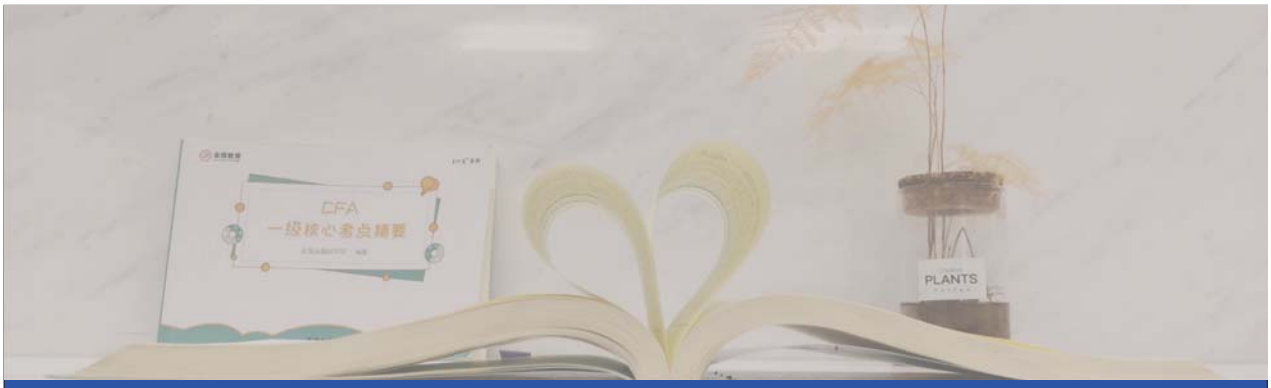


Economics

CFA一级培训项目

讲师：林正

林正

6年授课，4000+授课课时

学位证书

- 金程教育资深培训师
- 英国Essex大学硕士
- CFA持证人
- PMP（Project Management Professional）持证人

服务客户

- 中国银行、中国建设银行、民生银行、平安证券、杭州联合银行、杭州银行、国泰君安证券、苏州元禾控股等。

工作背景

- 曾历任某外资银行支行行长，总行战略项目经理，十二年的外企银行工作资历，积累了丰富的金融实战经验。
- 现为金程教育资深培训师，熟悉CFA考试重点，CFA全级别授课。

Topic Weightings in CFA Level I

Topics	Weights (%)
Quantitative Methods	8-12
Economics	8-12
Financial Statement Analysis	13-17
Corporate Issuers	8-12
Equity	10-12
Fixed Income	10-12
Derivatives	5-8
Alternative Investments	5-8
Portfolio Management	5-8
Ethical and Professional Standards	15-20

Economics

1. Firm and Market Structures
2. Understanding Business Cycles
3. Fiscal Policy
4. Monetary Policy
5. Introduction to Geopolitics
6. International Trade
7. Capital Flows and the FX Market
8. Exchange Rate Calculations

中文精读

1. 公司和市场结构
2. 理解经济周期
3. 财政政策
4. 货币政策
5. 地缘政治介绍
6. 国际贸易
7. 资本流动与外汇市场
8. 汇率计算

Framework

Module

Firms and Market Structures

1. Profit Maximization: Revenue, Cost, Profit Maximization, Breakeven and Shutdown Point
2. Introduction to Market Structures
3. Monopolistic Competition
4. Oligopoly
5. Determining Market Structure

Prerequisite Reading: Topics in Demand and Supply Analysis

- Demand and Supply Curve
- Market Equilibrium
- Elasticity of Demand

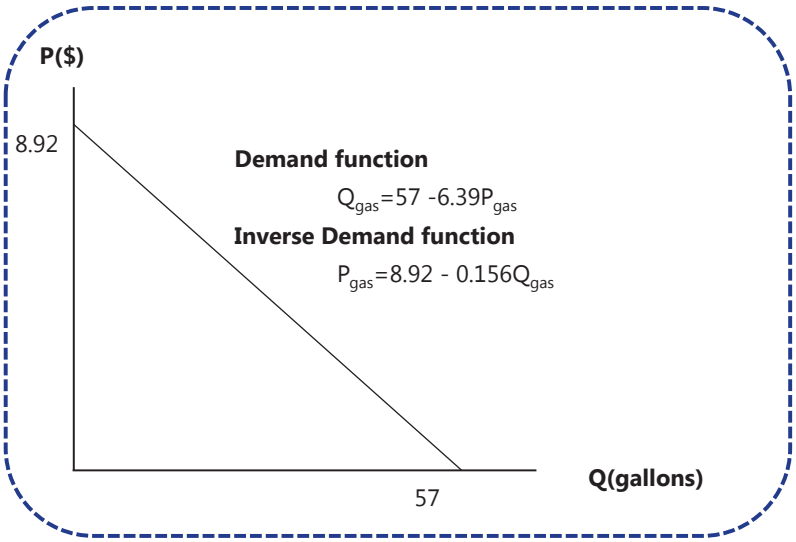
1.1 Demand

- **Demand function**
  - The quantity of demanded depends on income, the prices of other goods, as well as other factors.

$$Q_x^d = f(P_x, I, P_y)$$

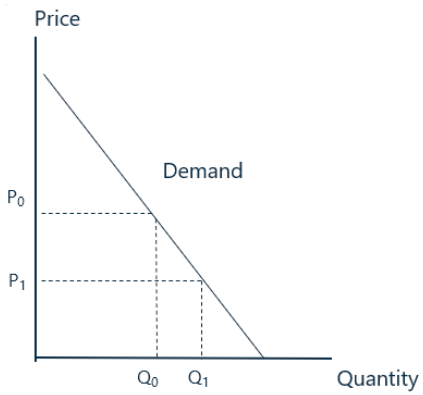
  - **Example:**
    - ✓ $Q_{gas}^d = 84.5 - 6.39P_{gas} + 0.25I - 2P_{auto}$
    - ✓ Assuming Income=50, $P_{auto}=20$
      - $Q_{gas}^d = 84.5 - 6.39P_{gas} + 0.25(50) - 2(20) = 57 - 6.39P_{gas}$ (demand function)
    - ✓ Invert the function
      - $P_{gas} = 8.92 - 0.156\,Q_{gas}^d$(**inverse demand function**)
      - The graph of the inverse demand function is called the **demand curve**.
- **Law of demand**
  - Demand decreased as the price increased.

1.2 Demand Curve

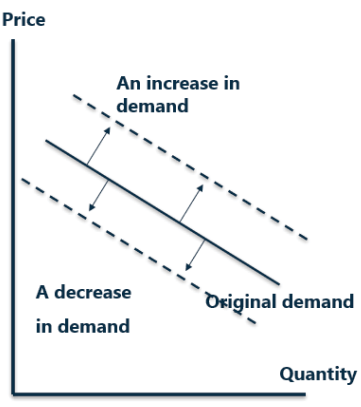


1.2 Demand Curve

- **Movements along demand curves.**
  - A change in the market price that simply increases or decreases the quantity demanded is represented by a movement along the curve.



- **Shifts in demand curves.**
  - A change in one of the independent variables other than price will result in a shift of the curve itself.
    - ✓ Such as income, price of other foods



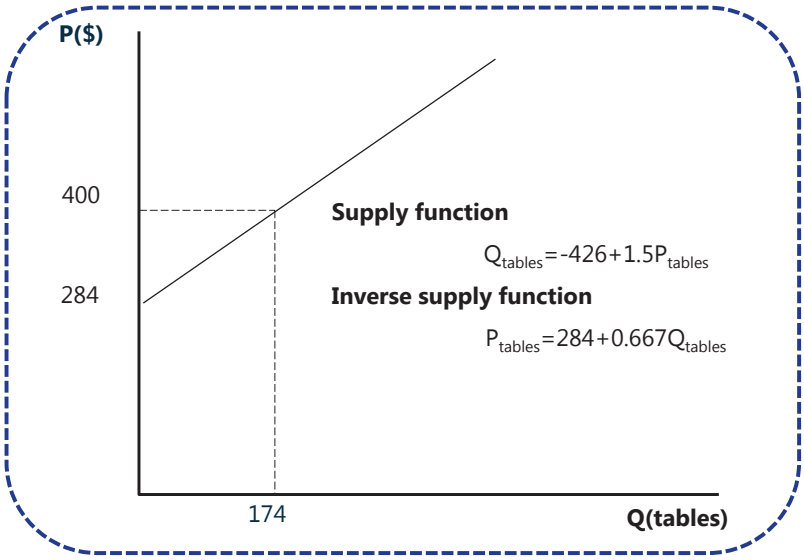
1.3 Supply

- **Supply function**
  - The quantity supply depends on the selling price, the costs of production depending on technology, the cost of labor, and the cost of other inputs into the production process.

$$Q_X^S = f(P_X, W, P_y)$$

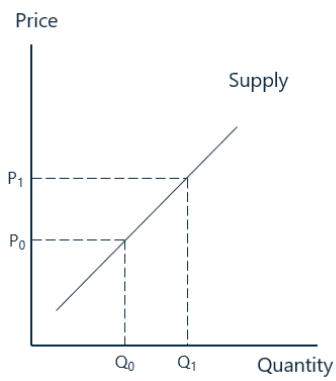
  - **Example**
    - ✓ $Q_{tables}^S = -300 + 1.5P_{tables} - 8W - 0.2P_{wood}$
    - ✓ Assuming Wage of worker=12, $P_{wood}=150$
      - $Q_{tables}^S = -426 + 1.5P_{tables}$ **(supply function)**
    - ✓ Invert the function
      - $P_{tables} = 284 + 0.667\,Q_{tables}^S$ **(inverse supply function)**
      - The graph of the inverse supply function is called the supply curve.
- **Law of supply**
  - Supply increased as the price increased.

1.4 Supply Curve

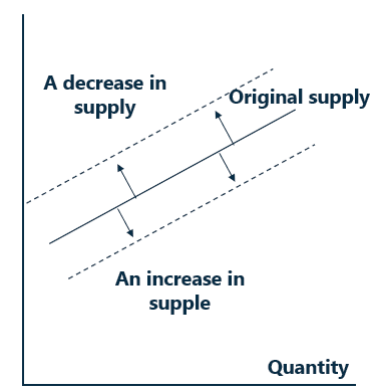


1.4 Supply Curve

- **Movements along supply curves.**
  - A change in the market price that simply increases or decreases the quantity supplied is represented by a movement along the curve.

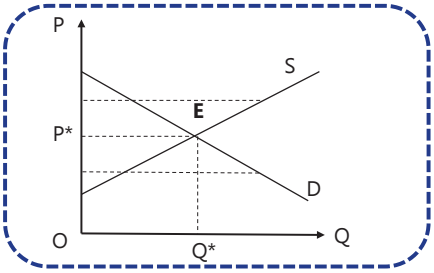


- **Shifts in supply curves.**
  - A change in one of the independent variables **other than price** will result in a shift of the curve itself.
    - ✓ Such as cost of labor



2.1 Market Equilibrium

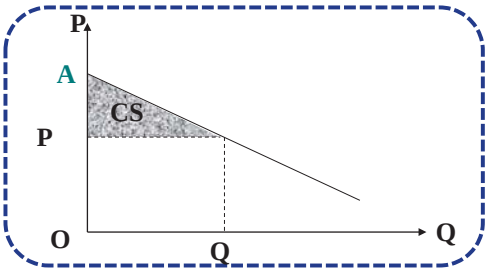
- **Equilibrium price and the equilibrium quantity**
  - When have a market supply and market demand curve for a good, we can solve for the **price** at which the quantity supplied equals the quantity demanded. We define this as the **equilibrium price** and the equilibrium quantity.

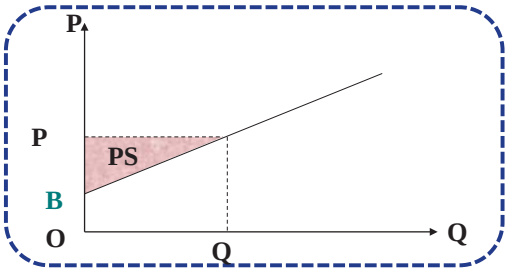


  - E: market equilibrium.
  - At the price, the quantity of supply=the quantity of demand.

2.2 Consumer Surplus

- **Consumer surplus and producer surplus**
  - **Consumer surplus** is the difference between the total value to consumers of the units of a good that they buy and the total amount they must pay for those units.
    - ✓ Marginal value (**MV or Marginal Benefit or Marginal Utility**) is the benefit derived from consuming one additional unit of a good or service.
  - **Producer surplus** is the excess of the market price above the opportunity cost of production.
  - Total surplus = consumer surplus + producer surplus



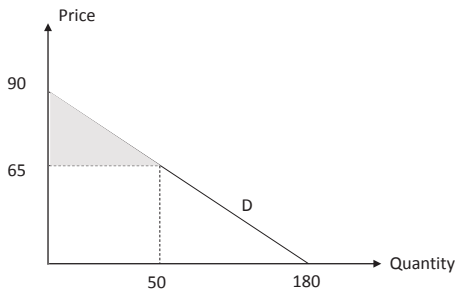


Example

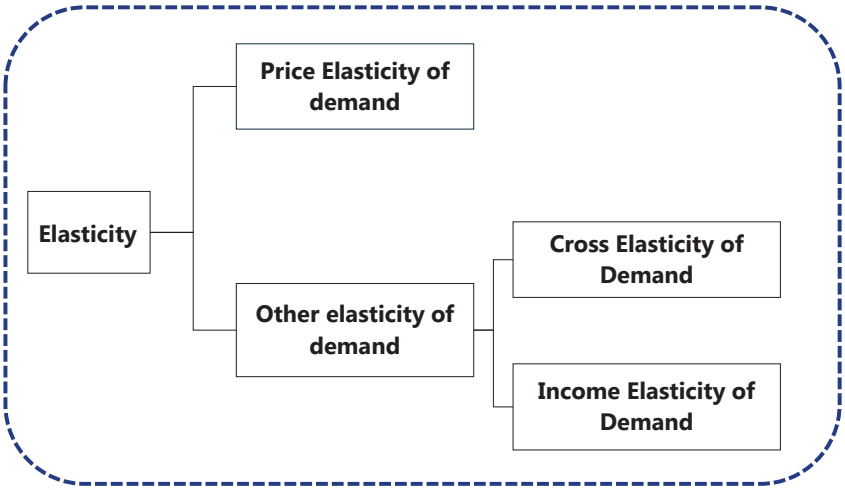
Consumer Surplus and Producer Surplus

- A market demand function is given by the equation Q_x^d = 180 – 2P. Find the value of consumer surplus if price is equal to 65.

- **Solution:**
  - Area = 0.5 (Base)(Height) = 0.5 × 50 ×25 = 625



3. Elasticity of Demand



3.1 Price Elasticity of Demand

- **Price elasticity is a measure of the responsiveness of the quantity demanded to a change in price.**
  - The formula used to calculate the price elasticity of demand is
    - ✓ Price elasticity of demand = $\frac{\text{percent change in quantity demand}}{\text{percent change in price}} = \frac{\Delta Q/Q}{\Delta P/P}$

$$E_{P_x}^d = \frac{\%\Delta Q_x^d}{\%\Delta P_x} = \frac{\Delta Q_x^d / Q_x^d}{\Delta P_x / P_x} = \left(\frac{\Delta Q_x^d}{\Delta P_x}\right)\left(\frac{P_x}{Q_x^d}\right)$$

Where

$E_{P_x}^d$ = price elasticity of demand of X,

ΔQ_x^d =change in quantity demanded of X,

ΔP_x =change in own price of X.

Example

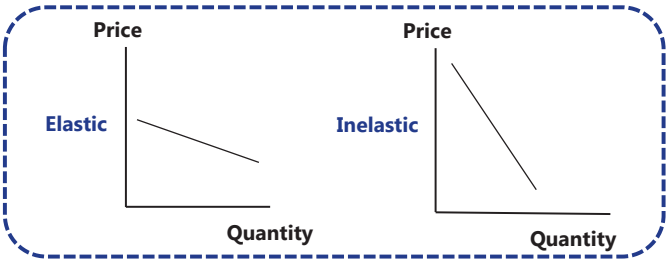
3.1 Price Elasticity of Demand

- Q_x^d = 8,400 - 400Px+ 60I - 10Py
- Choose \$3 for P_x , \$50 (thousands) for I, \$20 (thousands) for P_y

- **Solution:**
  - $E_{P_x}^d = \left(\frac{\Delta Q_x^d}{\Delta P_x}\right)\left(\frac{P_x}{Q_x^d}\right) = -400 \times \frac{3}{10000} = -0.12$ → own−price elasticity of demand

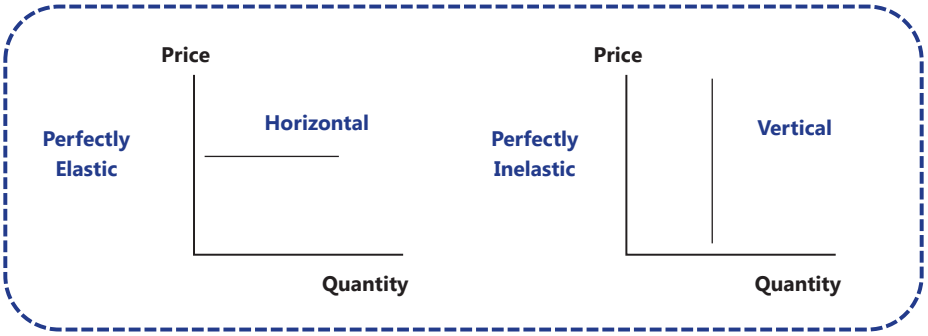
3.1 Price Elasticity of Demand

- **Types of Price elasticity**
  - When elasticity<1, the demand is said to be **inelastic**; P↑, total revenue ↑
  - When elasticity>1, the demand is said to be **elastic**; P↓, total revenue ↑
  - When elasticity=1, demand is said to be **unit elastic**, or **unitary elastic**.



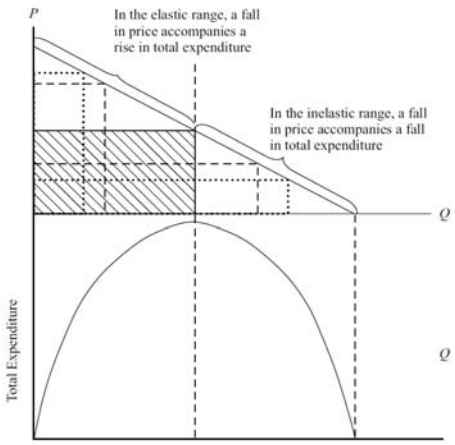
3.1 Price Elasticity of Demand

- **Types of Price elasticity**
  - Perfectly elastic
    - ✓ Demand curve is **horizontal** at some given price. It implies that even a minute price increase will reduce demand to zero.
  - Perfectly inelastic
    - ✓ Demand curve is **vertical**, quantity demanded is not sensitive to price at all.



3.1 Price Elasticity of Demand

- **The relation between price elasticity of demand and total revenue**
  - **Total revenue is maximized** at the price and quantity where demand is **unit elastic** (price elasticity =-1).
    - ✓ When demand is elastic, a fall in price brings about an increase in total revenue.



- **Note:**
  - Maximum total expenditure occurs at the unit-elastic point on a linear demand curve (the cross-hatched rectangle).
  - TR=P×Q
    - ✓ For demand is elastic (left), P decrease will bring larger Q increase, resulting higher TR
    - ✓ For demand is inelastic (right), P increase will bring smaller Q decrease, resulting higher TR

3.1 Price Elasticity of Demand

- **Influential Factors**
  - Availability of substitutes.
    - ✓ **Few** substitutes, demand is much **less elastic**. Vice versa，e.g. competitive, discretionary.
  - Portion of income spent on the good.
    - ✓ When the portion of consumer budgets spent on a particular good is relatively **small,** demand for that good will tend to be **relatively inelastic,** such as salt.
  - Long-run elasticity of demand is greater than short-run elasticity.
    - ✓ The price elasticity of demand for most products is **greater** in the **long run** than in the short run.
      - For example, gasoline.
    - ✓ Durable goods tend to behave in the opposite way.
      - Because in the long run, it is unlikely that a consumer would buy more durable goods, such as washing machines.

