market.

Foreign areas
(11): Foreign areas interact with domestic economy through the goods market (imports and export) **(X – M).**
(12): Foreign areas can borrow/ lend funds from domestic economy through the financial market.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.d] Compare GDP, national income, personal income, and personal disposable income

2. GDP components

Expenditure approach

GDP = C + I + G + (X – M)

C = consuption spending X = exports G = government purchase
I = business investment M = imports

=

Income approach

GDP = national income + capital consumption allowance + statistical discrepancy

National income is the **sum of the income received by all factors** of production that go into the creation of final output.

Capital consumption allowance: the depreciation of physical capital from the production of goods over a period.

Statistical discrepancy: an adjustment for the difference between GDP under income and expenditure approach due to difference data.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.d] Compare GDP, national income, personal income, and personal disposable income

3. National, personal and personal disposable income

National income

= Compensation of employees (wages + benefits) (H)
+ Corporate and government enterprises profits before tax
[Include: Corporate income taxes paid to government (G)
+ dividends paid to households (H)
+ undistributed corporate profits to firms (F)]
+ interest income (H)
+ unincorporated business net income (H)
+ rent (H)
+ indirect business taxes (G) – subsidies (transfer payments to households)

Personal income: The pretax income received by households

$= \sum H =$ national income $- \sum G - \sum F$
= **national income + transfer payments to households**
– corporate income taxes
– undistributed corporate profits
– indirect business taxes

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.d] Compare GDP, national income, personal income, and personal disposable income

3. National, personal and personal disposable income

Personal disposable income: Personal income after tax

= **Personal income – personal taxes**

Summary

National income	=	**Personal income**	=	**Personal disposable income**
				Personal taxes
		Corporate income taxes		Corporate income taxes
		Undistributed corporate profits		Undistributed corporate profits
Transfer payments to households		Indirect business taxes		Indirect business taxes

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.e] Explain the fundamental relationship among saving, investment, the fiscal balance, and the trade balance

Under income approach

GDP
= national income + capital consumption allowance + statistical discrepancy
= Personal disposable income (1)
+ [Personal taxes + Indirect business taxes + Corporate income taxes] (2)
+ [Undistributed corporate profits + Capital consumption allowance] (3)
– Transfer payments

Where:
(1) = Household consumption + Household savings
(2) = Direct and indirect taxes
(3) = Business sector savings

GDP = Household consumption + [Household savings + Business sector savings] + [Direct and indirect taxes - transfer payments]

GDP = Household consumption (C) + Total private sector savings (S) + Net taxes (T)

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.e] Explain the fundamental relationship among saving, investment, the fiscal balance, and the trade balance

Because GDP under expenditure approach equals under income approach
→ GDP = C + I + G + (X – M) = C + S + T
→ **S = I + (G – T) + (X – M)**
where **(G – T): the fiscal balance**
(X – M): the trade balance

The **relationship** among saving, investment, the fiscal balance and the trade balance:

S = I + (G – T) + (X – M)

Private savings can be used for:
- Investment (I)
- Financing government deficits (G – T)
- Lending domestic trade surplus (X – M) to oversea areas.

(G – T) = (S – I) + (M – X)

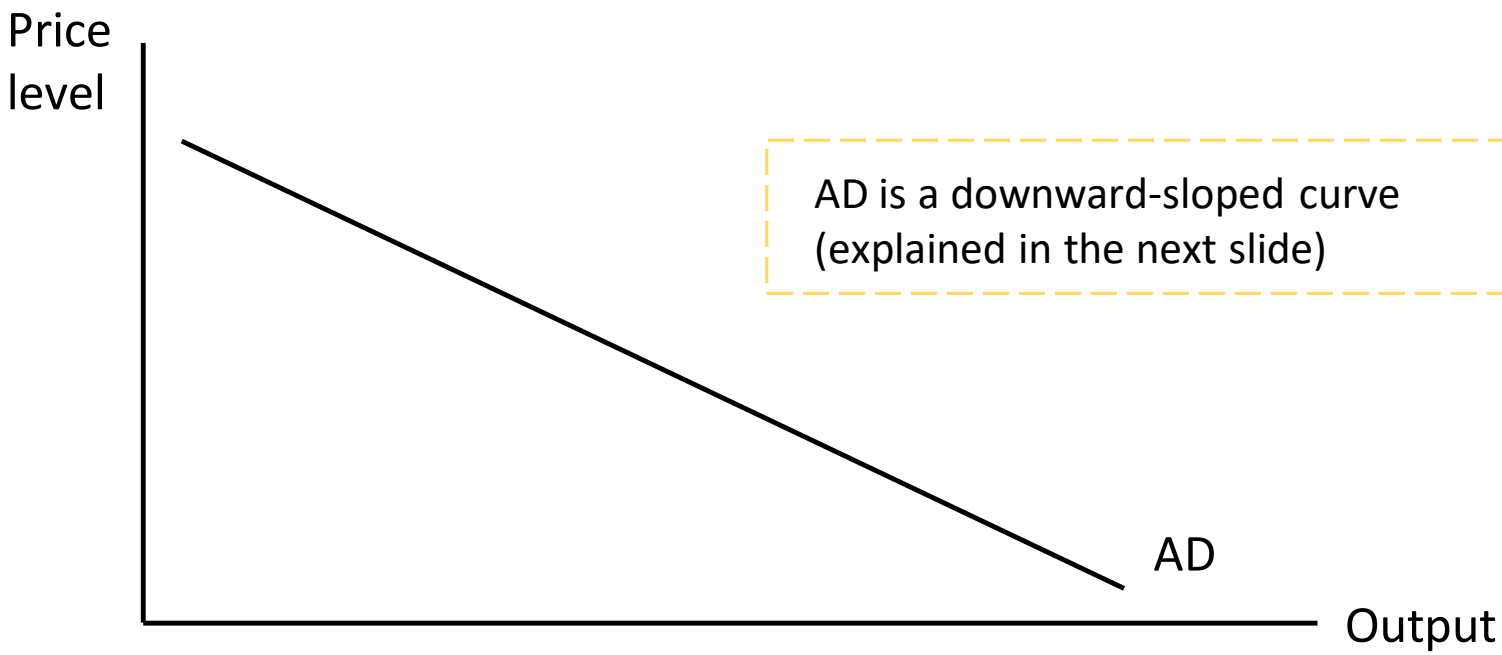
A government deficit (G – T > 0) must be financed by:
- Trade deficit (X – M < 0)
- Excess of private saving over private investment (S – I > 0).

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.f] Explain how the aggregate demand curve is generated

The aggregate demand (AD) curve describes the combinations of level of real output **(GDP) demanded** and **the price level** at which **two** conditions are sastified:

The good market is in equilibrium	The money market is in equilibrium
Aggregate income = aggregate expenditure C + S + T = C + I + G + (X – M)	The available real money supply is willingly held by households and businesses



AD is a downward-sloped curve (explained in the next slide)

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.f] Explain how the aggregate demand curve is generated

Three effects explain why the AD curve slopes downward

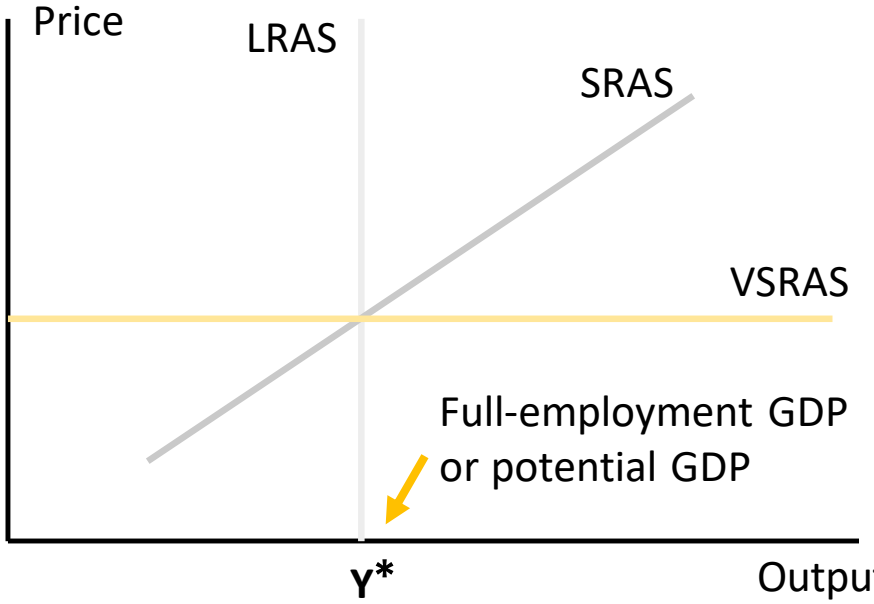
There is an increase in price level:

Wealth Effect	Interest rate effect	Real exchange rate effect
For any given amount of nominal wealth: ↑P → ↓consumption of goods and services	For a fixed nominal money supply: ↑P → need more money to buy the same amount of goods → ↑money demand → ↑price of money (interest rate) → ↓business investment due to high cost of fund and ↓purchasing goods on credit	↑P → domestic goods more expensive relative to foreign goods → reduce exports and raise imports
↓	↓	↓
C decrease → **Real output demanded decrease**	C and I both decrease → **Real output demanded decrease**	(X – M) decrease → **Real output demanded decrease**
↓	↓	↓

The AD curve is **downward – sloping** with the **negative** relationship between the price level and the real output demanded.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.g] Explain the aggregate supply curve in the short run and long run



The aggregate supply (AS) curve describes the relationship between **the price level** and **the quantity of real GDP supplied**, when all other factors are kept constant.

Very short run	Costs are not variable; Firms will **change** output by adjusting *labor hours* and *intensity of use of plant and equipment* → Keep price level **constant** → **VSRAS curve is perfectly elastic.**
Short run	Some input costs become variable → When price level **increases**, firms will **increase** outputs to get more profits → an **upward-sloping SRAS curve.**
Long run	All input costs become variable Price level **increases** → firms will **unchange** quantity of outputs supplied because *all input costs also increase proportionally* to the price level → **LRAS curve is perfectly inelastic.**

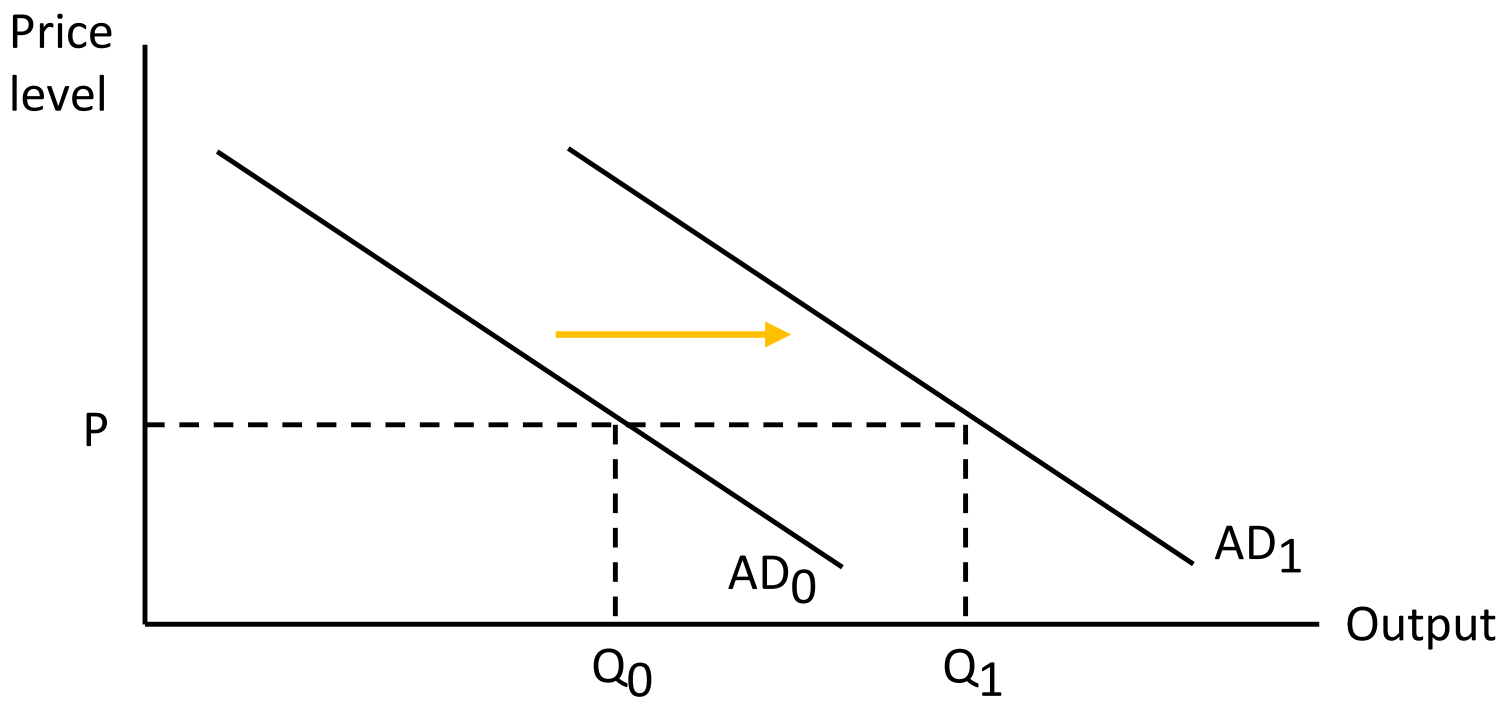
MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

1. Shifts in the aggregate demand curve

Shift in the aggregate demand curve is the **change in the quantity demanded of goods without any change in the price level.**

An increase in AD (shift to the right)



MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

1. Shifts in the aggregate demand curve

Some factors that cause AD shift to the right:

Factors	Detail of effects
Consumers' wealth	Households's wealth increases → savings falls and increase consumption → C increases → AD increases
Business expectations	Businesses are more optimistic about the future sales → increase investment in plant, equipment, inventory... → I increases → AD increases
Consumer expectations of future income	Consumers expect higher future incomes→ save less for future and spending more now → C increases → AD increases
High capacity utilization	Firms produce at a high percentage of their capacity → invest more in plant and equipment → I increases → AD increases

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

1. Shifts in the aggregate demand curve

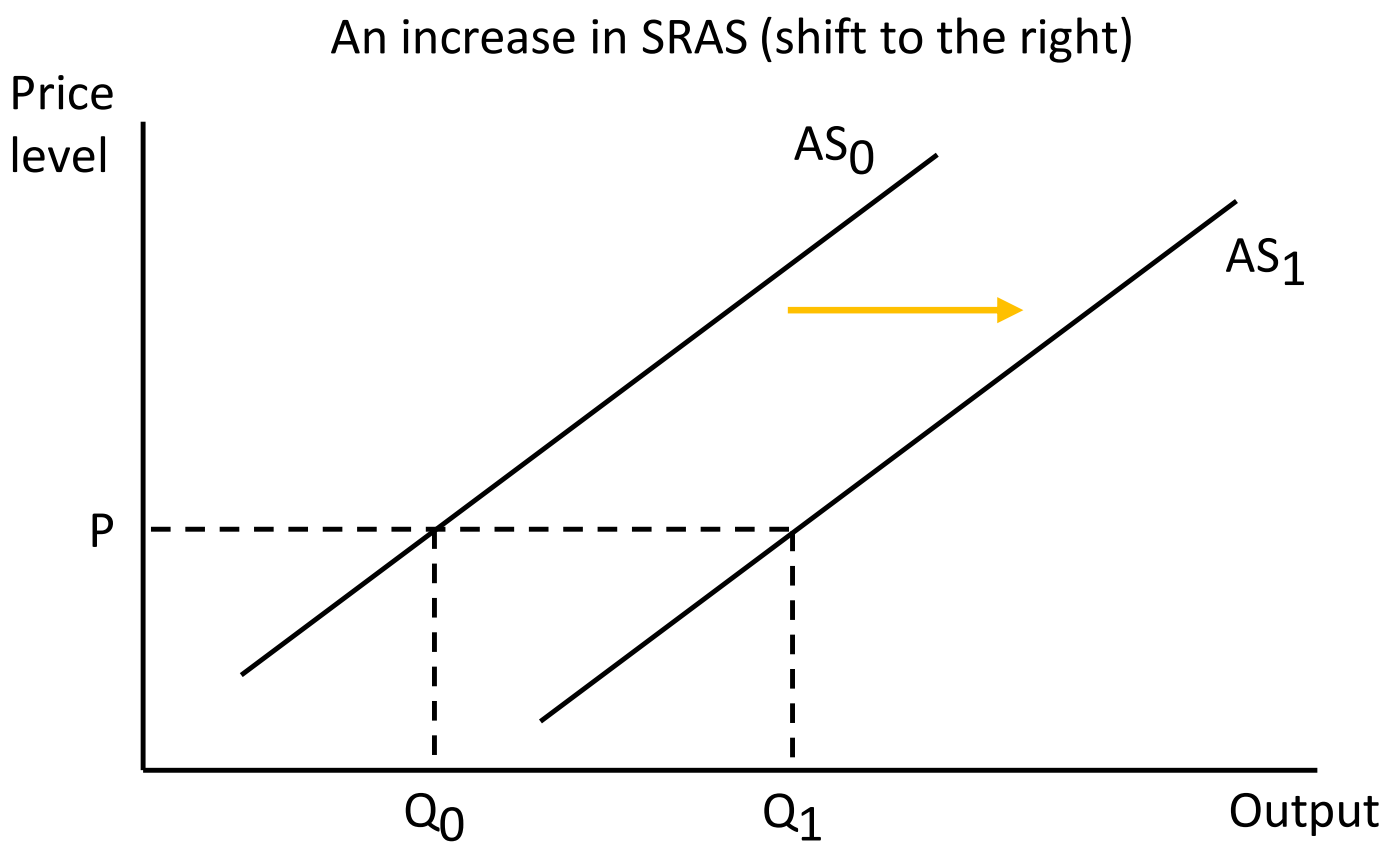
Factors	Detail of effects
Expansionary monetary policy	Money supply increases→ banks have more fund to lend → decline in interest rates: • cost of financing for firms declines → investment more in plant and equipment → I increases → AD increases • consumer's purchasing on credit increases → C increases → AD increases
Expansionary fiscal policy	• decrease taxes → disposable income increases → consumption increase→ C increases → AD increases • Increase government expenditures → G increases → AD increases
Exchange rates	A decrease in the relative value of a country's currency → rise in exports and fall in imports → (X – M) increase → AD increases
Global economic growth	GDP growth in foreign country → foreigners demand increases → domestic exports rises → (X – M) increase → AD increases

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

2. Shifts in the short-run aggregate supply curve

Shift in the short-run aggregate supply curve is **the change in the quantity of outputs supplied without any change in the price level.**



MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

2. Shifts in the short-run aggregate supply curve

A number of factors can cause SRAS shift to the right:

Factors	Detail of effects
Labor productivity	Holding the wage rate constant, an increase in labor productivity → decrease costs to firms→ increase output→ increase SRAS.
Input prices	A decrease in input prices → decrease production costs → firms increase production→ increase SRAS
Expectations of future income	Expect the price of output→ increase expand production → increase SRAS.
Taxes and government subsidies	Decrease in taxes or increase in government subsidies → decrease costs of production→ increase output → increase SRAS.
Exchange rate	Appreciation of a country currency → decrease costs of inputs imported → decrease production costs → increase output → increase SRAS.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

3. Shifts in the long-run aggregate supply curve

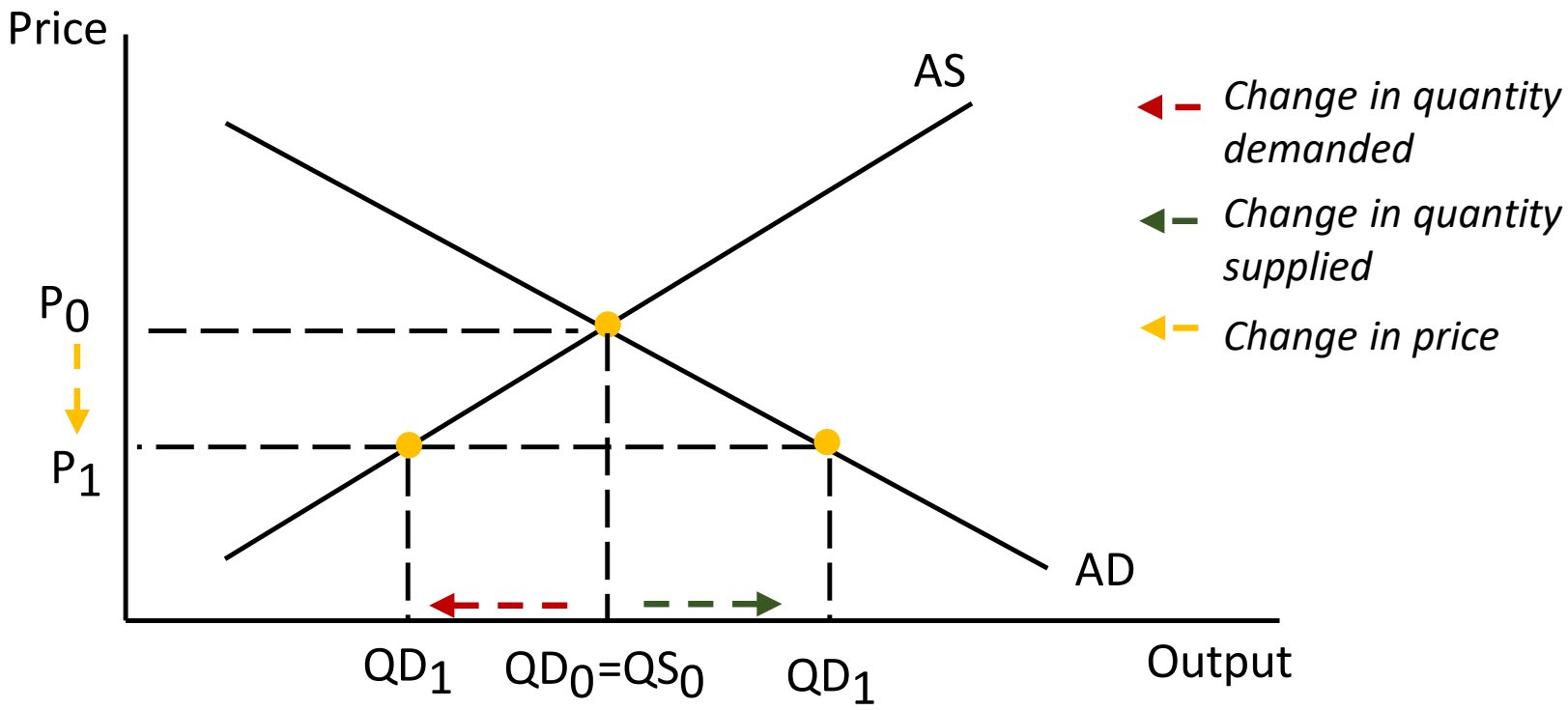
A number of factors can cause LRAS shift to the right:

Factors	Detail of effects
Increase in the supply and quality of labor	• Increase labor force→ increase full-employment output → increase LRAS. • Increase in the skills of the workforce→ increase productivity of a labor force→ increase potential GDP→ increase LRAS.
Increase in the supply of natural resources	Increase in the available amounts of important inputs → increase potential GDP →increase LRAS.
Increase in the stock of physical capital	For a labor force of a given size, an increase in an economy's accumulated stock of capital equipment → increase potential GDP.
Technology	Improvement in technology→ increase labor productivity → increase potential GDP→ increase LRAS.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.h] Explain causes of movements along and shifts in aggregate demand and supply curves

Movement along aggregate demand and supply curves



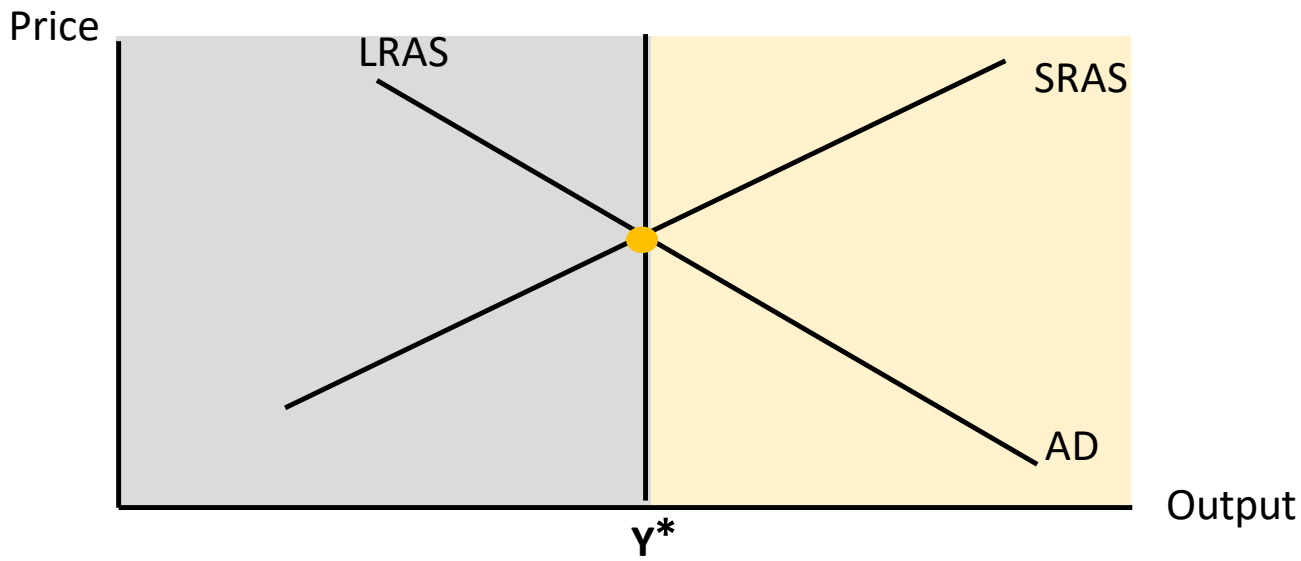
- **Movements along these curves** reflect the impact of **a change in the price level** on the quantity demanded and the quantity supplied.
- **Changes in the price level alone do not cause shifts in the AD and AS curves**, although we have allowed that changes in expected future prices can.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.k] Explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment

1. Long-run full-employment equilibrium

- Long-run full employment equilibrium: **the AD curve intersects the SRAS curve at a point on the LRAS curve.**
- At this point, actual real GDP equals **potential GDP** or **full-employment GDP (Y^*)**



Fluctuations in AD and SRAS in the short run cause fluctuations in short-run equilibrium real GDP → **business cycle**

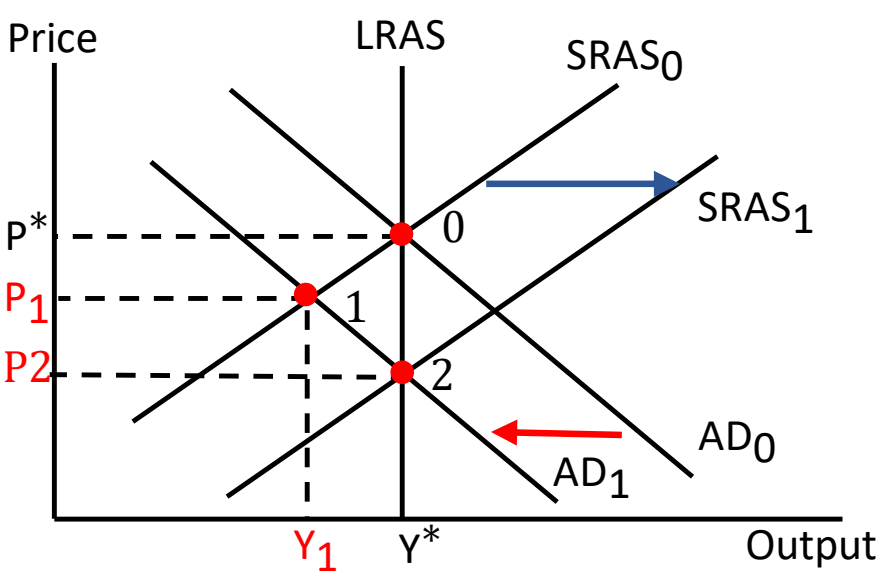
GDP (Y) < potential GDP (Y^*)
→ **recession period:** declining GDP and increasing unemployment

GDP (Y) > potential GDP (Y^*)
→ **expansion period:** inceasing GDP and declining unemployment

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.k] Explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment

2. Recesssionary gap



- A decrease in AD ($AD_0 \rightarrow AD_1$) will **reduce both real output and the price level** (P^*; Y^* to P_1, Y_1) in the short run.
- Potential GDP – real GDP
  $= Y^* - Y_1$
  = **recessionary gap**

Adjustment to a decrease in AD

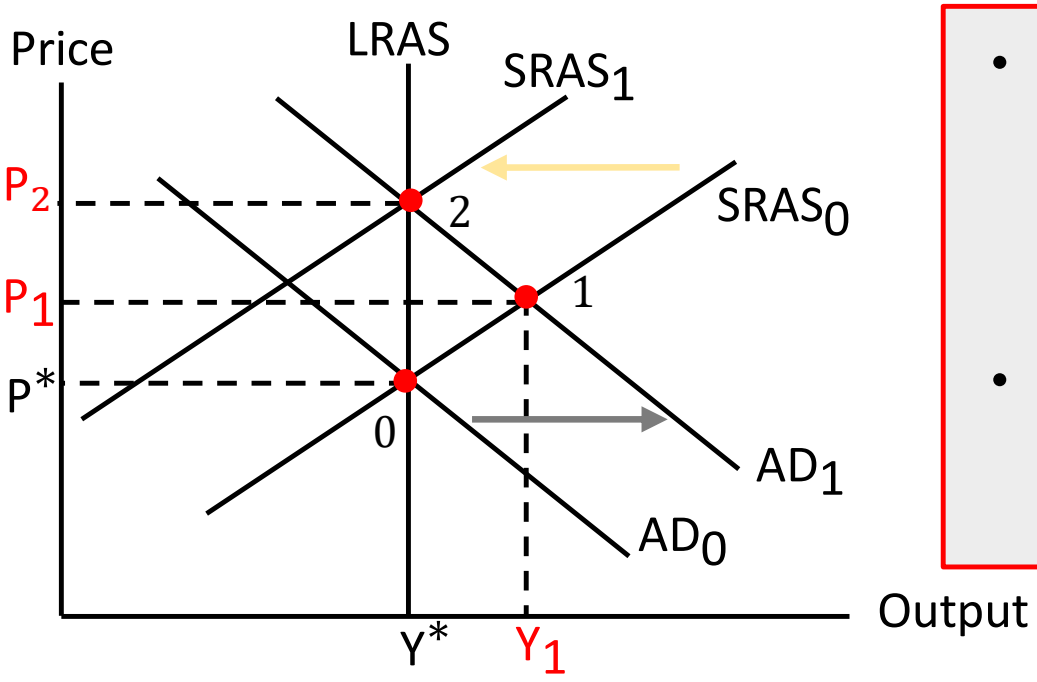
Supply adjustments: An increase in unemployment → increase competitiveness for available jobs → decrease nominal wages as production costs → increase SRAS to $SRAS_1$ → return to potential GDP.

Demand adjustments: expansionary fiscal policy and expansionary monetary policy from government → increase AD back to AD_0 → return to potential GDP.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.k] Explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment

3. Inflationary gap



- An increase in AD ($AD_0 \rightarrow AD_1$) will **increase both real output and the price level** (P*; Y* to P_1, Y_1) in the short run.
- Real GDP – potential GDP = Y_1 - Y* =**inflationary gap**

Adjustment to an increase in AD

Supply adjustments: competition among producer for workers, raw materials → decrease SRAS to $SRAS_1$ → return to potential GDP.

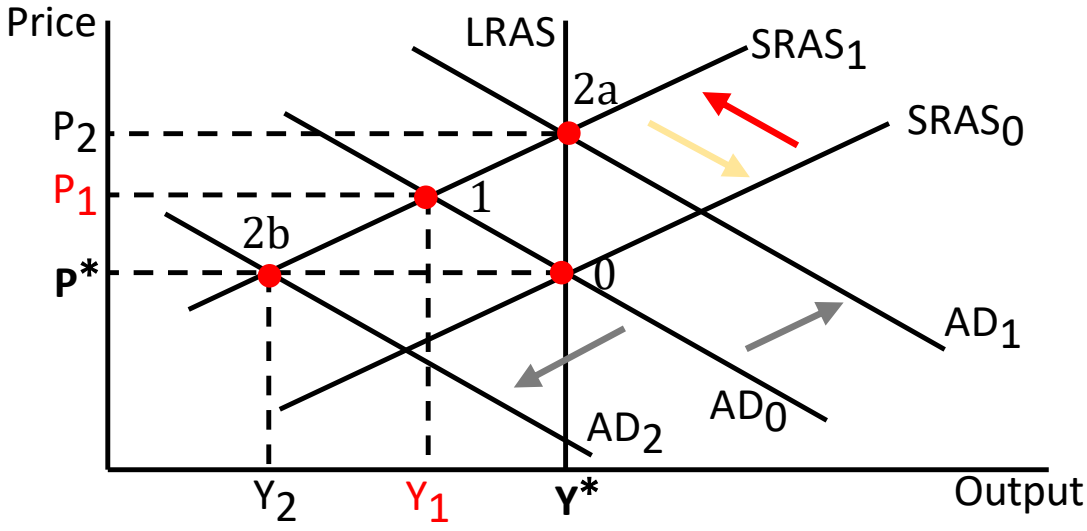
Demand adjustments: contractionary fiscal policy and monetary policy from government → decrease AD back to AD_0 → return to potential GDP.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.k] Explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment

4. Stagflation

A decrease in SRAS ($SRAS_0 \rightarrow SRAS_1$) will cause a **lower GDP** but **higher price level** (P*; Y* to P_1, Y_1) compared to long-run equilibrium → **stagflation**



Adjustment to a decrease in SRAS

Supply adjustments: A subsequent decrease in input prices → increase SRAS to $SRAS_0$ → return the economy to its long-run equilibrium output.

Demand adjustments: policy makers must choose between restoring potential GDP and inflation pressure:

- Expansionary fiscal policy and monetary policy from government → increase AD to AD_1 → return to potential GDP (Y*) but at a price level that is much higher than initial equilibrium (P_2). New equilibrium at point 2a
- Conversely, decrease AD to AD_2 → eliminate inflation (P*) but decrease GDP even further (Y2). New equilibrium at point 2b

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

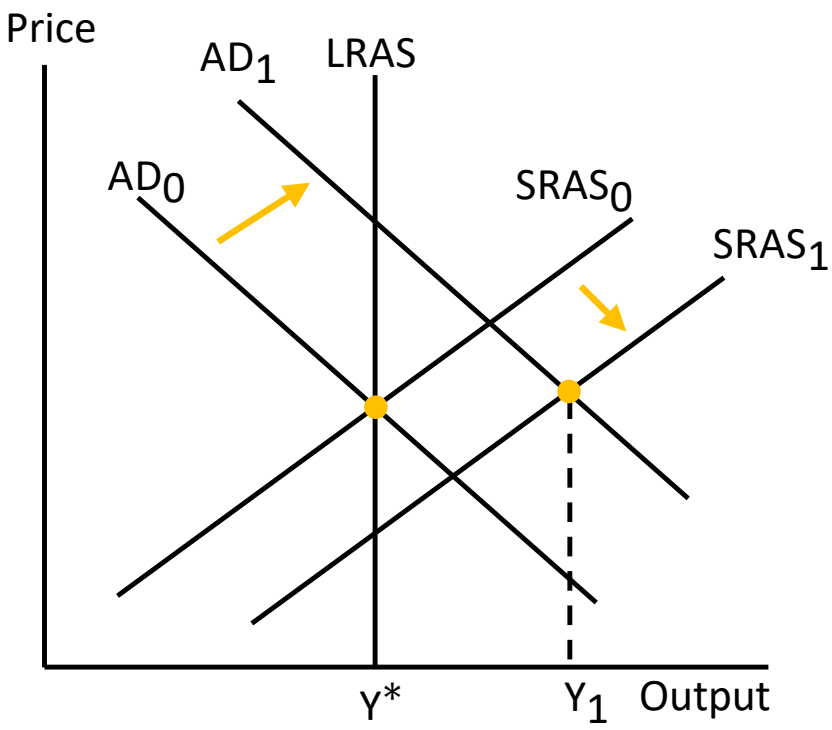
[LOS 3.k] Explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment

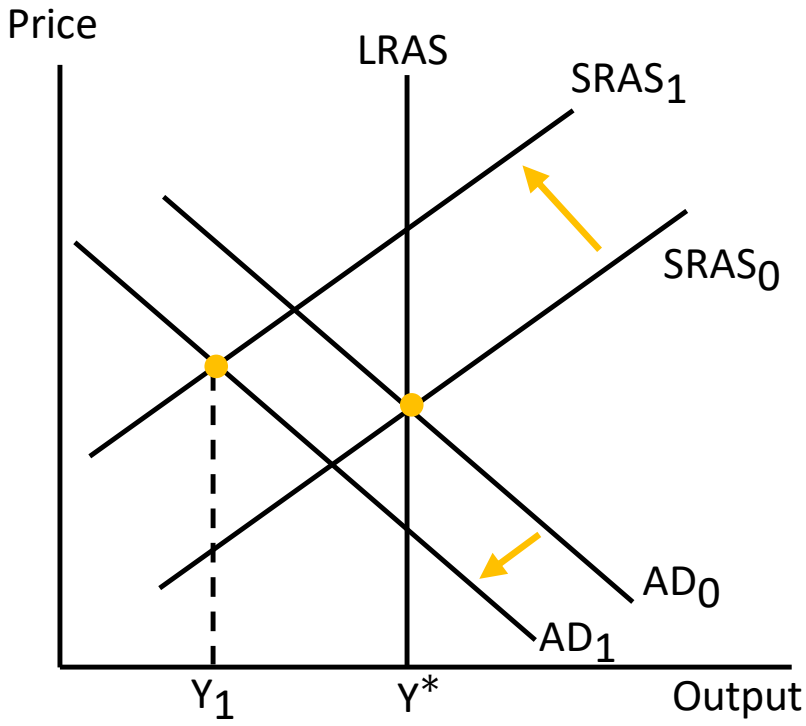
5. Summary of short-run macroeconomic effects

Changes	Real GDP	Unemployment	Price level
Increase in AD	Increase	decrease	increase
Decrease In AD	decrease	increase	decrease
Increase in AS	increase	decrease	decrease
Decrease in AS	Decrease	increase	increase

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.l] Analyze the effect of combined changes in aggregate supply and demand on the economy





AD and SRAS both increase → real GDP increase but **the price effects are in opposite direction**: AD increases→ P increases but SRAS increases → P decreases.

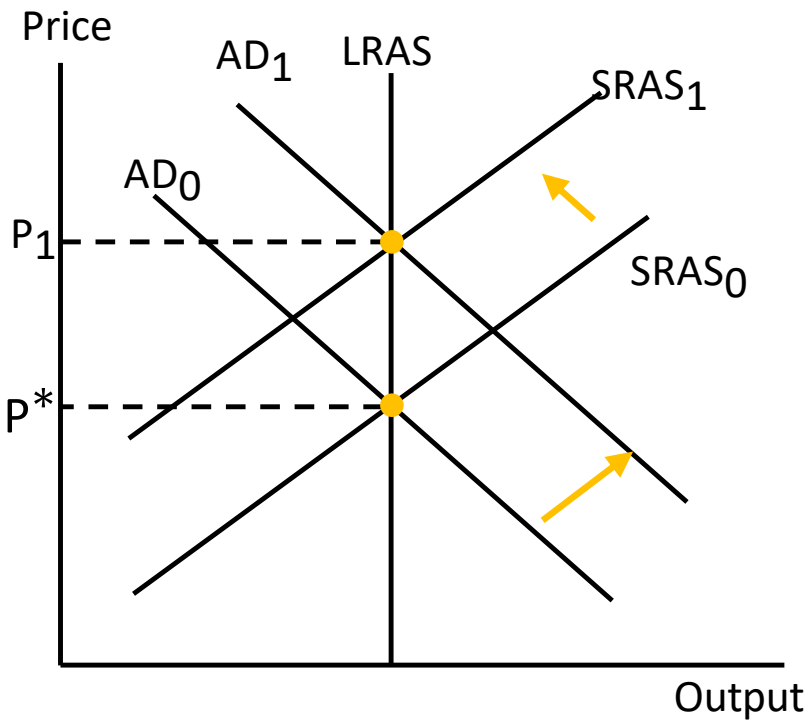
- AD increase > SRAS increase → increase in P > decrease in P → **price level increases.**
- In contrast, **price level decreases**.

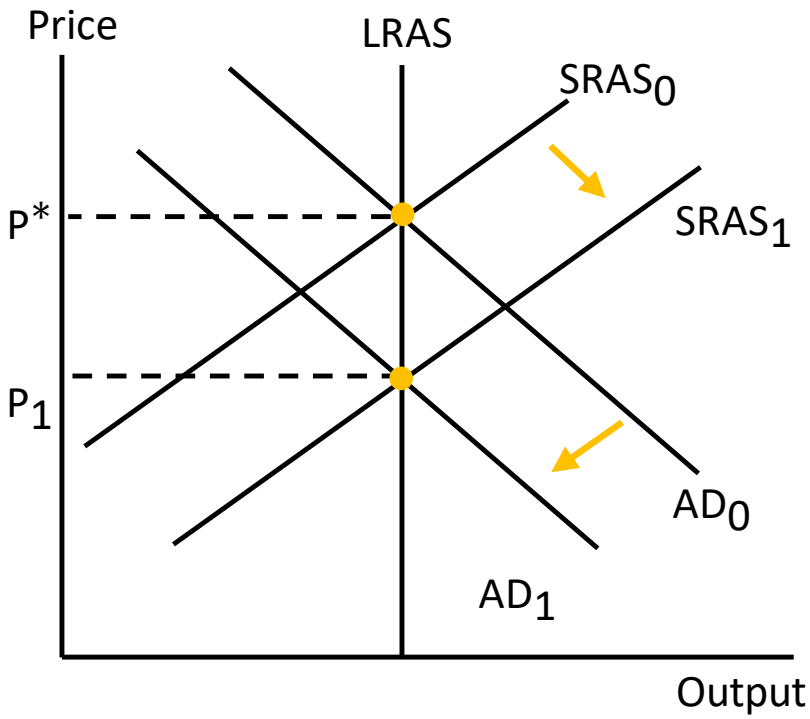
Similarly, **AD and SRAS both decrease → real GDP decrease**:

- Price level increases if AD decrease < SRAS decrease
- Price level decreases if AD decrease > SRAS decrease

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.l] Analyze the effect of combined changes in aggregate supply and demand on the economy





AD increases and SRAS decreases → price level increases but the effects on real GDP are in opposite direction:

- AD increase > SRAS decrease → GDP increase > GDP decrease → **increase real GDP.**
- In contrast, AD increase < SRAS decrease → **decrease GDP**.

Similarly, **AD decreases and SRAS increases→ price level decreases**:

- Real GDP increases if AD decrease < SRAS increase.
- Real GDP decreases if AD decrease > SRAS increase.

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.m] Describe sources, measurement, and sustainability of economic growth

Sources of economic growth	**Labor supply:** Growth in the number of people either working or available for work but currently unemployed (**labor force**) → economic growth.
	Human capital: the education and skill level of a country's labor force → more productive and better at technology application → greater rates of economic growth.
	Technology: improvements in technology → increase productivity and potential GDP → rapid improvement in technology → greater rates of economic growth.
	Physical capital stock: high rate of investment increases a country's stock of physical capital → increase labor productivity and potential GDP → increase economic growth.
	Natural resources: large amounts of productive natural resources → produce more economic output → greater rates of economic growth.

Potential GDP = Aggregate hours x Labor productivity	**Sustainability of economic growth**
Potential GDP growth rate = Long-term labor productivity growth rate + Long-term growth rate of labor force.	

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.n] Describe the production function approach to analyzing the sources of economic growth

- A production function describes the relationship of output to the size of the labor force, the captital stock and productivity.

$$Y = A \times f(L, K)$$

where:
Y = aggregate economic output
L = size of labor force
K = amount of capital available
A = total factor productivity (closely related to technology advances)

- The production function can be stated on a per-worker basis by dividing by L

$$Y/L = A \times f(K/L)$$

where:
Y/L = output per worker (labor productivity)
K/L = physical capital per worker
→ **Increase technology (A) or physical capital per capital (K/L) → increase labor productivity.**

MODULE 3: AGGREGATE OUTPUT, PRICES, AND ECONOMIC GROWTH

[LOS 3.o] Define and contrast input growth with growth of total factor productivity as components of economic

- As the Solow model or neoclassical model, the contribution of technology, labor and capital to economic growth is:

Growth in potential GDP = growth in technology
+ W_L x growth in labor
+ W_C x growth in capital

- As the multiplier A in production function, the additional growth of potential GDP from "**growth in technology "** represents the growth in **total factor productivity,** the growth of output that is not explained by the growth of labor and capital.
- Growth in technology is the primary driver of the growth in total factor productivity.

Example:

Consider a developed country where $W_L = 0.7$ and $W_C = 0.3$. For that country, a 1% increase in the labor force will lead to a much greater increase in economic output than a 1% increase in the capital stock.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

Learning outcomes

Details about business cycles

4.a. Describe the business cycle and its phases

4.b. Describe credit cycles

4.c. Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

4.d. Describe theories of the business cycle

Economic indicators and indexes

4.e. Interpret a set of economic indicators, and describe their uses and limitations

4.f. Describe types of unemployment, and compare measures of unemployment

4.g. Explain inflation, hyperinflation, disinflation, and deflation

4.h. Explain the construction of indexes used to measure inflation

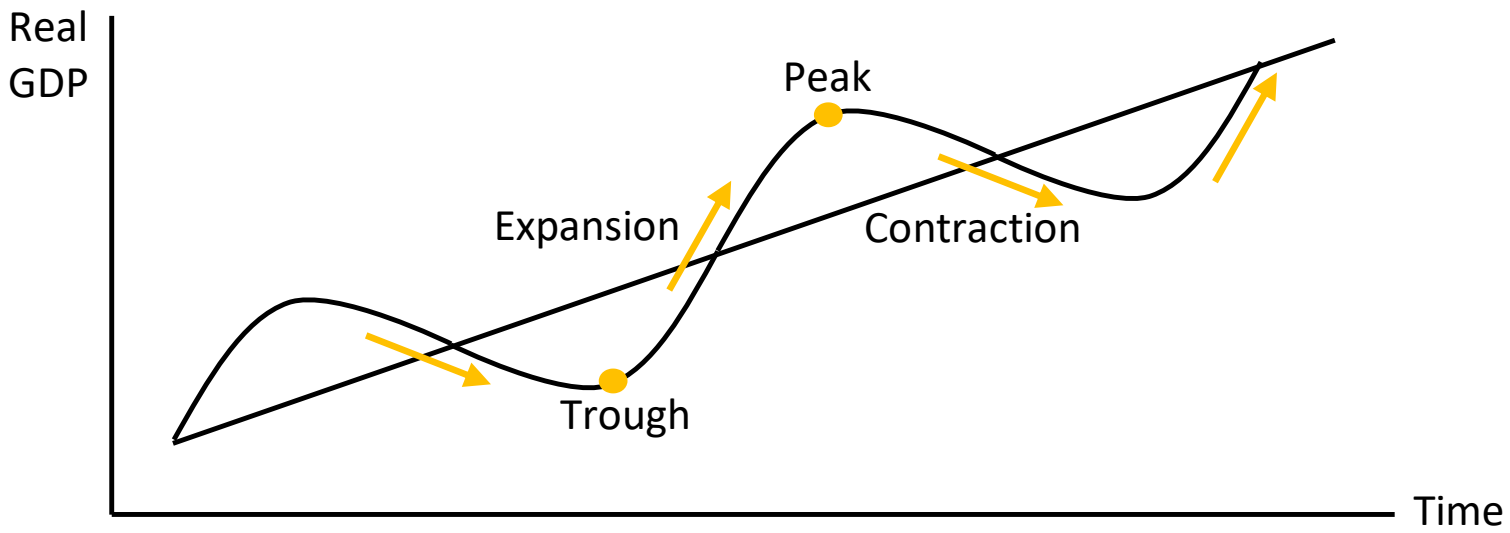
4.i. Compare inflation measures, including their uses and limitations

4.j. Contrast cost-push and demand-pull inflation

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.a] Describe the business cycle and its phases

Business cycle is characterized by **fluctuations** in economic activities. **Real gross domestic product (GDP)** and the **rate of unemployment** are the key variables used to determine the current phase of the cycle. **Business cycle is recurring but not at equal intervals.**



Trough	Real GDP stops decreasing and begins increasing new expansion or **recovery:** economic growth becomes positive again and inflation is typically moderate, but employment growth may not start to increase.
Expansion	Growth in most sectors of the economy, increasing employment, consumer spending, and business investment.
Peak	The rates of increase in spending, investment and employment slow but remain positive, while inflation accelerates.
Contraction (Recession)	Decline in most sectors, with inflation typically decreasing.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

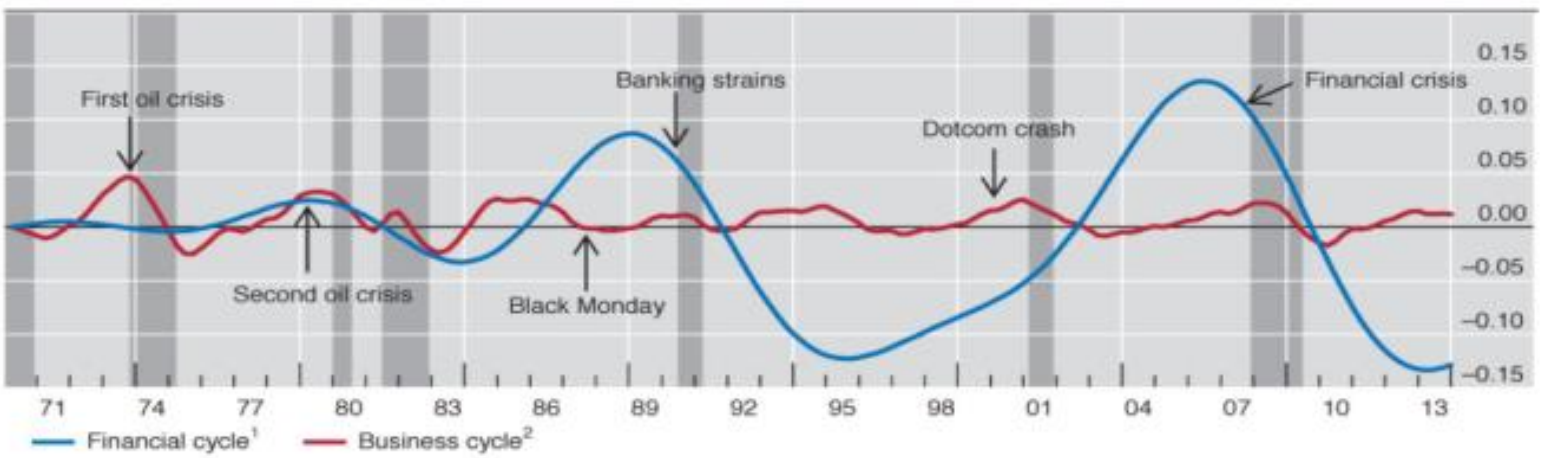
[LOS 4.b] Describe credit cycles

Credit cycles refer to cyclical fluctuations in interest rates and availability of loans (credit).

- During expansion, the willingness of lenders to extend credit is high → credit is more available and cheaper (low interest rates)
- During contraction, lenders "tighten" → credit less available and more expensive (high interest rates).

Credit cycles may amplify business cycle

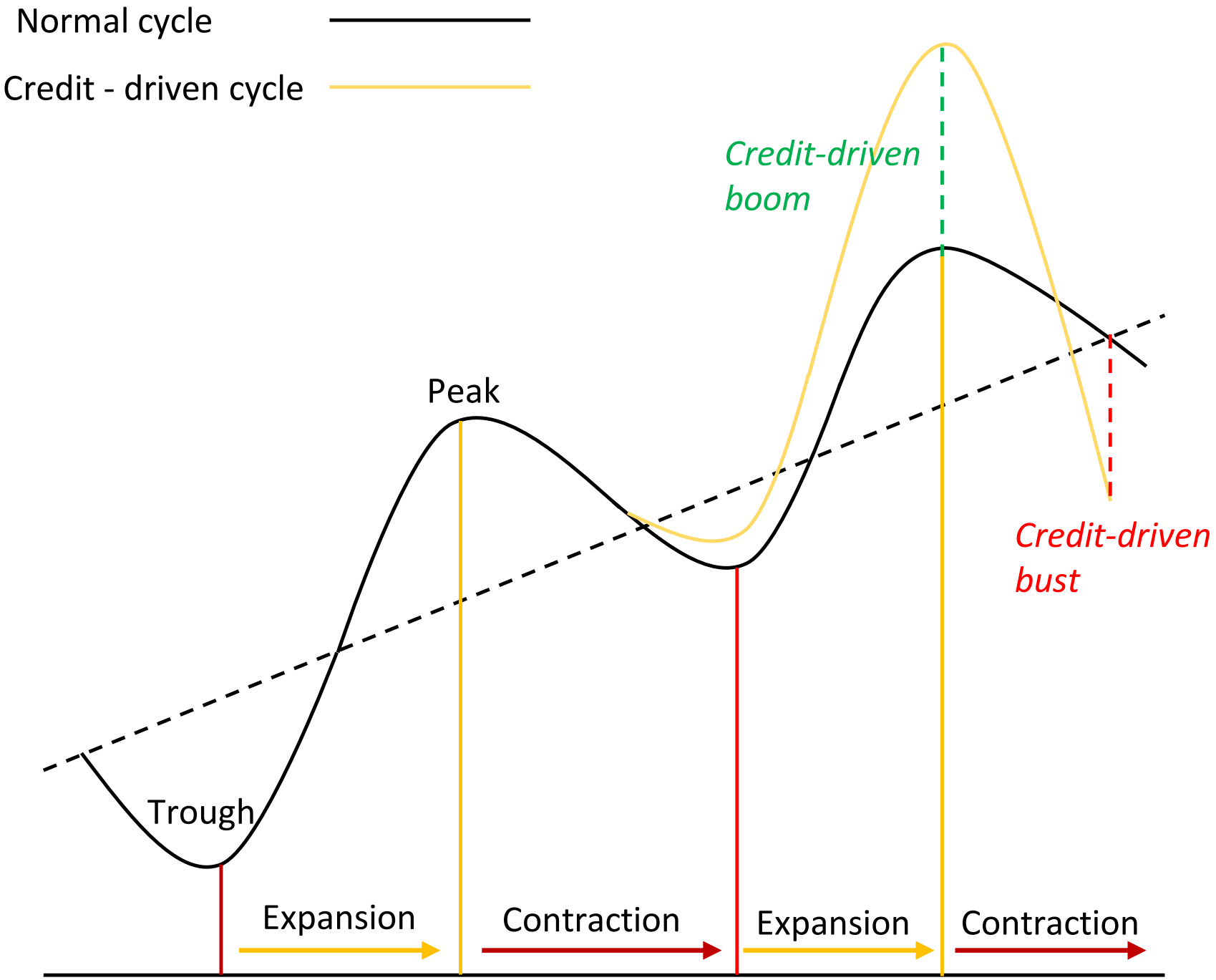
- When coincide with credit cycle, expansions tend to be stronger and contraction deeper and longer lasting.
- Credit cycles have been longer in duration than business cycles on average.



The credit and business cycles in the US

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.b] Describe credit cycles



The business cycles amplified by the credit cycle

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

1. Resource use fluctuation

- **Inventories** are an important business cycle indicator.
- **The ratio of inventory to sales** in many industries trends toward **a normal level** in times of steady economic growth.

	Trough	Expansionary	Peak	Contraction
Sales growth	Begin to accelerate (↑)	Rapidly increase (↑)	Begin to slow (↓)	Repidly decline (↓)
Inventories	Decrease (↓)	Decrease (↓)	Increase (↑)	Increase (↑)
Inventory to sales ratio	Below normal level	Below normal level	Above normal level	Above normal level
Firm's reaction	Expand production	Expand production	Reduce production	Reduce production

Sales growth and Inventories move **inversely** in each phase of the business cycle.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

2. Business sector activity

Business cycles phases do not persist				
	Expansion	**Peak**	**Contraction**	**Trough**
Labor	**Increase** working hours and productivity		**Decrease** working hours and productivity	
Capital	Use physical capital **more** intensively		Use physical capital **less** intensively	

Business cycles phases persist				
	Expansion	**Peak**	**Contraction**	**Trough**
Labor	**Hire more** workers		**Layoff** workers	
Capital	**Invest more** in physical capital		Spend **less on maintenance** or **delay the replacement** of equipment.	

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

3. Consumer sector activity

- Consumer spending depends on the level of consumers' **current income** and their **confidence** about the future income.
- Consumer spending in some sectors is **more sensitive to business cycle phases than spending in other sectors**.