3.2 Cross Elasticity

- **Cross elasticity of demand measures the change in the demand for a good in response to the change in price of a substitute or complementary good.**
  - The formula for calculating cross elasticity of demand is:
    - ✓ Cross elasticity of demand $= \dfrac{\text{percent change in quantity demanded}}{\text{percent change in price of substitutes or complements}} = \dfrac{\Delta Q_X/Q_X}{\Delta P_Y/P_Y}$
    - ✓ $E_{P_y}^d = \dfrac{\%\Delta Q_x^d}{\%\Delta P_y} = \dfrac{\Delta Q_x^d/Q_x^d}{\Delta P_y/P_y} = \left(\dfrac{\Delta Q_x^d}{\Delta P_y}\right)\left(\dfrac{P_y}{Q_x^d}\right)$
  - Cross elasticity of demand is **positive for substitute goods**. (E.g., apple and pear)
  - Cross elasticity of demand is **negative for complement goods**. (E.g., car and gas)

Example

3.2 Cross Elasticity of Demand

- An individual's demand for onions is given by the following equation:

  $Q_x^d = 3 - 0.05P_x + 0.009I - 0.16P_y$

  where Q_x^d is the number of onions demanded,
  P_x is the price per pound of onions,
  I is the household income,
  and P_y is the price per pound of tomatoes.
  If the price of onions is \$1.25, household income is \$2,500, and the price of tomatoes is \$3.75, the cross-price elasticity of demand for onions with respect to the price of tomatoes is closest to:

  A. –1.0597.
  B. –0.0242.
  C. –0.0081.

- **Solution：B**

$$E_{P_y}^d = \left(\frac{\Delta Q_x^d}{\Delta P_y}\right)\left(\frac{P_y}{Q_x^d}\right) = -0.16 \times \frac{3.75}{3 - 0.05 \times 1.25 + 0.009 \times 2500 - 0.16 \times 3.75} = -0.0242$$

→ cross−price *elasticity*

3.3 Income Elasticity

- **Income elasticity of demand** measures the sensitivity of the quantity of a good or service demanded to a change in a consumer's income.
  - The formula for income elasticity of demand is
    - ✓ Income elasticity of demand $= \frac{\text{percent change in quantity demanded}}{\text{percent change in income}} = \frac{\Delta Q_X / Q_X}{\Delta I / I}$
    - ✓ $E_I^d = \frac{\%\Delta Q_x^d}{\%\Delta I} = \frac{\Delta Q_x^d / Q_x^d}{\Delta I / I} = \left(\frac{\Delta Q_x^d}{\Delta I}\right)\left(\frac{I}{Q_x^d}\right)$
- **The application of income elasticity**
  - **Normal goods:** positive income elasticity, demand rises with income. ($E_I^d > 0$)
    - ✓ **Luxuries:** high positive elasticity, demand rises strongly with income. ($E_I^d > 1$)
    - ✓ **Necessities:** normal but low elasticity. (between 0 ~ 1)
  - **Inferior goods:** negative income elasticity, demand falls with income. ($E_I^d < 0$)

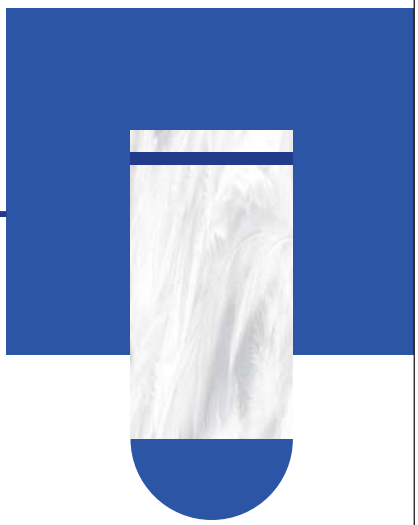
Example

3.3 Income Elasticity

- **Question**
  - $Q_x^d = 8{,}400 - 400P_x + 60I - 10P_y$
  - Choose \$3 for P_x , \$50 (thousands) for I, \$20 (thousands) for P_y
- **Solution**
  - $E_I^d = \left(\frac{\Delta Q_x^d}{\Delta I}\right)\left(\frac{I}{Q_x^d}\right) = 60 \times \frac{50}{10000} = 0.3 \rightarrow$ income *elasticity of demand*

Revenue

- Total Revenue, Average Revenue, and Marginal Revenue

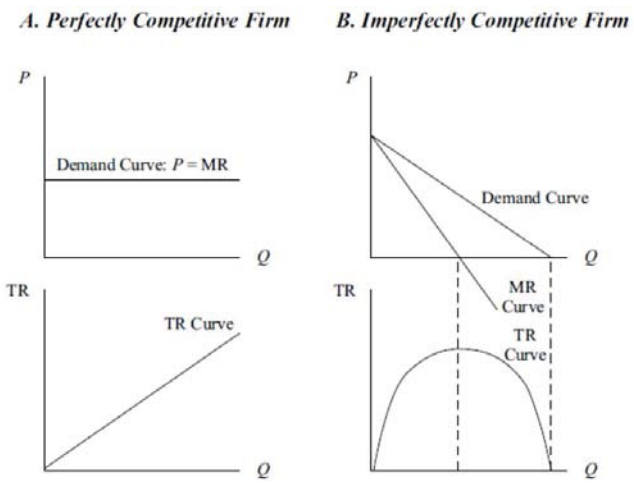


Total, Average, and Marginal Revenue

- **Total revenue (TR)** for any firm that charges a single price to all customers is calculated as price multiplied by quantity sold, or TR=P×Q
- **Average revenue (AR)** is equal to total revenue divided by the quantity sold, AR=TR/Q.
  - P=AR
- **Marginal revenue (MR)** is the increase in total revenue from selling one more unit of a good or service.

Total, Average, and Marginal Revenue

- The TR curve for the firm under conditions of **perfect competition** is linear, with a slope equal to price per unit.
- The TR curve for the **imperfectly competitive firm** first rises (in the range where MR is positive and demand is elastic) and then falls (in the range where MR is negative and demand is inelastic) with output.



Total, Average, and Marginal Revenue

Q	P	TR	AR	MR
1	70	70	70	70
2	65	130	65	60
3	60	180	60	50
4	55	220	55	40
5	50	250	50	30
6	45	270	45	20
7	40	280	40	10
8	35	280	35	0

- **There are two competing forces affecting revenue:**
  - (1) Additional units are sold at the new price,
  - (2) all units must now be sold at the lower price.
- **The firm is selling more units, but it is selling all units at a lower price than before.**
  - P=AR
  - P>MR

Total, Average, and Marginal Revenue

- **Assume demand for a product can be specified as:**
  - $Q_D = 50 - 2P$
- **We can get**
  - $P = 25 - 0.5Q_D$
  - $TR = P \times Q_D = 25Q_D - 0.5Q_D^2$
  - $AR = \frac{TR}{Q_D} = \frac{25Q_D - 0.5Q_D^2}{Q_D} = 25 - 0.5Q_D$
  - $MR = 25 - Q_D$

Total, Average, and Marginal Revenue

- **Under perfect competition**
  - The individual firm has virtually no impact on market price, **price taker**.
    - ✓ Since the individual seller must take the market price as given, it faces a **horizontal** demand curve over relevant output ranges.
  - Under perfect competition, **MR=P and TR=P×Q**
- **Under imperfect competition**
  - Firms face downward-sloping demand curve, **price searchers**.
    - ✓ Must lower it price to sell another unit. → **MR will be lower than price**.
    - ✓ Average revenue (AR) and marginal revenue (MR) will decline as quantity of goods sold increase.
  - Total revenue (TR)=P×Q=f(Q)×Q
    - ✓ When price is reduced and Q increases, a decrease in price initially increases total expenditure by buyers and TR to the firm because the decrease in price is outweighed by the increase in units sold. But as price continues to fall, the decrease in price overshadows the increase in quantity, and TR falls.
    - ✓ TR is maximized when MR=0.
  - The relationship between MR, P, and price elasticity of demand: **$MR=P[1-1/|E_p|]$**

Marginal Revenue

- MR is equal to price with an adjustment equal to quantity times the slope of demand curve.
  - $TR = (P)(Q)$
  - $MR = \Delta TR/(\Delta Q)$
  - $\Delta TR = (P)(\Delta Q) + (Q)(\Delta P)$
  - $MR = \frac{(P)(\Delta Q)}{\Delta Q} + \frac{(Q)(\Delta P)}{\Delta Q} = P + Q\frac{(\Delta P)}{\Delta Q} = P\left(1 + \frac{\Delta P}{\Delta Q} \times \frac{Q}{P}\right) = P\left(1 + \frac{1}{E}\right) = P\left(1 - \frac{1}{|E|}\right)$
    - ✓ A perfectly competitive firm faces a demand curve with a slope of zero. Substituting 0 for ΔP/ΔQ into the expression given, it becomes clear that MR = P.
    - ✓ For a firm in imperfectly competitive market, the demand curve is negatively sloped (ΔP/ΔQ<0). It is clear that MR < P.

Example

Marginal Revenue

- The marginal revenue per unit sold for a firm doing business under conditions of perfect competition will most likely be:
  A. equal to average revenue.
  B. less than average revenue.
  C. greater than average revenue.

Solution:

A is correct. Under perfect competition, a firm is a price taker at any quantity supplied to the market, and AR = MR = Price.

Example

Marginal Revenue

- A factory has introduced a new discount activity. When using the old price standard, it can sell 60 units of products every day at a selling price of 150 yuan. With discount, 80 units of products can be produced every day at a price of 130 yuan. The marginal revenue per product earned through discount activity is the closest to:
  A. 60
  B. 70
  C. 80

- **Solution: B.**
  - MR = ΔTR ÷ ΔQ
  - Change in total revenue per day = 130 × 80 – 150 × 60=1400
  - Change in units sold = 20 (80-60)
  - MR=1400 ÷20 = 70

Example

Total Revenue

- An agricultural firm operating in a perfectly competitive market supplies wheat to manufacturers of consumer food products and animal feeds. If the firm were able to expand its production and unit sales by 10%, the most likely result would be:
  A. a 10% increase in total revenue.
  B. a 10% increase in average revenue.
  C. a less than 10% increase in total revenue.

Solution: A

In a perfectly competitive market, an increase in supply by a single firm will not affect price. Therefore, an increase in units sold by the firm will be matched proportionately by an increase in revenue

Cost

- Long Run and Short Run
- Total, Average, Marginal, Fixed, Variable costs
- Economies of Scale and Diseconomies of Scale

Long Run and Short Run

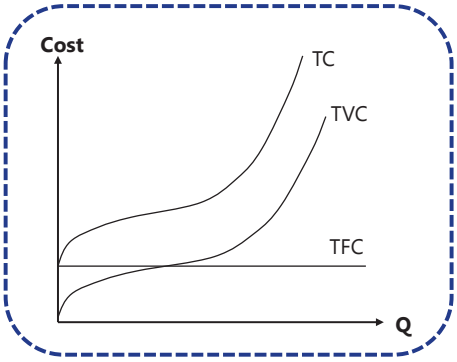
- **Long term & short term**
  - The **short term/run** is defined as a time period for which quantities of some resources are **fixed**, such as **buildings, technology and equipment**.
    - ✓ The technology of production is fixed in the short run and is a constraint on a firm's ability to increase production.
    - ✓ Typically, economists treat **labor and raw materials as variable** in the **short run**, holding plant size, capital equipment, and technology constant.
  - All of these factors **become variable in the long run**.

Total, Fixed, and Variable costs

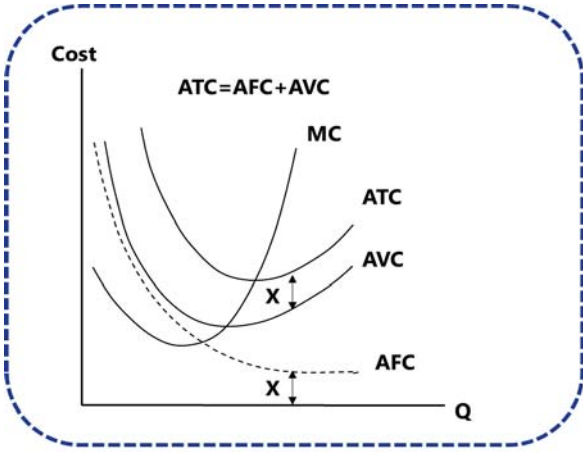
- **Total fixed cost (TFC)** is the cost of inputs that do not vary with the quantity of output and cannot be avoided over the period of analysis.
- **Total variable cost (TVC)** is the cost of all inputs that vary with output over the period of analysis.
- **Total cost (TC)** is the sum of all costs (fixed or variable, explicit and implicit) of producing a specific level of output.

Cost

- **Total cost** = total fixed cost + total variable cost
- **Marginal cost** = change in total cost / change in output=ΔTC/ ΔQ
- **Average fixed cost** = total fixed cost / output=TFC/Q
- **Average variable cost** = total variable cost / output=TVC/Q
- **Average (total) cost** = total cost / output = AFC+AVC



Total, Average, Marginal, Fixed, Variable costs



Average and Marginal Costs

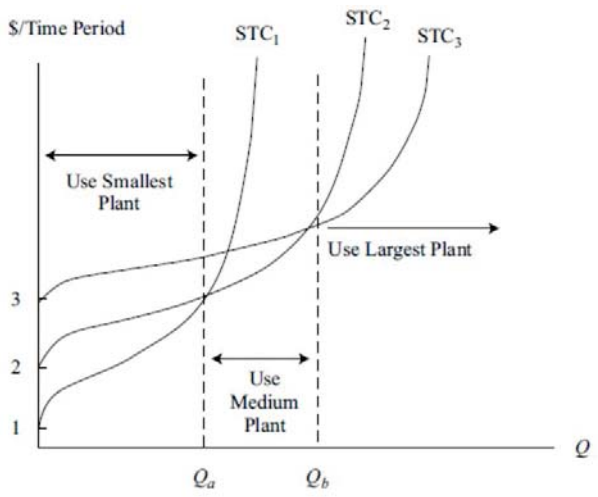
Total, Average, Marginal, Fixed, Variable costs

- **AFC** slopes downward. AFC=TFC/Q
  - As output quantity increases, AFC declines because TFCs are **spread over a larger number of units**.
- Both **ATC and AVC** take on a bowl-shaped pattern in which each curve initially declines, reaches a minimum level, and then increases after that point, reflecting the **law of diminishing marginal returns to labor**.
  - The vertical distance between the ATC and AVC curves is equal to AFC.
  - Minimum point on the ATC curve represents the lowest cost per unit, but it is not necessarily the **profit-maximizing point**.
- The **MC curve** intersects both the ATC and the AVC at their **minimum** points.
  - TFC do not change with the change of output, *so MC reflects the change of total variable cost only*.
  - With the increase of output, *MC declines initially, then increases*.
  - When MC is less than AVC, AVC will be decreasing.
  - When MC is greater than AVC, AVC will be increasing.

Long Run Cost Curves

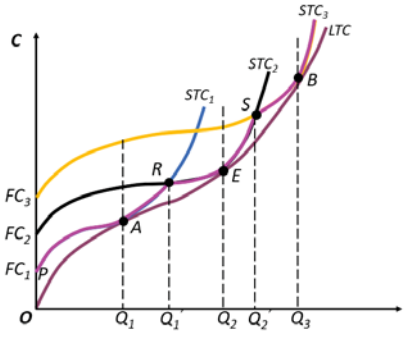
- **Long-Run**
  - At higher levels of fixed input, TFC is greater, but the production capacity of the firm is also greater.
  - Exhibit shows three different STC curves for the same technology but using three distinct levels of capital input—points 1, 2, and 3 on the vertical axis.
    - ✓ Plant Size 1 is the smallest and, of course, has the lowest fixed cost; hence, its STC_1 curve has the lowest vertical intercept. Note that STC_1 begins to rise more steeply with output, reflecting the lower plant capacity.
    - ✓ Plant Size 3 is the largest of the three and reflects that size with both a higher fixed cost and a lower slope at any level of output.
    - ✓ If a firm decided to produce an output between zero and Q_a, it would plan on building Plant Size 1 because for any output level in that range, its cost would be less than it would be for Plant Size 2 or 3.

Long Run Cost Curves



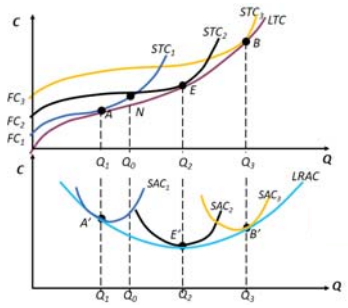
Long Run Cost Curves

- **Long-Run Total Cost Curve**
  - The long-run total cost curve is derived from the lowest level of STC for each level of output because in the long run, the firm is free to choose which plant size it will operate. Assumed that the production scale can be infinitely subdivided, resulting in countless SAC curves. The LRAC is the **envelope** of countless SAC curves.
  - This curve is called an "**envelope curve**." In essence, this curve envelopes—encompasses—all possible combinations of technology, plant size, and physical capital.



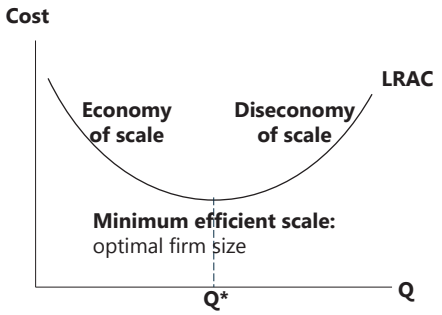
Long Run Cost Curves

- **Long-Run Average Total Cost Curve (LRAC)**
  - The production scale represented by the SAC curve is the optimal production scale for producing that output, and the average cost corresponding is the lowest average cost.
  - The shape of the LRAC curve reflects an important concept called economies of scale and diseconomies of scale.



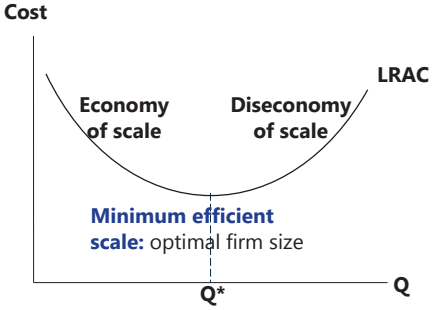
Economies of Scale and Diseconomies of Scale

- **Economies of scale**
  - Decreasing long-run cost per unit as output increases.
  - Should increase production level.
- **Diseconomies of scale**
  - Increasing long-run cost per unit as output increases.
  - Should decrease its production level.
- **Constant returns to scale**
  - Increases its quantity produced without any change in per-unit cost.
  - Minimum efficient scale，producer should operate at current level of production.



Economies of Scale and Diseconomies of Scale

- The **downward sloping** segment of the long-run average total cost curve indicates **the economies of scale.**
  - **Reason:** Specialization and bargaining power in input price.
- The **upward sloping** segment of this long-run average total cost curve indicates that **diseconomies of scale** are present when average unit costs rise as the scale of the business increase.
  - **Reason:** Bureaucratic and communication breakdowns and overlap and duplication (i.e., similar or identical automobile models).
    - ✓ For example, scale diseconomies occurred in GM through product overlap and duplication. So, GM decided to discontinue three brands (Saturn, Pontiac, and Hummer) in 2009.
  - **Reason:** Supply constrains lead to higher resource price



Example

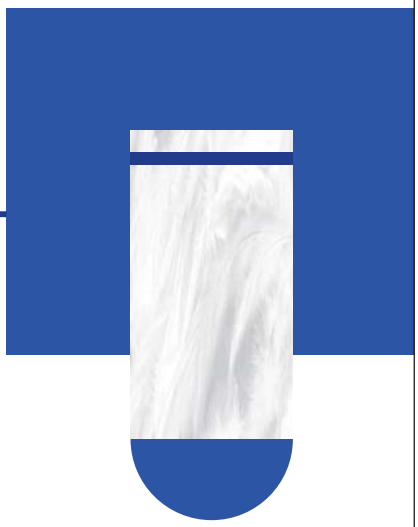
Economies of Scale and Diseconomies of Scale

- If a firm's long-run ATC increases same percentage with its output, the firm is experiencing:
  A. Economies of scale.
  B. Diseconomies of scale.
  C. Constant returns to scale.

- **Solution: B.**
  - Increasing long-run average total cost as a result of increasing output demonstrates diseconomies of scale.

Economic Profit

- Economic Profit

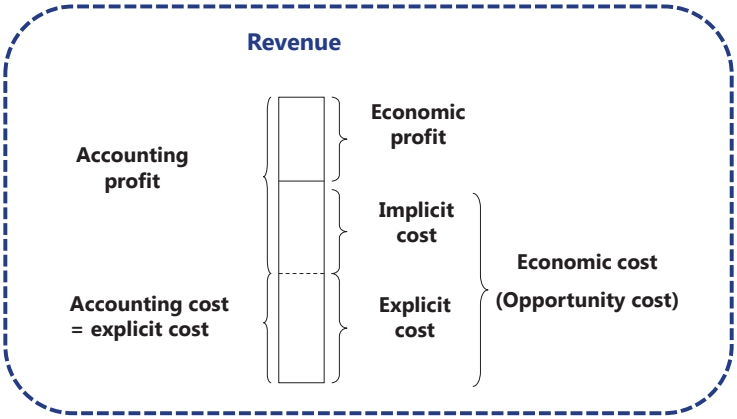


Accounting Profit and Economic Profit

- **Accounting profit** is the difference between total revenue and total accounting cost.
  - **Accounting profit = total revenue – total accounting (explicit) cost**
- **Economic profit** is also referred to as abnormal profit.
  - **Economic profit= total revenue – economic cost**
    - ✓ Economic cost considers the total opportunity cost of all factor of production
  - **Economic profit= accounting profit - implicit opportunity costs**
  - **Implicit costs** are the opportunity costs of resources supplied to the firm by its owners.
    - ✓ Opportunity cost is the next best alternative use of a resource forgone in making a decision.
    - ✓ For private firms, the implicit costs include
      - The opportunity cost of owner-supplied capital;
      - The opportunity cost of the time;
      - Entrepreneurial ability of the firm's owners.
    - ✓ For publicly firms, implicit costs are only the opportunity cost of equity owners' investment.