	Expansion	Peak	Contraction	Trough
Durable goods	**Increase** spending on high-value durable goods		**Decrease** spending on high-value durable goods	
Services	**Increase** spending on *discretionary* services		**Decrease** spending on *discretionary* services	
	For *less discretionary* services, spending is relatively stable			
Nondurable goods	Spending remains relatively stable over the business cycles			

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

4. Housing sector activity

Important determinants of the level of economic activity in the housing sector	**Mortgage rates**	*Expansion*: Low interest rates → borrowing becomes easier → increase home buying and construction
		Contraction: High interest rates → borrowing becomes difficult → reduce home buying and construction
	Housing costs relative to income	*Expansion*: High income relative to home costs and mortgage financing cost → increase home buying and construction
		Contraction: Low income relative to home costs and mortgage financing cost → decrease home buying and construction

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

4. Housing sector activity

Important determinants of the level of economic activity in the housing sector	**Speculative activity**	*Expansion*: Higher home prices → increase purchasing for further gains → more construction → excess buildings *Contraction: E*xcess buildings → falling home prices → decreased or eliminated speculative demand → decrease in housing activity
	Demogra-phic factors	High proportion of the population in the 25- to 40-year- old segment → increase demand for new housing because these are the ages of greatest household formation

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

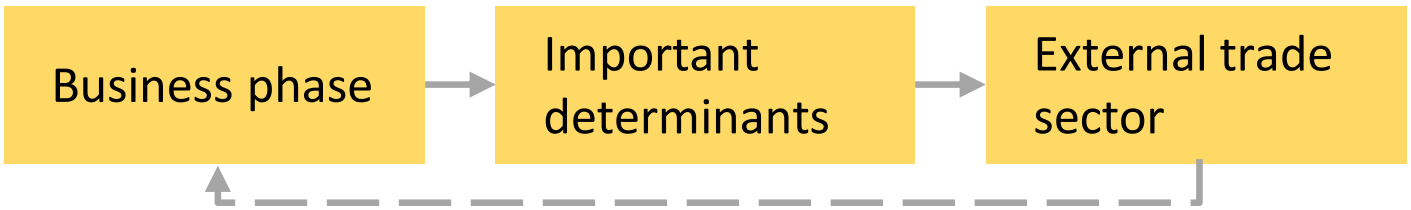
5. External trade sector

Important determinants of a country's export and import	**Domestic GDP growth**	*Expansion:* Increase → increase in purchase of foreign goods → increase imports
		Contraction: Decrease → decrease in purchase of foreign goods → reduce imports
	Trading partners' GDP growth	*Expansion:* Increase → increase sales to foreigners → increase exports
		Contraction: Decrease → decrease sales to foreigners → reduce exports

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

5. External trade sector



Important determinants of a country's export and import *(cont)*	**Currency exchange rate**	Increase → decrease the value of domestic currency → its goods cheaper to foreign buyers and foreign goods more expensive to domestic buyers → increase exporst and decrease imports
		Similarly: Decrease → decrease exports and increase imports

Note: Currency exchange rate movement is independent with domestic business phases.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.c] Describe how resource use, consumer and business activity, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle

6. Summary of typical business cycle characteristic

	Trough	Expansionary	Peak	Contractionary
GDP growth rate	Negative to positive	Increase	Decrease	Negative
Uunemploy-ment rate	Increase, use of overtime workers	Decrease as hiring accelerates	Decrease but hiring slows	Increase, hours worked decline
Consumer spending	Decrease at slower rate	Increase	Increase at slower rates	Decrease
Business investment				
Home construction				
Inflation rate	Moderate or decrease	Start to increase	Increase	Decrease with a lag

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.d] Describe theories of the business cycle

Neoclassical school	• Economists believe shifts in both AD and AS are primarily **driven by changes in technology** over time. • Business cycles result from **temporary deviations from long-run equilibrium** → the economy has strong tendency toward full-employment equilibrium.
Keynesian school	• Shifts in AD due to changes in **expectations** → business cycles • These fluctuations are due to swings **in the level of optimism** of those who run the business. • **Policy recommendations** to restore the full-employment GDP: wages are "**downward sticky**" → monetary and fiscal policy to affect AD.
New Keynesian school	Similar to Keynesian school, but added the asertion that **prices of other inputs other than labors are also "downward sticky"**

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.d] Describe theories of the business cycle

• Variations in the **rate of growth of money supply** → variations in AD → business cycles. • Recession can be caused by inappropriate decrease in money supply or external shocks → the central bank should follow a policy of steady and predictable increases in the money supply.	**Monetarist school**
New classical school	• **Real business cycle theory (RBC):** the effect of *real economic variables* (changes in **technology** and external shocks) opposed to monetary variales → business cycles. • Expansions and contractions are efficient market responses to real external shock → policymakers **should not try to counteract business cycles**.
• Business cycles are caused by **government intervention** in the economy. • Interest rates are forced down artificially → firms invest too much capital and speculative lines of production compared to actual demand → decrease ouput → contraction.	**Austrian school**

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.e] Interpret a set of economic indicators, and describe their uses and limitations

Leading indicators	Change direction **before** peaks or trough in the business cycles	• Average weekly hours in manufacturing • Initial claims for unemployment • **Manufacturer's new orders for consumer goods and material** • Institute for Supply Management new order index • **Building permits for new private housing unit** • **S&P 500 Index** • Leading credit index • 10-year Treasury to Fed funds interest rate spread • Consumer's expectations
Coincident indicators	Change direction **at roughly the same** as peaks or troughs	• **Employment on non-agricultural payrolls** • **Aggregate real personal income** • Industrial production index • Manufacturing and trade sales
Lagging indicators	Change direction **after** expansions or contractions are already underway.	• **Average duration of unemployment** • Average prime lending rate • **Inventory-sales ratio** • **Change in unit labor costs and CPI** • Consumer installment debt to income ratio • Consumer and industrial loans

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.e] Interpret a set of economic indicators, and describe their uses and limitations

Example: **Interpreting different economic indicators**

What do the following observations suggest regarding the state of the economy?

1. An increase in the ratio of consumer installment debt to income.
2. A positive change in the S&P 500.
3. A slight increase in the real personal income over two consecutive months.

Answer:

1. The ratio of consumer installment debt to income is a lagging indicator. An increase in this ratio suggests that an upturn is already underway. If coincident indicators have recently been pointing to an upturn, an increase in the ratio of consumer installment debt to income would confirm that the economy has rebounded.
2. The S&P 500 is a leading indicator. An increase in the index is a positive sign for future economic growth.
3. A small increase in the real personal income over two consecutive observations suggests that a modest economic expansion can be expected.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.f] Describe types of unemployment, and compare measures of unemployment

1. Types of unemployment

Frictional unemployment results from the time lag necessary to match employers who seek work with employers needing their skills.
Example: a person who has just graduated from college and is searching for a first-time job.

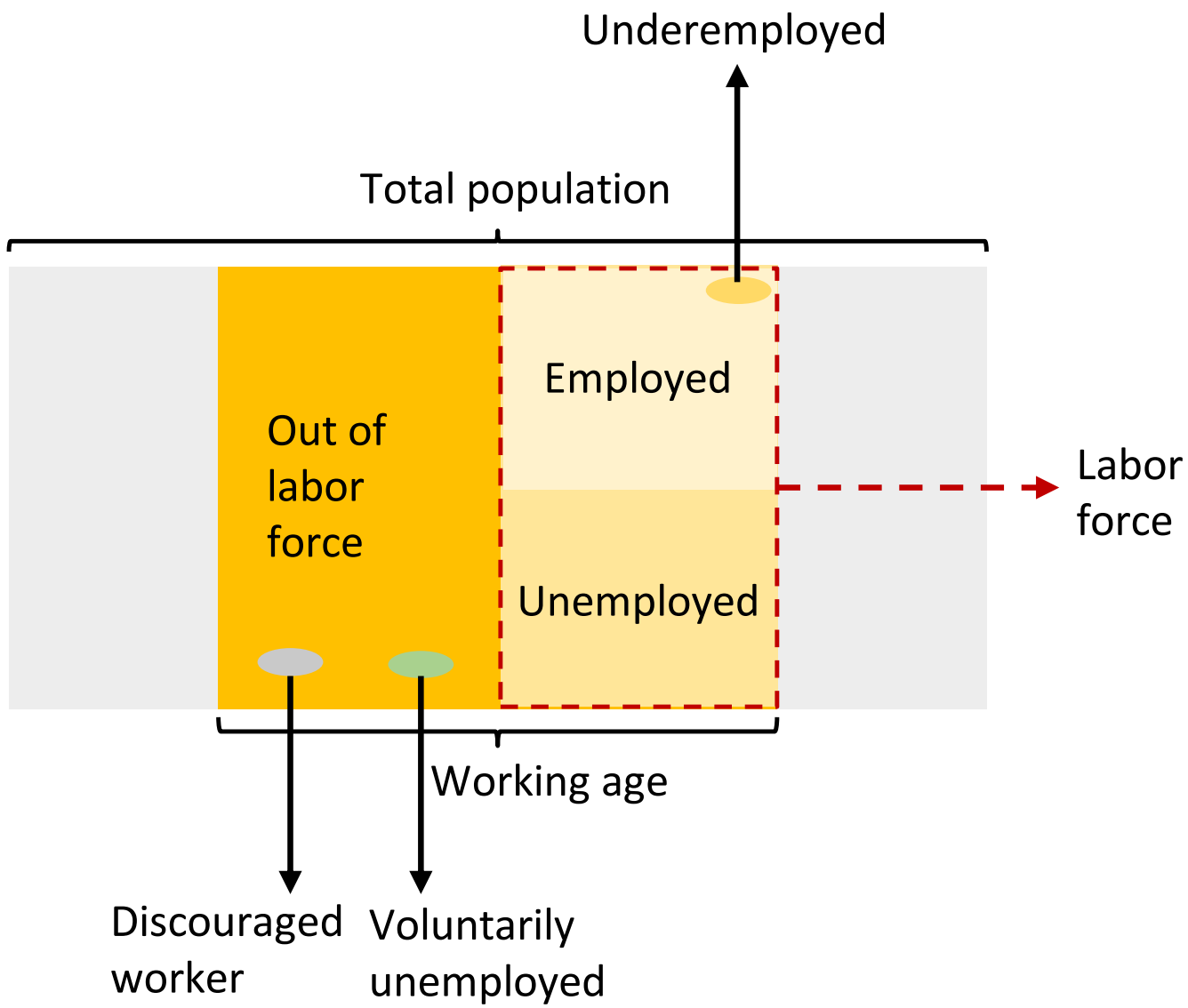
Structural unemployment results from long-term economic changes that eliminate some jobs while generating others for which unemployed workers are not qualified → require workers to learn new skills to fill available jobs.
Example: Applying advanced technology can cause some workers to be laid off due to the use of robots in manufacturing.

Cyclical unemployment is positive (negative) when the economy is producing less (more) than its potential real GDP.
Example: construction workers were laid off during the recession following the financial crisis of 2008.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.f] Describe types of unemployment, and compare measures of unemployment

2. Measures of unemployment



MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.f] Describe types of unemployment, and compare measures of unemployment

2. Measures of unemployment

- **The labor force** includes all people who are either employed or unemployed (even if he is actively searching for work).
- **The participation ratio (labor force participation ratio)**
  = (the labor force / working-age population) × 100

- **Unemployed:** A person **in the labor force** who is **not working** but is **actively searching for a work.**
- **Unemployment rate**
  = (the unemployed in the labor force/ the labor force) × 100

Underemployed: A person who **is employed** part time but would prefer to work full time or is employed at a **low-paying job** despite being qualified for a higher-paying one.

Voluntarily unemployed: person voluntarily outside the labor force

Discouraged worker: available for work but neither employed nor actively seeking for employment

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.g] Explain inflation, hyperinflation, disinflation, and deflation

Inflation

- **Inflation** is a **persistent increase** in the price level **over time**.
- Inflation erodes the purchasing power of a currency.

Hyperinflation

- **Hyperinflation** is inflation that accelerates out of control.
- **Hyperinflation** is said to be able to destroy country's monetary system and bring about social and political upheavals.

Disinflation

Disinflation refers to an inflation rate that is decreasing over time but remains greater than zero.

Deflation

Deflation occurs when there is a persistent decrease in price level (i.e., a negative inflation rate). Deflation is commonly associated with deep recessions.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.h] Explain the construction of indexes used to measure inflation

Consumer price index (CPI) compares the cost of the consumers' basket of goods today with the cost of the consumers' basket in an earlier period.

- In US, CPI measure is based on surveying all urban consumers.

$$\text{CPI} = \frac{\text{cost of basket at current price}}{\text{cost of basket at base period price}} \times 100 = \frac{\sum_{i=1}^{n} Q_{i,0} \times P_{i,t}}{\sum_{i=1}^{n} Q_{i,0} \times P_{i,0}} \times 100$$

where: i is the ith good in the basket

Price index for personal consumption expenditure (PCE) is similar to CPI but this index is created by surveying businesses instead.

Producer price index (PPI) or wholesale price index (WPI) tracks price changes experienced by domestic producers and includes items such as fuels, farm products, machinery, and equipment.

- PPI is a good indicator of future changes in the CPI.

Headline inflation
Refer to price indexes for all goods.

Core inflation
Refer to price indexes that exclude food and energy because their prices are typically more volatile than those of the others.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.h] Explain the construction of indexes used to measure inflation

Relative Importance in the US CPI as of April 2016

Category	*Percent of Index*
Food	**13.9%**
Energy	**6.6%**
All items less food and energy	**79.5%**
Commodities less food and energy commodities:	
Apparel	**3.2%**
New Vehicles	**3.8%**
Used cars and trucks	**2.1%**
Medical care commodities	**1.8%**
Alcoholic beverages	**1.0%**
Tobacco and smoking products	**0.7%**
Services less energy services:	
Shelter	**33.3%**
Medical care	**6.6%**
Transportation services	**5.9%**

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.h] Explain the construction of indexes used to measure inflation

Example 1: Caculate CPI and inflation rate

Item	Quantity	Price in base period	Current price
A	200	2.5	3
B	50	7	10
C	300	1.5	3
D	100	12	9

If the CPI of the last year is 110, determine the inflaion rate?

Answer:

Cost of basket in the base period

$$\sum_{i=1}^{n} Q_{i,t} \times P_{i,0}$$

$200 \times 2.5 + 50 \times 7 + 300 \times 1.5 + 100 \times 12 = 2500$

Cost of basket in the current period

$$\sum_{i=1}^{n} Q_{i,t} \times P_{i,t}$$

$200 \times 3 + 50 \times 10 + 300 \times 3 + 100 \times 9 = 2900$

$$\rightarrow \text{CPI} = \frac{\sum_{i=1}^{n} Q_{i,t} \times P_{i,t}}{\sum_{i=1}^{n} Q_{i,t} \times P_{i,0}} \times 100 = \frac{2900}{2500} \times 100 = 116 \rightarrow \text{ inflation rate} = (116/110) - 1 = 5.5\%$$

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.i] Compare inflation measures, including their uses and limitations

Laspeyres index	Use a **constant** (base) basket of goods and services to caculate price index. $\textbf{Laspeyres index} = \frac{\sum_{i=1}^{n} Q_{i,0} \times P_{i,t}}{\sum_{i=1}^{n} Q_{i,0} \times P_{i,0}} \times 100$
Paasche index	Use the **current** basket of goods, prices from the base period, and prices in the current period to caculate price index. $\textbf{Paasche index} = \frac{\sum_{i=1}^{n} Q_{i,t} \times P_{i,t}}{\sum_{i=1}^{n} Q_{i,t} \times P_{i,0}} \times 100$
Fisher index	The geometric mean of a **Laspeyres index** and **Paasche index**

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.i] Compare inflation measures, including their uses and limitations

3 factors cause Laspeyres index to be biased upward

New products bias	Quality bias	Substitution bias
New products are not included in the price index using a fixed basket of goods → an upward bias in the measured inflation rate.	If the price increases due to high quality → price index still increases but not due to inflation → an upward bias in the measured inflation rate	Customers replace expensive goods with cheaper substitutes → an upward bias in the computed inflation rate when fix basket of goods
	↓	↓
	Hedonic pricing	**Chained price index** (such as Fisher index)

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.i] Compare inflation measures, including their uses and limitations

Example 2: Calculating CPI index using different measures

	January 2010 (base)		Sep 2021	
Goods	Q	P	Q	P
A	70	2	100	3
B	50	5.5	60	5.6

Answer:

- **Laspeyres Index:** the quantities of goods in the consumption baskets will be fixed at their base-period levels.

  Laspeyres Index in February 2010 = $\frac{70 \times 3 + 50 \times 5.6}{70 \times 2 + 50 \times 5.5} \times 100 = 118.07$

- **Paasche Index:** base on the current quantity of goods in the basket.

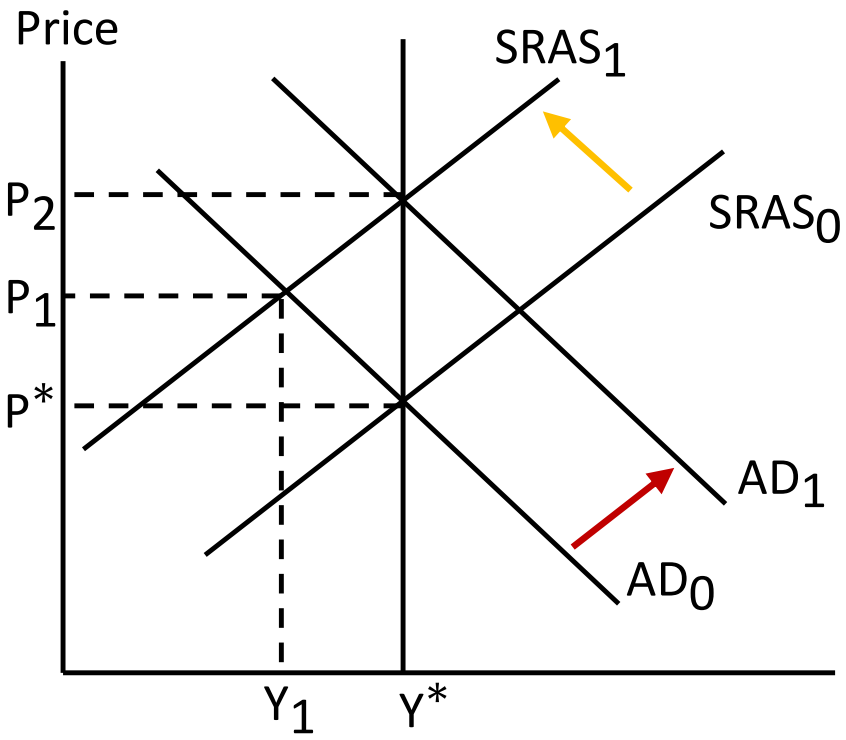
  Paasche Index in February 2010 = $\frac{100 \times 3 + 60 \times 5.6}{100 \times 2 + 60 \times 5.5} \times 100 = 120$

- **Fisher Index:** geometric mean of of the Laspeyres index and the Paasche index.
  Fisher Index in February 2010 = $\sqrt{(118.07 \times 120)} = 119.03$

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.j] Contrast cost-push and demand-pull inflation

1. Cost-push inflation



Decrease in SRAS to $SRAS_1$ → increase price level to P_1 and **reduce output to** Y_1.

Policy response that **stimulates AD** to restore the potential GDP (Y^*) → a further increase in the price level from P_1 to P_2.

Cost-push inflation occurs when **aggregate supply decreases** due to rising cost of production such as wages or raw materials raise prices.

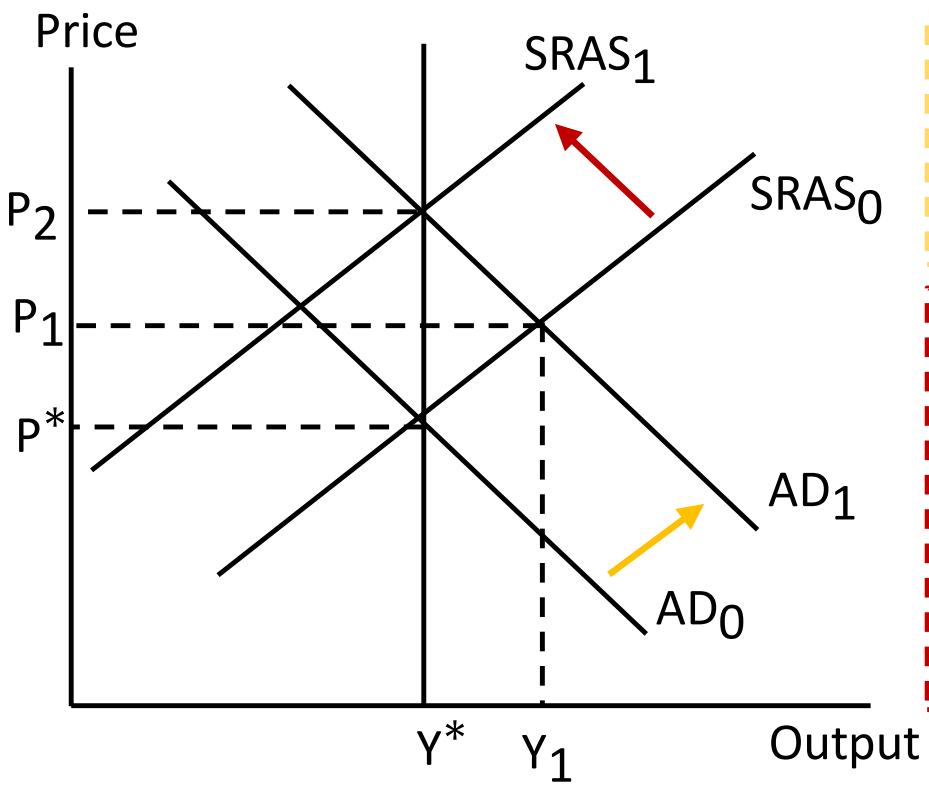
Sign of potential wage pressure (main cost of production):
Unit labor cost (ULC) = total labor compensation per hour/output per hour.

- Wage rates grow at faster rate than labor productivity cost per unit of output (ULC) increase → increase input cost → SRAS decrease → increase output price → cost-push inflation.

MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.j] Contrast cost-push and demand-pull inflation

2. Demand-pull inflation



Increase AD_0 to AD_1 → increase price level to P_1 **and increase output to** Y_1**.**

Unemployment falls below its natural rate → rising wage pressure → decrease SRAS until restore the potential GDP (Y^*) → a further increase in the price level to P_2.

Demand-pull inflation occurs when **aggregate demand increase due to** rising money supply, government spending raise price level.

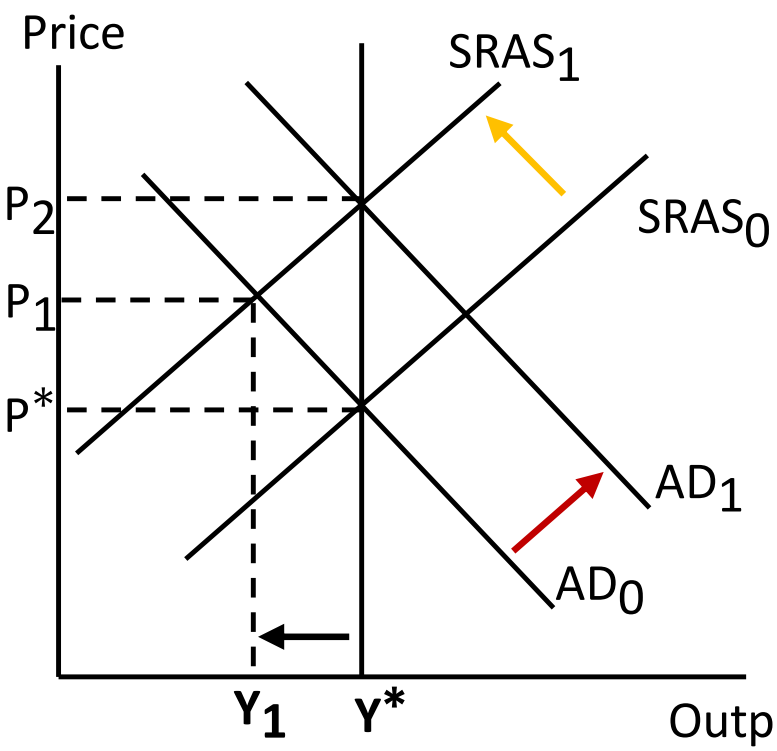
Sign of potential demand-pull inflation: **Capacity utilization**
High rate of capacity utilization → the economy is at or above potential GDP inflationary pressure.

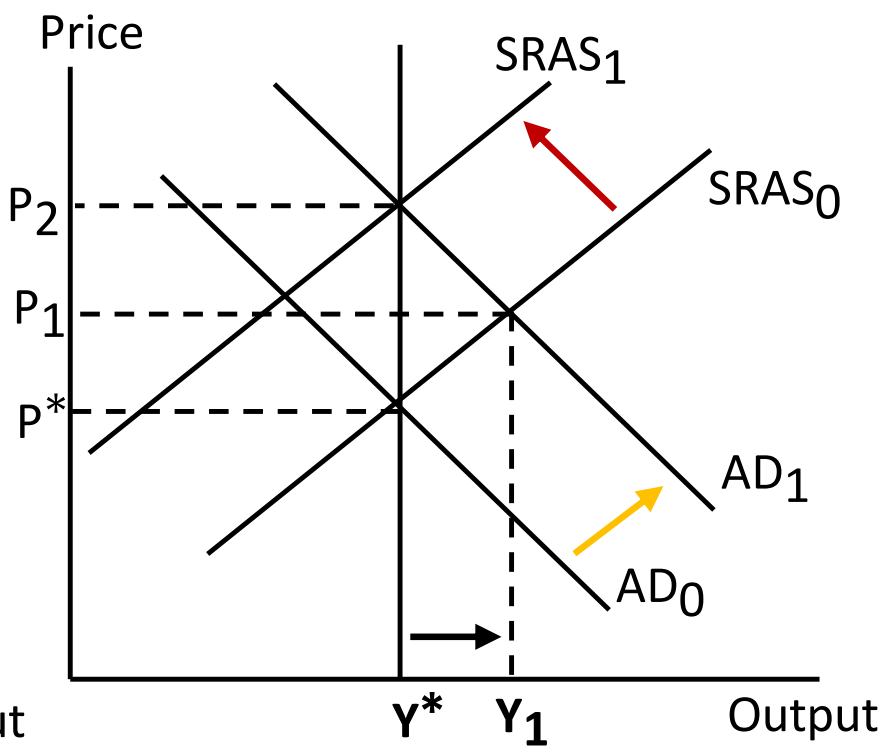
MODULE 4: UNDERSTANDING BUSINESS CYCLES

[LOS 4.j] Contrast cost-push and demand-pull inflation

3. Differences between cost-push and demand-pull inflation

Cost-push effect	Demand-pull effect
Resulted from **a decrease in aggregate supply**.	Resulted from **an increase in aggregate demand.**
Decrease GDP below potential GDP	**Increase** GDP above potential GDP





MODULE 5: MONETARY AND FISCAL POLICY

Learning outcomes

Introduction

5.a. Describe functions and definitions of money

5.b. Explain the money creation process

5.c. Describe theories of the demand for and supply of money

5.d. Describe the Fisher effect

5.e. Describe roles and objectives of central banks

5.f. Contrast the costs of expected and unexpected inflation

Monetary policy

5.g. Describe tools used to implement monetary policy

5.h. Describe the monetary transmission mechanism

MODULE 5: MONETARY AND FISCAL POLICY

Learning outcomes

5.i. Explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates

5.j. Describe qualities of effective central banks

5.k. Contrast the use of inflation, interest rate, and exchange rate targeting by central banks

5.l. Determine whether a monetary policy is expansionary or contractionary

5.m. Describe limitations of monetary policy

Fiscal policy

5.n. Describe roles and objectives of fiscal policy

5.o. Describe tools of fiscal policy, including their advantages and disadvantages

5.p. Describe the arguments about whether the size of a national debt relative to GDP matters

MODULE 5: MONETARY AND FISCAL POLICY

Learning outcomes

5.q. Explain the implementation of fiscal policy and difficulties of implementation

5.r. Determine whether a fiscal policy is expansionary or contractionary

5.s. Compare monetary and fiscal policy

5.t. Explain the interaction of monetary and fiscal policy

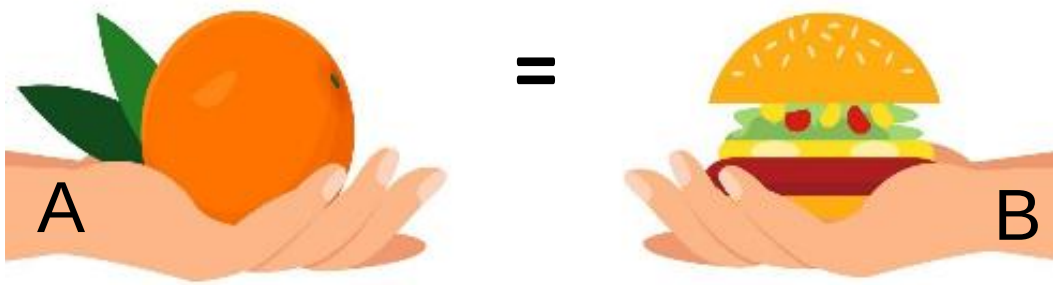
MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.a] Describe functions and definitions of money

Barter economy

Exchange goods and services directly.

Example:
A has oranges and wants a hamburger.
B has hamburgers and wants an orange.
→ They exchange an orange and a hamburger.



Problems with barter economy:

- Relies on the double coincidence of wants (i.e., each party must want what the other is selling).
- It is difficult to undertake transactions involving goods that are indivisible.
- Perishable goods are not good stores of value.
- There is no common measure of value.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.a] Describe functions and definitions of money

Definitions of money

To solve problems in barter economy → use money as medium of exchange (indirect exchange).

- **Money** is most commonly defined as **a generally accepted medium of exchange,** including**:**
  - **Narrow money** = (Notes + coins) in circulation + other highly liquid deposits
  - **Broad money** = Narrow money + the entire range of liquid assets that can be used to make purchases.

Functions of money

Three primary functions of money

Medium of exchange or **means of payment:** it is accepted by all parties as payment for goods and services → **main function of money**.

Unit of account: provide a common measure of the value of goods and services being exchanged → quantify the opportunity cost of consuming the good and facilitate efficient decision-making.

Store of value: Money is liquid and accepted everywhere → can be saved for later purchasing.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.b] Explain the money creation process

- All banks are required to hold **a minimum percentage of deposits as reserves:**

  Required reserve ratio = required reserves/ Total deposits
- The money creation process is resulted from the **lending, spending and depositing process** of the commercial banks in the economy.

Illustration of money multiplier

Consider a bank which has $1,000 in excess reserves (cash not need for reserves) resulted from selling Treasury bonds to the central bank. Assume the required reserve ratio is 10%. Calculate the money multiplier.

(1) The central bank buys $1,000 Treasury bonds from the 1st bank
(2) The 1st bank lends $1,000 to the borrower A
(3) The borrower A deposits 1,000 in the 2nd bank, the 2nd bank will be able to lend 900 to the borrower B
(4) The borrower B deposits 900 in the 3rd bank, the 3rd bank will be able to lend 810 to the borrower C

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.b] Explain the money creation process

(1) Initial money supply	**1,000**	**X**
(2) Money "created" from the 1st bank	1,000	X
(3) Money "created" from the 2nd bank	1,000(1-10%) = 900	X(1-rr)
(4) Money "created" from the 3rd bank	$1{,}000(1-10\%)^2$ = 810	$X(1-rr)^2$
...		
Money "created" from the nth bank	$1{,}000(1-10\%)^n$	$X(1-rr)^n$

Total money "created" from lending and depositing process in the commercial banks:

$$= X[1 + (1 - rr) + (1-rr)^2 + \ldots + (1-rr)^n] = X\left(\frac{1-(1-rr)^{n+1}}{1-(1-rr)}\right) = X \times \frac{1}{rr}$$

$$= 1{,}000 \times \frac{1}{10\%} = 10{,}000 \rightarrow \text{Money multiplier} = \frac{1}{rr} = \frac{1}{10\%} = 10$$

Money multiplier = $\frac{1}{\text{required reserve ratio}}$

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.c] Describe theories of the demand for and supply of money

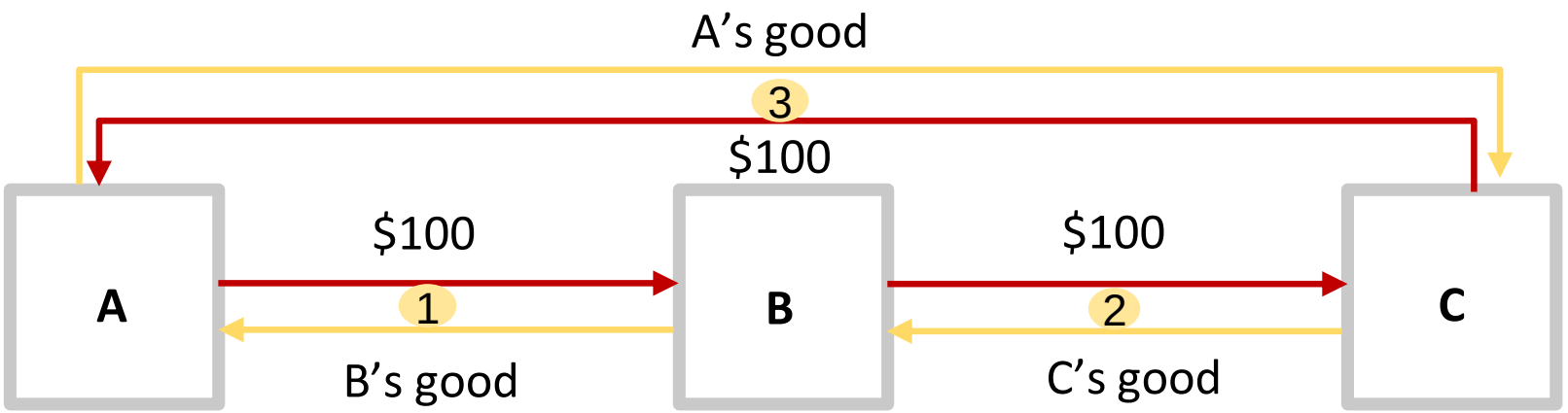
1. The quantity theory of money

The quantity theory of money expresses the relationship between **money supply** and **the price level.**

Money supply (M) × velocity (V)	=	**Price (P) × real output (Y)**
The amount of money used to purchase all goods and services		*The total spending*

Velocity is the average number of times per year each unit of money is used to buy goods and services.

- As the illustration below, we assume that A, B, C are the only participants of the economy: $100 is used 3 times to buy goods
  → velocity = 3



MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.c] Describe theories of the demand for and supply of money

1. The quantity theory of money

- **M × V = P × Y → P = M × (V/Y)** → If velocity (V) and real output (Y) are assumed constant → (V/Y) is constant
  → **any increase in money supply** (M) will lead to a proportionate **increase in the price level (P).**
  → Monetarists use **the quantity theory of money** to support their belief that **inflation can be controlled by manipulating the money supply growth rate.**
- **Money neutrality**: The belief that real output (Y) and velocity (V) are not affected by monetary variables (M&P).
  → the central bank can not change the GDP of a country by changing the money supply.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.c] Describe theories of the demand for and supply of money

2. The demand for and supply of money

Demand for money (MD) is known as the **amount of wealth** that households and firms in an economy choose to **hold in the form of money**.

The reasons for holding money

Transaction demand: Money held to finance transactions.
- Real GDP increase → increase size and numer of transaction → increase demand for money.

Precautionary demand: Money held for unforeseen future needs.
- Real GDP increase → increase size and numer of transaction → increase precautionary demand.

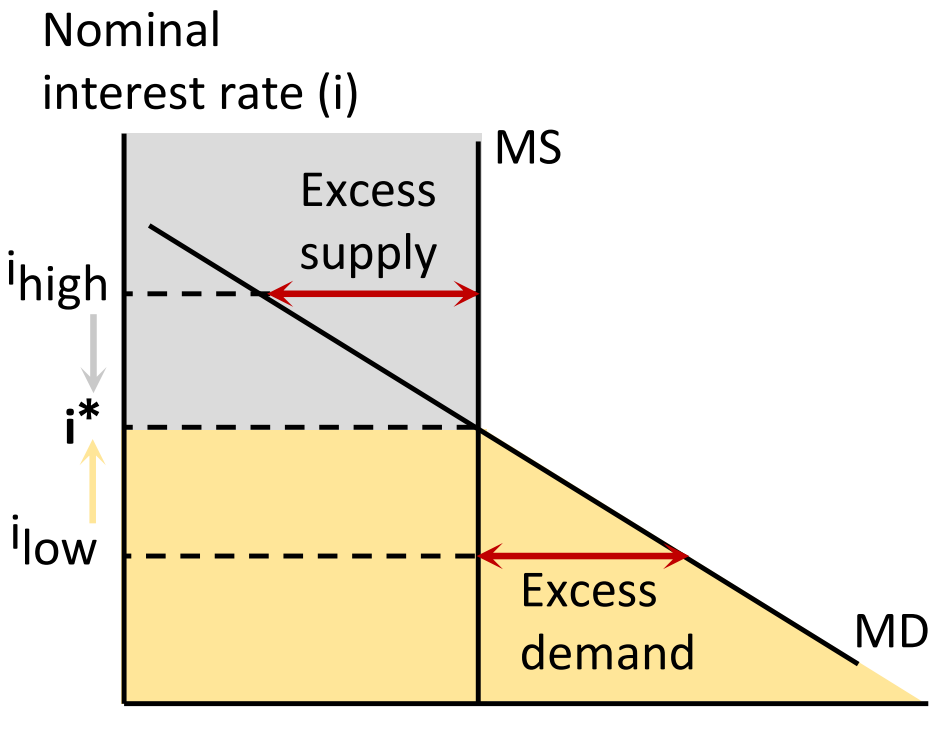
Speculative demand: Money held to take advantages of investment opportunities in the future.
- If financial assets provide higher returns → investors prefer investing more in financial assets to holding money → money demand is **inversely** related to interest rate → **downward-sloping money demand curve**.

- **Supply of money (MS)** refers to the **total volume of money** held by the public at a particular point in time in an economy.
- MS is determined by the central bank (the Fed in the United States) and is **independent** of the interest rate → **vertical money supply curve.**

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.c] Describe theories of the demand for and supply of money

2. The demand for and supply of money



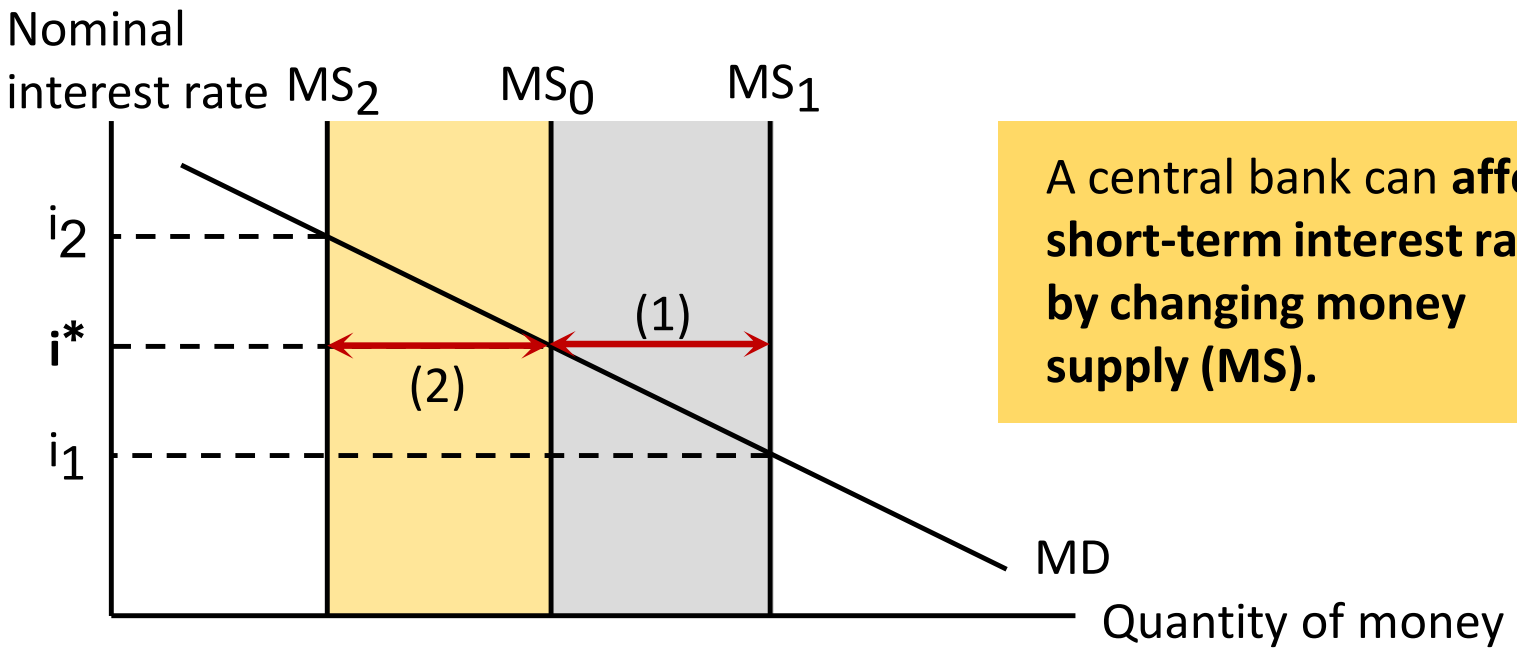
Short-term interest rates **(i^*)** are determined by the **equilibrium** between money supply (MS) and money demand (MD)

$i > i^*$	**excess supply of real money** → firms and households purchase government securities → increase demand for these securities → increase securities prices and **decrease the interest rate to i^***.
$i < i^*$	**excess demand of real money** → firms and households sell government securities → increase supply of these securities → decrease securities price and **increase interest rate to i^***.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.c] Describe theories of the demand for and supply of money

3. Increase in the money supply



A central bank can **affect short-term interest rates by changing money supply (MS).**

An increase in MS → shift the MS curve to the right ($MS_0 \rightarrow MS_1$) → excess supply of money (1) → firms and households buy securities → increase securities prices and **decrease interest rate** to the new equilibrium interest rate i_1.

A decrease in MS → shift the MS curve to the left ($MS_0 \rightarrow MS_2$) → excess demand of money (2) → firms and households sell securities → decrease securities prices and **increase interest rate** to the new equilibrium interest rate i_2.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.d] Describe the Fisher effect

- **The Fisher effect** states that **the nominal interest rate is simply the sum of the real interest rate and expected inflation.**

$$R_{Nom} = R_{Real} + E[I]$$

where:

R_{Nom} = nominal interest rate

R_{Real} = real interest rate

E[I] = expected inflation

- Real interest rates are relatively stable → **changes in interest rates are driven by changes in expected inflation.**

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.e] Describe roles and objectives of central banks

Roles of central banks	
Sole supplier of currency	• Central banks have the sole authority to supply money. • Guardians of the value of **fiat currencies (1)** and maintain the confidence in them.
Regulator and supervisor the banking system	• Impose standards of risk-taking allowed and reserve requirement of banks. • Ensure smooth operations of the domestic and external transactions.
Lender of last resort and banker to government and other banks	• Provide banking services to government and other banks in the economy. • Supply funds to banks with shortfalls → prevent bankrupts.
Conduct of monetary policy	Control and influence the money supply and growth rate of money supply.
Holder of gold and foreign exchange reserves	Central banks are often the repositories of the nation's gold and reserves of foreign currencies .

(1) ***Fiat currency*** *is money which is not backed by any tangible value and is deemed* ***legal tender****.*

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.e] Describe roles and objectives of central banks

Objectives of central banks

- **Stabilize the price**
- **Control inflation**
- **Maximum employment**
- **Stabilize exchange rate**
- **Sustainable positive economic growth**
- **Moderate long-term interest rates**

Main objectives, detail explanation in LOS 5.h

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.f] Contrast the costs of expected and unexpected inflation

Costs of expected inflation

- **Expected inflation** is the inflation rate that economic agents expect to see in the economy in the future.
- Expected inflation gives rise to:

Menu costs: *Costs to businesses* of having to change prices of goods and services.

Shoe leather costs: *Costs to individual* to deal with the effects of inflation: *Holding less cash on hand → frequently go to the banks to withdraw cash → wear out their shoe leather.*

Costs of unexpected inflation

- **Unexpected inflation** is the level of inflation that comes as a surprise to economic agents → **more costly** than expected inflation.
- In addition to the costs of expected inflation, unexpected inflation also leads to:

Higher risk premium in borrowing rates: volatile inflation rates → higher risk premium demanded by lenders → increase interest rates → slow economic activity.

Inequitable transfers of wealth between borrowers and lenders:

- Inflation > expected → the real value of loan payments falls → **benefit borrowers**
- Inflation < expected → the real value of loan payments rises → **benefit lenders**

A reduction in the information content of market prices: information about supply and demand from changes in price becomes less reliable.

MODULE 5: MONETARY AND FISCAL POLICY

Basics of monetary policy

	Monetary policy
Meanings	Refer to the central bank's actions that affect the quantity of money and credit in an economy to influence economic activity.
Managed by	The central bank
Relative to	The quantity of money and credit
Tools	Interest rate (i) and money supply (MS)
Goals	Maintaining stable price and producing positive economic growth.
Include	**Expansionary** monetary policy: Increase the quantity of money and credit.
	Contractionary monetary policy: Decrease the quantity of money and credit.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.g] Describe tools used to implement monetary policy

	Policy rate	Reserve requirement	Open market operations
Definition	**The rate at which banks can borrow funds** from the central banks if they have temporary shortfalls in reserves.	All banks are required to hold **a certain proportion of their deposits** in the form of reserves.	**Buying or selling of securities** by the central bank to directly influence the level of reserves held by banks.
Contracti-onary monetary policy	A **higher policy rate** → increase banks' cost of funds → decrease banks' lending → money supply declines → **increase interest rate.**	**Increase reserve requirement** → decrease funds available for lending → money supply declines → **increase interest rate.**	The central bank **sells securities** → decrease excess reserves in banks → decrease funds available for lending → money supply declines → **increase interest rate.**
Expansi-onary monetary policy	Similar explanation: a lower policy rate → **decrease interest rate.**	Similar explanation: decrease reserve requirement → **decrease interest rate.**	Similar explanation: the central bank buys securities → **decrease interest rate**

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.h] Describe the monetary transmission mechanism

The monetary transmission mechanism refer to **how a change in monetary policy affects the price level and inflation.**

Four channels in the monetary transmission mechanism

*When **the interest rates increase (contractionary monetary policy)**:*

Short-term rate	Asset values	Expectations	Currency exchange rates
Bank's short-term lending rate increase → consumers' credit purchase **(C) +** businesses' investment **(I) decrease**	Asset prices and values of capital projects fall → reduce household wealth → consumption **(C) decrease**	Expectations for the future economic growth decrease → consumers **(C) +** businesses expenditures **(I) decrease**	Attract foreign investment in debt securities → appreciation in domestic currency → net export **(X – M) decrease**

The total aggregate demand (AD) **decreases**
→ the price level **decreases**
→ inflation **decreases**

Similar explanation → the interest rates **decrease** (**expansionary monetary policy**) → increase total AD → **increase** price level → **increase** inflation

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.i] Explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates

Effect of contractionary monetary policy	
Interest rates	As explained in LOS 5.g, a contractionary monetary policy → a decrease in loanable funds and money supply → **an increase in interest rates** (both short and long term)
Exchange rates	As explained in LOS 5.h, a contractionary money policy → appreciation in domestic currency → a **decrease in exchange rates.**
Economic growth	As explained in LOS 5.h, a contractionary money policy → a decrease in aggregate demand (AD) → a decrease in real output in the short run → **a decrease in economic growth in the short run**
Inflation rates	As explained in LOS 5.h, a contractionary money policy → a decrease in the price level → a **decrease in inflation rates**

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.j] Describe qualities of effective central banks

Three essential qualities make a central bank succeed in its policies.

Independence	• **Operational independence**: the central bank is allowed to **independently determine the policy rate**.
	• **Target independence**: the central bank defines:
	  • how inflation is computed
	  • the target inflation level
	  • the horizon over which the target is to be achieved.

Credibility	To be effective, the central banks should **follow through on their stated intentions:** • If the market believes that a central bank is serious about achieving its inflation target is 3% (**credible central bank)** → wages and other nominal contract will be based on 3% inflation → actual inflation will be close to the target→ effective policy
Transparency	The central banks **periodically** disclose the state of the economic environment by issuing **inflation reports.**

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.k] Contrast the use of inflation, interest rate, and exchange rate targeting by central banks

	Details	Supported by	
		Rise above the target	**Fall below the target**
Interest rate targeting	The central bank makes **a target of interest rate** and the interest rate expectations must be managed.	Increase the **money supply** to decrease the interest rate	Decrease the **money supply** to increase the interest rate
Inflation targeting	The central bank sets **an inflation target** and contain inflation within an acceptable range.	Decrease **the money supply** to decrease inflation	Increase the **money supply** to increase inflation
Exchange rate targeting	The central bank **target a foreign exchange rate** between their currency and another.	**Buy** the domestic currency to increase its value	**Sell** the domestic currency to reduce its value

Cause **volatility of the domestic money supply** when maintain a stable exchange rate.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.l] Determine whether a monetary policy is expansionary or contractionary

The **trend rate** is an economy's **long – term sustainable real growth rate** and it changes over time as structural conditions of the economy change.

The **neutral interest rate** is the growth rate of the money supply that neither increase nor decrease the economic growth rate:

Neutral interest rate = trend rate + inflation target

Policy rate > neutral rate
→ **contractionary** monetary policy

Policy rate < neutral rate
→ **expansionary** monetary policy

The central bank needs to determine *the source of inflation* before deciding on its policy response:

Higher inflation due to **demand shocks**	Higher inflation due to **supply shocks**
The appropriate response is contractionary monetary policy to reduce inflation.	Contractionary monetary policy may take the economy further into a recession.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.m] Describe limitations of monetary policy

Expected inflation makes long-term rates not move together with short-term rates	The central bank decrease the money supply (increase interest rates) aim to reduce inflation → individuals and businesses expect a lower inflation rates in the future → long-term rates fall → increase economic growth while the central bank has increased short-term rates in order to slow economic activity.

Liquidity trap is a situation in **which interest rates are too low**, rendering monetary policy ineffective. In a liquidity trap, consumers choose to **keep their money** instead of purchasing Treasury securities. Bank **cannot raise capital**, business cannot borrow, leads to **low economy growth rate.**	**Liquidity trap**

Bond market vigilantes	• A **bond vigilante** is an investor who **protests against** monetary policy considered inflationary by selling bonds. • The central bank increase MS → they believe that the money supply growth is inflationary → higher expected future asset prices → long-term bonds less attractive → **bond market vigilantes** sell bonds → bond prices decreases → increase long-term interest rates → the policy is not effective.

During credit bubbles in 2008, banks around the world lost equity capital and desired to rebuild it → decrease their lending even as money supplies were increased and short-term rates fell → increasing the money supply might not increase economic activity	**Banks may not be willing to lend even with increasing excess reserves**

Risk associating with conducting quantitative easing	Quantitative easing is that the central bank **increases purchasing bonds** in order to increase the money supply in the economy. However, the central bank might take risk if they buy **risky securities** and cannot receive payment from borrowers.

MODULE 5: MONETARY AND FISCAL POLICY

Basics of fiscal policy

Meanings	Refer to a government's use of spending and taxation to influence economic activity.
Managed by	Government
Relative to	Government's revenue (T) and expenditure (G)
Tools	Government's taxation and expenditure (T, G)
Goals	• Maintaining stable price and producing positive economic growth. • Distribution of income and wealth.
Include	**Expansionary** fiscal policy: Increase G and/or decrease T
	Contractionary fiscal policy: Decrease G and/or increase T

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.n] Describe roles and objectives of fiscal policy

Roles of fiscal policy

Fiscal policy is a tool for government to regulate the economy through spending and tax policies, including:

Expansionary fiscal policy	Contractionary fiscal policy
Increase government spending (G) + decrease taxes (T) will lead to: • Increase AD as well as budget deficit (*) • Increase economic growth and employment	Decrease government spending (G) + increase taxes (T) will lead to: • Decrease AD as well as budget deficit (*) • Decrease economic growth and employment

Objectives of fiscal policy

Produce economic growth	Maximum employment
Redistribute wealth and income among segments of the population	
Allocate resources among economic agents and sectors in the economy	

(*) The budget surplus/deficit equals the difference between the government's revenue and expenditure (G – T) over a period of time:

- (G – T) < 0 → budget surplus
- (G – T) > 0 → budget deficit

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.o] Describe tools of fiscal policy, including their advantages and disadvantages

Tools of fiscal policy	
Spending tools	**Revenue tools**
• Transfer payments • Current spending • Capital spending	• Direct taxes • Indirect taxes

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.o] Describe tools of fiscal policy, including their advantages and disadvantages

1. Spending tools (G)

	Including
Transfer payment	**Welfare payments** that redistribute wealth, taxing some and making payments to others. • Increase transfer payments → increase households' income → increase households' consumption (C) → increase AD • Similarly, decrease transfer payment → decrease AD → **Indirect effect** on AD through individuals' income and consumption
Current spending	Government **purchases of goods and services** on a recurring, regular basis. • Increase current spending → increase government purchase (G) → increase AD • Similarly, decrease current spending → decrease AD → **Direct effect** on AD through government purchase (G)
Capital spending	Government spending on **infrastructure** → **boost future productivity** of the economy. • Increase capital spending → increase government purchase (G) → increase AD • Similarly, decrease capital spending → decrease AD → **Direct effect** on AD through government purchase (G)

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.o] Describe tools of fiscal policy, including their advantages and disadvantages

1. Spending tools (G)

Justification

- Provide services that benefit all the residents in a country.
- Invest in infrastructure to enhance economic growth.
- Support the country's growth and unemployment targets.
- Provide a minimum standard of living.
- Subsidize investment in research and development

Disadvantages

Transfer payments and **capital spending** take long time to implement.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.o] Describe tools of fiscal policy, including their advantages and disadvantages

2. Revenue tools (T)

Including	
Direct taxes	Direct taxes are levied on **income or wealth**: *Income taxes, corporate taxes, wealth taxes,…* • **Increase direct taxes** → decrease disposable income → decrease household consumption (C) → **decrease AD** • Similarly, decrease direct income → increase AD
Indirect taxes	Indirect taxes are levied on **goods or services**: *Sales taxes, VAT,…* • **Increase indirect taxes** → increase the price of goods and services → decrease household consumption (C) → **decrease AD** • Similarly, decrease indirect income → increase AD

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.o] Describe tools of fiscal policy, including their advantages and disadvantages

2. Revenue tools (T)

Desirable attributes

- **Simplicity** to use and enforce
- **Efficiency**: having **least** interference with market forces.
- **Fairness:**
  - *Horizontal equality*: people in similar situations should pay similar tax.
  - *Vertical equality*: richer people pay more in taxes.
- **Sufficiency:** taxes should generate sufficient revenues to meet spending needs

Advantages	Disadvantages
Indirect taxes make: • Social policies be implemented quickly. • Increase government revenues without significant cost.	**Direct taxes** takes a long time to implement → delay the impact of fiscal policy

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.p] Describe the arguments about whether the size of a national debt relative to GDP matters

Arguments for being concerned with the size of national debt

An increase in national debt → higher deficit
→ higher future taxes
→ disincentives to work
→ lower long -term GDP growth

An increase in national debt
→ higher deficit
→ lose confidence in the government
→ investors not refinance the debt
→ government defaulting or printing money
→ higher inflation

An increase in national debt
→ higher deficit
→ increase government borrowing
→ increase interest rates
→ reduce firm's investment
→ decrease impact on AD
(crowding-out effect)

Arguments against being concerned with the size of national debt

- The debt is not really a major issue to affect economic matters if it is owed internally to fellow citizens because the government can just print money to pay the debt (but it comes with high inflation risk).
- The debt is used to invest in capital → future economic gains repay the debt.
- Fiscal deficit may prompt needed tax reform
- Deficits would not matter if private sector savings in anticipation of future tax liabilities just offsets the government deficits.
- If the economy is operating at less than full capacity, deficits can increase GDP and employment.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

1. Implementation of fiscal policy

Discretionary fiscal policy and automatic stabilizers

	Discretionary fiscal policy	Automatic stabilizers
Details	Government **intentionally changes** taxes (T) or government spending (G) to stabilize the AD	Built-in fiscal devices such as personal taxes, transfer payments…that **automatically regulate** the economy.
Expansion	Government decrease G and or increase T → decrease AD	Tax revenue increase due to high personal income + lower outflows for social programs → decrease AD
Recession	Government increase G and or decrease T → increase AD	Tax receipts fall due to lower personal income + government expenditure on unemployment payments rises → increase AD

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

1. Implementation of fiscal policy

Fiscal multiplier

The fiscal multiplier determines **the potential increase in aggregate demand** resulting from an increase in government spending (G)

Illustration of Fiscal multiplier

Consider an increase in government spending of X when marginal propensity to consume is MPC and the tax rate is t. Determine the fiscal multiplier?

The detailed illustration is presented in the next slide.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

1. Implementation of fiscal policy

	Initial increase in spending	Additional disposable income	Additional spending (consumption)
1st one receives:	X	X(1-t)	X(1-t)MPC
2nd one receives:	X(1-t)MPC	$X(1-t)^2MPC$	$X(1-t)^2MPC^2$
	...		
nth one receives:	$X(1-t)^{n-1}MPC^{n-1}$	$X(1-t)^nMPC^{n-1}$	$X(1-t)^nMPC^n$

Total additional spending $= X[1+ (1-t)MPC + (1-t)^2MPC^2 +...+ (1-t)^nMPC^n]$

$= X\left(\frac{1}{1 - MPC(1 - t)}\right)$

→ With the *initial increase* in spending of X → total spending in the economy will increase by: $X\left(\frac{1}{1 - MPC(1 - t)}\right)$

Fiscal multiplier $= \frac{1}{1 - MPC(1 - t)}$

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

1. Implementation of fiscal policy

Balanced budget multiplier

- In order to balance the budget, the government could increase taxes by X to offset a X increase in spending.
- A increase in taxes of X → decrease disposable income by X → an **initial decrease** in spending = **(X × MPC)**
  → decrease in AD = **(X × MPC) × fiscal multiplier**

	Increase in spending (G) of X	Increase in taxes (T) of X
Effects on total spending	Increase = X × fiscal multiplier	Decrease = (X × MPC) × fiscal multiplier
Net effects on total spending	Increase = X × fiscal multiplier - (X × MPC) × fiscal multiplier = X × fiscal multiplier × (1 – MPC)	

Balanced budget multiplier = fiscal multiplier × (1 – MPC)

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

1. Implementation of fiscal policy

Ricardian equivalence

- **(G – T) = (S – I) + (M – X)**

- If an increase in savings (S) is just **enough** to repay the total debt the government issued to finance the increased deficit
  → no effect on AD
  → **Ricardian equivalence**

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

1. Implementation of fiscal policy

***Example*: Fiscal multiplier and balanced budget multiplier**

Consider an increase in government spending of 100 when MPC = 80% and the tax rate is 25%. Determine the effect on aggregate demand using fiscal multiplier and balanced budget multiplier.