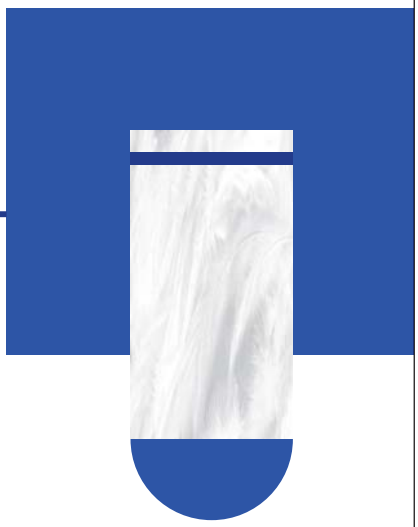
Normal Profit

- **Normal profit is the accounting profit that makes economic profit zero.**
  - Accounting profit = economic profit + normal profit



Profit Maximization

- Profit Maximization

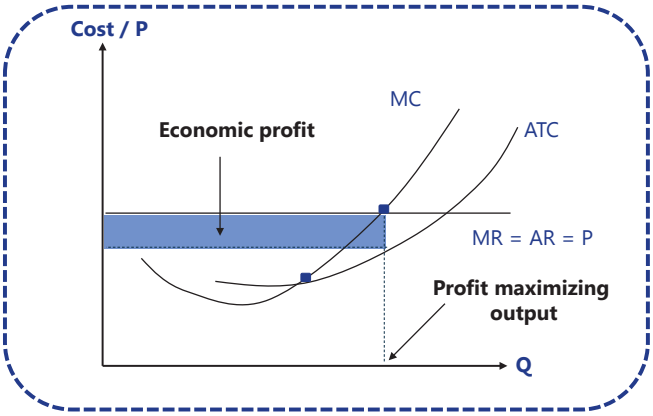


Profit Maximization

- **Profit maximization** occurs when
  - The difference between total revenue (TR) and total costs (TC) is the greatest;
  - **1) Marginal revenue (MR) equals marginal cost (MC); (MR=MC)**
    - ✓ The revenue value of the output from the last unit of input employed equals the cost of employing that input unit.
  - **2) MC not be falling with output**

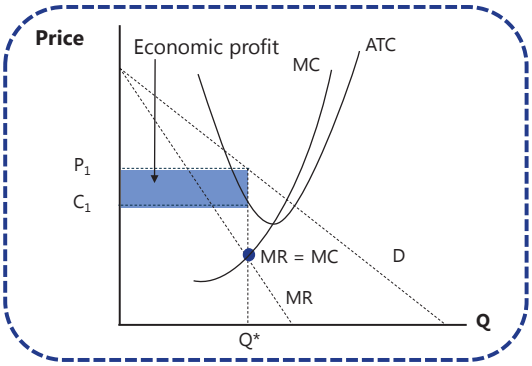
Profit Maximization

- **Perfectly competition**
  - Profit max: MR=MC
  - MR=P=AR



Profit Maximization

- **Imperfectly competition**
  - The **profit-maximizing** choice is the level of output where **MR=MC**.



Example

Profit Maximization

- A profit maximum is least likely to occur when:
  - A. average total cost is minimized.
  - B. marginal revenue is equal to marginal cost.
  - C. the difference between total revenue and total cost is maximized.

Solution: A

The quantity at which average total cost is minimized does not necessarily correspond to a profit maximum.

Breakeven Point and Shutdown Point

- Breakeven Point
- Shutdown Point

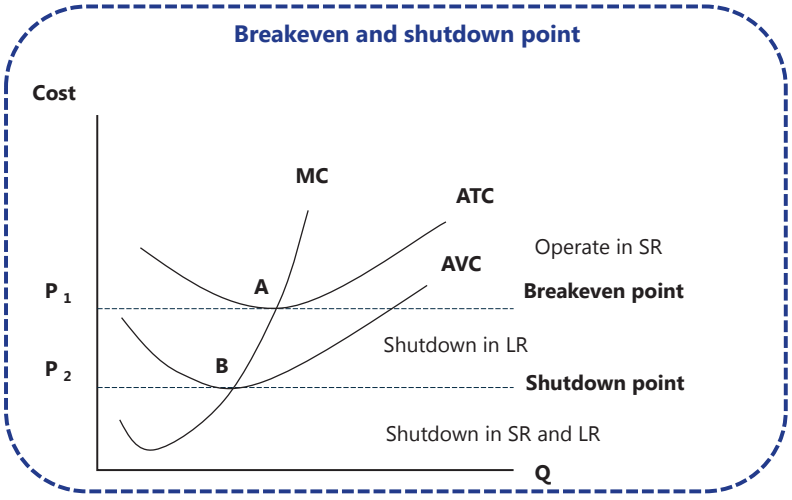
Breakeven Point and Shutdown Point

		Short-Run Decision	Long-Run Decision
TR > TC	AR > ATC	Stay in market	
TR=TC	AR = ATC	**Breakeven point**	
TVC < TR < TC	AVC < AR < ATC	Stay in market	Exit market
TVC=TR	AR = AVC	**Shutdown point**	
TR < TVC	AR < AVC	Shut down production to zero	Exit market

- The breakeven point occurs when TR equals TC, otherwise stated as the output quantity at which average total cost (ATC) equals price (AR).
- If all fixed costs are sunk costs, then shutdown occurs when the market price falls below the **minimum average variable cost**. After shutdown, the firm incurs only **fixed costs** and loses less money than it would operating at a price that does not cover variable costs.

Breakeven Point and Shutdown Point

- **Perfect competition**
  - Economists refer to the **minimum AVC point** as the **shutdown point** and **the minimum ATC point** as the **breakeven point**.



Example

Breakeven Point and Shutdown Point

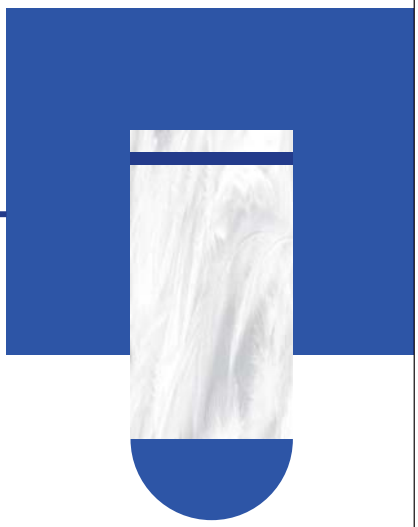
- The short-term breakeven point of production for a firm operating under perfect competition will most likely occur when:
  A. price is equal to average total cost.
  B. marginal revenue is equal to marginal cost.
  C. marginal revenue is equal to average variable costs.

Solution: A

Under perfect competition, price is equal to marginal revenue. A firm breaks even when marginal revenue equals average total cost.

Introduction to Market Structures

- Market Structure
- Perfect Competition



Market Structure

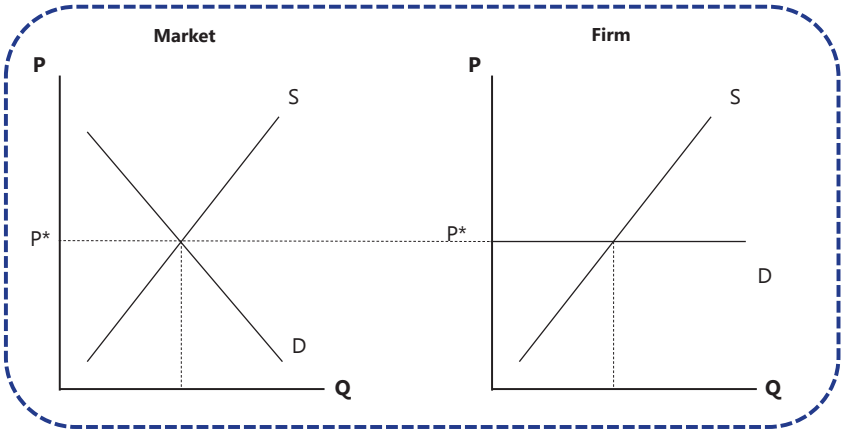
Type	Number of firms	Degree of difference of products	Barriers to Entry	Pricing Power of Firm	Non-Price Competition	The example in our life
Perfect competition	Many	Homogeneous/ Standardized	Very easy	None	None	Some agricultural products
Monopolistic competition	Many	Differentiated	Low	Some	Advertising and Product Differentiation	Some retail products, toothpaste
Oligopoly	More than one, but not many	Homogeneous/ Standardized	Difficult	Some or Considerable	Advertising and Product Differentiation	Steel, automobile, oil
Pure monopoly	Single	Unique, nearly no substitute	No way	Considerable	Advertising	Public sectors

Perfect Competition

- **The assumption of perfect competition**
  - There are a large number of potential buyers and sellers;
  - There are few or easily surmountable barriers to entry and exit;
  - The products offered by the sellers are virtually identical;
  - Sellers have no market-pricing power;
  - Non-price competition is low.
    - ✓ For example, advertising.
- A **price taker** is a firm that cannot influence the market price and that sets its own price at the market price.
- Individual firm's **demand schedule** is *perfectly elastic* (horizontal, Price = Marginal Revenue = Average revenue).

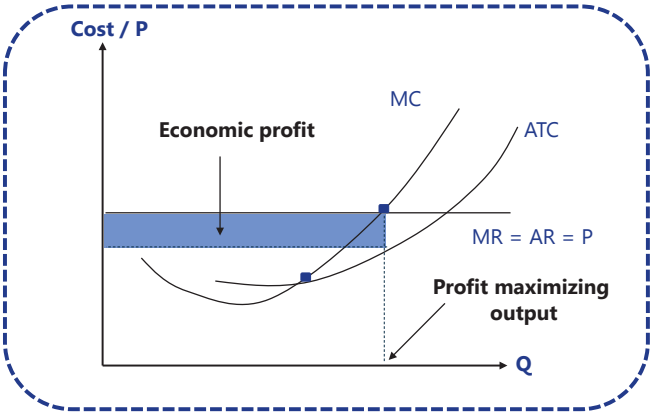
Perfect Competition

- **Firm and Market in Perfect Competition**



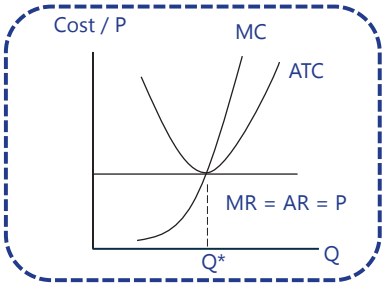
Perfect Competition

- **Perfectly competition firm's short-run equilibrium**
  - Profit max: MR=MC
  - MR=P=AR



Perfect Competition

- **Perfectly competition firm's long-run equilibrium**
  - The **long-run equilibrium** output level for perfectly competitive firms is where MR=MC=ATC, which is where **ATC is at a minimum**. At this output, economic profit is zero and only a normal return is realized.
  - In equilibrium, each firm is producing the quantity for which **P=MR=MC=ATC**, so that **no firm earns economic profits**.
    - ✓ When P>ATC, firms can earn economic profits → New joiners, supply curve shift right, price decrease till P=ATC.



Example

Market Structures

- A market structure characterized by many sellers with each having some pricing power and product differentiation is best described as:
  - A. oligopoly.
  - B. perfect competition.
  - C. monopolistic competition.

Solution: C

Monopolistic competition is characterized by many sellers, differentiated products, and some pricing power.

Example

Market Structures

- A market structure with relatively few sellers of a homogeneous or standardized product is best described as:
  - A. oligopoly.
  - B. monopoly.
  - C. perfect competition.

Solution: A

Few sellers of a homogeneous or standardized product characterizes an oligopoly.

Example

Market Structures

- The demand schedule in a perfectly competitive market is given by P=93–1.5Q (for Q≤ 62) and the long-run cost structure of each company is:

Total cost:	$256 + 2Q + 4Q^2$
Average cost:	$256/Q + 2 + 4Q$
Marginal cost:	$2 + 8Q$

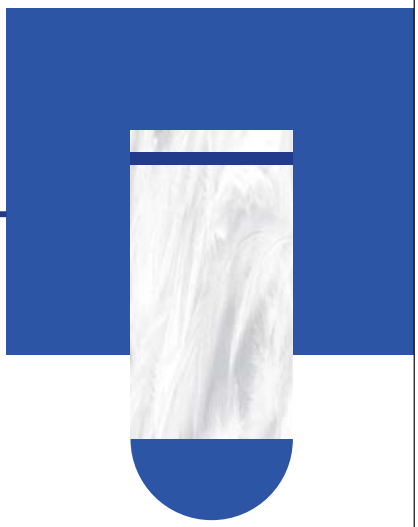
Above which price, new companies will enter the market

A. 8.
B. 66.
C. 81.

- **Solution: B.**
  - The long-run competitive equilibrium occurs where MC = AC = P for each company. Equating MC and AC implies 2 + 8Q = 256/Q + 2 + 4Q. Solving for Q gives Q = 8. Equating MC with price gives P = 2 + 8Q = 66. Any price above 66 yields an economic profit because P = MC > AC, so new companies will enter the market.

Monopolistic Competition

- Monopolistic Competition



Monopolistic Competition

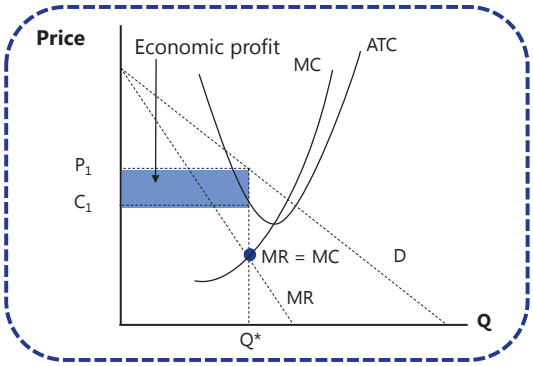
- **The following market and product features define monopolistic competition:**
  - There are a large number of independent sellers.
    - ✓ Each firm has relatively **small** market share.
  - Each seller try to sell **differentiated** product.
    - ✓ The most distinctive factor in monopolistic competition is product differentiation.
    - ✓ Have some pricing power.
  - Firms are free to enter and exit with fairly low cost.
  - Firms in monopolistic competition face downward-sloping demand curves and the curves are highly elastic because competing products are perceived by consumers as close substitutes.

Monopolistic Competition

- **Product development and marketing**
  - **Innovation and product development**
    - ✓ Less-elastic demand curve, earn economic profit;
    - ✓ Close substitutes and imitations will eventually erode the initial economic profit;
    - ✓ Continually look for innovative product features.
  - **Branding**
    - ✓ Provide information to consumer by providing them with signals about the quality of the branded product.
  - **Advertising**
    - ✓ High for firms in monopolistic competition;
    - ✓ Inform consumers about the unique features of the product, output increase;
    - ✓ Advertising costs are greater, and increase the ATC curve;
    - ✓ If advertising leads to enough of an increase in output (sales), it can actually decrease a firm's average total cost.

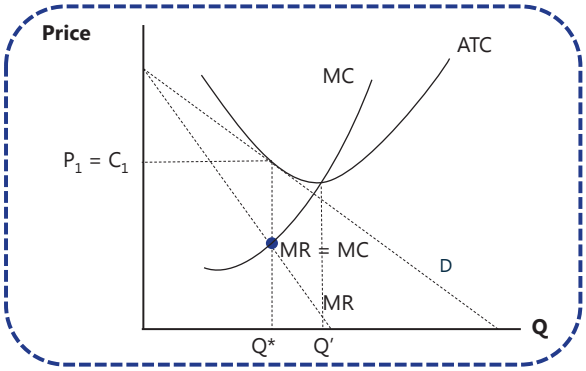
Monopolistic Competition

- **Short-run equilibrium in monopolistic competition**
  - In the short-run, the **profit-maximizing** choice is the level of output where **MR=MC**.
  - Because the product is somewhat different from that of the competitors, the firm can charge the price determined by the demand curve.



Monopolistic Competition

- **Long-run equilibrium in monopolistic competition**
  - In the long run for the monopolistic competitive firm, **economic profit will fall to zero**.
  - In **long-run equilibrium**, output is still optimal at the level where **MR=MC**.



Example

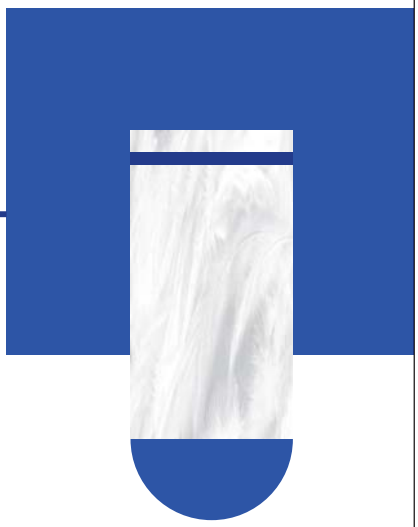
Monopolistic Competition

- A company doing business in a monopolistically competitive market will most likely maximize profits when its output quantity is set such that:
  A. average cost is minimized.
  B. marginal revenue is equal to average cost.
  C. marginal revenue is equal to marginal cost.

Solution: C

The profit maximizing choice is the level of output at which marginal revenue equals marginal cost.

Oligopoly



- Oligopoly
- Kinked Demand Curve Model
- Cournot Model
- Nash Equilibrium Model
- Collusion
- Dominant Firm Model

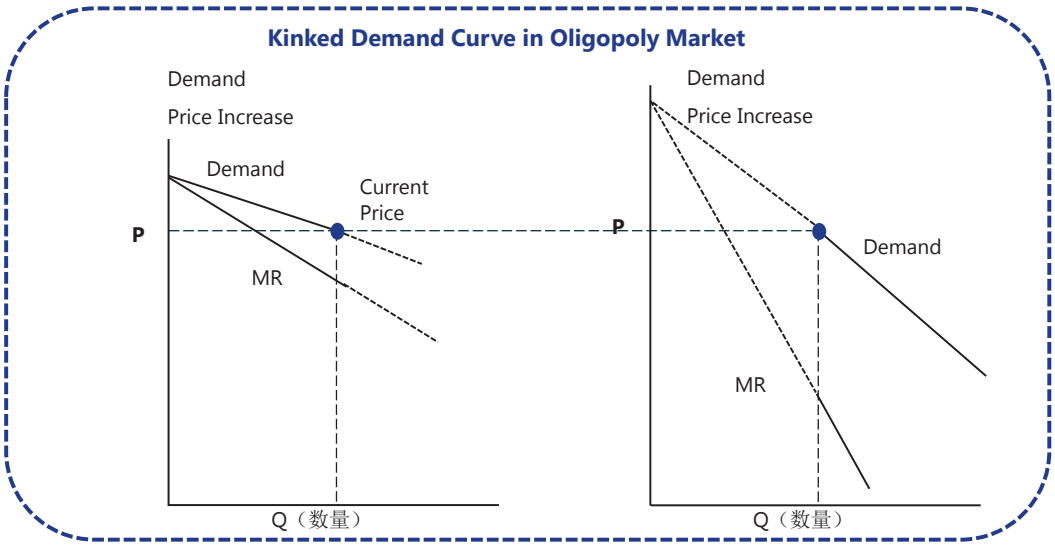
Oligopoly

- **Oligopoly** is a form of market competition characterized by:
  - A small number of sellers;
  - **Interdependence** among competitors;
    - ✓ In contrast to a monopolist, oligopolies are highly dependent upon the actions of their rivals when making business decisions.
  - Significant barriers to entry; Large economies of scale, **substantial pricing power**;
  - Compared to monopolistic competition, an oligopoly market has less elastic firm demand curves;
- **Four pricing models of oligopoly**
  - Kinked demand curve model (Pricing interdependence)
  - Cournot duopoly model
  - Nash equilibrium model
  - Dominant Oligopolist's price leadership

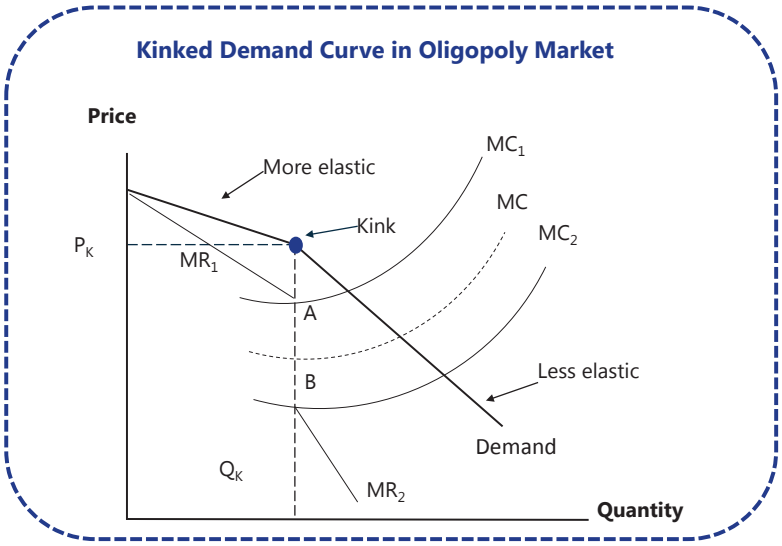
Kinked Demand Curve Model

- **The kinked demand curve model of oligopoly** is based on the assumption that each firm believes that if it raises its price, others will not follow, but if it cuts its price, other firms will cut theirs.
  - Between range A and B, the optimum Q_K is constant, **determine price P_K which is prevailing.**
  - Q_k is the profit-maximizing level of output and the price at which the kink is located is the firm's profit maximizing price.
- **Shortcoming of kinked demand curve model**
  - **Inability to determine** what the prevailing price is from the outset.
    - ✓ Discontinuous marginal revenue structure
      - From MC_1 to MC_2, a wide variety of cost structures passes through the gap in marginal revenue, and consistent with the prevailing price
    - ✓ Because it cannot determine the original prevailing price, it is considered an **incomplete pricing analysis**.