Answer:

- Fiscal multiplier $= \frac{1}{1 - MPC(1 - t)} = \frac{1}{1 - 0.8(1 - 0.25)} = 2.5$
- Balanced budget multiplier = fisher multiplier × (1 – MPC) = 2.5 × (1 – 0.8) = 0.5
- In order to balance the budget, government has increase taxes by 100 to offset the 100 increase in government spending

→ Net effect on total spending of both is an increase of:

100 × Balanced budget multiplier = 100 × 0.5 = 50.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

2. Difficulties of implementation

The lag between the economic conditions and the impact of fiscal policy

Recognition lag	Action lag	Impact lag
The time policymakers recognize the nature and extent of the economic problems.	The time government take to discuss, vote and enact fiscal policy changes.	The time between the enactment of fiscal policy changes and when the impact actually takes place.

Example:

- Recognition lag*:* if global oil prices rise sharply, it will take some time before the cost of this is passed on to consumers and businesses throughout the economy and for any resulting economic damage to occur.
- Action lag: Policymakers may need several weeks to debate the appropriate policy response.
- Impact lag: While Trump's tax reform went into effect in January 2018, it was for the 2018 tax year, but the impact was not felt until the spring of 2019 when Americans filed their 2018 taxes.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.q] Explain the implementation of fiscal policy and difficulties of implementation

2. Difficulties of implementation

Additional macroeconomic issues	
Misreading economic statistics	The full employment level is not precisely measurable → higher inflation due to mistaken expansionary fiscal policy.
Crowding-out effect	Expansionary fiscal policy may reduce private investment → reduce impact on AD.
Supply shortages	If slow economic growth is resulted from supply constraints → expansionary fiscal policy will lead to further inflation *(explained in Module 3 – LOS 3.k)*
Limits to deficits	If funding deficit which is too high relative to GDP → higher interest rates make the situation worse.
Multiple target	Fiscal policy can not address both high unemployment and high inflation simultaneously (*explained in Module 3 – LOS 3.k).*

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.r] Determine whether a fiscal policy is expansionary or contractionary

As mentioned in **LOS 5.q, the automatic stabilizers** can cause the change in *budget deficit (G – T)* and unrelated to fiscal policy changes
→ we can not only follow the changes in budget deficit to determine whether the fiscal policy is expansionary or contractionary
→ look at the **structural (or cyclically adjusted) budget deficit (*)** as an indicator of the fiscal stance.

(*) Structural budget deficit: the deficit that occur on current policy if the economy is at full employment.

Compare with the structural budget deficit

If the current budget deficit is **lower**	If the current budget deficit is **higher**
→ **contractionary** fiscal policy	→ **expansionary** fiscal policy

The government needs to determine *the source of deficit* before deciding on its policy response:

If the deficit is a natural outcome of the recession (increase transfer payments and reduce tax revenue) *without* any explicit action of the government → expansionary fiscal policy is not necessary.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.s] Compare monetary and fiscal policy

	Fiscal policy	Monetary policy
Meanings	Refer to a government's use of spending and taxation to influence economic activity.	Refer to the central bank's actions that affect the quantity of money and credit in an economy to influence economic activity.
Managed by	Government	The central bank
Relative to	Government's revenue and expenditure	The quantity of money and credit
Tools	Government's taxation (T) and expenditure (G)	Interest rate (i) and money supply (MS)
Goals	Maintaining stable price and producing positive economic growth. • Fiscal policy's goal is also to redistribution of income and wealth.	
Include	**Expansionary** fiscal policy: Increase G and/or decrease T	**Expansionary** monetary policy: Increase the quantity of money and credit.
	Contractionary fiscal policy: Decrease G and/or increase T	**Contractionary** monetary policy: Decrease the quantity of money and credit.

MODULE 5: MONETARY AND FISCAL POLICY

[LOS 5.t] Explain the interaction of monetary and fiscal policy

Expansionary fiscal policy

Increase government spending/ decrease taxes → increase AD → **increase output** and **public sectors**

Expansionary monetary policy

Interest rates decrease → private sectors demand **increase**

Decrease government spending/ increase taxes → decrease AD → **decrease output** and **public sectors**

Contractionary fiscal policy

Interest rates increase → private sectors demand **decrease**

Contractionary monetary policy

Monetary policy	Fiscal policy	Interest rate	Output	Private sectors	Public sectors
Expansionary	Expansionary	↓	↑	↑	↑
Expansionary	Contractionary	↓	N/A	↑	↓
Contractionary	Expansionary	↑	↑	↓	↑
Contractionary	Contractionary	↑	↓	↓	↓

MODULE 6: INTRODUCTION TO GEOPOLITICS

Learning outcomes

6.a. Describe geopolitics from a cooperation versus competition perspective

6.b. Describe geopolitics and its relationship with globalization

6.c. Describe tools of geopolitics and their impact on regions and economies

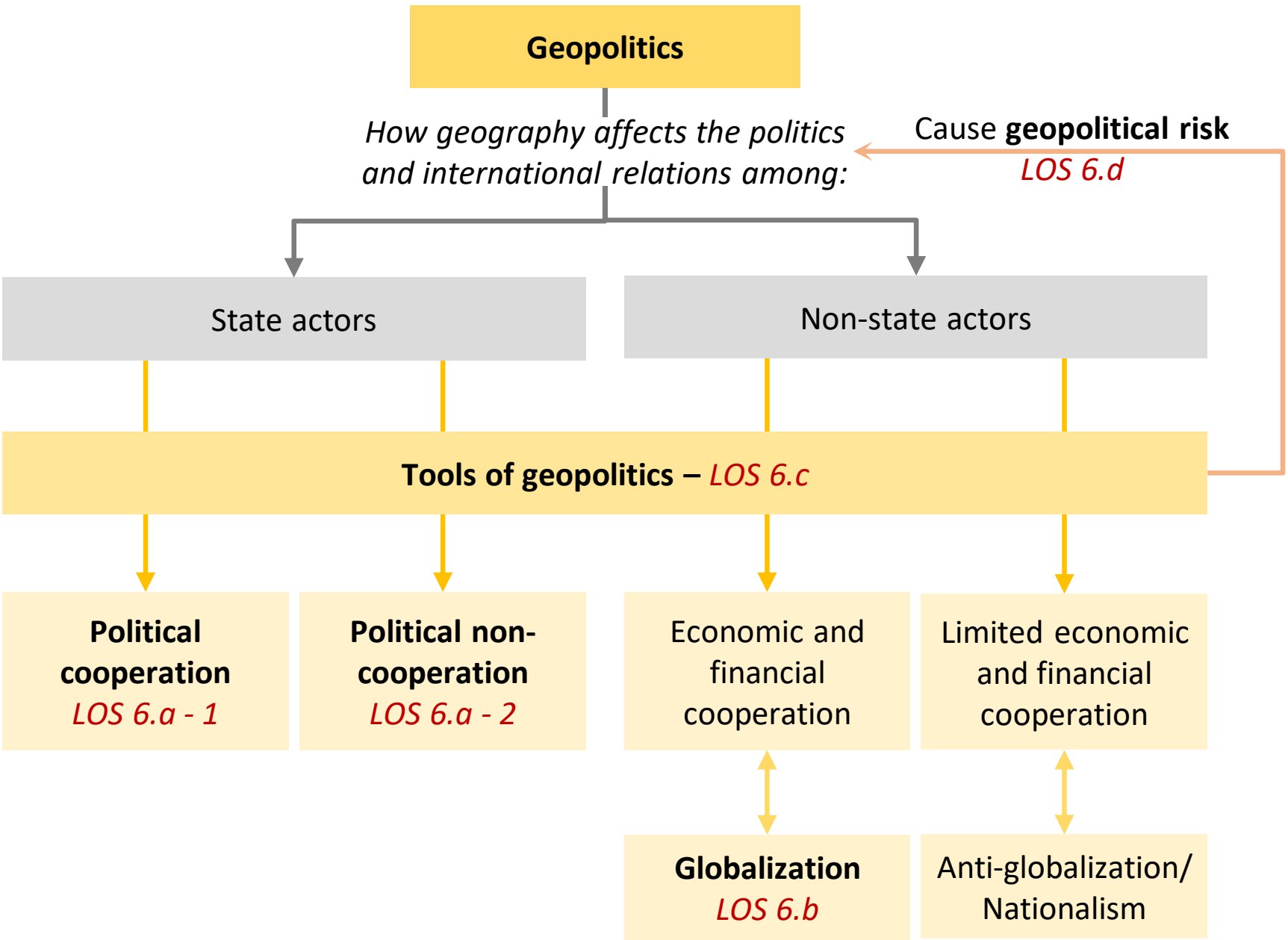
6.d. Describe geopolitical risk and its impact on investments

MODULE 6: INTRODUCTION TO GEOPOLITICS

Introduction some terms of geopolitics	
Geopolitics	The study of how geography affects **politics** and **international relations**. Analysts will study ***actors*** and how they interact with one another.
Actors	Individuals, organizations, companies, and national governments that carry out political, economic, and financial activities. • **State actors**: typically national governments, political organizations, or country leaders that exert authority over a country's national security and resources. • **Non-state actors**: participate in global political, economic, or financial affairs but do not directly control national security or country resources.
Geopolitical risk	The risk associated with tensions or actions between actors that affect the normal and peaceful course of international relations. • Tend to rise when the ***geographic and political factors*** underpinning country relations shift.

MODULE 6: INTRODUCTION TO GEOPOLITICS

Overview



MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.1. Features of Political Cooperation

Cooperation is the process by which countries work together toward some shared goal or purpose

Political cooperation is the degree to which countries work toward agreements on rules and standardization for the activities and interactions between them.

Non-cooperation *represented by:*	**Cooperation** *engage and reciprocate in:*
Inconsistent Rules	Rules Standardization
Arbitrary Rule	Harmonization of Tariffs
Restricted Movement Across Borders	Free Movement Across Borders
Restricted Trade; Capital Controls	Permitted movement of Goods, Services, and Capital
Retaliation	Reciprocation
Lack of Technology Exchange	Technology Exchange

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.2. Motivations for Cooperation

Motivations for cooperation are typically defined by a country's **national interest** – **set of goals and ambitions**, and they could be military, economic, or cultural.

1.2.1. National Security or Military Interest

National security or **national defense** involves protecting a country from external threat (military attacks, terrorism, crime, cyber-security, natural disasters).

Geographic factors can affect cooperative approach of a country as they play an important role in shaping a country's approach to national security.

Landlocked countries (no access to the open sea)
Switzerland, rely extensively on their neighbors for access to vital resources → make cooperation more important for sustaining international access and growth, or even for survival.

Coastal countries (direct access to the open sea)
Vietnam has an advantage related to trade and transport as well as the natural resources provided by the ocean → have different cooperation approach for improving economic growth instead of survival.

Countries with special geographic location
Countries highly connected to trade routes (Singapore) or countries acting as a conduit for trade (Panama) may use their geographic location as a lever of power in broader international dynamics.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.2. Motivations for Cooperation

1.2.2. Economic interest

Economic factors, including access to such resources as energy, food, or water, can affect cooperative approach of a country as they also play an important role in maintaining national security and supporting economic growth.

Trade
(to secure essential resources)

Standardization
(to level the global playing field for their companies/ industries)

On a domestic level

A country cooperates to support growing national wealth and limiting income inequality → social stability

On an international level

A country cooperates to support the ability of national firms to operate on a global scale.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.3. Geophysical Resource Endowment

Geophysical resource endowment includes factors such as livable geography and climate; access to food and water, which are necessary for sustainable growth.

The resource endowment inequality among countries can affect the term of engagement between states.

For resource-rich country	For resource-poor country
Have **more political leverage** when dealing with another country. **Internal political instability** caused by interest groups. May rely on other countries for **other basic needs** (only rich in one type of resources - Saudi Arabia)	Be dependent on cooperation for key factors of production and innovation to survive.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.4. Standardization

Governments have more incentive to cooperate with others in standardizing the rules of engagement to support **cross-border economic and financial activities**

- **Standardization** is the process of creating protocols for the production, sale, transport, or use of a product or service.
- Standardization occurs when relevant parties agree to follow these protocols together.

Higher economic growth and standards of living.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.4. Standardization

Types of Rules Standardization

	Regulatory Cooperation	Process Standardization	Operational Synchronization
Challenge	Inconsistent governance and risk management of the banking sector	Difficulties of financial transactions across borders: higher cost, longer wait time	Inconsistent container shapes and sizes → supply chain bottlenecks
Solution	Basel Committee on Banking Supervision (BCBS)	Society for Worldwide Interbank Financial Telecommunication (SWIFT)	Containerization
Benefit	Allows for **more effective supervision** of the global banking sector and international capital flows.	Facilitates global payments in more than 200 countries and territories, servicing more than 11,000 institutions worldwide.	**Dramatically reduces** the time and cost of shipping goods.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.5. Cultural Considerations and "Soft Power"

Cultural reasons can affect the political cooperation due to historical relations between countries such as long-standing political ties, immigration patterns, shared experiences, or cultural similarities.

Soft power is a means of influencing another country's decisions without force. Soft power can be built over time through such actions as **cultural programs, advertisement, travel grants, and university exchange.**

Example: South Korea advertises visiting Seoul in subway systems globally. These advertisements use popular Korean-made products, musical acts, and actors to encourage interaction with Korean culture and business.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.6. Factors affecting Political cooperation

1.6.1. The Role of Institutions

An **institution** is an established organization or practice in a society or culture. Institutions can, but need not be, formed by national governments.

Example: Non-governmental organizations, charities, religious customs, family units, the media, political parties, educational practice.

Strong institutions

Contribute to more **stable internal and external political forces** → more opportunity to develop cooperative relationships.

Promote government accountability, rule of law and property rights → **more authority and independence** in the international space.

Make cooperative relationships more **durable**.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.6. Factors affecting Political cooperation

1.6.2. Hierarchy of Interests and cost of cooperation

A country's national interest can be considered as a **hierarchy of factors**, with those essential for survival at the top of the hierarchy and nice-but-not-essential elements lower in the hierarchy.

Governments use the hierarchy of interests to guide their behavior: when two needs result in conflicting cooperation tactics, those higher on the hierarchy are prioritized.

Example: Cooperation in the form of tariff harmonization may benefit the country on a stand-alone basis; however, if those countries are in a military conflict, then there is a *higher cost to cooperation* → if military determination is higher on the countries' hierarchies, then cooperation may not be in their national interest despite potential benefits.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

1. Political Cooperation

1.6. Factors affecting Political cooperation

1.6.3. Power of the Decision Maker

The **hierarchy of national interests** can become more **subjective**
→ One government may treat the prioritization of some national interests very **differently** from the previous government.

How governments weigh those issues will determine **the depth and nature of political cooperation.**

The **length of a country's political cycle** has an important impact on priority designation:

- Shorter cycles → Prioritize short-term projects/ goals to long-term ones
  → Harder to combat long-term risks (climate change, income inequality)

Decision makers' motivations can impact a country's cooperative and non-cooperative choices.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a] Describe geopolitics from a cooperation versus competition perspective

2. Political Non-Cooperation

Political non-cooperation happens when countries consider **political self-determination** to be more important than the benefits of any cooperative actions.

The importance of cooperation for other state actors may result in attempts to **force** non-cooperative state actors into participation.

Example: International sanctions against Venezuela (2015 -)
The European Union urged Venezuelan officials to work towards political reconciliation but ultimately joined the United States in targeted sanctions to encourage a credible and meaningful process towards re-starting cooperation.
→ Venezuela's non-cooperative stance indicates that its political self-determination is a priority above that of the humanitarian cost being inflicted on its citizens.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.b] Describe geopolitics and its relationship with globalization

1. Features of Globalization

The process of interaction and integration among people, companies, and governments worldwide

Globalization

Trade of goods and services
Capital flows
Currency exchange
Cultural and information exchange

accelerate ← Political cooperation

Organic private sector forces (without government support)

Limited Trade
Limited Capital Flows
Restricted Currency Exchange

Anti-globalization or **Nationalism**

the promotion of a country's own economic interests to the exclusion or detriment of the interests of other nations

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.b] Describe geopolitics and its relationship with globalization

2. Motivations for Globalization

2.1. Increasing Profits

Increasing sales	Reducing costs
Access to **new customers** → require extensive investment, hiring and training workers in new markets → Benefiting the countries involved	Access to **lower tax-operating environments,** connection to **efficient supply chain**, **labor costs reduction**

2.2. Access to Resources and Markets

Access to **scarce resources** which are readily available in other countries	Access to **new markets** or ***foreign investment opportunities (*)***

(*)

Portfolio investment flows	**Foreign Direct Investments (FDI)**
Short-term investments in foreign assets	Long-term investments in the productive capacity of a foreign country

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.b] Describe geopolitics and its relationship with globalization

2. Motivations for Globalization

2.3. Intrinsic Gain

Intrinsic gain is a side effect or consequence of an activity that **generates a benefit beyond profit** itself.

Example: Personal growth or education that individuals may receive from expanding their horizons, experiencing new places, or learning new ideas; accelerated productivity from learning new methods.

2.4. Others

Globalization can increase choice, competition among firms; provide higher quality goods, higher efficiency, and higher labor mobility.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.b] Describe geopolitics and its relationship with globalization

3. Costs of Globalization and Threats of Rollback

3.1. Unequal Economic and Financial Gains

Some actors will benefit from globalization, but others may suffer.

Example: If a company moves a factory to another country, it creates jobs in the new country but reduces them at home, while firms in the new country may have to compete with the foreign firm for labor.

3.2. Lower Environmental, Social, and Governance Standards

When operating in lower-cost countries, firms follow local standards of those countries which can be lower standards → reduce their standards of production → higher profit but **overall negative effect** on human, administrative, and environmental resources.

Example: Many European countries have stricter standards on carbon emissions than those elsewhere in the world.
If a Europe-based company decides to produce in a different country with lighter environmental regulations and cheaper labor costs
→ follow local standards rather than its home country standards
→ make more profit but reduce environmental quality.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.b] Describe geopolitics and its relationship with globalization

3. Costs of Globalization and Threats of Rollback

3.3. Political Consequences

Globalization

↓

Labor force utilization of foreign country
vs.
Unemployment in the home country

↓

Globalization can contribute to **income and wealth inequality**, **differences in opportunity**, within and between countries.

↓

Forces from local politics to **reduced political and economic cooperation** and **a rollback in political cooperation**.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.b] Describe geopolitics and its relationship with globalization

3. Costs of Globalization and Threats of Rollback

3.4. Interdependence

Globalization

↓

Companies may become **dependent on other countries' resources** for their supply chains.

↓

Supply chain shortages happen → disruptions to production occurs in those countries.

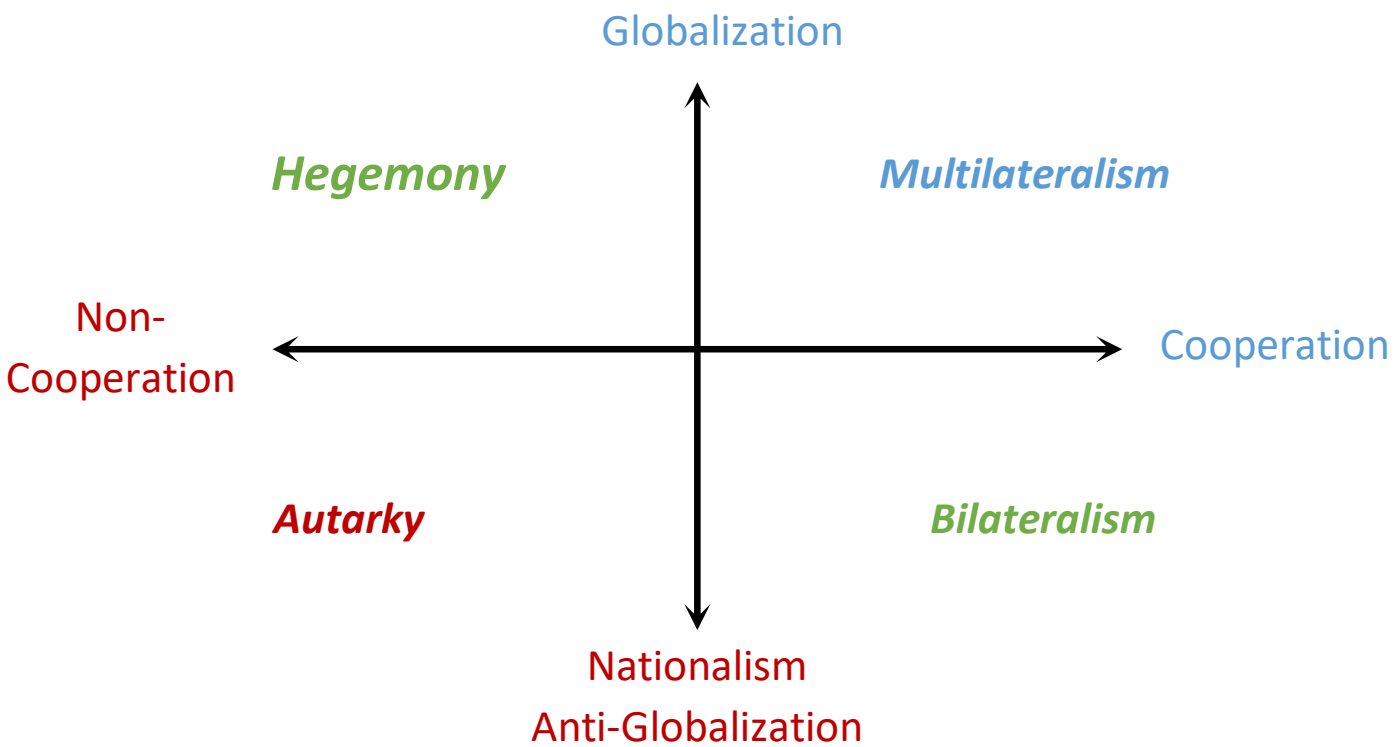
Example: COVID-19 pandemic and supply chain shortages

Semiconductor production is highly concentrated in China and is very important to the automobile industry. As the pandemic wore on, mobility began to improve but supply remained constrained → a severe shortage of semiconductor supply, which contributed to high and rising prices for new, used, and rental automobiles in many countries across the world.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a,b] Forms of international relations

Investment analysts can **assess geopolitical actors** and the likelihood of **threat to investment outcomes** based on the following framework: political cooperation and non-cooperation and globalization versus nationalism.



There are 4 types of country behavior: **autarky (1), hegemony (2), multilateralism (3), and bilateralism (4)** and each type has its own *costs, benefits, and tradeoffs* with respect to geopolitical risk.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a,b] Forms of international relations

1. Autarky

1.1. Definition

Autarky describes countries seeking political self-sufficiency with **little or no external trade or finance**.

1.2. Features

- **State-owned enterprises** control **strategic domestic industries.**
- **Stronger politically**, including the ability to exercise complete control over the supply of technology, goods, and services, media and political messaging.

Benefit	Cost
Can provide a country with **swifter economic and political development** (China for much of the 20th century)	Can also result in **negative outcome** such as **substantial poverty, economic loss** (North Korea, Venezuela)

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a,b] Forms of international relations

2. Hegemony

2.1. Definition

Hegemony describes countries that tend to be **regional** or even **global leaders** and use their political/ economic influence of others to **control resources.**

Example: China, Russia

2.2. Features

Benefit	Cost
• *For the country itself*: provide **important influence on global affairs** due to dominance stance. • *For the global system:* countries aligning with the hegemon's rules and standards may enjoy the rewards by the leader.	As hegemons gain or lose influence in the international system, they may become **more competitive**, **increasing the likelihood of geopolitical risk.**

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a,b] Forms of international relations

3. Multilateralism

3.1. Definition

Multilateralism describes countries that participate in **mutually beneficial trade relationships** and **extensive rules harmonization.**

Example: Singapore

3.2. Features

Private firms are fully integrated into global supply chains with multiple trade partners.

Benefit	Cost
Generates **higher economic growth rates** due to greater global cooperation.	**More vulnerable to geopolitical risk** than those countries that are less dependent on cooperation and trade.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.a,b] Forms of international relations

4. Bilateralism

4.1. Definition

Bilateralism refers to the conduct of political, economic, financial, or cultural cooperation **between two countries**.

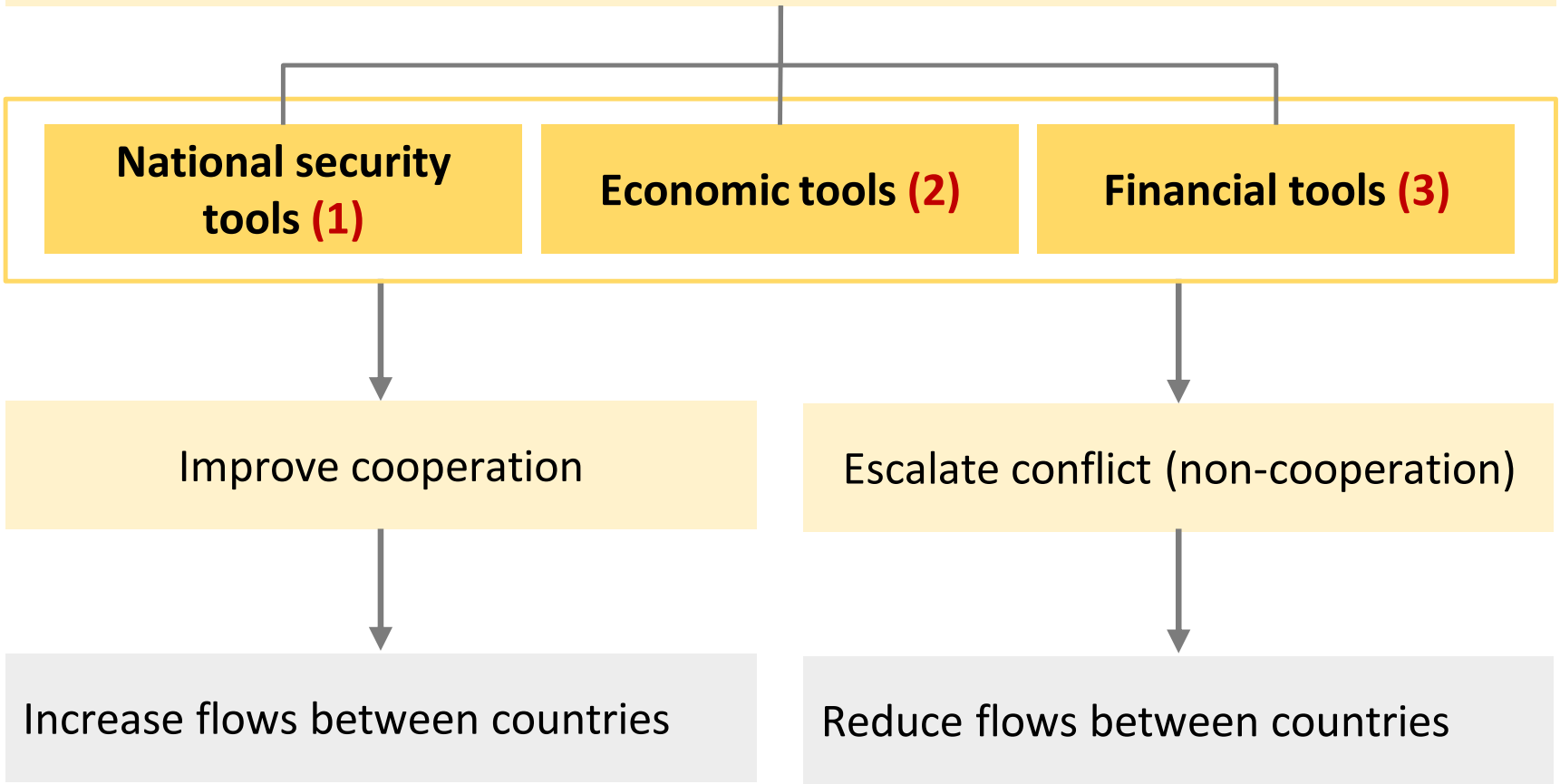
4.2. Features

- Countries may have relations with many different countries, but they are **one-at-a-time agreements without multiple partners.**
- In between bilateralism and multilateralism is **regionalism**, in which a group of countries cooperate with one another.
- Both bilateralism and regionalism can be conducted at the exclusion of other groups.
- Relatively few countries perfectly fit the bilateral mold due to organic growth of globalization and innovations (internet, digital transfer)

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.c] Describe tools of geopolitics and their impact on regions and economies

We can examine the tools these actors use to manifest or reinforce their interests with respect to others
→ the tools an actor uses are ultimately the **source of geopolitical risk** as it impacts investors (LOS 6.d)



MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.c] Describe tools of geopolitics and their impact on regions and economies

1. National security tools

National security tools are those used to influence or coerce a **state actor** through **direct or indirect** impact on the country's **resources, people, or borders.**

Active

The tools are being used at the time of analysis.

Threatened

The tools are **not currently** used but their use is likely enough to warrant concern.

Example:

1. *Direct and active national security tools*: **Armed conflict - The Syrian refugee crisis**
   - Destruction of physical infrastructure: long-term damage on a country's capital stock and ability to rebuild that stock
   - Migration away from areas: reshape international flows of goods, services, capital, and labor → Impact neighboring countries and states accepting refugees.
2. *Indirect national security tools:* **Espionage** - obtain political or military information.
3. *Cooperative national security tools:* **the North Atlantic Treaty Organization (NATO)** - de-escalate potential conflict among members and between members and outside states.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.c] Describe tools of geopolitics and their impact on regions and economies

2. Economic tools

Economic tools are the actions used to reinforce cooperative or non-cooperative stances **via economic means.**

Cooperative	Non-cooperative
• Multilateral trade agreements - Southern Common Market (MERCOSUR) • Global harmonization of tariff rules – WTO • Common markets - EU, or a common currency -the euro.	**Nationalization** - the process of transferring an activity or industry from private to state control (privatize energy sector).

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.c] Describe tools of geopolitics and their impact on regions and economies

3. Financial tools

Financial tools are the actions used to reinforce cooperative or non-cooperative stances **via financial mechanisms.**

Cooperative	Non-cooperative
The free exchange of currencies across borders; allowance for foreign investment	Limiting access to local currency markets and restricting foreign investment

Benefit
May reduce geopolitical risk if they encourage cooperation in security, economic, or financial arenas.

Cost
The same tools may also create **vulnerabilities** in the international system.

Example: The dominance of the US dollar in the international interbank market
Benefit: the free exchange of currency helps facilitate financial activity and cooperation more broadly
Cost: the US dollar's importance to exchange also makes other countries vulnerable to changes in US monetary policy.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.c] Describe tools of geopolitics and their impact on regions and economies

4. Multi-Tool Approaches

Systems of political, economic, and financial cooperation can be, and often are, intertwined.

As actors incorporate more tools of collaboration, they are less likely to initiate conflict or use a non-cooperative tool against associated actors.

Example:

- Cabotage - the right to transport passengers or goods within a country by a foreign firm → Allowing cabotage requires coordination on areas like physical security and economic coordination, a highly multilateral process.
- ASEAN is comprised of 10 members states and seeks to facilitate economic, political, security, military, educational, and cultural integration between its members.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.c] Describe tools of geopolitics and their impact on regions and economies

5. Geopolitical Risk and Comparative Advantage

Geopolitical risk and **the tools of geopolitics** can tilt comparative advantage *(refer to Module 7: International trade)* in **one direction** or **another** and generate both **risks and opportunities** for investors.

- Countries or regions with limited geopolitical risk exposure may attract more labor and capital.
- A consistent threat of conflict may drive more regular volatility in asset prices, prompting investors to require higher compensation for risk taken.

Case study: Syrian Refugee Crisis (since 2011) and Impacts on Germany

Countries with a lower geopolitical risk exposure have the ability to attract resources, such as labor and capital. With its strong economic position in the EU and longstanding stability of political leadership, Germany was able to undertake the resettlement of one million Syrian refugees.

In the short-term, such decision was causing disruption to domestic politics and international cooperation as not all citizens and neighboring countries were supportive of the approach.

In the long-term, such decision improves its long-term demographic balance by adding young and talented migrants, with the resulting increase in labor and capital stock potentially increasing Germany's economic growth rate.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

1. Types of Geopolitical risk

1.1. Event risk

Event risk is **an "known in advance" event** of which outcome negatively impacts the performance of financial markets.

Events
Elections, new legislation, holidays, political anniversaries

↓

Changes in investor expectations related to a country's cooperative stance

↓

Negative changes in financial markets

Example:
Event: **United Kingdom's referendum on European Union membership**
→ Investors expected a "no", but the result turned out to be "yes", the expectations related to the United Kingdom's cooperative stance drastically changed
→ The market reacted negatively, GBP depreciated 8.1% in the first day and 14.5% in 1 year.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

1. Types of Geopolitical risk

1.2. Exogenous risk

Exogenous risk is a **sudden or unanticipated risk** that impacts either a country's cooperative stance, the ability of non-state actors to globalize, or both.

Exogenous risk (extrogenous adverse occurences)
Sudden uprisings, invasions, or natural disasters

↓

Change in country's cooperative stance or ability of non-state actors to globalize

↓

Negative changes in financial markets and investment environment

Example:
Adverse occurence: **Japan's Fukushima nuclear disaster** which resulted in further human, property, and environmental damage and also disrupted supply chains.
→ Investors' expectations and perspectives towards Japan's economy changed
→ Equities fell, the currency depreciated, and bond prices rose.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

1. Types of Geopolitical risk

1.3. Thematic risk

Thematic risk is the known risk that **evolve and expand over a period of time**, causing negative impact on the investment environment

Thematic risks
Climate change, pattern migration, the rise of populist forces, and the ongoing threat of terrorism, cyber threats

↓

Changes in investor expectations and perspective towards the involving companies, sectors, economies

↓

Negative changes in financial markets and investment environment

Example:
Thematic risks: **Cyber threats** - US consumer credit reporting company Equifax announced a data breach (September 2017)
→ Investor's perspective towards Equifax became negative
→ Equifax's equity price fell by 13.7% in one day and by 34.9% over the first week, reaching its low on 15th September 2017.

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

2.	Assessing Geopolitical risk
To **assess geopolitical risk,** we should consider	**2.1. Likelihood** it will occur
	2.2. Velocity (speed) of its impact
	2.3. Size and nature of that **impact**

2.1. Likelihood

Definition	The likelihood of a risk is the probability that it will occur
Characteristics	• Highly **collaborative and globalized countries** are less likely to experience geopolitical risk because the costs of partners inflicting those risks are higher • **Internal political stability, economic need, and the motivations of governmental actors** are also important consideration when assessing the likelihood
Example	• High likelihood risk: cyber risk • Low likelihood risk: United Kingdom “yes” vote on Brexit

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

2. Assessing Geopolitical risk

2.2. Velocity (speed)

Definition	The **velocity** of geopolitical risk is the pace at which it impacts an investor portfolio.
Characteristics	**High-velocity** risk can affect entire industries or even the entire market, but the impact does not last long
	• **Medium-velocity** risks impact some sectors (or companies) much more than others. • Those risks begin to impair companies' processes, costs, and investment opportunities, resulting in lower valuations
	• **Low-velocity** risks have limited immediate impact on investments or portfolios. • However, it may have important environmental, social, governance, and other impacts, affecting choice of asset classes and investment styles—for a long-term horizon

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

2. Assessing Geopolitical risk

2.2. Velocity (speed)

Example

Level of velocity	High velocity	Medium velocity	Low velocity
Example	An unexpected protest event	Pipeline disruption	Patter Migration Unfolds
Impact	May increase investor concern right away, and then resolve	Takes several quarters to fix, impacting the energy sector of impacting countries	Over years impacting countries' political processes and economic growth

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

2. Assessing Geopolitical risk

2.3. Impact

Definition	Risk impact is a estimate of potential losses associated with an identified risk
Characteristics	Risk impact can be assessed under several dimensions:
	High impact or low impact: Generally, high level of impact means more expected losses, which leads to higher level of risk
	Discrete impact or broad impact: • Discrete-impact risk are those that impact only one company or sector at a time • Broad-impact risk are those that holistically impact a sector, a country, or the global economy.

When assessing geopolitical risk for portfolio management, investors should **consider all three geopolitical risk factors**—likelihood, velocity, and size and nature of impact—**together.**

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

2. **Assessing Geopolitical risk**

2.4. Scenario analysis

Scenario analysis is the process of evaluating portfolio outcomes across potential circumstances of risk – with different level of likelihood, velocity and impact.

- Scenarios help investment teams understand where they stand with respect to a risk that might cause them to change their behavior.
- Scenario analysis can strengthen a team's conviction about its prioritization and calls to action → good investment choices at opportune moments.
- Scenarios can take the form of qualitative analysis, quantitative measurement, or both.

MODULE 6: INTRODUCTION TO GEOPOLITICS

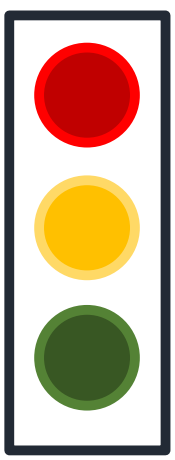
[LOS 6.d] Describe geopolitical risk and its impact on investments

3. Tracking risks according to signposts

- Tracking priority risks and creating plans for addressing priority risks as they occur can help reduce the events' impact on investment outcomes.
- Signpost is a effective tool for tracking risk.

A **signpost** is an indicator, market level, data piece, or event that signals a risk is becoming more or less likely.

Signpost can be though of like a traffic light.



"Action needed": High level of likelihood, velocity, or impact

"Caution needed": Medium level of likelihood, velocity, or impact

"No action needed": Low level of likelihood, velocity, or impact

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

4. Manifestations of Geopolitical Risk

The impact of geopolitical risk on investor portfolios is multi-faceted.

Type of risk	Manifestation	Example
High-velocity risks	Prompt changes in assets' price	Economic shutdown due to COVID19 → S&P 500 Index fell from a level of 3,386 on 19/2/2020 to 2,237.4 on 23/3 (- 34%)
Low-velocity risks	Prolonged impact: smaller revenues, higher cost, lower valuation of assets	In COVID19, disruptions to mobility and consumption had long-lasting impacts on company revenues and supply chains.

Manifestations in a economy:

Investors may require higher compensation in countries, regions, or sectors perceived to have more geopolitical risk → Risk premium ↑
→ Investors' required rate of return ↑
→ Discount rate for asset valuation ↑
→ Lower asset prices

MODULE 6: INTRODUCTION TO GEOPOLITICS

[LOS 6.d] Describe geopolitical risk and its impact on investments

5. Acting on Geopolitical Risk

Macroeconomics ← Impact capital markets conditions, such as economic growth, interest rates, and market volatility.

Asset allocation ← Influence asset allocation decisions, including an investor's choice of geographic exposures.

Portfolio ← Influence the appropriateness of an investment security or strategy for an investor's goals, risk tolerance, and time horizon.

Geopolicical risks have a tangible impact on investment outcomes.

Investors should consider geopolitical risk and also act on it.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

Learning outcomes

7.a. Compare gross domestic product and gross national product

7.b. Describe benefits and costs of international trade

7.c. Contrast comparative advantage and absolute advantage

7.d. Compare the Ricardian and Heckscher–Ohlin models of trade and the source(s) of comparative advantage in each model

7.e. Compare types of trade and capital restrictions and their economic implications

7.f. Explain motivations for and advantages of trading blocs, common markets, and economic unions

7.g. Describe common objectives of capital restrictions imposed by governments

7.h. Describe the balance of payments accounts including their components

7.i. Explain how decisions by consumers, firms, and governments affect the balance of payments

7.j. Describe functions and objectives of the international organizations that facilitate trade, including the World Bank, the International Monetary Fund, and the World Trade Organization.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.a] Compare gross domestic product and gross national product

Introduction some terms of international trade	
Imports	Goods and services that firms, individuals and governments purchase from producers in other countries.
Exports	Goods and services that firms, individuals and governments from other countries purchase from domestic producers.
Autarky/closed economy	A country that does not trade with other countries. *Example: North Korea*
Free trade	A government places no restrictions or charges on import and export activity.
Trade protection	A government places restrictions, limits, or charges on exports or imports.
World price	The price of a good or service in world markets for those to whom trade is not restricted.
Domestic price	The price of a good or service in the domestic country, which may be equal to the world price if free trade is permitted or different from the world price when the domestic country restricts trade.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.a] Compare gross domestic product and gross national product

Introduction some terms of international trade	
Net exports	The value of a country's exports **minus** the value of its imports over some period (X – M) – trade balance
Trade deficit	(X – M) < 0: the value of the goods and services a country exports is less than the value of the goods and services it imports.
Trade surplus	(X – M) > 0: the value of the goods and services a country exports are greater than the value of the goods and services it imports.
Terms of trade	The ratio of an index of the prices of a country's exports to an index of the prices of its imports expressed relative to a base value of 100. *Example: A country's terms of trade are currently 102, the prices of the goods it exports have risen relative to the prices of the goods it imports since the base period*.
Foreign direct investment	Ownership of productive resources (land, factories, natural resources) in a foreign country. *Example: Samsung's factories located in Vietnam*
Multinational corporation	A firm that has made foreign direct investment in one or more foreign countries, operating production facilities and subsidiary companies in foreign countries. *Example: Samsung, Apple,…*

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.a] Compare gross domestic product and gross national product

Gross domestic product (GDP) and Gross national product (GNP)		
	Gross domestic product (GDP)	**Gross national product (GNP)**
Measure	Measures the market value of all final goods and services produced **within a country's border** during a given time period.	Measures the market value of all final goods and services produced **by citizens of a country**.
Include	the production of goods and services **by foreigners within that country**.	the production of goods and services **by its citizens outside country.**
Exclude	the production of goods and services **by its citizens outside country.**	the production of goods and services **by foreigners within that country**.

GDP is more **closely** related to economic activity within a country than GNP.

iPhones of Apple produced in China is included in which country's GDP? China or USA?

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.a] Compare gross domestic product and gross national product

Benefits	>	Costs
• *For importer:* Lower – cost goods to consumers. • *For exporter:* Increase employment, wages for workers and profits from its exported products.		*For importer:* • Domestic industries must compete with imported goods → lost profits • Increase import → **higher (structural) unemployment** → need to be retrained for new jobs

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.c] Contrast comparative advantage and absolute advantage

Absolute advantage

- Refers to a country's ability to produce a good at a **lower cost** or use **fewer resources** than its trading partners.
- According to Adam Smith, **specializing** in the products that each country has **an absolute advantage** in and then **trading** the products → make all countries better off.

Example 1:

Output per unit of Labor

	Pencil	Pen
China	100	80
Thailand	90	110

- *In the production of pencils*: A Chinese worker produces 100 pencils a day while a Thailand worker produces only 90 pencils a day → China produces pencils at a lower cost than Thailand
  → China has **an absolute advantage** in the production of pencils and should specialize in producing pencils.
- *In the production of good B*: With similar explanation → Thailand has **an absolute advantage** in the production of pens and should specialize in producing pens.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.c] Contrast comparative advantage and absolute advantage

Comparative advantage

- Refers to a country's ability to produce a particular good at a **lower opportunity cost** than its trading partners.
- According to David Ricardo, regardless of which country has an absolute advantage, **specializing** in the products that each country has **a comparative advantage** in and then **trading** the products makes all countries better off.

Example 2:

Output per unit of Labor

	Pencil	Pen
China	100	110
Thailand	90	80

As similar explanation in the Example 1 → China has an absolute advantage in producing pencils as well as pens while Thailand has **no absolute advantages** in the production of any goods.

In this scenario, will Thailand still benefit from specializing and trading?

According to David Ricardo, Thailand can still specialize in producing the good that it has a **comparative advantage** in.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.c] Contrast comparative advantage and absolute advantage

Comparative advantage

Example 2: (cont)

Output per unit of Labor

	Pencil	Pen
China	100	110
Thailand	90	80

Opportunity cost

	Pencil	Pen
China	1.1 pen	0.91 pencil
Thailand	0.89 pen	1.125 pencil

- A Chinese worker can produce only 100 pencils or 110 pens on the same working day
  → opportunity cost of 100 pencils is 110 pens and vice versa
  → China's opportunity cost of a unit of pencils is 110/100 = 1.1 units of pens and its opportunity cost of a unit of pens is 100/110 = 0.91 units of pencils.
- Similarly, Thailand's opportunity cost of a units of pencil is 80/90 = 0.89 units of pens and its opportunity cost of a unit of pens is 90/80 = 1.125 units of pencils.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.c] Contrast comparative advantage and absolute advantage

Comparative advantage

Example 2: (cont)

- *In the production of pencils*: China's opportunity cost (1.1) > Thailand's opportunity cost (0.89)
  → Thailand has a **comparative advantage** in the production of pencils and should specialize in producing pencils and trade its products.
- *In the production of pens*: China's opportunity cost (0.91) < Thailand's opportunity cost (1.125)
  → China has a **comparative advantage** in the production of pens and should specialize in producing pens and trade its products.

As a result, Thailand will trade pencils for pens and in contrast, China will trade pens for pencils → both countries can gain from the trade and have more of both pen and pencils in total (explained in the next slide).

Even if a country did **not** have an **absolute advantage** in the production of any good, it could still **gain from trade** if it had a **comparative advantage** in the production of a good.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.c] Contrast comparative advantage and absolute advantage

The benefits of trade based on comparative advantage

Continue with Example 2:
2 countries both join the trading and *specialize* in producing the goods which it has comparative advantage in: China will specialize in producing pens and Thailand will specialize in producing pencils.

- Each of two Chinese workers initially produces 100 pencils and 110 pens a day
  → after specializing, both of them all produce pens
  → total outputs in China = 110 x 2 = 220 pens.
- Similarly, after specializing, total outputs in Thailand = 90 x 2 = 180 pencils.

Without trading

	Pencil	Pen
China	100	110
Thailand	90	80
Total	380	

With trading

	Pencil	Pen
China	0	220
Thailand	180	0
Total	400	

Total output has increased through trade and the negotiated terms of trade will determine how the two countries share these gains.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.d] Compare the Ricardian and Heckscher–Ohlin models of trade and the source(s) of comparative advantage in each model

	The Ricardian model	The Heckscher-Ohlin model
Focus on	**Comparative advantage** of each countries	
Factor of production	One factor – Labor	Two factors – Labor and capital
Source of comparative advantage	The differences in **labor productivity** due to differences in **technology**	The differences in the **relative amounts of each factor** the countries possess.
Suggestion	The countries specialize in producing a good that they have comparative advantage.	The countries specialize in producing a good whose production requires **intensive use** of a factor which is **relatively abundant** in those countries.
Prices	The imported goods' prices fall and the exported goods' prices rise.	

In the **Heckscher-Ohlin** model, there is a **redistribution of wealth** between the two factors of production within a country: more of the abundant factor-intensive good is produced → increase demand for the abundant factor → increase price of that factor → **redistribute income from scarce factor to abundant factor**.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

a. The reasons for trade restrictions

Some main reasons	
Infant industry	Protect new domestic industries from foreign competition until they are mature.
National security	Protect domestic producers of goods crucial to the country's national defense.
Protecting domestic jobs	Protect employment from negative effect of free trade.
Protecting domestic industries	Protect industry firms from foreign competition by using political influence.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

a. The reasons for trade restrictions

Other reasons

- Retaliation for foreign trade restrictions
- Government collection of tariffs (taxes on imported goods)
- Countering the effects of government subsidies paid to foreign producers
- Preventing foreign exports at less than their cost of production **(dumping)**

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

b. Types of trade restrictions

Tariffs	• Taxes on good collected by the government. • Imposed by importer • *Example: USA places a tariff of 20% for the first 1.2 million machines imported each year, with all additional imports paying a 50% tax.*
Quotas	• Limits on the amount of imports allowed. • Imposed by importer • *Example: Vietnam places a quota to restrict the import of tobacco, alcohol and some luxury items.*
Export subsidies	• Government payments to firms that export goods. • Imposed by exporter • *Example: the EU was spending €10 billion a year on export subsidies by paying the difference between the EU's high internal prices and lower world market prices in the 1990s.*

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

b. Types of trade restrictions

Minimum domestic content	• Requirement that some percentage of product content must be from the domestic country. • Imposed by importer • *Example: The Australian government requires a minimum domestic content of 50% for cigarettes, which means that 50% of the value of the products must be produced domestically.*
Voluntary export restraint (VER)	• A country voluntarily restricts the amount of a good that can be exported, often in the hope of avoiding tariffs or quotas imposed by their trading partners. • Imposed by exporter. • *Example: VER imposed by Japan on the export of Japanese manufactured cars into the U.S.*

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

c. Effects of Tariff and Quota (imposed by importers)

Tariff	Quota
A tariff placed on an imported good increases the domestic price, decreases the quantity imported and increases the quantity supplied domestically.	A quota restricts the quantity of a good imported to the quota amount. When a quota is in place, each importing firm receives an import license (*), which specifies the quantity that it can import.

(*) If the government charges for the import licenses, exporting country has to pay a **quota rent.**
If the government does not charge for the import licenses, exporting country does not have to pay a quota rent.

Illustration the overall welfare effects of quotas and tariffs

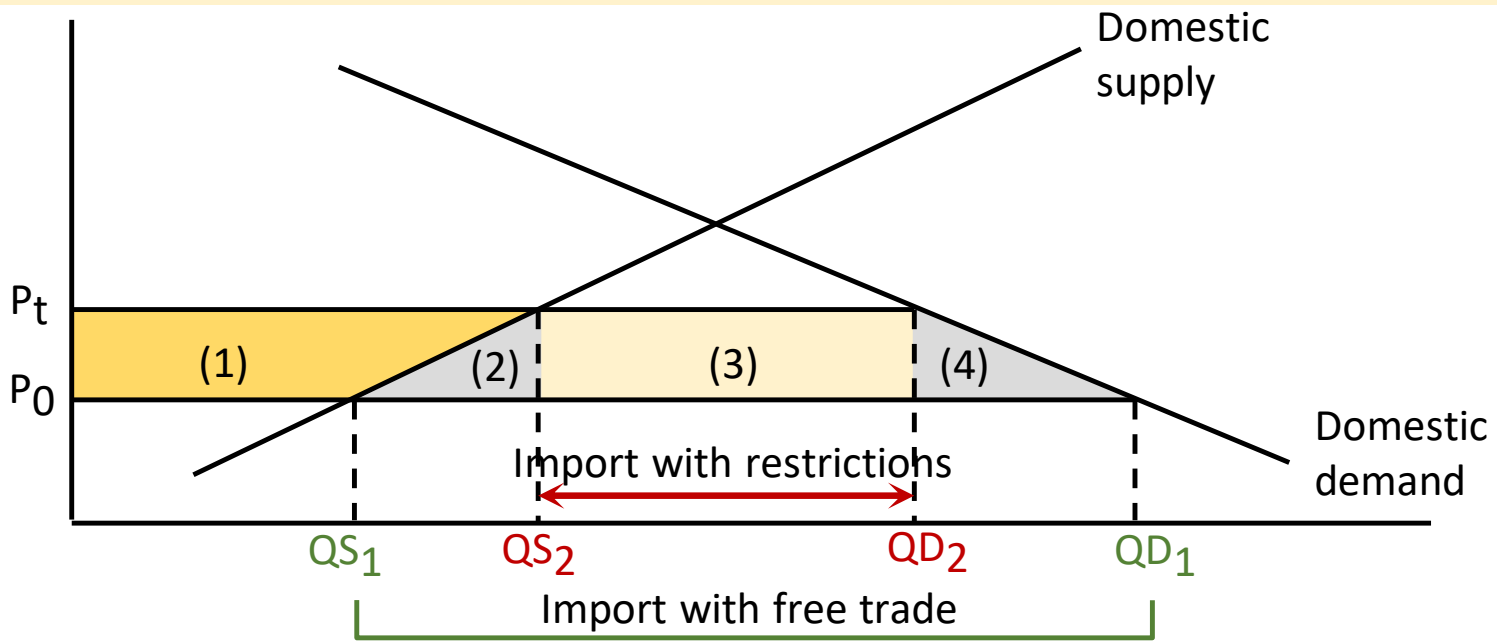
Assumption: Define a quota that will result in the **same decrease** in the quantity of good imported as the tariff. We will examine the effect of quota and tariff as one.
Detail illustration of the effects is presented in the next slide.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

c. Effects of Tariff and Quota (imposed by importers)



Without trade restrictions	With trade restrictions
The World (domestic) price is P_0 → domestic demand is QD_1 and domestic supply is QS_1 → domestic quantity imported = $QD_1 - QS_1$	Place a tariff/ quota on imports → increase the domestic price to P_t: → domestic demand decreases to QD_2 and domestic supply increases to QS_2 → domestic quantity imported = $QD_2 - QS_2$

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

c. Effects of Tariff and Quota (imposed by importers)

Trade restrictions	Tariff	Quota	
		Government charges for the import licenses	Government does not charge for the import licenses
Domestic PS *	Increase = (1)		
Domestic CS *	Decrease = (1) + (2) + (3) + (4)		
Government gain	= **tax revenue** = (3)	= **quota rent** = (3) and foreign exporters gain is 0	= 0 and foreign exporters gain **quota rent**
Deadweight loss (DWL)	= (2) + (4)	= (2) + (4)	= (2) + (3) + (4)
Total national welfare	**In small country:** Total national welfare decreases = DWL **In large country:** the exporting country may lower its price to retain its market shares in the importing country → reduce the world price → may increase welfare.		

(*) PS, CS are the producer surplus and consumer surplus.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

d. Effect of Voluntary export restraint (VER) (imposed by exporters)

- VER refers to a voluntary agreement by a government to limit the quantity of a good that can be exported.
- Exporting country's gains under VER is equal to that of an equivalent quota with no government charge for the import licenses. *(refer to slide 17, 18)*
  → the exporting country captures the quota rent (3)
  → the welfare loss to the importing country equals (2) + (3) + (4)

e. Effect of Export subsidies (imposed by exporters)

Export subsidies are payments by government to its producers (domestic exporters). It benefits domestic exporters but at the same time, increases prices and reduce consumer surplus in the exporting country. Further, domestic producers would be **more inclined to export their output rather than selling it in the domestic market.**

- **Small country (price taker):** the increase in domestic price is equal to the amount of the subsidy.
- **Large country (price searcher):** subsidies → world supply increases → world price falls → increase welfare in other countries while the domestic economy incurs a welfare loss due to high domestic price → a part of the subsidy will be transferred abroad .

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

1. Trade restrictions

f. Summary

	Tariff	Quota	VER	Export subsidy
Impact on	Importer	Importer	Importer	Exporter
Domestic price	Increase	Increase	Increase	Increase
Trade	Decrease imports	Decrease imports	Decrease imports	Increase export
Domestic CS	Decrease	Decrease	Decrease	Decrease
Domestic PS	Increases	Increases	Increases	Increases
Government gain	Increases	Increases or no change	No change	Decrease
National welfare	Decrease in small country Increase in large country		Decrease	Decrease

Four types of trade restrictions cause the same effects

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

2. Capital restrictions

Capital restrictions are defined as **controls placed on the flow of financial capital across border**, including:

Price controls	Special taxes on returns on international investments.
	Taxes on certain types of transactions.
	Mandatory reserve requirements.
Quantity controls	Limiting the maximum of the borrowings from foreign creditors.
	Requiring special authorization for borrowings from foreign creditors.
	Requiring government approval for certain transactions.

Outright prohibitions on international trade in assets.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.e] Compare types of trade and capital restrictions and their economic implications

2. Capital restrictions

Effect of capital restrictions on economic welfare

Benefits of capital restrictions

Short-run benefits: capital restrictions help developing countries avoid impact of great inflows of foreign capital (expansion) and large outflows of foreign capital (contraction).

Costs of capital restrictions

Long-run costs:

- Administrative costs.
- Controls may give rise to negative market perceptions and make it more costly for the country to raise foreign funds.
- Protection of domestic financial markets may delay necessary policy adjustments or impede private-sector adaptation to changing international circumstances.