Kinked Demand Curve Model



Kinked Demand Curve Model



Cournot Model

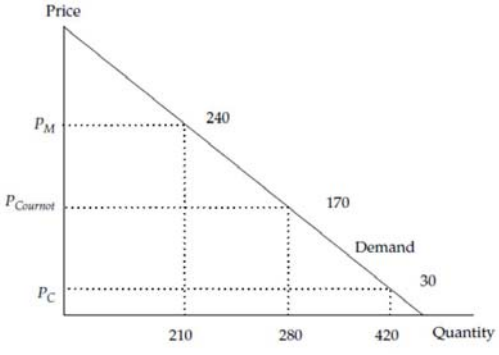
- **Cournot model**
  - **Cournot Assumption** - each firm determines its profit-maximizing production level by assuming that the other firms' output will not change.
    - ✓ This assumption simplifies pricing strategy because there is no need to guess what the other firm will do to retaliate.
  - Each firm attempts to maximize its own profits under the assumption that the other firm will continue producing the same level of output in the future.

Cournot Model

- **Cournot model could be explained as the following**
  - Aggregate market demand: Q=450-P, $Q=q_1+q_2$,
  - The supply function is represented by constant marginal cost MC=30.
  - Rearranging the aggregate demand function in terms of price, we get: $P=450-Q=450-q_1-q_2$, and MC=30
  - Total revenue for each of the two firms
    - ✓ $\mathbf{TR_1=Pq_1=(450-q_1-q_2)*q_1=450q_1-q_1^2-q_1q_2}$
    - ✓ $\mathbf{TR_2=Pq_2=(450-q_1-q_2)*q_2=450q_2-q_2^2-q_1q_2}$
  - $MR_1=\triangle TR_1/\triangle q_1=450-2q_1-q_2$
  - $MR_2=\triangle TR_2/\triangle q_2=450-2q_2-q_1$

Cournot Model

- **Cournot model could be explained as the following**
  - For the **profit-maximizing** output, set **MR=MC**, or
    - ✓ $450-2q_1-q_2=30$ and $450-2q_2-q_1=30$
  - Therefore, $\mathbf{q_1 = 140, q_2 = 140, and\ Q=280}$
  - The price is **P = 450 – 280 =170**
  - $\mathbf{P_M}$ is the monopoly optimum price
  - $\mathbf{P_C}$ is the competitive firm's equilibrium price



Nash Equilibrium Model

- **Nash equilibrium** is present when two or more participants in a **non-cooperative game** have **no incentive to deviate** from their respective equilibrium strategies after they have considered and anticipated their opponent's rational choices or strategies.
- **Nash equilibrium** is reached when the choices of all firms are such that there is no other choice that makes any firm better off (increases profits or decrease loss) .
- **Prisoners' Dilemma** is a game that illustrates that the best course of action for an oligopoly firm, when engaging in collusion with another oligopoly firm, is to cheat.

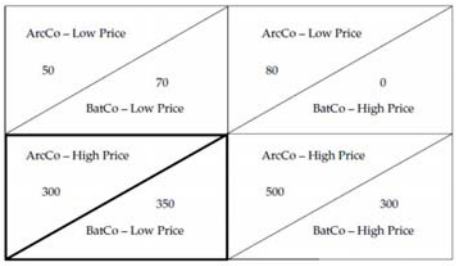
	Prisoner B is silent	**Prisoner B confesses**
Prisoner A is silent	A gets 6 months B gets 6 months	A gets 10 years B goes free
Prisoner A confesses	A goes free B gets 10 years	A gets 2 years B gets 2 years

  - Best overall outcome is for both to remain silent and get sentences of six months. But it is not equilibrium.
  - The Nash equilibrium is for both prisoners to confess, and for each to get a sentence of two years.

Nash Equilibrium Model

- The duopoly result from the Nash equilibrium. Assume there are two firms in the market, ArcCo and BatCo. ArcCo and BatCo can charge high prices or low prices for the product.

	BatCo low price	**BatCo high price**
ArcCo low price	ArcCo 50 BatCo 70	ArcCo 80 BatCo 0
ArcCo high price	**ArcCo 300** **BatCo 350**	ArcCo 500 BatCo 300



Collusion

- **Collusion** is when firms make an agreement among themselves to avoid various competitive practices, particularly price competition. When openly and formally, the firms involved are called **Cartel.**
  - There are **six major factors** that affect the chances of successful collusion :
    - ✓ 1. The number and size distribution of sellers
      - More likely if number of firms decreases or one is dominant
      - More difficult if number increases or the few firms have similar market shares (tend to compete).
    - ✓ 2. The similarity of the products
      - homogeneous → more successful;
      - more differentiated → less likely.
    - ✓ 3. Cost structure
      - The more similar the firms' cost structures, the more likely to collude.

Collusion

- There are six major factors that affect the chances of successful collusion :
  - ✓ 4. Order size and frequency
    - more likely when orders are frequent, received on a regular basis, and relatively small for small opportunity and reward of cheating in collusion.
  - ✓ 5. The strength and severity of retaliation
    - less likely to break the collusive agreement if the threat of retaliation by the other firms in the market is severe.
  - ✓ 6. The degree of external competition
    - less likely to break the collusive agreement if competition is intense.

Dominant Oligopolist's price leadership

- **Dominant firm model**
  - A single firm has a significantly large market share
    - ✓ Greater scale;
    - ✓ Lower cost structure.
  - Market price is essentially determined by the dominant firm.
  - The other competitive firms take this market price as given.
- **Follower firms** follow the pricing patterns of the dominant firm. Why ?
  - If the other companies in the market attempts to gain market share by undercutting the price set by the dominant firm, the market share of the dominant firm will increase.
    - ✓ **Reason:** Dominant firm's supremacy often stems from a lower cost of production.

Dominant Oligopolist's price leadership

- **Long-run economic profits are possible for firms operating in oligopoly markets.**
  - Over time, the dominant company's market share tends to **decrease** as profit attract entry by other companies.
    - ✓ Over time, the marginal costs of the entrant firms decrease because they adopt more efficient production techniques, the dominant firm's demand and marginal revenue shrink, and the profitability of the dominant firm declines.
- **When is an oligopoly not an oligopoly?**
  - In practice, if the oligopolists are producing a good or service that can be easily replicated, and is not protected by brand recognition or patents, they will not be able to charge high prices. The easier it is for a new supplier to enter the market, the lower the margins. In practice, this oligopoly will behave very much like a perfectly competitive market.

Example

Oligopoly

- Oligopolistic pricing strategy most likely results in a demand curve that is:
  A. kinked.
  B. vertical.
  C. horizontal.

Solution: A

The oligopolist faces two different demand structures, one for price increases and another for price decreases. Competitors will lower prices to match a price reduction, but will not match a price increase. The result is a kinked demand curve.

Example

Oligopoly

- Collusion is less likely in a market when:
  A. the product is homogeneous.
  B. companies have similar market shares.
  C. the cost structures of companies are similar.

Solution: B

When companies have similar market shares, competitive forces tend to outweigh the benefits of collusion.

Example

Oligopoly

- In an industry composed of three companies, which are small-scale manufacturers of an easily replicable product unprotected by brand recognition or patents, the most representative model of company behavior is:
  A. oligopoly.
  B. perfect competition.
  C. monopolistic competition.

Solution: B

The credible threat of entry holds down prices and multiple incumbents are offering undifferentiated products.

Example

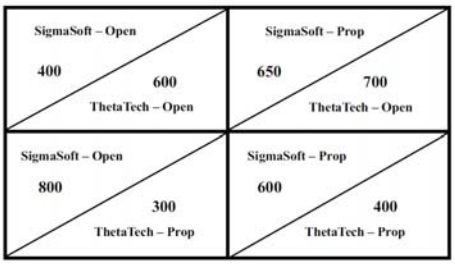
Oligopoly

SigmaSoft and ThetaTech are the dominant makers of computer system software. The market has two components: a large mass-market component in which demand is price sensitive, and a smaller performance-oriented component in which demand is much less price sensitive. SigmaSoft's product is considered to be technically superior. Each company can choose one of two strategies:

Open architecture (Open): Mass market focus allowing other software venders to develop products for its platform.

Proprietary (Prop): Allow only its own software applications to run on its platform.

Depending upon the strategy each company selects, their profits would be:



Example

Oligopoly

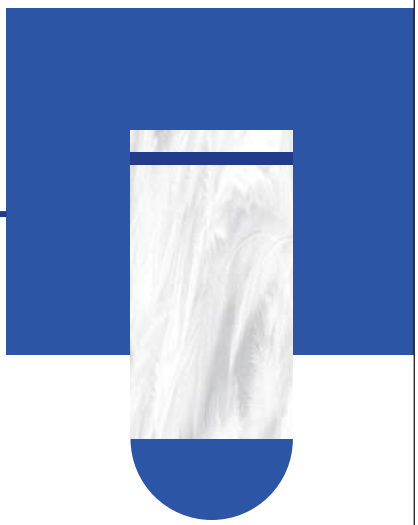
- The Nash equilibrium for these companies is:
  A. proprietary for SigmaSoft and proprietary for ThetaTech.
  B. open architecture for SigmaSoft and proprietary for ThetaTech.
  C. proprietary for SigmaSoft and open architecture for ThetaTech.

Solution: C

In the Nash model, each company considers the other's reaction in selecting its strategy. In equilibrium, neither company has an incentive to change its strategy. ThetaTech is better off with open architecture regardless of what SigmaSoft decides. Given this choice, SigmaSoft is better off with a proprietary platform. Neither company will change its decision unilaterally.

Monopoly

- Monopoly



Monopoly

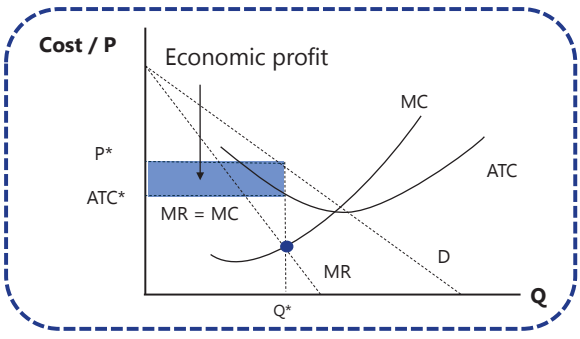
- **A monopoly is characterized by**
  - A single seller of a highly differentiated product for which there are no good substitutes.
  - High barriers to the entry of other firms into the market for the product.
  - Considerable pricing power.
- **Types of barriers**
  - Legal barriers to entry create legal monopoly. A legal monopoly is a market in which competition and entry are restricted by the granting of a public franchise, government license, patent or copyright.
    - ✓ Example: mobile operating license.
  - Natural barriers to entry create natural monopoly, which is an industry in which one firm can supply the entire market at a lower price than two or more firms can **(Economies of scale)**
    - ✓ Example: electric utility.

Monopoly

- **Demand analysis in monopoly markets**
  - A monopolist faces a downward sloping demand curve. Just as price searchers with low entry barriers will expand output until **MR=MC**, so do monopolists. This will maximize profit.
  - Positive economic profits can exist in the long run due to the high entry barriers.
- **Profit Maximization**
  - The monopolists want to maximize profits, not price. So they will not charge the highest possible price.
  - Compared to a perfect competitive industry, the monopoly firm will produce less total output and charge a higher price.

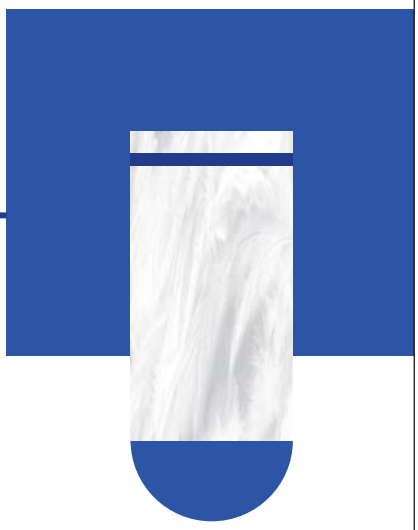
Monopoly

- **Monopolist's optimal output and price**
  - The relationship between MR and price elasticity (Ep) is **MR=P[1-1/Ep]**
    - ✓ Profit maximization: MR=P[1-1/Ep]=MC
  - Economic profit = (P*- ATC*) ×Q*



Determining Market Structure

- Econometric Approaches
- Concentration Measures



Econometric Approaches

- **How should one measure market power?**
  - The theoretical answer is to estimate the elasticity of demand and supply in a market. If demand is very elastic, the market must be very close to perfect competition. If demand is rigid inelastic, companies may have market power.
  - **Regression analysis** is useful in computing elasticity but requires a large number of observations.
    - ✓ Time-series approach: The market structure may have changed radically over those 20 years, however, and the estimated elasticity may not apply to the current situation.
    - ✓ Cross-sectional: this approach requires a substantial data-gathering effort, and therefore, this estimation method can be complicated.

Concentration Measures

- **Concentration measures**
  - **The N-Firm Concentration Ratio:** the sum or the percentage market shares of the largest N firms in a market.
    - ✓ Advantage: simple to compute.
    - ✓ Limitation: it may be relatively insensitive to mergers of two firms with large market shares.
  - **The Herfindahl-Hirschman Index (HHI):** the sum of the squares of the market shares of the largest firms in the market.
    - ✓ Advantage: HHI can **reflect the mergers in industry**.
    - ✓ If there are M firms in the industry with equal market shares, then the HHI equals (1/M).
      - For example, an HHI of 0.20 would be analogous to having the market shared equally by 5 firms.
  - **Limitation**
    - ✓ Both concentration measures do not directly quantify **market power**.
      - Even a firm with high market share may not have much pricing power **if barriers to entry are low and there is potential competition**.
      - The simple presence of a potential entrant may be sufficient to convince the firm to behave like in **perfect competition**.

Example

Concentration Measures

An analyst gathers the following market share data for an industry:

Company	Sales (in millions of euros)
ABC	300
Brown	250
Coral	200
Delta	150
Erie	100
All others	50

Example

Concentration Measures

- The industry's four-company concentration ratio is closest to:
  A. 71%.
  B. 86%.
  C. 95%.

Solution: B

The top four companies in the industry account for 86 percent of industry sales:

(300 + 250 + 200 + 150)/(300 + 250 + 200 + 150 + 100 +50) = 900/1050 = 86%.

Example

Concentration Measures

An analyst gathered the following market share data for an industry composed of five companies:

Company	Market Share (%)
Zeta	35
Yusef	25
Xenon	20
Waters	10
Vlastos	10

Example

Concentration Measures

- The industry's three-firm Herfindahl–Hirschman index is closest to:
  A. 0.185.
  B. 0.225.
  C. 0.235.

Solution: B

The three-firm Herfindahl–Hirschman index is $0.35^2 + 0.25^2 + 0.20^2 = 0.225$.

Example

Concentration Measures

- One disadvantage of the Herfindahl–Hirschman index is that the index:
  A. is difficult to compute.
  B. fails to reflect low barriers to entry.
  C. fails to reflect the effect of mergers in the industry.

Solution: B

The Herfindahl–Hirschman index does not reflect low barriers to entry that may restrict the market power of companies currently in the market.

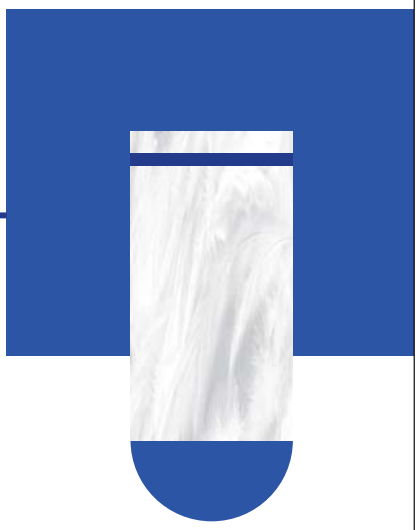
Summary

Module: Firm and Market Structures

Profit Maximization
Introduction to Market Structures
Monopolistic Competition
Oligopoly
Determining Market Structure

Prerequisite Reading : Aggregate Output and Economic Growth

- GDP
- Aggregate Demand and Aggregate Supply
- Economic Growth
- Unemployment Rate
- Inflation Rate



1.1 Gross Domestic Product (GDP)

- **Gross domestic product (GDP) measures**
  - The total market value of all final goods and services produced within the economy in a given period of time (output definition) or, equivalently.
    - ✓ The aggregate income earned by all households, all companies, and the government within the economy in a given period of time (income definition).
    - ✓ The total amount spent on the final goods and services produced within the economy during a given period (expenditure approach).
    - ✓ Total expenditure = Total income
  - **Include even without the market value:**
    - ✓ Goods and services provided by government at cost to government (e.g., the services provided by police and the judiciary, and goods such as roads and infrastructure improvements)
    - ✓ The value of owner-occupied housing, just as including the value of rental housing service.

1.1 Gross Domestic Product (GDP)

- **Gross domestic product (GDP)**
  - **Exclude:**
    - ✓ The sale or resale of goods produced in previous period
    - ✓ Transfer payments made by the government (e.g., unemployment, retirement, and welfare benefits)
    - ✓ In-process goods
    - ✓ The value of labor not sold (e.g., babysitting, clearing, homeowner's repairs to his own home)
    - ✓ By-products of production (e.g., environmental damage)
    - ✓ Underground economy (e.g., illegal trade, undocumented labor who are paid "off the books")
    - ✓ Barter transaction (e.g., neighbors exchanging services with each other)

1.2 GDP and GNP

- **GDP and GNP**
  - **GDP** measures the market value of all final goods and services produced by factors of production located within a country/economy during a given period of time, generally a year or a quarter.
  - **GNP** (Gross National Product) measures the market value of all final goods and services produced by factors of production supplied by residents of a country, regardless of whether such production takes place within the country or outside of the country.
- **Difference between GDP and GNP**
  - GDP includes, and GNP excludes, the production of goods and services or income to capital owned by foreigners within that country.
  - GNP includes, and GDP excludes, the production of goods and services or income to capital owned by its citizens outside of the country.
  - GDP is **more closely related to economic activity** within a country and so to its employment and growth.

1.3 Nominal and Real GDP

- **Nominal GDP**
  - Measures the value of goods and services measured **at current prices**.
  - Nominal $GDP_t = \sum(P_t \times Q_t)$, where P_t = Prices in year t , Q_t = Quantity produced in year t
- **Real GDP**
  - Total expenditures on the output of goods and services **at constant price** (in terms of a **base-year** if prices were unchanged).
  - Real $GDP_t = \sum(P_B \times Q_t)$, where P_B = Prices in the base year , Q_t = Quantity produced in year t
  - To **evaluate an economy**, it is often useful to use real GDP.
    - ✓ Because higher income driven solely by changes in the price level is not indicative of a higher level of economic activity.
- **Per capita GDP**
  - Real GDP divided by population, determines the standard of living in each country and the ability of the average person to buy goods and services.

1.4 GDP Deflator

- **The GDP deflator**
  - broadly measures the aggregate changes in prices across the **overall economy**, and hence changes in the deflator provide a useful gauge of inflation within the economy.
  - Measures inflation across all sectors of the economy, including the consumer, business, government, exports, and imports.

$$\textbf{GDP } \textit{deflator} = \frac{\textit{Nominal GDP}}{\textit{Real GDP}} \times 100 = \frac{\textit{Value of current year output at current year prices}}{\textit{Value of current year output at base year prices}} \times 100$$

  - For example,

	2021	2022
GDP at market prices	1,994,911	2,035,506
Real GDP	1,762,561	1,786,677

    - ✓ 2021: GDP deflator = 1,994,911/1,762,561×100 = 113.2
    - ✓ 2022: GDP deflator = 2,035,506/1,786,677×100 = 113.9
    - ✓ 2022 Inflation = (113.9/113.2)-1 = 0.62%
    - ✓ $Deflator_0 \times (1 + inflation)^t = Deflator_t$

1.5 Potential GDP

- **Potential GDP**
  - Potential GDP is the **maximum** amount of output an economy can sustainably produce by **fully utilizing** its production resources **without accelerating inflation**.
    - ✓ In practice, it is difficult to calculate whether all production factors such as machinery, equipment, labor, and land have been fully utilized. Relatively speaking, it is relatively easy to calculate the utilization of labor. Therefore, potential GDP is also defined as the output achieved under **full employment**.