Short-term benefits may not offset long-term costs capital restrictions → **decrease economic welfare in overall.**

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.g] Describe common objectives of capital restrictions imposed by governments

Reduce the volatility of domestic asset prices	Capital restrictions reduce capital inflow/outflow of a country during an expansion/contraction → decrease the volatility in prices of assets that are relative to the amount of foreign investment.
Maintain fixed exchange rates	Capital restrictions can limit the flows of foreign investment capital → make it easier to meet the fixed exchange rate targets and increase impacts of monetary and fiscal policy in meeting economic goals.
Keep domestic interest rates low	Capital restrictions limit the outflow of investment capital → keep domestic interest rates low
Protect strategic industries	Capital restrictions sometimes prohibit investment by foreign entities in industries which are important for national security, such as defense or telecommunications industries.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.f] Explain motivations for and advantages of trading blocs, common markets, and economic unions

Five degrees of integration:

(1) Removing barriers to import and export among members
(2) Common trade restrictions for non-member
(3) Free movement of labor and capital goods
(4) Common institutions and economic policy for the union
(5) Common and single currency

Types of agreements, referred to as trading blocs or regional trading agreements (RTA)

Degrees of integration	Free Trade Areas	Customs Union	Common Market	Economic Union	Monetary Union
(1)	✓	✓	✓	✓	✓
(2)		✓	✓	✓	✓
(3)			✓	✓	✓
(4)				✓	✓
(5)					✓
Example	USMCA	Benelux	MERCOSER	EU	Euro zone

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.f] Explain motivations for and advantages of trading blocs, common markets, and economic unions

Motivations for trading blocs, common markets and economic unions

Reducing barriers to trade, member countries are able to **allocate resources more efficiently.**

Positive effect	Negative effect
• Increase trade based on comparative advantage. • Increase competition among member countries' firms.	• Decrease wealth and incomes of some firms/industries/ groups of workers. • Structural unemployment → retrain to get new jobs

- On balance, **economic welfare is improved by reducing/eliminating trade restrictions.**
- However, if lower-cost imports from non-member country is replaced by higher-cost imports from member country (trade diversion)→ economic welfare may be reduced.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.f] Explain motivations for and advantages of trading blocs, common markets, and economic unions

Advantages of trading blocs, common markets and economic unions

- All benefits of free trade: greater specialization, technology transfers,…
- Reduce the potential for conflict among members.
- Give members greater bargaining power in the global economy as they form a united front.
- Offer new opportunities for trade and investment.
- Growth in a member country tends to spill over into other members as well.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

The balance of payments (BOP) is a double entry bookkeeping system that summarizes a country's economic transactions with the rest of the world over a period of time, including:

- The current account: reflects flows of goods and services.
- The capital account: consists of capital transfers and net sales of non-produced, non-financial assets.
- The financial account: records investment flows.

→ The balance of payments (BOP) is the **method countries use to monitor all international monetary transactions at a specific period.**

Basic entries of BOP	
Debits (Assets increase, Liabilities decrease)	**Credits (Assets decrease, Liabilities increase)**
Value of imported goods and services	Payments for imports of goods and services
Purchases of foreign financial assets	Payments for foreign financial assets
Receipt of payments from foreigners	Value of exported goods and services
Increase in debt owed by foreigners	Payment of debt by foreigners
Payment of debt owed to foreigners	Increase in debt owed to foreigners

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

Current account	• **Merchandise trade:** all commodities and manufactured goods bought, sold, or given away. • **Services**: tourism, transportation, engineering, and business services. • **Income receipts**: income from foreign assets (e.g., interest and dividends). • **Unilateral transfers:** one-way transfer of assets (money from those working abroad and direct foreign aid).
Capital account	• **Capital transfers:** debt forgiveness and migrants' transfers. • **Sales and purchases of non-produced, nonfinancial assets: such as rights to natural resources, intangible assets** (e.g., patents, copyrights, etc.).
Financial account	• **Government-owned financial assets abroad:** gold, foreign currencies, foreign securities, the government's reserve position at the IMF, direct foreign investment, and claims reported by resident banks. • **Foreign-owned financial assets:** domestic securities, domestic direct investment, domestic currency, domestic liabilities to foreigners reported by domestic banks.

To keep the BOP balanced, any **surplus (export > import) or deficit (import > export**) in the current account would be **offset by the deficit or surplus (purchases or sales of foreign assets)** in the capital and financial account.

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

Vietnam BOP Q2-2021 (Million USD)

Chỉ tiêu		Số liệu
A. Cán cân vãng lai		**-4.596**
	Hàng hóa: Xuất khẩu f.o.b	79.934
	Hàng hóa: Nhập khẩu f.o.b	80.288
	Hàng hóa (ròng)	-354
	Dịch vụ: Xuất khẩu	891
	Dịch vụ: Nhập khẩu	4.759
	Dịch vụ (ròng)	-3.868
	Thu nhập đầu tư (Thu nhập sơ cấp): Thu	269
	Thu nhập đầu tư (Thu nhập sơ cấp): Chi	4.139
	Thu nhập đầu tư (Thu nhập sơ cấp) (ròng)	-3.870
	Chuyển giao vãng lai (Thu nhập thứ cấp): Thu	4.243
	Chuyển giao vãng lai (Thu nhập thứ cấp): Chi	747
	Chuyển giao vãng lai (Thu nhập thứ cấp) (ròng)	3.496
B. Cán cân vốn		**0**
	Cán cân vốn: Thu	0
	Cán cân vốn: Chi	0
	Tổng cán cân vãng lai và cán cân vốn	-4.596

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

Vietnam BOP Q2-2021 (Million USD)

Chỉ tiêu		Số liệu
C. Cán cân tài chính		**10.844**
	Đầu tư trực tiếp nước ngoài: Tài sản có	-66
	Đầu tư trực tiếp vào Việt Nam: Tài sản nợ	4.120
	Đầu tư trực tiếp (ròng)	4.054
	Đầu tư gián tiếp ra nước ngoài: Tài sản có	4
	Đầu tư gián tiếp vào Việt Nam: Tài sản nợ	559
	Đầu tư gián tiếp (ròng)	563
	Đầu tư khác: Tài sản có	589
	Tiền và tiền gửi	628
	Tổ chức tín dụng	1.212
	Dân cư	-584
	Cho vay, thu hồi nợ nước ngoài	
	Tín dụng thương mại và ứng trước	
	Các khoản phải thu/ phải trả khác	-39
	Đầu tư khác: Tài sản nợ	5.638

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

Vietnam BOP Q2-2021 (Million USD)

Chỉ tiêu		Số liệu
D. Lỗi và sai sót		**-4.743**
E. Cán cân tổng thể	Đầu tư trực tiếp nước ngoài: Tài sản có	1.505
F. Dự trữ và các hạng mục liên quan	Đầu tư trực tiếp vào Việt Nam: Tài sản nợ	-1.505
	Tài sản dự trữ	-1.505
	Tín dụng và vay nợ từ IMF	0
	Tài trợ đặc biệt	0

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

Example: **Balance of payment**

USD million

	1970	1980	1985	1990	2000	2009
Current Account						
Exports of goods and services	56,640	217,834	289,070	535,233	1,070,597	1,570,797
Income receipts	11,748	72,606	98,542	171,742	350,918	588,203
Imports of goods and services	-54,386	-219,241	-410,950	-616,097	-1,449,377	-1,945,705
Income payments	-5,515	-42,532	-72,819	-143,192	-329,864	-466,783

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

	1970	1980	1985	1990	2000	2009
Unilateral current transfer, net	-6,156	-8,349	-21,998	-26,654	-58,645	-124,943
Capital Account						
Capital account, net				-7,220	-1	-140
Financial Account						
US-owned assets abroad	-9,337	-86,967	-44,752	-81,234	-560,523	-140,465
Foreign-owned assets in the US	7,226	62,037	144,231	139,357	1,038,224	305,736

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.h] Describe the balance of payments accounts including their components

	1970	1980	1985	1990	2000	2009
Financial derivatives, net	NA	NA	NA	NA	NA	50,804

1.Calculate the current account balance for each year.
2. Calculate the financial account balance for each year.
3. Describe the long-term change in the current account balance and the reason for this change
4. Describe the long-term change in the financial account balance

Answer:

	1970	1980	1985	1990	2000	2009
Current account	2,330	2,317	-118,155	-78,969	-416,371	-378,432
Financial account	-2,111	-24,930	99,479	58,123	477,701	216,075

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.i] Explain how decisions by consumers, firms, and governments affect the balance of payments

- As described in Module 3:
  $C + I + G + (X - M) = C + S + T$
  $\rightarrow$ **$X - M = S + (T - G) - I$**
  = private savings + government savings – investment
- Lower levels of private and government savings together with high rates of domestic investment $\rightarrow$ net savings are less than investment in domestic capital $\rightarrow S + (T - G) - I < 0 \rightarrow (X - M) < 0$
  $\rightarrow$ trade deficit (current account deficit).

Trade deficit resulting from **high private and government consumption (S+[T-G)] ↓)**

Increase domestic liabilities **without any increase in future productivity power**

Trade deficit resulting from **high domestic investment (I ↑)**

Increase domestic liabilities **with an increase in future productivity power (thanks to investment).**

MODULE 7: INTERNATIONAL TRADE AND CAPITAL FLOWS

[LOS 7.j] Describe functions and objectives of the international organizations that facilitate trade, including the World Bank, the International Monetary Fund, and the World Trade Organization.

	Functions	Objectives
WB	• Provide cheap loans and grants to countries Provide analysis, advice, and information to countries. • Share knowledge. • Help members create the basic economic infrastructure.	Source of financial and technical assistance to developing countries → **fight poverty and enhance environmentally sound economic growth.**
IMF	• Promote international monetary cooperation. • Facilitate the growth of international trade. • Promote exchange rate stability. • Assist the multilateral payment systems • Make resources available with adequate safeguard.	Ensure the **stability** of the international monetary and exchange rates system, and international payments.
WTO	• Ensure the trade flows as smoothly, predictably and freely as possible. • Establish global trade rules • Ensure countries' trade policies conform with WTO rules to reduce risk of dispute.	**Enhance and liberalize international trade** by reducing the risk of dispute due to political conflict.

MODULE 8: CURRENCY EXCHANGE RATES

Learning outcomes

8.a. Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

8.b. Describe functions of and participants in the foreign exchange market

8.c. Calculate and interpret the percentage change in a currency relative to another currency

8.d. Calculate and interpret currency cross-rates

8.e. Calculate an outright forward quotation from forward quotations expressed on a points basis or in percentage terms

8.f. Calculate and interpret a forward discount or premium

8.g. Explain the arbitrage relationship between spot rates, forward rates, and interest rates

8.h. Calculate and interpret the forward rate consistent with the spot rate and the interest rate in each currency

8.i. Describe exchange rate regimes

8.j. Explain the effects of exchange rates on countries' international trade and capital flows

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.a] Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

An exchange rate is simply the **price or cost of one currency *(base currency)* in terms of another *(price currency)***.

Example: An exchange rate of 1.416 USD/EUR means that:

→ EUR is the base currency and USD is the price currency

→ It means that each euro costs 1.416 USD and we can say the exchange rate is 1.416 USD per euro.

An exchange rate quoted as *price currency/base currency* is referred to **a direct quote** from point of view of an investor in the *price currency country* and **an indirect quote** from the point of view of an investor in the *base currency country*.

Example:

- A quote of 1.416 USD/EUR would be a direct quote for a USD-based investor and indirect quote for a EUR-based investor.
- Conversely, a quote of 1/ 1.416 = 0.706 EUR/USD would be a direct quote for a EUR-based investor and indirect quote for a USD-based investor.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.a] Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

The appreciation and depreciation of a currency

With the quote of ***price currency/base currency*** exchange rate:

- If the exchange rate **decreases** → the cost of a base currency in term of the price currency decreases → **the base currency depreciates** relative to the price currency → **the price currency appreciates** relative to the base currency.
- Similarly, if the exchange rate **increase** → **the base currency appreciates** relative to the price currency → **the price currency depreciates** relative to the base currency.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.a] Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

Nominal exchange rate	Real exchange rate
The value of a currency is stated in terms of units of another currency (*as in the example in slide 2*)	The real exchange rate is the **real price** individual will pay to buy a foreign product using their home currencies

$$\text{Real exchange rate} = \text{nominal exchange rate} \times \frac{CPI_{\text{base currency}}}{CPI_{\text{price currency}}}$$

Read the example below:

Consider the nominal exchange rate of 1.6 USD/GBP. The CPI in the U.S. is 110 and in the U.K. is 112.

→ The real exchange rate = 1.6 × (112/110) **=** 1.6 x **1.0181** = 1.629 USD/GBP → the real exchange rate of 1.629 USD/GBP is greater than the nominal exchange rate of 1.6 USD/GBP.

This is because the prices of U.K. goods are higher than the prices of U.S goods → a U.S. consumer must give up **1.81%** (=1.0181-1) domestic goods to purchase a given amount of U.K. goods → the higher inflation in the U.K. has increased real cost of U.K. goods to U.S. consumers (the real exchange rate).

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.a] Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

Factors affect the real exchange rate *(relative purchasing power of **base currency country's** individual)*	
Nominal exchange rate	• **An increase** in the nominal exchange rate → the price currency depreciate relative to base currency (as explained in slide 3) → base country's individual ability to purchase goods from the price country increases → purchasing power **increases.** • Similarly, **a decrease** in the nominal exchange rate → purchasing power **decreases.** → The nominal exchange rate and relative purchasing power are **positively** related.
The price level in base country	• **An increase** in base country's prices, which are assumed to be **directly proportional** to base country's individual income → ability to purchase goods from the price country increases → purchasing power **increases.** • Similarly, a **decrease** in foreign prices → purchasing power **decreases** → The base country's price level and relative purchasing power are **positively** related.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.a] Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

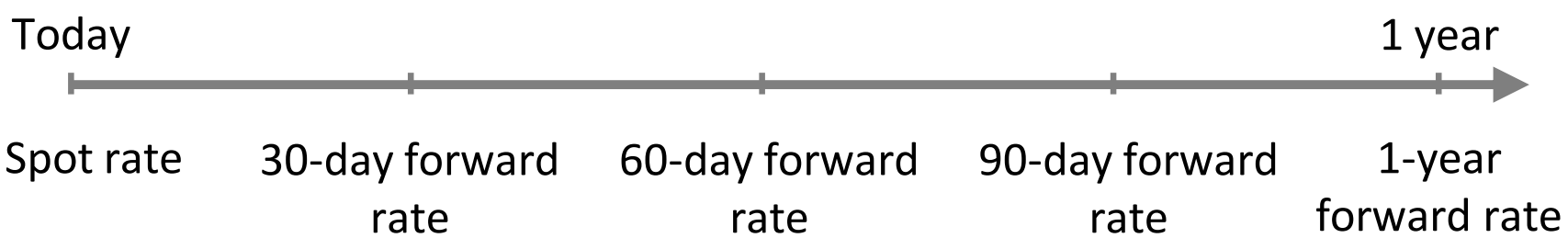
Factors affect the real exchange rate
*(relative purchasing power of **base currency country's** individual)*

The price level in price country	• **An increase** in price country's prices → base country's individual ability to purchase goods from the price country falls → purchasing power **decreases.** • Similarly, a **decrease** in domestic prices → purchasing power **increases** → The price level in price country and relative purchasing power are **inversly** related.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.a] Define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates

Spot exchange rate	Forward exchange rate
Is the currency exchange rate for **immediately delivery,** which for most currency the exchange of currencies takes place 2 days after the trade.	Is a currency exchange rate for an **exchange to be done in the future**. Forward rates are quotes for various future dates (30 days, 60 days, 90 days or 1 year)



MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.b] Describe functions of and participants in the foreign exchange market

Functions of the foreign exchange (FX) market

- **Facilitate international trade** in goods and services: allow individuals and companies to purchase items produced in foreign countries.
- Allow investors to **convert between currencies** in order to move funds into (or out of) foreign assets.
- Provide a variety instrument for market participants who face exchange rate risk to **hedge their risks.**
- Other market participants undertake FX transactions to **speculate** on currency values.

Participants in the foreign exchange (FX) market

Sell side	Buy side
Sell-side is the part of the financial industry that is involved with the purchasing and **sale** of foreign currency to the public market.	**Buy-side** is the part of the financial industry that buy or sell foreign currency for **their own purposes.**

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.b] Describe functions of and participants in the foreign exchange market

Participants in the foreign exchange (FX) market	
Sell side	
Large multinational banks	Maintain a **competitive advantage** in the FX market: high technology, broad & global client base → provide competitive price quotes across a wide range of financial products.
Regional and local banks	Fall into the second and third tier of the FX market sell-side due to lacking the economies of scale and global client base.
Buy side	
Corporations	• Cross-border purchases and sales of goods and services. • Cross-border investment flows (e.g., international M&A transactions, investments in foreign assets, and foreign currency borrowings).

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.b] Describe functions of and participants in the foreign exchange market

Participants in the foreign exchange (FX) market	
Buy side	
Investment accounts	Many types transact in foreign currencies such as holding foreign securities or currency derivatives: • **Real money account**: refer to mutual funds, pension funds, insurance companies, and other institutional accounts that **do not use derivatives.** • **Leveraged account:** refer to the various types of investment firms that **use derivatives** including hedge funds, firms that trade for their own account,…
Retail accounts	Refers to FX transactions by households and relatively small institutions for tourism, cross-border investment, or speculative trading.
Governments	• **Central banks**: enter FX markets to affect the domestic exchange rates in the short term in accordance with policy. • **Sovereign wealth funds**: enter FX market for transaction needs, investment or speculation.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.c] Calculate and interpret the percentage change in a currency relative to another currency

Consider the example below:

Example:

Consider a USD/EUR exchange rate that has change from 1.42 to 1.39 USD/EUR.

- The percentage change in the cost of a euro in term of dollar is 1.39/1.42 – 1 = -0.0211 = - 2.11% → the dollar price of a euro decrease 2.11% → the euro has **depreciated** by 2.11% relative to the dollar.

Can we conclude that the dollar has appreciated by 2.11% relative to the euro?

- To calculate the percentage change of the dollar, we need to convert the quotes to EUR/USD:
  - 1.42 USD/EUR = 1/1.42 = 0.7042 EUR/USD
  - 1.39 USD/EUR = 1/1.39 = 0.7194 EUR/USD

  → The percentage change in the cost of a dollar in term of euro is 0.7194/0.7042 – 1 = 0.0216 = 2.16% → the euro price of a dollar increase 2.16% → the dollar has **appreciated** by 2.16% relative to the euro.

→ ***For the same quotes, the percentage appreciation in the dollar is NOT the same as the depreciation in the euro***

- We can **correctly calculate** the percentage change of the **base currency** in a foreign exchange quotation.
- For the same quotes, the percentage appreciation/depreciation in the price currency is **not** the same as the depreciation/appreciation in the base currency when there is a change in the exchange rate.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.d] Calculate and interpret currency cross-rates

The cross rate is the exchange rate between two currencies implied by their exchange rates with a common **third currency** when there is no active FX market in the currency pair.

The rule of **cross rate** with three currency A, B, C as follow:

$$\frac{A}{B} = \frac{A}{C} \times \frac{C}{B}$$

Or

$$\frac{A}{B} = \frac{A}{C} : \frac{B}{C}$$

$$\frac{A}{B} = \frac{C}{B} : \frac{C}{A}$$

Example:

Consider the following quotations of 10.7 MXN/USD and 0.6 USD/AUD. Using these two exchange rates, calculate the cross rate between Australian dollars and pesos (MXN/AUD)?

Answer:

The cross rate between Australian dollars and pesos

MXN/AUD = MXN/USD × USD/AUD = 10.7 × 0.6 = 6.42 MXN/AUD

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.e] Calculate an outright forward quotation from forward quotations expressed on a points basis or in percentage terms

Point basis

- **Forward exchange rates are quoted in terms of points**, which simply represent the **difference** between the forward rate and the spot rate.
- The unit of points is the last decimal place in the spot rate (usually the fourth decimal place) and each point = 0.0001 or 1/10,000th
- If the points are **positive** → the forward rate is **higher** than the spot rate
- If the points are **negative** → the forward rate is **lower** than the spot rate

Example: **Forward exchange rates in points**

The AUD/EUR spot rate is 0.7313 and 1-year forward rate quoted at +3.5 points. What is the 1-year forward exchange rate?

Answer:

+3.5 points = 3.5/10,000 = 0.00035

→ The 1-year forward exchange rate = 0.7313 + 0.00035 = 0.73165

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.e] Calculate an outright forward quotation from forward quotations expressed on a points basis or in percentage terms

Percentage terms

Forward exchange rates or points may be quoted as **a percentage of the spot rate** → the forward rate may be calculated by **multiplying the spot rate by one plus (minus) the percentage premium (discount)**.

- **Percentage premium** (positive percentage) is when the forward rate is **higher** than the spot rate.
- **Percentage discount** (negative percentage) is when the forward rate is **lower** than the spot rate.

Example: **Forward exchange rates in percentage**

The AUD/EUR spot rate is 0.7313 and 1-year forward rate quoted at – 0.062%. What is the 1-year forward exchange rate?

Answer:

The 1-year forward exchange rate = 0.7313 × (1 – 0.062%) = 0.7308

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.f] Calculate and interpret a forward discount or premium

- The **forward premium or forward discount** for a currency is calculated relative to the spot exchange rate.
- The forward premium or discount for the *base currency* is the **percentage difference** between the forward rate and the spot rate.

Forward premium	Forward discount
The forward rate is **higher** than the spot rate → **the base currency** is trading at a **forward premium** and tend to **appreciate** in the future. • Forward premium = (forward rate/spot rate) – 1	The forward rate is **lower** than the spot rate → **the base currency** is trading at a **forward discount**, as it is expected to **depreciate**. • Forward discount = (forward rate/spot rate) – 1

Example: **Forward premium and Forward discount**

1. A spot CAD/USD exchange rate of 1.0155 and a 1-year forward CAD/USD exchange rate of 1.0183.
2. A spot CAD/USD exchange rate of 1.0183 and a 1-year forward CAD/USD exchange rate of 1.0155.

Calculate the forward premium and discount?

Answer:

1. Forward premium = (1.0183/1.0155) – 1 = 0.2757% → the base currency (USD) is said to be trading at a forward premium of 0.2757%.
2. Forward discount = (1.0155/1.0183) – 1 = – 0.2749% → the base currency (USD) is said to be trading at a forward discount of – 0.2749%.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.g] Explain the arbitrage relationship between spot rates, forward rates, and interest rates

Forward exchange rates are calculated in a manner that ensures that traders are not able to earn arbitrage profits. This means that a trader has a specific domestic currency will earn the same amount from investing via any currency.

Illustration:

The exchange rate is quoted as USD/EUR, with the spot rate S.

Consider an investor has 1,000 EUR and there are 2 options for him:

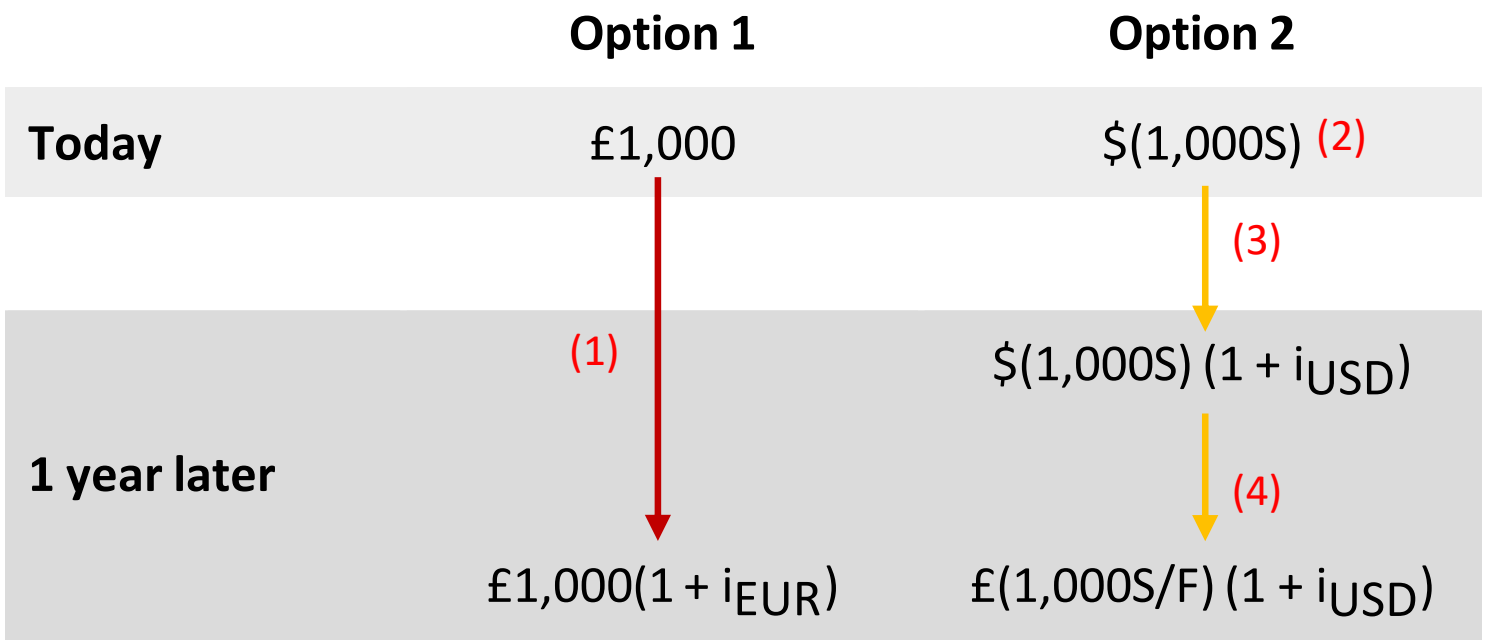
Option 1: invest in EUR to earn interest rate i_{EUR}.

Option 2: exchange to USD and invest it to earn interest rate i_{USD}, and then, convert it back to EUR by a a forward contract with 1-year forward rate F.

(continue in the next slide)

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.g] Explain the arbitrage relationship between spot rates, forward rates, and interest rates



Option 1

(1): Invest £1,000 in the euro → after 1 year earn **£1,000(1 + i_{EUR})**

Option 2

(2): £1,000 converted to the USD using the spot rate S USD/EUR is equal to $(1,000S)

(3): Invest $(1,000S) at the interest rate i_{USD}
→ after 1 year earn $(1,000S) (1 + i_{USD})

(4): Turn it back into the euro using the forward rate F USD/EUR
→ earn **£(1,000S/F) (1 + i_{USD})** in the **option 2**

(continue in the next slide)

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.g] Explain the arbitrage relationship between spot rates, forward rates, and interest rates

Consider 2 cases when:

Earnings in option 2 > option 1:

$£(1{,}000S/F)\ (1 + i_{USD}) > £1{,}000(1 + i_{EUR})$

$\Updownarrow$

$S/F > (1 + i_{EUR})/(1 + i_{USD})$

or **$F/S < (1 + i_{USD})/(1 + i_{EUR})$**

There is an **arbitrage** opportunity:

- **Today:** Borrow £1,000 in the euro and then convert it into the USD to invest at the interest rate i_{USD}.
- **After 1 year**: The cost of the debt the investor has to pay is $£1{,}000(1 + i_{EUR})$, which is less than the earnings he receives from the investment after turning it back to the euro is $£(1{,}000S/F)\ (1 + i_{USD})$

→ The investor earns a profit without risk in overall

Earnings in option 2 < option 1:

$£(1{,}000S/F)\ (1 + i_{USD}) < £1{,}000(1 + i_{EUR})$

$\Updownarrow$

$S/F < (1 + i_{EUR})/(1 + i_{USD})$

or **$F/S > (1 + i_{USD})/(1 + i_{EUR})$**

There is an **arbitrage** opportunity:

- **Today:** Borrow $(1,000S) in the USD and then convert it into the euro to invest at the interest rate i_{EUR}.
- **After 1 year**: The cost of the debt the investor has to pay is $\$(1{,}000S)(1 + i_{USD}) = £(1{,}000S/F)\ (1 + i_{USD})$, which is less than the earnings he receives from the investment is $£1{,}000(1 + i_{EUR})$

→ The investor earns a profit without risk in overall

To eliminate the opportunity of arbitrage → the earnings in both 2 options must be the same → $\dfrac{\textbf{forward rate (F)}}{\textbf{Spot rate (S)}} = \dfrac{1 + i_{USD}}{1 + i_{EUR}}$

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.g] Explain the arbitrage relationship between spot rates, forward rates, and interest rates

The no-arbitrage relation:

$$\frac{\textbf{forward rate}}{\textbf{Spot rate}} = \frac{\textbf{1 + i}_{\textbf{price currency}}}{\textbf{1 + i}_{\textbf{base currency}}}$$

$$\rightarrow \frac{\text{forward rate}}{\text{Spot rate}} - 1 = \frac{1 + i_{\text{price currency}}}{1 + i_{\text{base currency}}} - 1$$

$$\rightarrow \frac{\text{forward rate} - \text{Spot rate}}{\text{Spot rate}} = \frac{i_{\text{price currency}} - i_{\text{base currency}}}{1 + i_{\text{base currency}}}$$

$$\rightarrow \frac{\text{forward rate} - \text{Spot rate}}{\text{Spot rate}} \approx i_{\text{price currency}} - i_{\text{base currency}}$$

(because $(1 + i_{base\ currency}) \approx 1$)

To maintain a no-arbitrage condition (no opportunity to make a profit without risk), the **percentage difference between forward and spot exchange rates** is **approximately equal** to the **difference between the two countries' interest rates.**

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.h] Calculate and interpret the forward rate consistent with the spot rate and the interest rate in each currency

As explained in the LOS 8.g → to maintain no arbitrage condition forward rate is defined as:

$$\textbf{Forward rate} = \textbf{Spot rate} \times \frac{1 + i_{\textbf{price currency}}}{1 + i_{\textbf{base currency}}}$$

Example: **Forward exchange rates**

A trader is provided with the following information:

Spot AUD/USD = 1.0240

12-month risk-free interest rate in the United States = 4%

12-month risk-free interest rate in Australia = 2%

Calculate the one-year forward AUD/USD exchange rate.

Answer:

$$F_{AUD/USD} = S_{AUD/USD} \times \frac{1 + i_{AUD}}{1 + i_{USD}} = 1.0240 \times (1.02/1.04) = 1.0043$$

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.i] Describe exchange rate regimes

Countries that do not have their own currency	1.a. Dollarization
	1.b. Monetary union
Countries that have their own currency	2.a. Currency board arrangement
	2.b. Conventional fixed peg arrangement
	2.c. Target zone
	2.d. Crawling peg
	2.e. Fixed Parity with Crawling Bands
	2.f. Managed Float
	2.g. Independently Floating Rates

Exchange rate flexibility

Loss of monetary policy independence

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.i] Describe exchange rate regimes

1. With countries that do not have their own currency

a. Dollarization

Definition	A country uses the currency of another nation (usually the U.S. dollar) as its medium of exchange and unit of account. Ex: Ecuador, Caribbean Netherlands use US dollar as their currency.
Characteristics	• The country inherits that currency's (e.g., the USD) credibility, but not its credit-worthiness. • Interest rates on U.S. dollars in a dollarized economy are usually not the same as those on dollar deposits in the United States. ***Explanation:*** *With the countries that use the US dollars: the local banks in these countries may borrow, lend, and accept deposits in US dollars, but they are not members of the US Federal Reserve System nor are they backed by deposit insurance from the Federal Deposit Insurance Corporation. → they are not as credit-worthy as banks in the US, and the interest rates in these countries are therefore not the same as in the USA)*

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.i] Describe exchange rate regimes

1. With countries that do not have their own currency

a. Dollarization (cont)

Pros	• Central banks are not able to print their way out of high national debt. • Can facilitate growth of trade and international capital flows, as it creates an expectation of economic stability.
Cons	Countries lose their ability to conduct independent monetary policy.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.i] Describe exchange rate regimes

1. With countries that do not have their own currency

b. Monetary union

Definition	Member countries share the same legal tender. *Example: the European Economic and Monetary Union (EMU) whose members use the Euro as their currency.*
Characteristics	• Monetary policy is conducted by the ECB for the entire region.
Pros	• Gives credibility to economies that have a history of fiscal excess and monetary indiscipline.
Cons	• Members do not gain creditworthiness *Example: Greece's sovereign debt crisis in 2010.* • Members cannot conduct their own independent monetary policy.

MODULE 8: CURRENCY EXCHANGE RATES

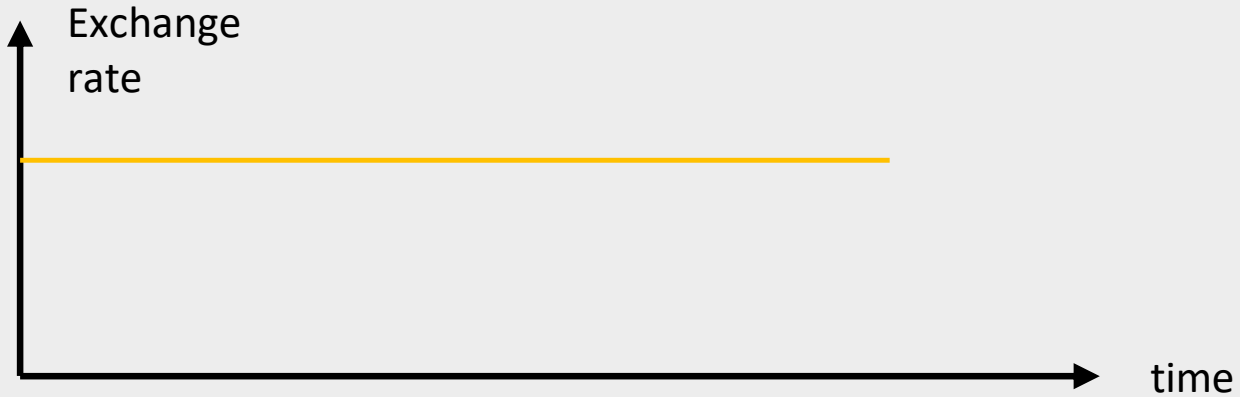
[LOS 8.i] Describe exchange rate regimes

2. With countries that have their own currency

a. Currency board arrangement

- An explicit commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate.
- Currency is only issued when fully backed by holdings of an equivalent amount of that specified foreign currency.
  (Therefore, the currency board arrangement is a regime that helps to resist the central bank from printing money in an uncontrolled manner, which can lead to inflation)

Example:
Hong Kong: currency is only issued when fully backed by holdings of an equivalent amount of U.S. dollars.
→ When the central bank wants to print more money they have to buy an equivalent amount of US dollar into their reserve, and vice versa.



MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.i] Describe exchange rate regimes

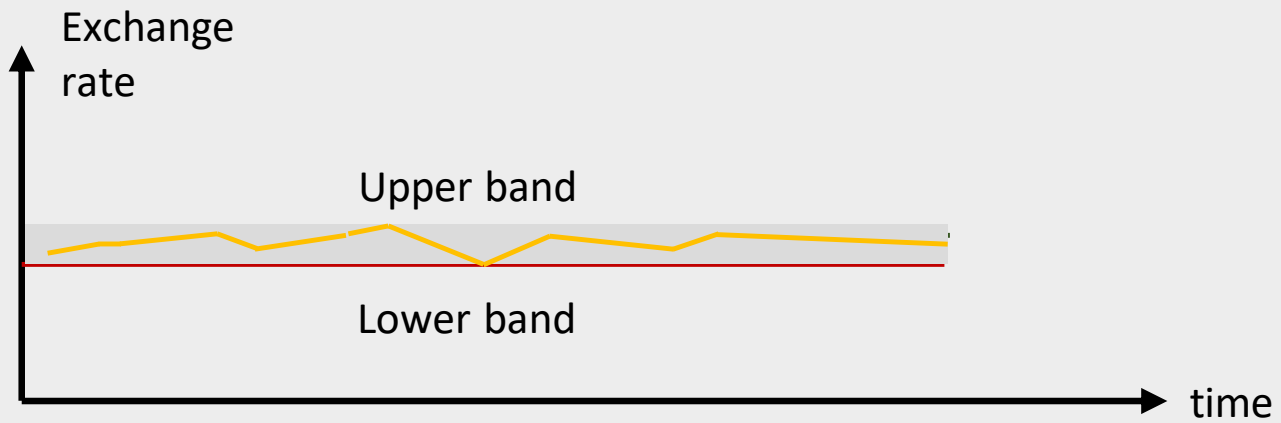
2. With countries that have their own currency

b. Conventional fixed peg arrangement

- A country pegs its currency within margins of ±1% versus another currency or a basket that includes the currencies of its major trading or financial partners.
- The monetary authority stands ready to buy or sell foreign currency reserves to maintain the exchange rate within a narrow band.

Example: The United Arab Emirate uses a fixed exchange rate regime in which the dirham is pegged to the US dollar.

Illustration



MODULE 8: CURRENCY EXCHANGE RATES

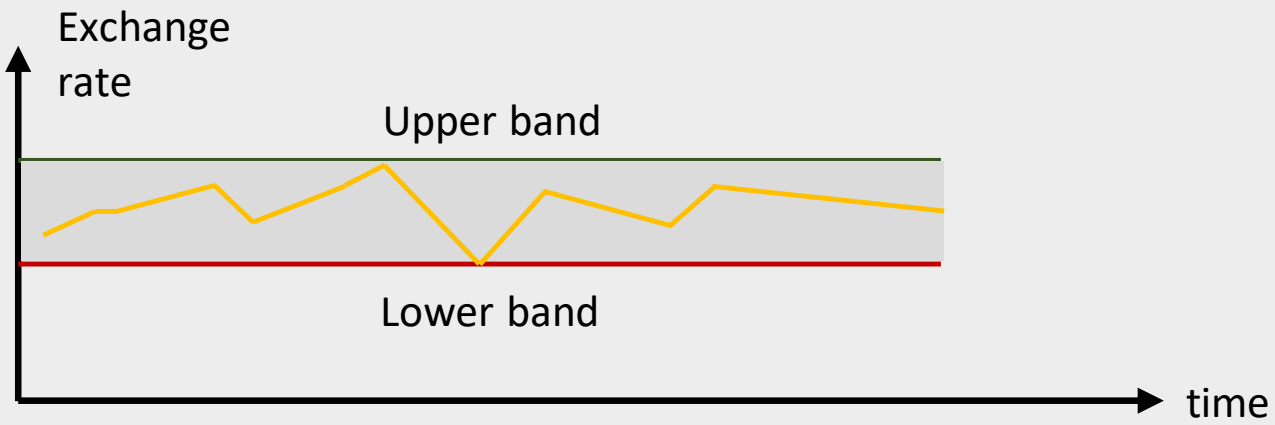
[LOS 8.i] Describe exchange rate regimes

2. With countries that have their own currency

c. Target zone

- Similar to a fixed-rate system.
- The only difference is that the monetary authority aims to maintain the exchange rate within a slightly broader range.

Illustration



MODULE 8: CURRENCY EXCHANGE RATES

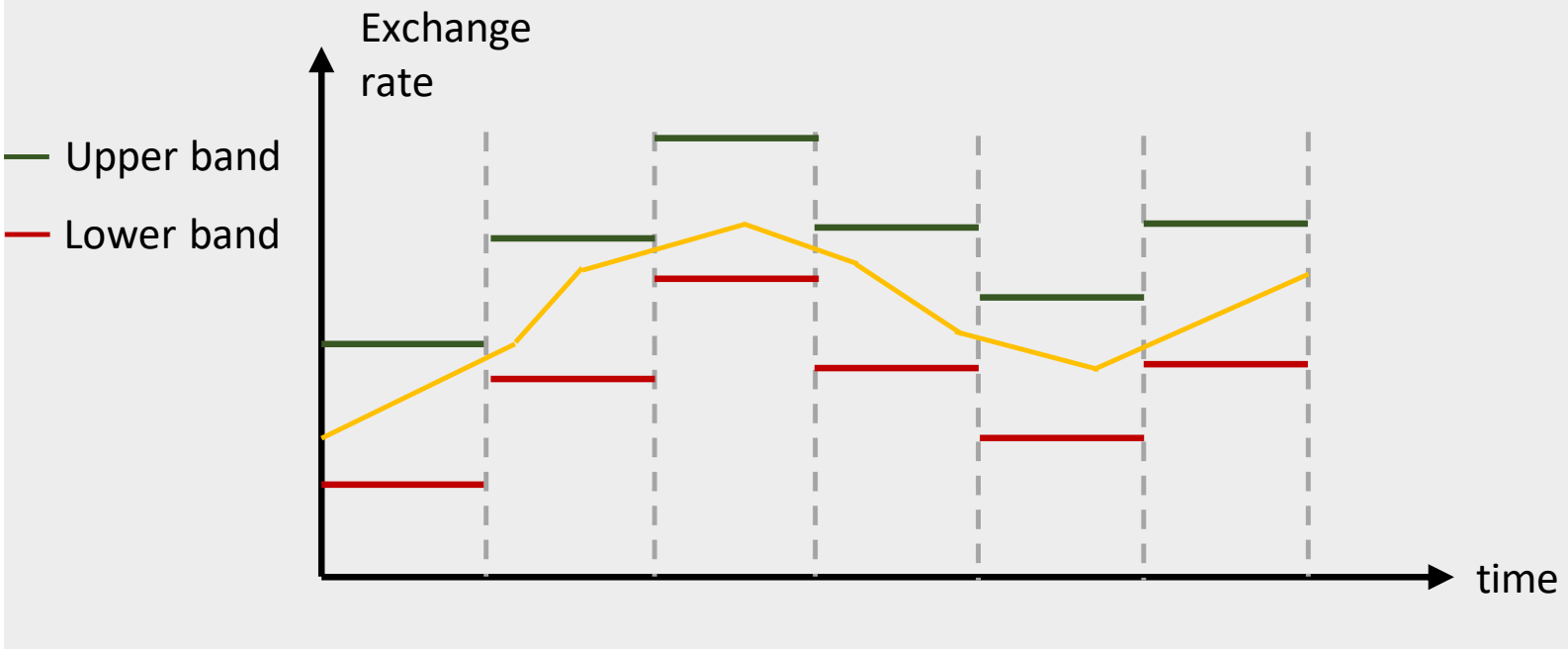
[LOS 8.i] Describe exchange rate regimes

2. With countries that have their own currency

d. Crawling peg

- Passive crawling peg: the exchange rate is adjusted frequently in line with the rate of inflation.
- Active crawling peg: the exchange rate is pre-announced for the coming weeks and changes are made in small steps.

Illustration



MODULE 8: CURRENCY EXCHANGE RATES

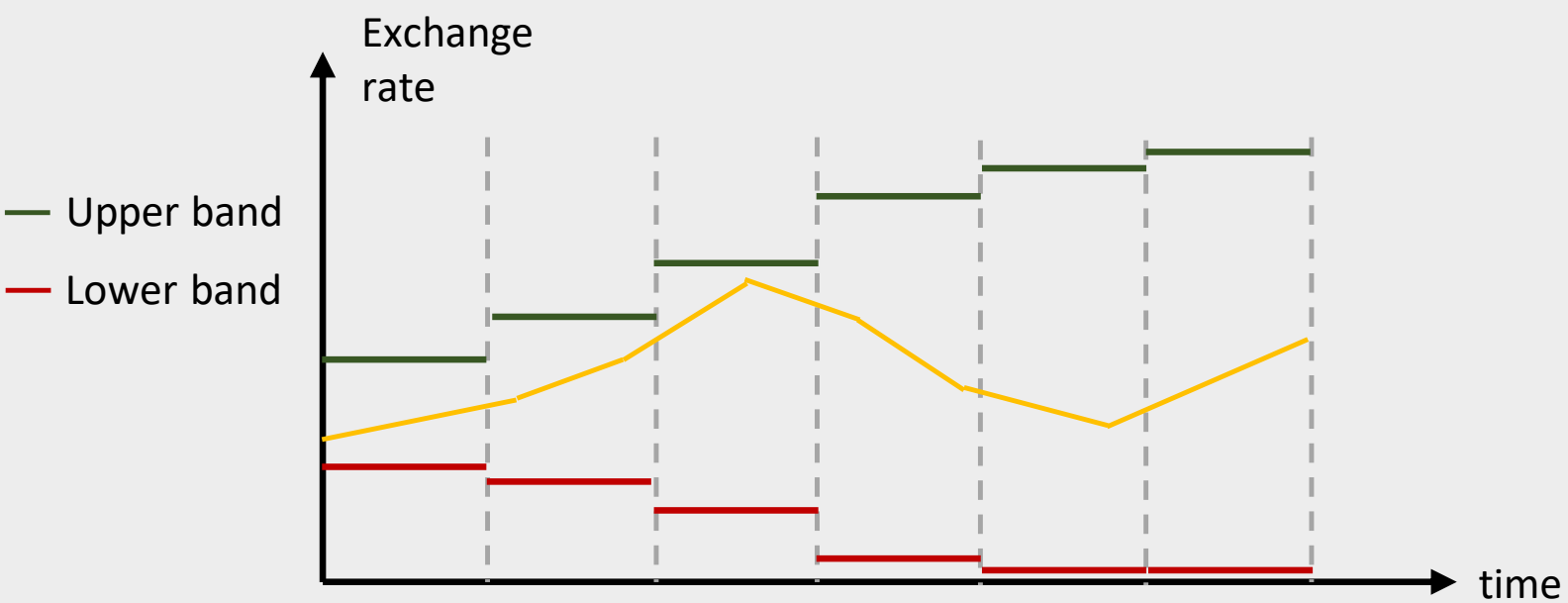
[LOS 8.i] Describe exchange rate regimes

2. With countries that have their own currency

e. Fixed Parity with Crawling Bands

The width of the bands that identify permissible exchange rates is increased over time, which shows that the country is moving toward a more flexible system.

Illustration



MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.i] Describe exchange rate regimes

2. With countries that have their own currency

f. Managed Float

The country does not explicitly state its exchange rate target, but intervenes in the FX markets to meet its policy objectives (regarding balance of trade, price stability, or unemployment).

Example:
In 2000: The euro *(a "freely floating" currency)* fell in value to less than a dollar, threatening to cause huge political consequences, prompting a crisis of confidence in the currency. Interventions needed to be made to prevent the euro from falling constantly in value.
→ In September 2000, the European Central Bank (ECB) tried to influence the exchange rate to save the value of Euro. The intervention are conducted by selling the equivalence of EUR 2.5 billion in interest revenues from foreign assets denominated in US dollars.
The mechanism of the intervention:
Portfolio balance mechanism: sell a huge amount of assets denominated in US dollar → assets denominated in US dollar becomes less attractive to foreign investors → capital flow to assets denominated in US dollar decreases → demand for US dollars decreased → US dollars depreciated → euro relatively appreciated.

You can read more about Portfolio mechanism here: Pre-CFA level II – Economics – 6.2; and about The intervention of the ECB here.

MODULE 8: CURRENCY EXCHANGE RATES

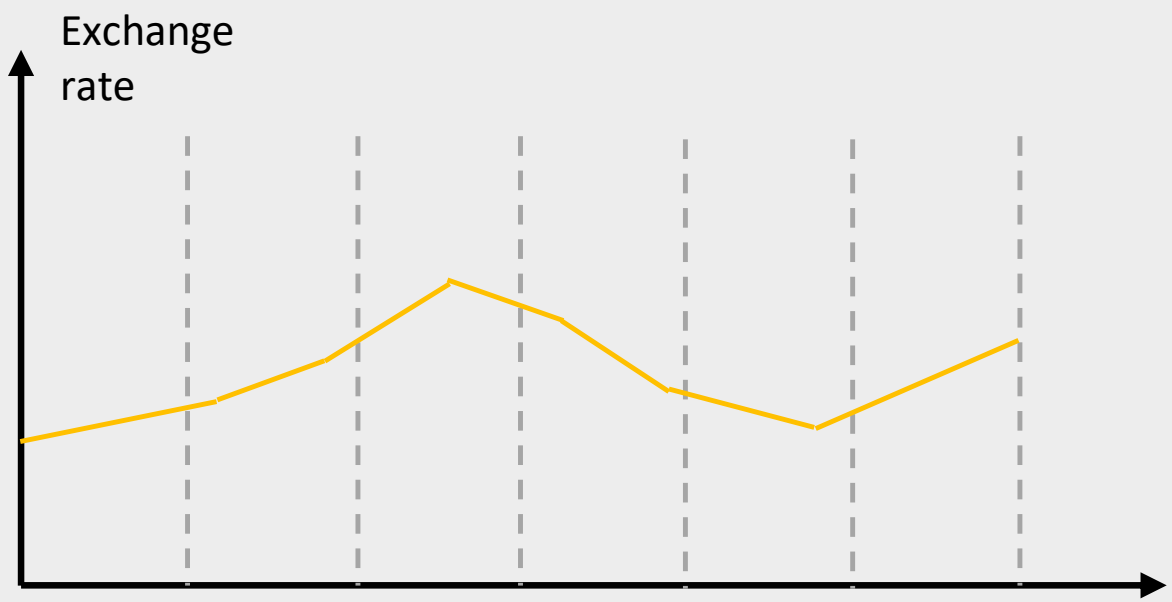
[LOS 8.i] Describe exchange rate regimes

2. With countries that have their own currency

g. Independently Floating Rates

The central bank rarely intervenes in the determination of its exchange rate, which is left to be determined by market supply and demand factors.

Illustration



There is no band imposed

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

In this LOS, we are going to address the question:
"How does a change in exchange rates affect a country's balance of trade?"
The question is addressed using two approaches.

- Elasticities approach

Exchange rate changes →	Import (M) and export (X) changes →	Current account surplus/ deficit

- Absorption approach

Exchange rate changes →	Capital flows →	Current account surplus/ deficit

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

1. Elasticity approach

a. The effect on balance of trade

Domestic currency depreciates

↓

Domestic goods become less expensive	Foreign goods become more expensive

In order to determine the effect of changes in the value of domestic currency on current account, we have to investigate the effect of the "expensiveness" of goods on export and import quantity, via two scenarios:

• **Scenario 1: Demand for export and import are relatively elastic** *(Marshall Lerner condition is satisfied: $\omega_X\varepsilon_X + \omega_M(\varepsilon_M - 1) > 0$)*	• **Scenario 2: Demand for export and import are relatively inelastic** *(Marshall Lerner condition is not satisfied: $\omega_X\varepsilon_X + \omega_M(\varepsilon_M - 1) < 0$)*
↓	↓
Export, import demand is sensitive to price changes	Export, import demand is insensitive to price changes

We are going to analyze what would happen in each scenario in the next two slides.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

1. Elasticity approach

a. The effect on balance of trade (cont)

- **Scenario 1:** Demand for export and import are relatively elastic

(Marshall Lerner condition is satisfied: $\omega_X\varepsilon_X + \omega_M(\varepsilon_M - 1) > 0$)

Domestic currency depreciates

↓

Domestic goods become less expensive	Foreign goods become more expensive

↓

Demand is **sensitive** to price changes → the increase in demand (Q) when price falls is relatively higher than the fall in price (P) → Export revenue (PxQ) increases → X increases	Demand is **sensitive** to price changes → the decrease in demand (Q) when price rises is relatively higher than the increase in price (P) → import expenditure (PxQ) decreases → M decreases

↓

X-M increases → Reduce current account deficit

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

a. The effect on balance of trade (cont)

- **Scenario 2:** Demand for export and import are relatively inelastic

(Marshall Lerner condition is not satisfied: $\omega_X\varepsilon_X + \omega_M(\varepsilon_M - 1) < 0$)

Domestic currency depreciates

↓

Domestic goods become less expensive	Foreign goods become more expensive

↓

Demand **insensitive** to price changes → the increase in demand (Q) when price falls is relatively smaller than the fall in price (P) → Export revenue (PxQ) decreases → X decreases	Demand **insensitive** to price changes → the decrease in demand (Q) when price rises is relatively smaller than the increase in price (P) → import expenditure (PxQ) increases → M increases

↓

X-M decreases → Increase current account deficit

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

a. The effect on balance of trade (cont)

Summary:

- **Demand for export and import are relatively elastic** *(Marshall Lerner condition is satisfied: $\omega_X\varepsilon_X + \omega_M(\varepsilon_M - 1) > 0$):* Domestic currency depreciates → Reduce current account deficit.
- **Demand for export and import are relatively inelastic** *(Marshall Lerner condition is not satisfied: $\omega_X\varepsilon_X + \omega_M(\varepsilon_M - 1) < 0$):* Domestic currency depreciates → Increase current account deficit.

Conclusion: The effect of exchange rate on current account depends on the elasticity of import and export goods:
→ Domestic currency depreciation will result in a greater improvement in the trade deficit only when demand for export and import are relatively elastic.

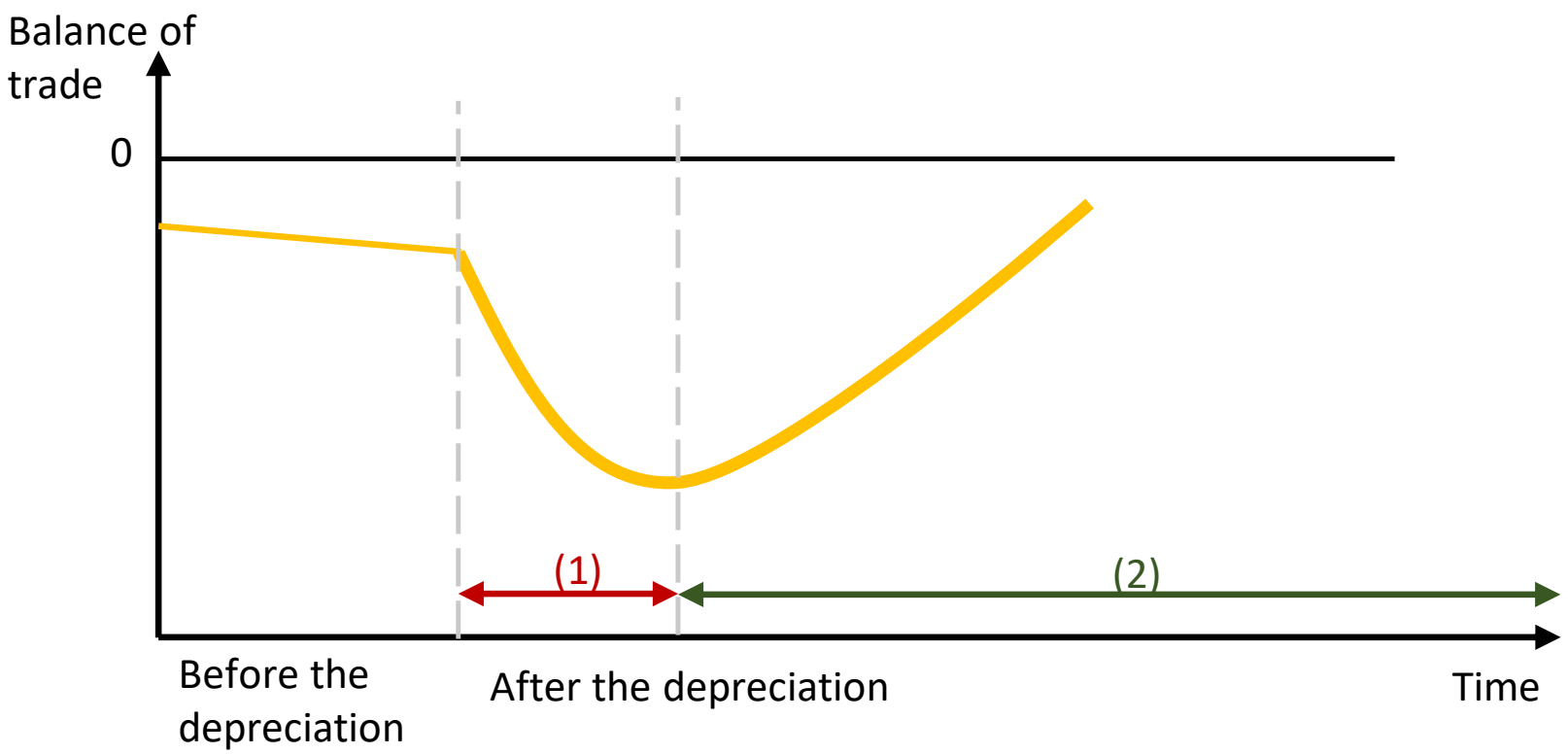
We use the same logic for the case that domestic currency appreciates.

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

b. How much time does it take for the effects to take place?

Import and export contracts for the delivery of goods most often require delivery and payment in the future.
→ Import and export quantities may be relatively insensitive to currency depreciation in the short run.
→ A currency depreciation may worsen a trade deficit initially – (1).
Importers and exporters adjust over time until the effects actually take place – (2).



MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

2. Absorption approach

The absorption approach is a macroeconomic technique that focuses on the capital flows (capital account) and can be represented as:
BT = Y – E
Where:
Y = domestic production of goods and services or national income
E = domestic absorption of goods and services, which is total expenditure
BT = balance of trade

The depreciation of the exchange rate can increase the current account surplus if it increases:

- National income relative to expenditure; or equivalently.
- National saving relative to investment in physical capital.

Whether a currency depreciation has these effects depends on the current level of capacity utilization in the economy. We will investigate two cases:
a. The economy is operating at less than full employment (capacity)
b. The economy is operating at full employment (capacity)

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

2. Absorption approach

a. The economy is operating at less than full employment (capacity)

Currency depreciation

↓

Domestic goods and assets relatively more attractive than foreign goods and assets.

↓

Demand shifts from foreign goods and assets towards domestic goods and assets

↓

Increase both expenditures and income

↓

Because part of the income increase will be saved, national income will increase more than total expenditure

↓

Balance of trade (current account) improves

Use the same logic for Currency appreciation

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

2. Absorption approach

b. The economy is operating at full employment (capacity)

If the economy is operating at full employment (potential GDP), output/income cannot be increased further.

Currency depreciation

Increase in domestic spending, but the output is not increased	Decline in the value of domestic assets → decline in savers' real wealth
Higher domestic price	Increase in saving to rebuild wealth
Reverse the relative price changes of the currency depreciation	Regain wealth overtime and decrease saving

Returning the economy to its previous state and balance of trade.

Use the same logic for Currency appreciation

MODULE 8: CURRENCY EXCHANGE RATES

[LOS 8.j] Explain the effects of exchange rates on countries' international trade and capital flows

2. Absorption approach

Summary:

- **The economy is operating at less than full employment (capacity)***:* Domestic currency depreciates → Reduce current account deficit.
- **The economy is operating at full employment (capacity)***:* Domestic currency depreciates → have no actual effect on balance of trade

Conclusion: The effect of exchange rate on current account depends on current level of capacity utilization in the economy :
→ Domestic currency depreciation will result in a greater improvement in the trade deficit only when the economy is operating at less than full capacity.

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