1.5 Potential GDP

- **Distinguish the connection**
  - **Potential GDP** is the GDP that a country can achieve when its resources are fully utilized, indicating the potential of an economy. **Actual GDP** is the actual GDP produced.
    - ✓ Potential GDP = actual GDP, it indicates that an economy has fully utilized its potential.
    - ✓ Potential GDP > actual GDP, the economic potential is not fully realized.
    - ✓ Potential GDP < actual GDP, the economic development exceeds the potential, and resources are overutilized, it will cause economic overheating.
    - ✓ To determine whether the a country economy is overheating, the first step is to determine its potential GDP.

1.6 GDP Measurement

- **The value-of-final-output method**
  - Expenditure approach—summing the values of **all final goods and services** produced.
- **The sum-of-value-added method**
  - Summing **the additions to value** created at each stage of production and distribution. An example of the calculation for a specific product is presented in the following figure.

1.6 GDP Measurement

Value of Final Product Equals Income Created			
	Receipts at each stage	**Value added (=Income created) At each stage**	
Receipts of farmer from miller	0.15	0.15	Value added by farmer
Receipts of miller from baker	0.46	0.31	Value added by miller
Receipts of baker from retailer	0.78	0.32	Value added by baker
Receipts of retailer from final customer	1.00	0.22	Value added by retailer
	1.00	1.00	
	Value of final output	Total value added = Total income created	

1.7 GDP Calculation

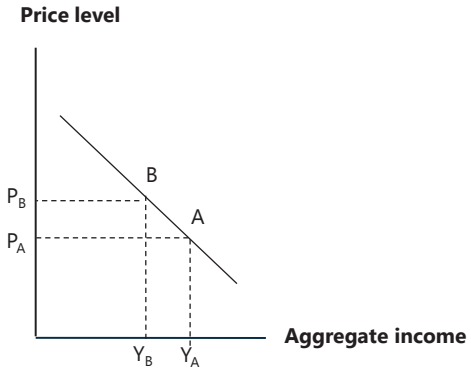
- **Expenditure approach**
  - GDP = C +I+G+(X-M)
    - ✓ C = Consumer spending on final goods and services
    - ✓ I = Gross private domestic investment
      - which includes **business investment** in capital goods (e.g., plant and equipment) and **changes in inventory** (inventory investment)
    - ✓ G = Government purchase on final goods and services
      - **Government spending** and **Government fixed investment**
    - ✓ X = Exports
    - ✓ M = Imports
      - X-M is often called as Net Export

1.8 Components of GDP

- To derive the aggregate demand curve, we need to understand the factors that determine each of the components of GDP:
  - **Consumption**: function of disposable income.
    - ✓ Personal Income ↑ or taxes ↓ → both consumption and saving ↑
    - ✓ Marginal propensity to consume (MPC): the proportion of additional income spent on consumption
    - ✓ MPC + MPS =1, MPC=ΔConsumption/ ΔIncome, MPS= ΔSaving/ ΔIncome.
  - **Investment**: a function of expected profitability and the cost of financing.
    - ✓ Busines gross fixed investment.
    - ✓ Change in inventories.
  - **Government purchases** : be viewed as independent of economic activity.
  - **Net exports** are a function of domestic disposable incomes (which affect imports), foreign disposable incomes (which affect exports).

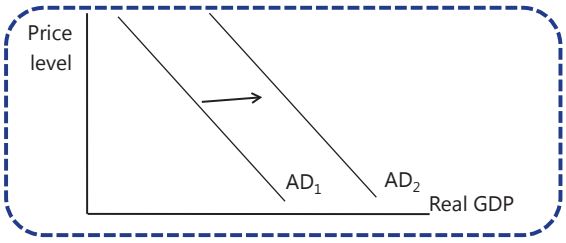
2.1 Aggregate Demand Curve

- **Aggregate demand curve**
  - The aggregate demand curve represents the combinations of aggregate income and the price level at which two conditions are satisfied.
    - ✓ Aggregate expenditure equals aggregate income.
    - ✓ The available real money supply is willingly held by households and businesses.
  - The downward slope of the aggregate demand curve results from three effects. (Assume price level ↑)
    - ✓ Wealth effect: real value of wealth↓, C ↓
    - ✓ Interest rate effect: Md↑ , interest rate ↑ , I ↓
    - ✓ Real exchange rate effect: real exchange rate appreciation, export ↓, import ↑, (X-M) ↓
  - Assuming nominal money supply is held constant.



2.2 Shifts in the AD Curve

- **Shifts in the aggregate demand curve**
  - The aggregate demand (AD) curve reflects the total level of expenditures in an economy by consumers, businesses, governments, and foreigners. A number of factors can affect this level of expenditures and cause the AD curve to shift.
  - Note that a **change in the price level is represented as a movement along the AD curve**, not a shift in the AD curve. See the following figure, an increase in aggregate demand is shown by a shift to the right, indicating that the quantity of goods and services demanded is greater at any given price level.



2.2 Shifts in the AD Curve

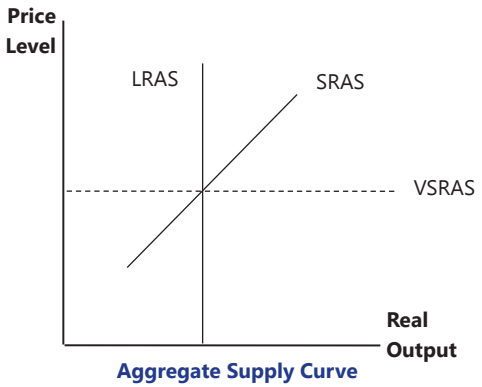
Impact of Factors Shifting Aggregate Demand		
An Increase in the Following Factors:	Shifts the AD Curve:	Reason:
Stock prices	Rightward: Increase in AD	Higher consumption
Housing prices	Rightward: Increase in AD	Higher consumption
Consumer confidence	Rightward: Increase in AD	Higher consumption
Business confidence	Rightward: Increase in AD	Higher investment
Capacity utilization	Rightward: Increase in AD	Higher investment
Government spending	Rightward: Increase in AD	Government spending a component of AD
Taxes	Leftward: Decrease in AD	Lower consumption and investment
Bank reserves	Rightward: Increase in AD	Lower interest rate, higher investment and possibly higher consumption
Exchange rate (foreign currency per unit domestic currency, domestic currency appreciates)	Leftward: Decrease in AD	Lower exports and higher imports
Global growth	Rightward: Increase in AD	Higher exports

2.3 Aggregate Supply Curve

- **Aggregate Supply Curve**
  - 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. That is, it represents the amount of output that firms will produce at different price levels.
  - We need to consider three aggregate supply curves with different time frames: the very short-run aggregate supply (VSRAS) curve, the short-run aggregate supply (SRAS) curve, and the long-run aggregate supply (LRAS) curve.
    - ✓ The **VSRAS curve** is perfectly elastic.
      - Companies will increase or decrease output without changing prices.
      - Output change is based on stronger or weaker demand at that period.
    - ✓ The **SRAS curve** is upward sloping.
      - Wages and other input costs are relatively inflexible in short run and not fully adjust to changes in output prices due to long-term contract.
      - P↑, constant nominal wage→ real wage↓ →cost↓→employ more workers → Y↑; P↑→profit ↑→ Y↑.
      - P↓, cost constant → profit↓ → Y↓.

2.3 Aggregate Supply Curve

- **LRAS:** Prices adjust proportionally with the price of input. Price level will not affect real output.
  - The **LRAS curve** is perfectly inelastic.
    - ✓ In the long run, wages and other input prices change proportionally to the price level, so the price level has no long-run effect on aggregate supply.
      - Long run means long enough that wage and input prices can adjust.
    - ✓ We refer to this level of output as **potential GDP**, which can increase as economy's resource capacity grows.



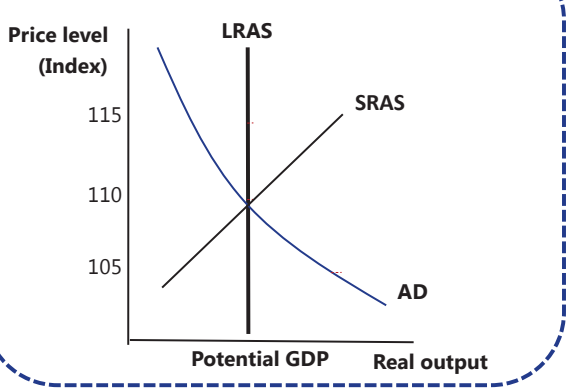
Aggregate Supply Curve

2.4 Shifts in the AS Curve

Impact of Factors Shifting Aggregate Supply			
An **Increase** in	**Shifts SRAS**	**Shifts LRAS**	**Reason**
Supply of labor	Rightward	Rightward	Increases resource base
Supply of natural resources	Rightward	Rightward	Increases resource base
Supply of human capital	Rightward	Rightward	Increases resource base
Supply of physical capital	Rightward	Rightward	Increases resource base
Labor productivity and technology	Rightward	Rightward	Improves efficiency of inputs
Nominal wages	Leftward	**No impact**	Increases labor cost
Input prices (e.g., energy)	Leftward	**No impact**	Increases cost of production
Expectation of future prices	Rightward	**No impact**	Anticipation of higher costs and/or perception of improved pricing power
Business taxes	Leftward	**No impact**	Increases cost of production
Subsidy	Rightward	**No impact**	Lowers cost of production
Exchange rate (FC/DC, domestic currency appreciates)	Rightward	**No impact**	Lowers cost of production

2.5 Long-Run Equilibrium Real Output

- **Long-Run Equilibrium Real Output**
  - The long-run equilibrium level of output, is referred to as the ***full employment, or natural*, level of output.**
  - At this level of output, the economy's resources are deemed to be fully employed, and (labor) *unemployment is at its natural rate*.
    - ✓ Companies have enough spare capacity to avoid bottlenecks, and there is a modest, stable pool of unemployed workers (job seekers equal job vacancies) looking for and transitioning into new jobs.



3.1 Production Function

- **A production function describes the relationship between output and labor, the capital stock, and productivity.**
  - Economic output can be thought of as a function of the amounts of labor and capital that are available and their productivity, which depends on the level of technology available. That is:

$$Y = A \times f(L, K) \quad (Y = TK^{\alpha}L^{(1-\alpha)})$$ **Cobb-Douglas production function**

where:

Y = aggregate economic output; L = size of labor force;

K = amount of capital available ; A = total factor productivity.

- Total factor productivity quantifies the amount of output growth that cannot be explained by the increases in labor and capital.
- **TFP**, as well as **potential GDP**, **is not directly observed** in the economy but instead is estimated.

3.1 Production Function

- **A well-known model** of the contributions of technology, labor, and capital to economic growth is
  - Growth Accounting Equation/ Solow Accounting Equation/ Neoclassical growth model
    - ✓ **Growth in potential GDP = growth in technology + W_L(growth in labor) + W_C (growth in capital)**
      - W_L (1-α): labor's percentage share of national income
      - W_c (α) : capital's percentage share of national income

$$\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + (1-\alpha)\frac{\Delta L}{L} + \alpha\frac{\Delta K}{K}$$

- Growth in potential GDP is also referred as sustainable growth rate.

3.1 Production Function

- **Labor productivity data** can be used to estimate the rate of sustainable growth of the economy.
  - A useful way to describe potential GDP is as a combination of aggregate hours worked and the productivity of those workers.
  - Potential GDP = Aggregate hours worked × Labor productivity
- Transforming the above equation into growth rate, we can get the following:
  - **Potential growth rate = Long-term growth rate of labor force + Long-term labor productivity growth rate**

$$\frac{\Delta Y}{Y} = \frac{\Delta L}{L} + \frac{\Delta y}{y}$$

3.1 Production Function

- Growth in total factor productivity is driven by improvements in technology. Sometimes, the relationship between potential GDP, technology improvements, and capital growth is written on a per-capita basis as
  - **Growth in per-capita potential GDP= growth in technology + W_C (growth in the capital-to-labor ratio)**
    - ✓ Assuming the number of workers remain constant, increases in output can be gained by increasing capital per worker **(capital deepening)** or by improving technology **(increasing TFP).**

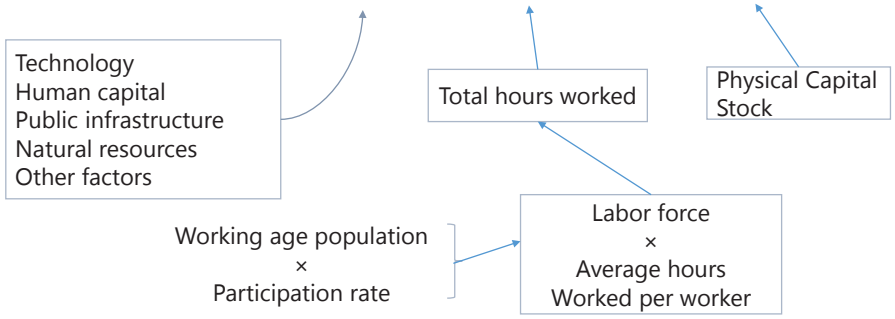
$$\frac{\Delta y}{y} = \frac{\Delta A}{A} + \alpha \frac{\Delta k}{k}$$

    - ✓ Where, k=capital-to-labor ratio=K/L, y=per capita output=Y/L.

3.2 Sources of Economic Growth

- **Factors influencing economic growth**

Growth in potential GDP = Growth in TFP + W_L(Growth in labor) + W_C(Growth in capital)



$$\frac{\Delta Y}{Y} = \frac{\Delta A}{A} + (1-\alpha)\frac{\Delta L}{L} + \alpha \frac{\Delta K}{K}$$

3.2 Sources of Economic Growth

- **Factors influencing economic growth**
  - Labor supply (over the age of 16)
    - ✓ Affected by:
      - Population growth;
      - Net immigration;
      - Labor force participation rate.
    - ✓ **Increase** in labor force → **higher** GDP growth.
  - Human capital
    - ✓ Skillful and well-educated workers
      - More human capital; more capable in keeping up with technology advance.
      - Education may also have a ***spillover or externality effect***: Increasing the educational level of one person not only raises that person's output but also the output of those around her.
    - ✓ **Investment** in human capital → **greater** economic growth.

3.2 Sources of Economic Growth

- **Factors influencing economic growth**
  - **Physical capital stock**
    - ✓ Investments increases a country's stock of physical capital.
    - ✓ Accumulated amount of buildings, machinery, and equipment used to produce goods and services.
    - ✓ **Higher** rate of investment → **growing** physical capital stock → **higher** rate of GDP growth.
  - **Technology**
    - ✓ **Advanced** technology → increase productivity → **higher** GDP growth.
    - ✓ More rapid improvements in technology lead to greater rates of economic growth.
  - **Natural resources**
    - ✓ Serve as inputs in production. (E.g., oil or land)
      - Renewable (e.g., forests);
      - Nonrenewable (e.g., coal).
    - ✓ **Larger amounts** of productive natural resources → **higher** GDP growth.

3.2 Sources of Economic Growth

- **Factors influencing economic growth**
  - **Public infrastructure**
    - ✓ Examples: Roads, water systems, mass transportation, airports, and utilities are all examples of public infrastructure or public capital.
    - ✓ A key feature of public capital is that they create **positive externalities (spillover effect).**
      - The full benefit of public infrastructure investment may extend beyond its direct expenditure because it boosts the productivity of private capital.
  - **Other factors driving growth**
    - ✓ **Positive externality**: there may be constant or increasing returns to the inputs, and thus the economy **is no longer constrained** by diminishing marginal productivity. E.g., R&D, public education.
    - ✓ **Negative externality:** Externalities also have a negative effect on growth——air pollution, climate change, etc.
    - ✓ **A country's economic environment** can play an important role in influencing economic growth.
      - legal and political environment, development of financial markets, openness to trade, etc.

4. Unemployment Rate

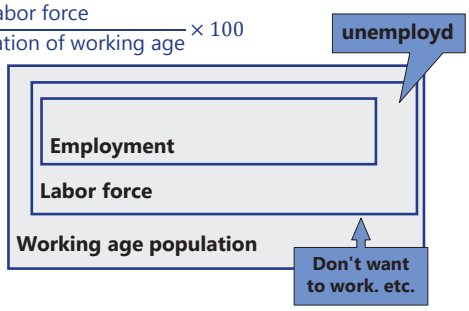
- **Employed:** number of people with a job.
  - This figure normally does not include people working in the informal sector (e.g., unlicensed cab drivers, illegal workers, etc.)
- **Labor force:** number of people who either have a job or are actively looking for a job.
  - This number **excludes** retirees, children, stay-at-home parents, fulltime students, and other categories of people who are neither employed nor actively seeking employment.
- **Participation ratio** (also referred to as the **activity ratio** or **labor force participation rate**): The ratio of labor force to total population of working age (i.e., those between 16 and 64 years of age).

$$\text{Labor force participation rate} = \frac{\text{Labor force}}{\text{Total population of working age}} \times 100$$

- **Unemployment rate** is the percentage of people in the labor force who are unemployed.

$$\text{Unemployment rate} = \frac{\text{number of unemployed}}{\text{labor force}} \times 100$$

  - Unemployment rate is a **lagging economic indicator** of the business cycle.



4. Unemployment Rate

- **Unemployment :** People who are actively seeking employment but are currently without a job. Some special subcategories include:
  - **Frictionally unemployed**: People who are not working at the time of filling out the statistical survey, or people who have left one job and are about to start another job.
    - ✓ The frictionally unemployed includes people who have voluntarily left their previous positions to change their jobs and those new entrants or re-entrants into the labor force who have not yet found work.
  - **Structural unemployment** is caused by long-run changes in the economy that eliminate some jobs while generating others for which unemployed workers are not qualified.
  - **Cyclical unemployment** is caused by changes in the general level of economic activity.
- **Voluntarily unemployed**
  - Person voluntarily outside the labor force.
  - For example: a jobless worker refusing an available vacancy for which the wage is lower than their threshold or those who retired early.

4. Unemployment Rate

- **Underemployed**: A person who has a job but either has the qualifications to work at a significantly higher-paying job or works part-time but desires a full-time position.
  - It may be difficult to classify whether a person is truly underemployed.
- **Discouraged worker**
  - Person who has stopped looking for a job.
  - When economy returns to be good (recovery), the unemployment rate will increase because the discouraged workers enter the labor force and has not found the job.
    - ✓ Unemployment rate ↑ =(unemployed + return of discouraged)/(labor force+ return of discouraged)
  - Discouraged workers and underemployed people may be considered examples of **"hidden unemployment"**.

5.1 Inflation Rate

- **Inflation is a persistent increase in the price level over time.**
  - If inflation is present, the prices of almost **all** goods and services are increasing.
  - Inflation rate is the percentage increase in the price level, typically compared to the prior year.
- **Hyperinflation: 500%-1000%**
  - When large scale government spending is not backed by real tax revenue and the monetary authority accommodates government spending by increasing the money supply.
  - Hyperinflation may also be caused by the shortage of supply created during or after a war, economic regime transition, or prolonged economic distress of an economy caused by political instability.
    - ✓ Germany from 1923 to 1924. During the peak of this episode, prices doubled every 3.7 days.
  - During hyperinflation, people are eager to change their cash into **real goods** because prices are rising very fast.
    - ✓ Most likely results in **increase velocity** of money.

5.1 Inflation Rate

- **Deflation**
  - A sustained decrease in aggregate price level, which corresponds to a negative inflation rate. E.g., Japan.
  - Often associated with substantial macroeconomic contraction.
  - When deflation occurs, the value of money actually increases.
    - ✓ Because most debt contracts are written in fixed monetary amounts, **the liability of a borrower** also rises in real terms during deflation.
    - ✓ Facing increasing real debt, a company that is short of cash usually cuts its spending, investment, and workforce sharply.
    - ✓ Less spending and high unemployment further **exacerbate the economic contraction**.
  - To avoid getting too close to deflation, the consensus on the preferred inflation rate is around **2% per year** for developed economies.
- **Disinflation**
  - A decline in the inflation rate.
  - Disinflation is very different from deflation because even after a period of disinflation, **the inflation rate remains positive**, and the aggregate price level keeps rising (although **at a slower speed**).

5.2 CPI and PPI

- **The consumer price index (CPI)**
  - CPI is the best-known indicator of U.S. inflation. The CPI measures the average price for a defined "basket" of goods and services that represents the purchasing patterns of a typical urban household.

$$\text{CPI} = \frac{\text{cost of basket at current prices}}{\text{cost of basket at base period prices}} \times 100$$

  - Analysts compare national CPI to **predict macroeconomic policy** of various central banks.
  - Analysts who compare price indexes for different countries should be aware of differences in their composition.
    - ✓ **The weights** assigned to each good and service reflect the typical consumer's purchasing patterns, which are likely to be significantly different across countries and regions.

Module

Understanding Business Cycles

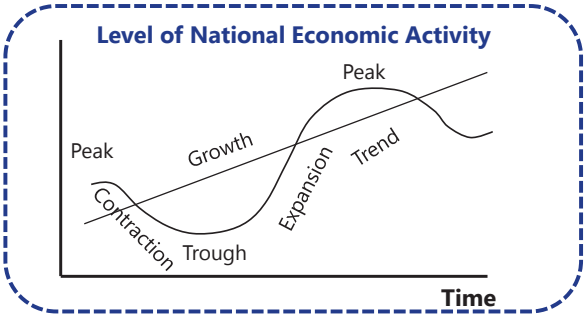
1. Business Cycles and Four Phases
2. Credit Cycles
3. Economic Indicators over the Business Cycle

Business Cycle and Four Phases

- Business Cycles
- Types of Business Cycle
- Four Phases of Business Cycle

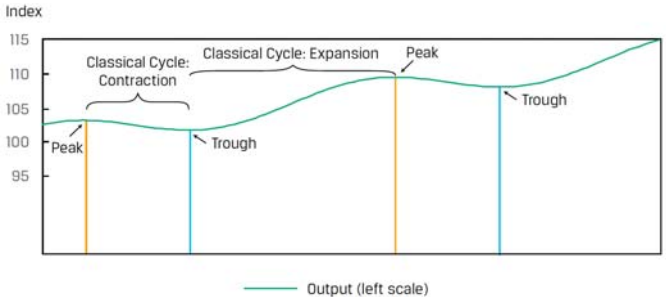
Business cycles

- **Business cycles**
  - recurrent expansions and contractions in economic activity affecting broad segments of the economy.
    - ✓ **Expected sequence of phases**: the expansion (or the upswing) and the contraction (or the downturn);
    - ✓ **Recurrent** but **not periodic** (not all have the exact same intensity and duration), two key turning points: peaks and troughs.



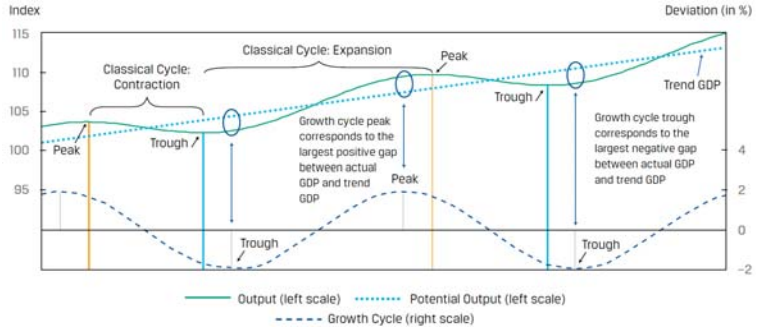
Business cycles

- **Types of business cycle**
  - **Classical cycle:** refers to fluctuations **in the level of economic activity** when measured **by GDP** in volume terms.
    - ✓ The **contraction phases** between peaks and troughs are **often short**, while **expansion phases** are much **longer**. In addition, an **absolute decline** in activity between peaks and troughs does not occur frequently.
    - ✓ Not widely used, because it does not easily allow the breakdown of movements in GDP between short term fluctuations and long-run trends.



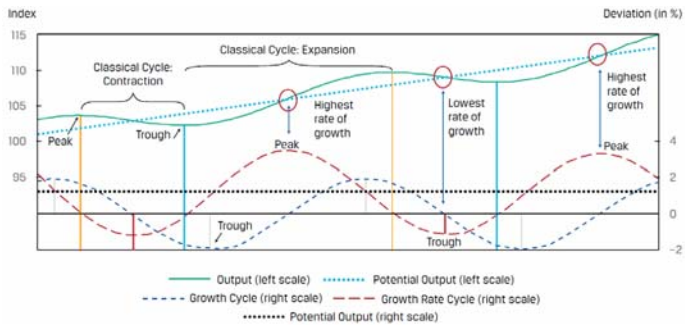
Business cycles

- **Types of business cycle**
  - **Growth cycle** refers to fluctuations in economic activity around the **long-term potential or trend growth level.**
    - ✓ The wave shows **gaps** between actual output and trend output/potential output.
    - ✓ It dissects overall economic activity into: driven by **long-run trends** and **short-run fluctuations**.
    - ✓ The time periods below and above trend growth are of **similar length.**



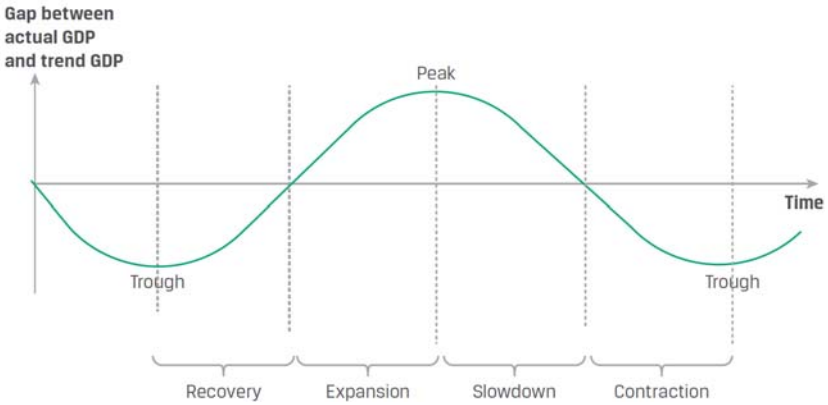
Business cycles

- **Types of business cycle**
  - **Growth rate cycle** refers to fluctuations in the growth rate of economic activity (e.g., GDP growth rate).
    - ✓ The **growth cycle** reflects the percentage deviation of output relative to its trend.
    - ✓ The growth rates in the **growth rate cycle** are calculated as annualized month-over-month growth rates. Economic growth being above or below potential growth rate, reflecting upswings or downturns.



Business cycles

- **Practical issues**
  - **The growth cycle** is used for the business cycle can be thought of as fluctuations around potential output.
  - Recession: when a country experiences two consecutive quarters of negative real GDP growth.



Business cycles

Phase	Recovery	Expansion	Slowdown	Contraction
Description	Economy going through a trough. Negative output gap starts to narrow.	Economy enjoying an upswing. Positive output gap opens.	Economy going through a peak. Positive output gap starts to narrow.	Economy weakens and may go into a recession. Negative output gap opens.
Activity level: consumers and businesses	Activity levels are below potential but start to increase.	Activity measures show above-average growth rates.	Activity measures are above average but decelerating. Moving to below-average rates of growth.	Activity measures are below potential. Growth is lower than normal.
Employment	Layoffs slow. Businesses rely on overtime before moving to hiring. Unemployment remains higher than average.	Businesses move from using overtime and temporary employees to hiring. Unemployment rate stabilizes and starts falling.	Business continue hiring but at a slower pace. Unemployment rate continues to fall but at decreasing rates.	Businesses first cut hours, eliminate overtime, and freeze hiring, followed by outright layoffs. Unemployment rate starts to rise.
Inflation	Inflation remains moderate.	Inflation picks up modestly.	Inflation further **accelerates**.	Inflation decelerates but with a lag.

Example

Business cycles

- The characteristic business cycle patterns of trough, expansion, peak, and contraction are:
  A. periodic.
  B. recurrent.
  C. of similar duration.

Solution: B

The stages of the business cycle occur repeatedly over time.

Example

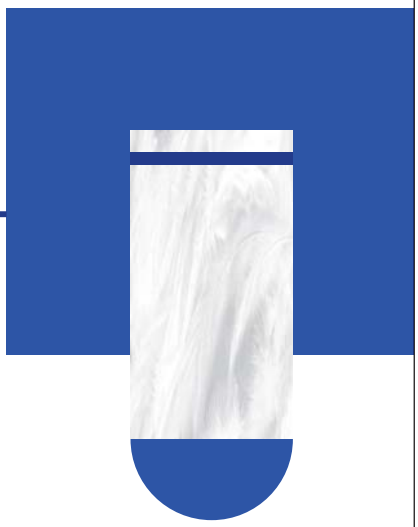
Business cycles

- During the contraction phase of a business cycle, it is most likely that:
  A. inflation indicators are stable.
  B. aggregate economic activity relative to potential output is decreasing.
  C. investor preference for government securities declines.

Solution: B

The net trend during contraction is negative.

Credit Cycles



- Credit Cycles

Credit cycles

- **Definition**
  - Credit cycles describe the changing **availability** and **pricing** of credit. They describe growth in private sector credit (availability and usage of loans), which is essential for business investments and household purchases of real estate.
- **When the economy is weak or weakening**
  - Firstly, asset price and real estate bubbles occurs by loosen credit policy. Real estate bubbles' drawdown is mostly due to **weaker fundamentals** and burst when **capital market outflows**.
  - Lenders tighten credit by making credit less available and more expensive. This frequently contributes to the decline of such asset values as real estate, causing further economic weakness and higher defaults.

Credit cycles

- **Applications of credit cycles**
  - It is recognized that in real world, business cycles can be **amplified**. Because of changes in access to external financing, recessions will **deeper** and expansion will **more extensive**.
    - ✓ It is found that the **duration and magnitude** of recessions and recoveries are often shaped by linkages between business and credit cycles (Claessens, Kose, and Terrones 2012).
      - Financial variables tend to co-vary closely with each, but they are not always synchronized with the traditional business cycle. Credit cycles tend to be **longer, deeper, and sharper** than business cycles.

Credit cycles

- **Investors pay attention to the credit cycle**
  - It helps them understand developments in the **housing and construction markets**;
  - It helps them assess the extent of business cycle expansions and contractions, particularly the **severity of a recession** if it coincides with the **contraction phase of the credit cycle**;
  - It helps them better anticipate policy makers' actions.
    - ✓ Whereas monetary and fiscal policy traditionally concentrate on reducing the volatility of business cycles, macroprudential stabilization policies have gained importance.
    - ✓ This is further stressed by findings that ***strong peaks in credit cycles*** are closely associated with ***subsequent systemic banking crises*** (Schuler, Hiebert, and Peltonen 2017).

Example

Credit cycles

- With which sector of the economy would analysts most commonly associate credit cycles?
  - A. Exports
  - B. Construction and purchases of property
  - C. Food retail

Solution: B

Credit cycles are associated with availability of credit, which is important in the financing of construction and the purchase of property.

Example

Credit cycles

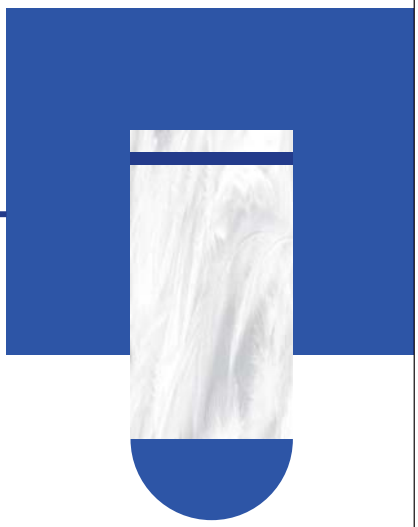
- The reason analysts follow developments in the availability of credit is that:
  A. loose private sector credit may contribute to the extent of asset price and real estate bubbles and subsequent crises.
  B. loose credit helps reduce the extent of asset price and real estate bubbles.
  C. credit cycles are of same length and depth as business cycles.

Solution: A

Studies have shown that loose credit conditions contribute to the extent of asset price and real estate bubbles that tend to be followed by crises.

Economic Indicators over the Business Cycle

- Firm's Perspective
- Economic Indicators



Firm's Perspective

- **1. Unemployment:** Levels of employment **lag** the cycle
  - During recovery
    - ✓ Businesses rely on overtime before moving to hiring
    - ✓ Unemployment remains higher than average
  - During expansion
    - ✓ Businesses move from using overtime and temporary employees to hiring.
    - ✓ Unemployment rate stabilizes and starts falling
    - ✓ Firm may experience a decrease in availability of qualified workers.
  - During slowdown
    - ✓ Businesses continue hiring but at a slower pace
    - ✓ Unemployment rate continues to fall but at slowly decreasing rates
  - During contraction
    - ✓ Businesses first cut hours, eliminate overtime, and freeze hiring, followed by outright layoffs
    - ✓ Unemployment rate starts to rise
    - ✓ Firms will run "**lean production**" to generate maximum output with the fewest number of workers at the end of contractions.

Firm's Perspective

- **2. Capital spending**
  - During recovery
    - ✓ Capital expenditures focus on efficiency rather than capacity.
    - ✓ Upturn most pronounced in orders for light producer equipment
      - Typically, the orders initially reinstated are for equipment with a high rate of obsolescence, such as software, systems, and technological hardware.
  - During expansion
    - ✓ Customer orders and capacity utilization increase.
    - ✓ The composition of the economy's capacity may not be optimal for the current structure of demand, necessitating spending on new types of equipment. Companies start to focus on capacity expansion.
      - Heavy and complex equipment, warehouses, and factories.
  - During slowdown
    - ✓ Companies continue to place new orders as they operate at or near capacity.
    - ✓ New orders intended to increase capacity may be an early indicator of the late stage of the expansion phase
  - During contraction
    - ✓ New orders halted, and some existing orders canceled
      - Order cancel: light equipment & technology before construction and heavy ones.
    - ✓ Existing physical capital adjusts through aging plus lack of maintenance.

Firm's Perspective

- **3. Inventory based on inventory to sales ratio**
  - During recovery
    - ✓ Sales decline slows.
    - ✓ Production upturn follows but lags behind sales growth.
    - ✓ Begins to fall as sales recovery outpaces production.
  - During expansion
    - ✓ Sales increase.
    - ✓ Production rises fast to keep up with sales growth and to replenish inventories of finished products.
    - ✓ Ratio stable.
  - During slowdown
    - ✓ Sales slow faster than production; inventories increase.
    - ✓ Ratio increases. Signals weakening economy.
  - During contraction
    - ✓ Businesses produce at rates below the sales volumes necessary to dispose of unwanted inventories.
    - ✓ Ratio begins to fall back to normal.

Economic Indicators

- **Economic indicators**
  - variables that provide information on the state of the overall economy.
- **Types of economic indicators**
  - **Leading economic indicators:** have **turning points** that usually precede overall economy.
    - ✓ Predicting the economy's future state, usually near-term.
  - **Coincident economic indicators:** have turning points that are usually close to overall economy
    - ✓ Identifying the economy's present state.
  - **Lagging economic indicators:** have turning points that are usually later to overall economy
    - ✓ Identifying the economy's past condition.
- While no single indicator is definitive, a **mix of them** can offer the effective signal of economy performance.

Economic Indicators

Leading	Reason
Average weekly hours, manufacturing	Business will cut overtime before laying off workers in a downturn and increase it before rehiring in a cyclical upturn. Move up and down before the general economy.
Average weekly initial claims for unemployment insurance	A very sensitive test of initial layoffs and rehiring.
Manufacturers' new orders for consumer goods and materials	Because businesses cannot wait too long to meet demands for consumer goods or materials without ordering. Orders tend to lead at upturns and downturns and captures business sentiment.
Manufacturers' new orders for nondefense capital goods	Captures business expectations and offers first signal of movement up or down. Important sector.

Economic Indicators

Leading	Reason
ISM new order index	Reflects the month on month change in new orders for final sales. Decline of new orders can signal weak demand and can lead to recession.
	The Institute of Supply Management (ISM) polls its members to build indexes of manufacturing orders, output, employment, pricing, and comparable gauges for services.
	A diffusion index usually measures the percentage of components in a series that are rising in the same period. It indicates how widespread a particular movement in the trend is among the individual components.
Average consumer expectations for business conditions	Optimism tends to increase spending. Provides early insight into the direction ahead for the whole economy.

Economic Indicators

Leading	Reason
Building permits for new private housing units	Signals new construction activity as permits required before new building can begin.
S&P 500 Stock Index	Useful early signal. When an expansion is expected, the markets will start incorporating higher profit expectations into the prices of corporate bonds and stocks.
Leading Credit Index	A vulnerable financial system can amplify the effects of negative shocks, causing widespread recessions. Aggregates the information from six leading financial indicators, which reflect the strength of the financial system to endure stress.
Interest rate spread between 10-year treasury yields and overnight borrowing rates (federal funds rate)	LT (10 or 30 year) bond yields express market expectations about the direction of short-term interest rates. As rates ultimately follow the economic cycle up and down, *a wider spread*, by anticipating short rate increases, also anticipates an *economic upswing* and vice versa. Inversion of the yield curve occurs when ST interest rate exceed LT rates – meaning that ST rates are expected to fall and *activity is expected to weaken*.

Economic Indicators

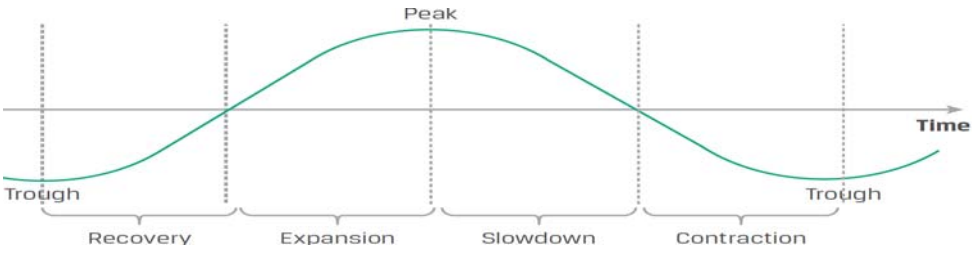
- **Coincident indicators**
  - Industrial production index
    - ✓ Industrial production reflects the current state better than services
  - Manufacturing and trade sales
  - Real personal incomes
  - Employees on non-agricultural payrolls

Economic Indicators

- **Lagging indicators**
  - Average duration of unemployment
    - ✓ Businesses wait to see that upturn or downturn is confirmed before changing employment.
  - Inventory to sales ratio
  - Change in unit labor costs
    - ✓ ULC=total labor compensation per hour per worker / output per hour per worker=W/O
    - ✓ W: wage per hour per worker, O: output per hour per worker (productivity)
  - Inflation
    - ✓ Adjusts slower as index includes more stable services component
  - Average prime lending rate
  - Ratio of consumer instalment debt to income
  - Commercial and industrial loans outstanding loans
    - ✓ Frequently support inventory building, lagging the cycle

Summary of indicators

	recovery	expansion	slowdown	contraction
Inventory/Sales	↓ (Production<Sale)	stable (Production=Sale)	↑ (Production>Sale)	↓ (Production lower, old inventory ↑)
Change in Unit labor cost	↓ (productivity↑)	↑ (Wage↑)	↑ (Wage↑)	↓ (wage↓>productivity↓)
Average duration of unemployment	↑	↓	↓	↑
Unemployment rate	Remain high	↓	↓	↑



Example

Firm's Perspective

- An economic peak is most closely associated with:
  A. accelerating inflation.
  B. stable unemployment.
  C. declining capital spending.

Solution: A

Inflation is rising at peaks.

Example

Economic Indicators

- Leading, lagging, and coincident indicators are:
  A. the same worldwide.
  B. based on historical cyclical observations.
  C. based on Keynesian or Monetarist theory.

Solution: B

The recognition of economic indicators is based on empirical observations for an economy.

Example

Economic Indicators

- In the morning business news, a financial analyst, Kevin Durbin, learned that average hourly earnings had increased last month. The most appropriate action for Durbin is to:
  A. call his clients to inform them of a good trading opportunity today.
  B. examine other leading indicators to see any confirmation of a possible turning point for the economy.
  C. use the news in his research report as a confirmation for his belief that the economy has recovered from a recession.

Solution: B

Financial analysts need to synthesize the information from various indicators in order to gather a reliable reading of the economic trends.

Example

Economic Indicators

- The following table shows the trends in various economic indicators in the two most recent quarters:

Economic Indicator	Trend
Interest rate spread between LT government bonds and overnight borrowing rate	Narrowing
New orders for capital goods	Declining
Residential building permits	Declining
Employees on non-agricultural payrolls	Turned from rising to falling
Manufacturing and trade sales	Stable
Average duration of unemployment	Small decline
Change in unit labor costs	Rising

- Given the information, this economy is most likely experiencing a:
  A. continuing recession.
  B. peak in the business cycle.
  C. strong recovery out of a trough.

- **Solution: B.**

Example

Economic Indicators

- **Solution: B.**
  - The first three indicators are leading indicators, and all of them are indicating an impending recession, which means the economy has reached the peak in this cycle.
  - Non-agricultural payrolls and manufacturing and trade sales are coincident indicators. The trends in these two variables further indicate that the economy may begin to decline.
  - The trends in the last two indicators—both lagging indicators—indicate that the economy may either continue to grow or it may be close to a peak.
  - Aggregating the signals given by all three groups of economic indicators, it appears the economy may be near the peak of a business cycle.

Economic Indicator	Trend
Interest rate spread between long-term government bonds and overnight borrowing rate	Narrowing
New orders for capital goods	Declining
Residential building permits	Declining
Employees on non-agricultural payrolls	Turned from rising to falling
Manufacturing and trade sales	Stable
Average duration of unemployment	Small decline
Change in unit labor costs	Rising

Summary

Module: Understanding Business Cycles

Business Cycles and Four Phases
Credit Cycles
Economic Indicators over the Business Cycle

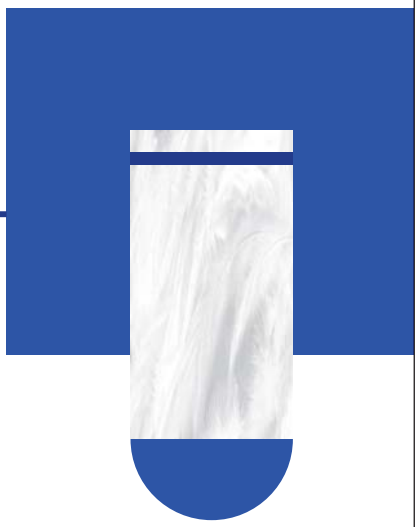
Module

Fiscal Policy

1. Introduction to Monetary and Fiscal Policy
2. Fiscal Policy Tools
3. Limitations of Fiscal Policy

Introduction to Monetary and Fiscal Policy

- Monetary and Fiscal Policy



Monetary and Fiscal Policy

- **Fiscal policy refers to** a government's use of spending and taxation to ***influence economic activity***.
  - Also aim to achieve budget balance and redistribute income and wealth
    - ✓ The budget is said to be balanced when tax revenues equal government expenditures.
      - A **budget surplus** occurs when government tax revenues exceed expenditures.
      - A **budget deficit** occurs when government expenditures exceed tax revenues.
- **Monetary policy refers to** the central bank's actions that affect the ***quantity of money and credit*** in an economy in order to ***influence economic activity***.
  - Monetary policy is said to be **expansionary** when the central bank **increases the quantity of money and credit** in an economy.
  - When the central bank is reducing the quantity of money and credit in an economy, the monetary policy is said to be **contractionary**.
- Both monetary and fiscal policies are used by policymakers with the goals of maintaining **low inflation and producing stable, positive economic growth.**

Example

Monetary and Fiscal Policy

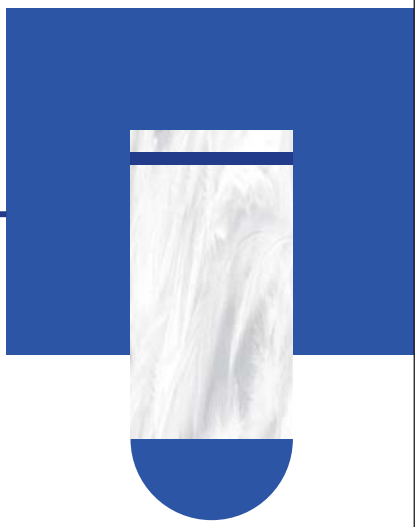
- Which of the following statements best describes monetary policy? Monetary policy:
  A. involves the setting of medium-term targets for broad money aggregates.
  B. involves the manipulation by a central bank of the government's budget deficit.
  C. seeks to influence the macroeconomy by influencing the quantity of money and credit in the economy.

Solution: C

As monetary policy involves central bank activities directed toward influencing the quantity of money and credit. Choice A is incorrect because, although the setting of targets for monetary aggregates is a possible tool of monetary policy, monetary policy itself is concerned with influencing the overall, or macro, economy.

Fiscal Policy Tools

- Spending Tools
- Revenue Tools
- Fiscal Multiplier



Fiscal Policy

- **Fiscal policy** refers to a government's use of spending and taxation to meet macroeconomic goals.
- **Objectives of fiscal policy**
  - **Influencing the level of economic activity and aggregate demand.**
  - **Redistributing wealth and income among segments of the population.**
  - **Allocating resources among economic agents and sectors in the economy.**

Fiscal Policy Tools

- **Spending Tools**
  - **Transfer payments:** Redistribute wealth, taxing some and making payments to others, transfer payments are not included in GDP computations.
  - **Current spending:** refers to government purchases of goods and services on an ongoing and routine basis.
  - **Capital spending:** refers to government spending on infrastructure such as roads, schools, bridges, and hospitals.
    - ✓ Capital spending is expected to **boost future productivity** of the economy
- **Justification for spending tools**
  - Provide services such as national defense that benefit all the residents in a country.
  - Invest in infrastructure to enhance economic growth.
  - Support the country's growth and unemployment targets by directly affecting aggregate demand.
  - Provide a minimum standard of living.
  - Subsidize investment in research and development for certain high-risk ventures consistent with future economic growth or other goals (e.g., green technology).

Fiscal Policy Tools

- **Revenue Tools**
  - **Direct taxes** are levied on income or wealth. These include income taxes, taxes on income for national insurance, wealth taxes, estate taxes, corporate taxes, capital gains taxes, and Social Security taxes. Some progressive taxes.
  - **Indirect taxes** are levied on goods and services. These include excise duties on fuel, alcohol, and tobacco and value-added taxes (VATs). Indirect taxes can be used to reduce consumption of some goods and services. Much more quickly to practice than direct taxes.
- **Desirable attributes of tax policy**
  - **Simplicity** to use and enforce
  - **Efficiency**, having the least interference with market forces and not acting as a deterrent to working.
  - **Fairness** is quite subjective, but two commonly held beliefs are
    - ✓ **Horizontal equality:** people in similar situations should pay similar taxes.
    - ✓ **Vertical equality:** richer people should pay more in taxes.
  - **Sufficiency**, in that taxes should generate sufficient revenues to meet the spending needs of the government.

Fiscal Policy Tools

- **Advantages**
  - **Indirect taxes** can be adjusted almost **immediately** after they are announced and can influence spending behavior **instantly** and generate revenue for the government at **little or no cost** to the government.
    - ✓ Social policies, such as discouraging alcohol or tobacco use, can be adjusted almost **instantly** by raising such taxes.
- **Disadvantages:**
  - **Direct taxes** are more **difficult to change** without considerable notice, often **many months**, because payroll computer systems will have to be adjusted. The same may be said for welfare and other social transfers.
    - ✓ Direct taxes take time to implement, **delaying** the impact of fiscal policy
  - **Capital spending plans take longer to formulate and implement**, typically over a period of years.
    - ✓ For example, building a road or hospital requires detailed planning, legal permissions, and implementation. On the other hand, such policies add to the productive potential of an economy, unlike a change in personal or indirect taxes.

Fiscal Policy Tools

- **Expansionary fiscal policy**
  - Cuts tax
    - ✓ Cuts in personal income tax, raises disposable income, boosts aggregate demand.
    - ✓ Cuts in sales (indirect) taxes to lower prices, raises real incomes, raises consumer demand.
    - ✓ Cuts in corporation taxes to boost business profits, which may raise capital spending.
    - ✓ Cuts in tax rates on personal savings to raise disposable income, raises consumer demand.
  - New public spending on social goods and infrastructure, boosting personal incomes.
- **Budget surplus/deficit**
  - Indicators of whether the fiscal policy is getting tighter or looser.
    - ✓ Increase in a budget deficit would be associated with expansionary fiscal policy.
    - ✓ Economists often look at the **structural (or cyclically adjusted) budget deficit** as an indicator of the fiscal stance. This is defined as the deficit that would exist if the economy was at **full employment** (or full potential output).
- **Pay-as-you-go**
  - you pay for a service before you use it and you cannot use more than you have paid for.
  - **Neutral fiscal policy**

Fiscal Multiplier

- **Fiscal multiplier**

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

  - **MPC:** Marginal propensity of consumption (b)
  - The fiscal multiplier is **inversely** related to the tax rate and **directly** related to the marginal propensity to consume.
    - ✓ **Example:** Consider an increase in government spending of $100, when the MPC is 80%, and the tax rate is 25%. The fiscal multiplier is 1/[1 - 0.8 (1-0.25)] = 2.5
      - ☐ The increase of $100 in government spending increase aggregate demand by $250.
- **The Balanced Budget Multiplier**
  - If a government increases G by the same amount as it raises taxes, the aggregate output actually rises.

Example

Fiscal Policy

- Which of the following statements best describes fiscal policy? Fiscal policy:

A. is used by governments to redistribute wealth and incomes.
B. is the attempt by governments to balance their budgets from one year to the next.
C. involves the use of government spending and taxation to influence economy activity.

Solution: C

Note that governments may wish to use fiscal policy to redistribute income and balance their budgets, but the overriding goal of fiscal policy is usually to influence a broader range of economic activity.

Example

Fiscal Policy

- The least likely goal of a government's fiscal policy is to:
  A. redistribute income and wealth.
  B. influence aggregate national output.
  C. ensure the stability of the purchasing power of its currency.

Solution: C

Ensuring stable purchasing power is a goal of monetary rather than fiscal policy. Fiscal policy involves the use of government spending and tax revenue to affect the overall level of aggregate demand in an economy and hence the level of economic activity.

Example

Fiscal Policy Tools

- Which of the following best represents a contractionary fiscal policy?
  A. Temporary suspension of payroll taxes
  B. Public spending on a high-speed railway
  C. Freeze in discretionary government spending

Solution: C

A freeze in discretionary government spending is an example of a contractionary fiscal policy.

Example

Fiscal Policy Tools

- A "pay-as-you-go" rule, which requires that any tax cut or increase in entitlement spending be offset by an increase in other taxes or reduction in other entitlement spending, is an example of which fiscal policy stance?
  A. Neutral
  B. Expansionary
  C. Contractionary

Solution: A

A "pay-as-you-go" rule is a neutral policy because any increases in spending or reductions in revenues would be offset. Accordingly, there would be no net impact on the budget deficit/surplus.

Example

Fiscal Policy Tools

- Which of the following is not associated with an expansionary fiscal policy?
  A. Rise in capital gains taxes
  B. Cuts in personal income taxes
  C. New capital spending by the government on road building

Solution: A

A rise in capital gains taxes reduces income available for spending and hence reduces aggregate demand, other things being equal. Cutting income tax raises disposable income, while new road building raises employment and incomes; in both cases, aggregate demand rises and hence policy is expansionary.

Example

Fiscal Policy Tools

- Fiscal expansions will most likely have the greatest impact on aggregate output when the economy is in which of the following states?
  A. Full employment
  B. Near full employment
  C. Considerable unemployment

Solution: C

When an economy is close to full employment, a fiscal expansion raising aggregate demand can have little impact on output because there are few spare unused resources (e.g., labor or idle factories); instead, there will be upward pressure on prices (i.e., inflation). The greatest impact on aggregate output will occur when there is considerable unemployment.

Example

Fiscal Policy Tools

- Which of the following is not a tool of fiscal policy?
  A. A rise in social transfer payments
  B. The purchase of new equipment for the armed forces
  C. An increase in deposit requirements for the buying of houses

Solution: C

Rises in deposit requirements for house purchases are intended to reduce the demand for credit for house purchases and hence would be considered a tool of monetary policy. This is a policy used actively in several countries and is under consideration by regulators in other countries to constrain house price inflation.

Example

Fiscal Policy Tools

- Which of the following statements is most accurate?
  A. Direct taxes are useful for discouraging alcohol consumption.
  B. Because indirect taxes cannot be changed quickly, they are of no use in fiscal policy.
  C. Government capital spending decisions are slow to plan, implement, and execute and hence are of little use for short-term economic stabilization.

Solution: C

Capital spending is much slower to implement than changes in indirect taxes; and indirect taxes affect alcohol consumption more directly than direct taxes.

Example

Fiscal Policy Tools

- Which of the following is the most likely example of a tool of fiscal policy?
  A. Public financing of a power plant
  B. Regulation of the payment system
  C. Central bank's purchase of government bonds

Solution: A

Public financing of a power plant could be described as a fiscal policy tool to stimulate investment.

Example

Fiscal Policy Tools

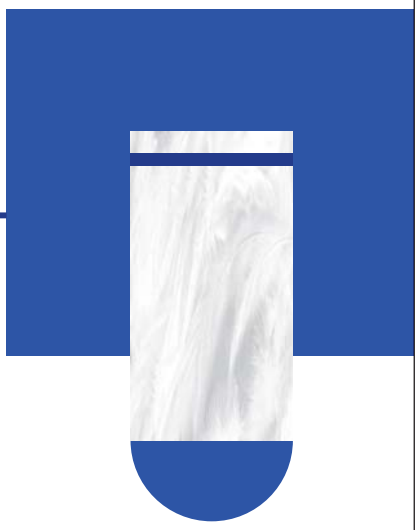
- Which of the following statements is most accurate?
  A. An increase in the budget deficit is always expansionary.
  B. An increase in government spending is always expansionary.
  C. The structural deficit is always larger than the deficit below full employment.

Solution: A

Note that increases in government spending may be accompanied by even bigger rises in tax receipts and hence may not be expansionary.

Limitations of Fiscal Policy

- Recognition Lag, Action Lag and Impact Lag
- Crowding-out Effect
- Ricardian Equivalence



Limitations of Discretionary Fiscal Policy

- **Limitations of Discretionary Fiscal Policy**
  - Economic forecasts might be wrong, leading to incorrect policy decisions.
  - Complications arise in practice that **delay** both the implementation of discretionary fiscal policy and the impact of policy changes on the economy.
    - ✓ The lag results that discretionary fiscal policy **cannot completely stabilize AD** of economy.
      - **Recognition lag:** the policy maker does not have complete information about how the economy functions. It may take several months for policy makers to realize that an economy is slowing, because data appear with a considerable time lag and even then are subject to substantial revision. The recognition lag has been likened to the problem of driving while looking in the rearview mirror.
      - **Action lag:** The time governments take to discuss, vote on, and enact fiscal policy changes.
      - **Impact lag:** The time between the enactment of fiscal policy changes and when the impact of the changes on the economy actually takes place.
    - ✓ Monetary actions may face **less delay** to take action than fiscal policy, especially when the central bank is **independent**.

Limitation of Fiscal Policy

- **Additional macroeconomic issues may hinder usefulness of fiscal policy:**
  - Misreading economic statistics: The full employment level for an economy is **not precisely measurable**. If the government relies on expansionary fiscal policy mistakenly at a time when the economy is already at full capacity, it will simply drive inflation higher.
  - **Crowding-out effect:** Expansionary fiscal policy may crowd out private investment, reducing the impact on aggregate demand.
  - Supply shortages: If economic activity is slow due to resource constraints (low availability of labor or other resources) and not due to low demand, expansionary fiscal policy will fail to achieve its objective and will probably lead to higher inflation.
  - Limits to deficits: There is a limit to expansionary fiscal policy. If the markets perceive that the deficit is already too high as a proportion of GDP, funding the deficit will be problematic. This could lead to higher interest rates and actually make the situation worse.
  - Multiple targets: If the economy has high unemployment coupled with high inflation, fiscal policy cannot address both problems simultaneously.

Limitation of Fiscal Policy

- **Additional macroeconomic issues may hinder usefulness of fiscal policy:**
  - **Macroeconomic forecasting models** generally do not have a good track record for accuracy and hence cannot be relied on to aid the policy-making process in this context.
    - ✓ Different models embrace differing views on how the economy works, including differing views on the impact of fiscal stimuli.
  - In addition, when discretionary fiscal adjustments are announced (or are already underway), private sector behavior may well change, leading to rises in consumption or investment, both of which will reinforce the effects of a rise in government expenditure. Again, this will make it difficult to calibrate the required fiscal adjustment to secure full employment and use fiscal policy as a stabilization tool.

Ricardian Equivalence

- **Ricardian Equivalence: Increases in the current deficit mean greater taxes in the future.**
  - To maintain their preferred pattern of consumption over time, taxpayers may increase current savings (reduce current consumption) in order to offset the expected cost of higher future taxes.
  - If taxpayers reduce current consumption and increase current saving by just enough to repay the principal and interest on the debt the government issued to fund the increased deficit, there is no effect on aggregate demand.
  - Then, expansionary fiscal policy has no effective results by fiscal multiplicative effect.
- However, if taxpayers **underestimate** their future liability for servicing and repaying the debt, so that aggregate demand is increased by equal spending and tax increases, Ricardian equivalence **does not** hold.

Arguments for Size of Fiscal Deficit

- **Arguments for being concerned with the size of fiscal deficit**
  - Higher deficits lead to higher future taxes. Higher future taxes will lead to **disincentives** to work and entrepreneurship. This leads to lower long-term economic growth.
  - If markets lose confidence in the government, investors may not be willing to refinance the debt. This can lead to the government defaulting (if debt is in a foreign currency) or having to simply "print money" (if the debt is in local currency). Printing money would ultimately lead to higher inflation.
  - Increased government borrowing will tend to increase interest rates, and firms may reduce their borrowing and investment spending as a result, decreasing the impact on aggregate demand of deficit spending.
    - ✓ This is referred to as the **crowding-out effect** because government borrowing is taking the place of private sector borrowing.

Arguments for Size of Fiscal Deficit

- **Arguments against being concerned with the size of fiscal deficit**
  - If the debt is primarily being held by domestic citizens, the scale of the problem is overstated.
  - If the debt is used to finance productive capital investment, future economic gains will be sufficient to repay the debt.
  - Fiscal deficits may prompt needed tax reform.
  - Deficits would not matter if private sector savings in anticipation of future tax liabilities just offsets the government deficit (Ricardian equivalence holds).
  - If the economy is operating at less than full capacity, deficits do not divert capital away from productive uses. On the contrary, deficits can aid in increasing GDP and employment.

Example

Limitations of Fiscal Policy

- Which statement regarding fiscal deficits is most accurate?
  A. According to the Ricardian equivalence, deficits have a multiplicative effect on consumer spending.
  B. Higher government spending may lead to higher interest rates and lower private sector investing.
  C. Central bank actions that grow the money supply to address deflationary conditions decrease fiscal deficits.

Solution: B

Government borrowing may compete with private sector borrowing for investment purposes.

Example

Fiscal Policy Tools

- Which one of the following is most likely a reason to not use fiscal deficits as an expansionary tool?
  A. They may crowd out private investment.
  B. They may facilitate tax changes to reduce distortions in an economy.
  C. They may stimulate employment when there is substantial unemployment in an economy.

Solution: A

A frequent argument against raises in fiscal deficits is that the additional borrowing to fund the deficit in financial markets will displace private sector borrowing for investment (i.e., crowding out).

Example

Limitations of Fiscal Policy

- Which of the following statements is least accurate?
  A. The economic data available to policy makers have a considerable time lag.
  B. Economic models always offer an unambiguous guide to the future path of the economy.
  C. Surprise changes in exogenous economic variables make it difficult to use fiscal policy as a stabilization tool.

Solution: B

Economic forecasts from models will always have an element of uncertainty attached to them and thus are not unambiguous or precise in their prescriptions. Once a fiscal policy decision has been made and implemented, unforeseen changes in other variables may affect the economy in ways that would lead to changes in the fiscal policy if we had perfect foresight. Note that it is true that official economic data may be available with substantial time lags, making fiscal judgments more difficult.

Example

Limitations of Fiscal Policy

- Which of the following statements is least accurate?
  A. Discretionary fiscal changes are aimed at stabilizing an economy.
  B. Automatic fiscal stabilizers include new plans for additional road building by the government.
  C. In the context of implementing fiscal policy, the recognition lag is often referred to as "driving while looking in the rearview mirror."

Solution: B

New plans for road building are discretionary and not automatic.

Example

Limitations of Fiscal Policy

- Which of the following statements regarding a fiscal stimulus is most accurate?
  A. Accommodative monetary policy reduces the impact of a fiscal stimulus.
  B. Different statistical models will predict different impacts for a fiscal stimulus.
  C. It is always possible to precisely predict the impact of a fiscal stimulus on employment.

Solution: B

Different models embrace differing views on how the economy works, including differing views on the impact of fiscal stimuli.

Summary
Fiscal Policy

Introduction to Monetary and Fiscal Policy

Fiscal Policy Tools

Limitations of Fiscal Policy

Module

Monetary Policy

1. Central Banks
2. Monetary Policy Tools and Monetary Transmission
3. Limitation of Monetary Policy
4. Interaction of Monetary and Fiscal Policy

Prerequisite Reading : Money Creation Process

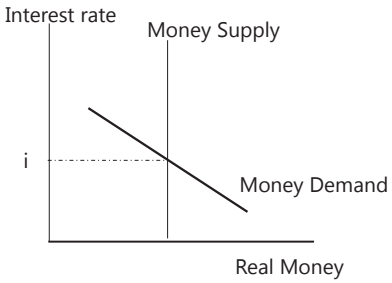
- How Money is Created
- Classification of Money
- Quantity Theory of Money
- Fisher Effect

Money Demand

- **The Demand for money** is largely determined by interest rates and it is also influenced by income level and price level
- Three reasons for holding money:
  - **Transaction demand**: Money held to meet the need for undertaking transactions. As the level of real GDP increases, the size and number of transactions will increase, and the demand for money to carry out transactions increases.
  - **Precautionary demand**: Money held for unforeseen future needs. In the aggregate, the total amount of precautionary demand for money increases with the size of the economy.
  - **Speculative demand**: Money that is available to take advantage of investment opportunities that arise in the future. It is inversely related to expected returns of other financial assets available in the market and directly related to the perceived risk of other financial assets.

Money Supply

- **Money supply**
  - The supply of money is determined by the central bank and is not affected by changes in interest rates. Thus, the supply of money curve is vertical.
  - Notice that as the Fed increases the money supply, the interest rate falls, which reduces the opportunity cost of holding money. At lower interest rates, firms and households choose to hold more money.



How Money is Created

- **How Do the Banks Create Money ?**
  - **Fractional reserve banking system**: r=10%

	Reserves	Loans	New deposit
Bank 1	10	90	100
Bank 2	9	81	90
Bank 3	8.1	72.9	81

  - Money created = $\frac{\text{new deposit}}{\text{reserve requirement}} = \frac{100}{0.1} = 1000$
  - Money multiplier = $\frac{1}{\text{reserve requirement}} = \frac{1}{0.1} = 10$

Classification of Money

- **Narrow money** is the amount of notes (currency) and coins in circulation in an economy plus very highly liquid deposits.
- **Broad money** includes narrow money plus any amount available in liquid assets, which can be used to make purchases.
- **According to the Federal Reserve Bank of New York**
  - **M1:** currency in the hands of the public; travelers checks; demand deposits; and other deposits against which checks can be written.
  - **M2:** includes M1, plus savings accounts, time deposits of under $100,000, and balances in retail money market mutual funds.

Quantity Theory of Money

- **The Quantity Theory of Money**

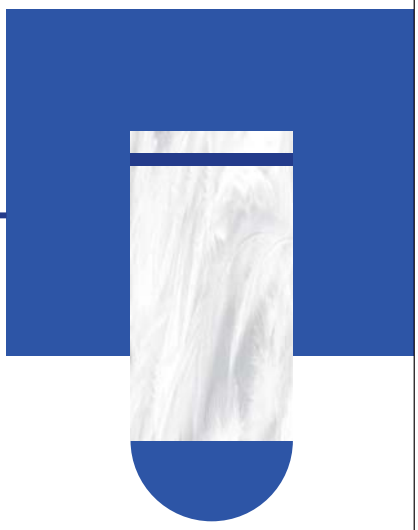
  money supply × velocity = price × real output (MV = PY)
- **Assumptions:**
  - V refers to speed of money that change hands and remains constant in long run.
  - Real output remains constant in long run.
- **Implications:**
  - Price multiplied by real output is total spending.
  - Assuming that velocity and real output **remain constant**, any increase in the money supply will lead to a proportionate increase in the price level.
  - The price level or at least the **rate of inflation can be controlled** by manipulating the **rate of growth of the money supply**. Monetarists believe that there is a **causal relationship running from money growth to inflation**.
    - ✓ **Money neutrality:** An increase in the money supply is thought **in the long run** simply to lead to an increase in the price level while leaving real variables like output and employment unaffected.
      - In other words, money supply can be used to influence the output and employment **in the short run** (not neutral in short run).

Fisher Effect

- **The Fisher effect** states that the nominal interest rate is simply the sum of the real interest rate and expected inflation.
  - $R_{Nom} = R_{Real} + \pi^e$
    - ✓ R_{Nom} : nominal interest rate
    - ✓ R_{Real} : real interest rate
    - ✓ π^e = expected inflation
- Investors are exposed to the risk that actual inflation may differ from expected inflation. Investors require an additional return (a risk premium) for bearing this risk, which we can consider a third component of a nominal interest rate.
  - $R_{Nom} = R_{Real} + \pi^e + RP$
    - ✓ RP = risk premium for inflation uncertainty

Central Bank

- Role and Objectives of Central Bank
- Cost of Inflation
- Different Targets Used by Central Banks
- Qualities of Effective Central Banks



Role and Objectives of Central Bank

- **Role of central bank**
  - **Sole supplier of domestic currency.**
  - Banker to the government and other banks.
  - **Lender of last resort**
  - Supervise banks
    - ✓ Not sole supervisor. In UK, supervision responsibility was assigned to Financial Services Authority (FSA) in 1997 – 2013.
  - Holder of gold and foreign exchange reserves
  - Regulator and supervisor of the payments system
  - Conductor of monetary policy
- **Objectives of a central bank**
  - Control inflation so as to promote ***price stability (Overarching objective)***
  - Stability in exchange rates with foreign currencies
  - Moderate long-term interest rates
  - Full employment
  - Sustainable positive economic growth

Costs of Expected Inflation

- In traditional society, the high inflation is bad.
  - **Menu costs:** higher inflation requires the businesses constantly change the advertised prices of their goods and services.
  - **Shoe leather costs:** higher inflation makes people to hold less cash and therefore they would wear out their shoe leather (or more likely the engines of their cars) in making frequent trip to the bank to withdraw cash.

Costs of Unexpected Inflation

- **Much more important** are the **costs** imposed on an economy **by unanticipated inflation**. Unanticipated inflation has **greater costs** than anticipated inflation.
  - **Inequitable wealth transfer.**
    - ✓ **When inflation is higher than expected**, **borrowers gain at the expense of lenders** as loan payments in the future are made with currency that has less value in real terms.
    - ✓ Conversely, inflation that is less than expected will benefit lenders at the expense of borrowers.
  - **Give rise to risk premia in borrowing rates and the prices of other assets.**
    - ✓ In an economy with **volatile** inflation rates, lenders will require **higher** interest rates to compensate for the additional risk they face from unexpected changes in inflation.
    - ✓ Higher borrowing rates **slow** business investment and reduce the level of economic activity.

Costs of Unexpected Inflation

- **Reduce the information of market price.**
  - ✓ Information about supply and demand from changes in prices becomes less reliable.
    - ☐ Suppose that when expected inflation is 5%, a manufacturer sees that prices for his product have increased 10%.
      - If this is interpreted **as an increase in demand for the product**, the manufacturer will increase capacity and production in response to the perceived increase in demand.
      - If, in fact, general price inflation is 10% rather than the expected 5% over the recent period, the price increase in the manufacturer's product **did not result from an increase in demand**. The expansion of production will result in excess inventory and capacity, and the firm will decrease production, laying off workers and reducing or eliminating expenditures on increased capacity for some time.
- Because of these effects, unexpected inflation can **increase the magnitude or frequency of business cycle**.

Different Targets Used by Central Banks

- Central banks have used various economic variables and indicators over the years to make monetary policy decisions.
  - **1. Interest rate targeting**
    - ✓ Interest rate > target, increasing the money supply
    - ✓ Interest rate < target, decreasing the money supply
  - **2.** Currently, **inflation targeting** is the **most widely used** tool for making monetary policy decisions.
    - ✓ The most common and overarching inflation rate target is 2%, with a permitted deviation of (+/-)1% so the target band is 1% to 3%.
  - **3. Exchange rate targeting**.
    - ✓ Many emerging market economies choose to operate monetary policy by targeting their currency's exchange rate, rather than an explicit level of domestic inflation.

Different Targets Used by Central Banks

- **Exchange rate targeting.**
  - ✓ How a successful exchange rate policy **imports the inflation** of the foreign economy
    - Assume that the domestic inflation rates are very similar in both countries and that the monetary authorities of the developing economy have set an exchange rate target that is consistent with relative price levels in the two economies. As long as domestic inflation closely mirrors US inflation, the exchange rate should remain close to its target. It is in this sense that a successful exchange rate policy imports the inflation of the foreign economy.
  - ✓ Now suppose that economic activity in the developing economy starts to rise rapidly and that domestic inflation in the developing economy rises above the level in the United States.
    - With a freely floating exchange rate regime, the currency of the developing economy would start to fall against the dollar.
    - To protect the exchange rate target, the developing economy's monetary authority **sells foreign currency reserves** and **buys its own currency**. This has the effect of **reducing** the domestic money supply and **increasing short-term interest rates**.

Different Targets Used by Central Banks

- **Exchange rate targeting**.
  - ✓ When the central bank or monetary authority chooses to target an exchange rate, interest rates and conditions in the domestic economy must **adapt to accommodate this target** and domestic interest rates and money supply can become more volatile.
    - If the target comes under pressure, domestic interest rates may **have to rise, regardless of domestic conditions.**

Qualities of Effective Central Banks

- The success of inflation-targeting by central banks depends on three key characteristics: central bank independence, credibility, and transparency.
- **1. Independence**
  - It should be free from political interference.
  - Independence should be thought of in **relative** terms (degrees of independence) rather than absolute terms.
  - Independence can be evaluated based on both operational independence and target independence.
    - ✓ **Operational independence** means that the central bank is allowed to independently determine the **policy rate**.
    - ✓ **Target independence** means the central bank also defines how inflation is computed**, sets the target inflation level**, and determines the horizon over which the target is to achieved.

Qualities of Effective Central Banks

- **2. Credible**
  - The independence of the central bank and public confidence in it are key in the design of an inflation-targeting regime.
    - ✓ If a respected central bank assumes the inflation-targeting role and if economic agents believe that the central bank will hit its target, the belief itself could become **self-fulfilling**.
      - If everyone believes that the central bank will hit an inflation target of 2 percent next year, this expectation might be built into wage claims and other nominal contracts that would make it hit the 2 percent target.
- **3. Transparent**
  - Transparency on the part of central banks aids their credibility. Transparency means central banks periodically disclose the state of the economic environment by issuing Inflation Reports.
- Many central banks in developed economies target an inflation rate of 2 percent, But why target 2 percent and not 0 percent? The answer is that aiming to hit 0 percent could result in negative inflation, known as deflation.

Example

Central Bank

- A central bank is normally **not** the:
  - A. lender of last resort.
  - B. banker to the government and banks.
  - C. body that sets tax rates on interest on savings.

Solution: C

A central bank is normally the lender of last resort and the banker to the banks and government, but the determination of all tax rates is normally the preserve of the government and is a fiscal policy issue.

Example

Central Bank

- Which of the following best describes the overarching, long-run objective of most central banks?
  - A. Price stability
  - B. Fast economic growth
  - C. Current account surplus

Solution: A

Central banks normally have a variety of objectives, but the overriding one is nearly always price stability.

Example

Central Bank

- Which role is a central bank least likely to assume?
  A. Lender of last resort
  B. Supplier of the currency
  C. Sole supervisor of banks

Solution: C

The supervision of banks is not a role that all central banks assume. When it is a central bank's role, responsibility may be shared with one or more entities.

Example

Qualities of Effective Central Banks

- The reason some inflation-targeting banks may target low inflation and not zero percent inflation is best described by which of the following statements?
  A. Some inflation is viewed as being good for an economy.
  B. It is very difficult to eliminate all inflation from a modern economy.
  C. Targeting zero percent inflation runs a higher risk of a deflationary outcome.

Solution: C

Inflation targeting is art, not science. Sometimes inflation will be above target and sometimes below. Were central banks to target zero per- cent, then inflation would almost certainly be negative on some occasions. If a deflationary mindset then sets in among economic agents, it might be difficult for the central bank to respond to this because they cannot cut interest rates much below zero.

Example

Qualities of Effective Central Banks

- A central bank that decides the desired levels of interest rates and inflation and the horizon over which the inflation objective is to be achieved is most accurately described as being:
  A. target independent and operationally independent.
  B. target independent but not operationally independent.
  C. operationally independent but not target independent.

Solution: A

The central bank described is target independent because it set its own targets (e.g., the target inflation rate) and operationally independent because it decides how to achieve its targets (e.g., the time horizon).

Example

Different Targets Used by Central Banks

- When the central bank chooses to target a specific value for its exchange rate:
  A. it must also target domestic inflation.
  B. it must also set targets for broad money growth.
  C. conditions in the domestic economy must adapt to accommodate this target.

Solution: C

The adoption of an exchange rate target requires that the central bank set interest rates to achieve this target. If the target comes under pressure, domestic interest rates may have to rise, regardless of domestic conditions. It may have a "target" level of inflation in mind as well as "targets" for broad money growth, but as long as it targets the exchange rate, domestic inflation and broad money trends must simply be allowed to evolve.

Example

Different Targets Used by Central Banks

- With regard to monetary policy, what is the expected benefit of adopting an exchange rate target?
  A. Freedom to pursue redistributive fiscal policy
  B. Freedom to set interest rates according to domestic conditions
  C. Ability to "import" the inflation experience of the economy whose currency is being targeted

Solution: C

Note that interest rates have to be set to achieve this target and are therefore subordinate to the exchange rate target and partially dependent on economic conditions in the foreign economy.

Monetary Policy Tools and Monetary Transmission

- Policy Rate
- Open Market Operations
- Reserve Requirements
- Monetary Transmission Mechanism

Tools of the Central Bank

- **1. Policy rate**
  - Suppose that a central bank announces an increase in its official interest rate, commercial banks normally would increase their base rates at the **same time**.
    - ✓ A lower rate reduces banks' cost of funds encourage lending and tends to decrease interest rates.
    - ✓ A higher policy rate increases banks' cost of funds discourage lending and tends to increase interest rates.
  - **Policy rate ↓ → Low financing cost , release liquidity (expansionary monetary policy)**
  - **Policy rate ↑ → High financing costs, tightening liquidity (tighten monetary policy**

Neutral Interest Rate

- The **neutral interest rate** of an economy is the growth rate of the money supply that neither increases nor decreases the economic growth rate.
  - **Neutral interest rate = real trend rate of economic growth + long run inflation target**
    - ✓ Real trend rate/trend rate: an economy's long-term sustainable real growth rate.
  - Policy rate> Neutral rate: **contractionary**
  - Policy rate< Neutral rate: **expansionary**
  - Policy rate= Neutral rate: **stable long-run inflation**

Tools of the Central Bank

- **2. Reserve requirements**
  - Reserve requirement ↑ → available funds for lending ↓ → money supply ↓ → interest rate ↑ .
  - This tool only works well to increase the money supply if banks are willing to lend and customers are willing to borrow.

    required reserve ratio ↑ → tighten monetary policy

    required reserve ratio ↓ → expansionary monetary policy
- **3. Open market operations**
  - Central bank buy securities – funds available funds for lending ↑ - money supply ↑ - interest rate ↓.
  - This tool is **the Fed's most commonly used tool** and is important in achieving the federal funds target rate (policy rate). Also **widely used** worldwide.

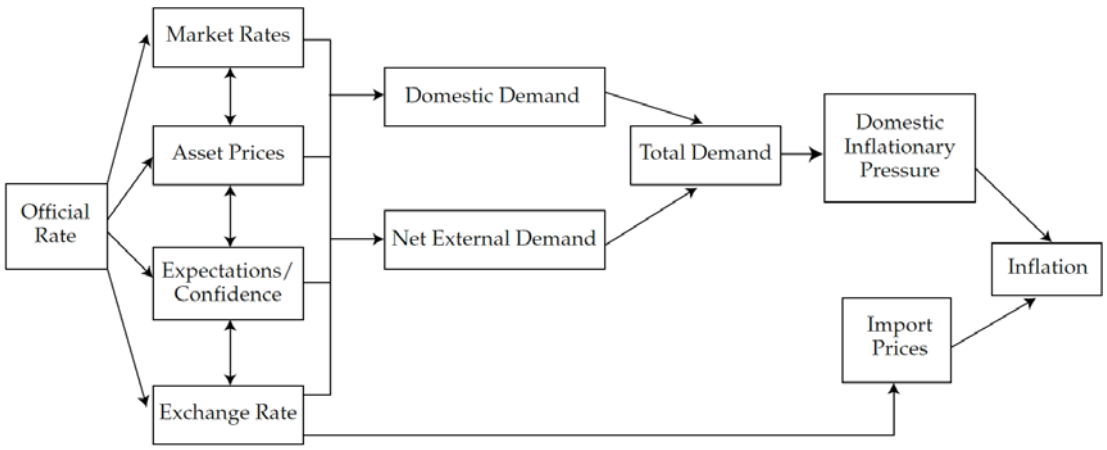
    central bank buy bonds → expansionary monetary policy

    central bank sell bonds → tighten monetary policy

Monetary Transmission Mechanism

- The central bank target policy rate is used to influence short- and long-term interest rates and, ultimately, real economic activity. The **monetary transmission mechanism** refers to how the execution of monetary policy affects the overall economy.
  - Work through following **4 interrelated channels:**
    - ✓ 1: Short-term interest rates
      - policy rate↓→short-term interest rate↓ → businesses and consumers borrow↑→ Higher demand
    - ✓ 2: Changes in the values of key asset prices
      - Decrease in interest rates → lower discount rate → increase in bond, equity and asset prices → Wealth effect : increase in assets value → decrease savings → increase expenditures → Higher demand
    - ✓ 3. Expectation/Economic growth confidence
      - Expectation for future economic growth increase → increase expenditures → Higher demand
    - ✓ 4: The exchange rate
      - Decrease in interest rates → depreciation of domestic currency → increase demand for the export goods

Monetary Transmission Mechanism



Example

Monetary Policy

- Monetary policy is least likely to include:
  - A. setting an inflation rate target.
  - B. changing an official interest rate.
  - C. enacting a transfer payment program.

Solution: C

C is correct. Transfer payment programs represent fiscal, not monetary policy.

Example

Monetary Policy

- Which is the most accurate statement regarding central banks and monetary policy?
  A. Central bank activities are typically intended to maintain price stability.
  B. Monetary policies work through the economy via four independent channels.
  C. Commercial and interbank interest rates move inversely to official interest rates.

Solution: A

Central bank activities are typically intended to maintain price stability. B is not correct because the transmission channels of monetary policy are not independent.

Example

Monetary Policy

- If an economy's trend GDP growth rate is 3 percent and its central bank has a 2 percent inflation target, which policy rate is most consistent with an expansionary monetary policy?
  A. 4 percent
  B. 5 percent
  C. 6 percent

Solution: A

The neutral rate of interest, which in this example is 5 percent, is considered to be that rate of interest that neither spurs on nor slows down the underlying economy. As such, when policy rates are above the neutral rate, monetary policy is contractionary; when they are below the neutral rate, monetary policy is expansionary. It has two components: the real trend rate of growth of the underlying economy (in this example, 3 percent) and long-run expected inflation (in this example, 2 percent).

Example

Monetary Policy

- An increase in a central bank's policy rate might be expected to reduce inflationary pressures by:
  A. reducing consumer demand.
  B. reducing the foreign exchange value of the currency.
  C. driving up asset prices leading to an increase in personal sector wealth.

Solution: A

If an increase in the central bank's policy rate is successfully transmitted through the money markets to other parts of the financial sector, consumer demand might decline as the rate of interest on mortgages and other credit rises. This decline in consumer demand should, all other things being equal and among other affects, lead to a reduction in upward pressure on consumer prices.

Example

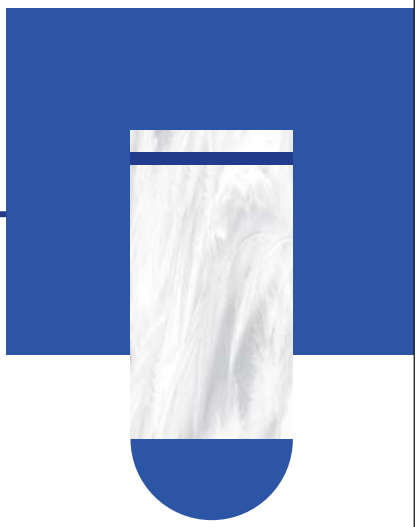
Monetary Policy

- In theory, setting the policy rate equal to the neutral interest rate should promote:
  A. stable inflation.
  B. balanced budgets.
  C. greater employment.

Solution: A

The neutral rate of interest is that rate of interest that neither stimulates nor slows down the underlying economy. The neutral rate should be consistent with stable long-run inflation.

Limitations of Monetary Policy



- Source of the Shock
- Limitations of Monetary Policy

Source of the Shock

- Monetary policy is often adjusted to reflect the source of inflation.
  - If inflation is above target due to higher aggregate demand, then contractionary monetary policy may be an appropriate response to reduce inflation. (demand shock).
  - If inflation is higher due to supply shocks, and the economy is already operating below full employment, a contractionary monetary policy may make a bad situation worse. (supply shock).

Limitation of Monetary Policy

- The transmission mechanism for monetary policy does **not always produce the intended results.**
  - Long-term rates may not rise and fall with short-term rates because of the effect of monetary policy changes on expected inflation.
    - ✓ **Increasing the money supply:** to stimulate economic activity would lead to an **increase** in expected inflation rates and long-term bond yields, even as short-term rates fall.
    - ✓ **Decreasing the money supply:** If individuals and businesses believe that a decrease in the money supply intended to reduce inflation will be successful, they will expect lower future inflation rates.
      - Monetary tightening may be viewed as too extreme, increasing the probability of a recession, making long-term bonds more attractive and **reducing** long-term interest rates.
    - ✓ Bond market participants that act in this way have been called **bond market vigilantes.**

Limitation of Monetary Policy

- Another situation in which the transmission mechanism may not perform as expected is if demand for money becomes very elastic and individuals willingly hold more money even without a decrease in short-term rates. Such a situation is called a **liquidity trap**.
  - ✓ Increasing growth of the money supply will not decrease short-term rates under these conditions because individuals and economic agents hold the money in cash balances instead of investing in interest-bearing securities.
  - ✓ Another reason for increasing the money supply might not increase economic is that even with increasing excess reserves, banks may not be willing to lend.
    - Banks decreased their lending, even as money supplies were increased and short-term rates fell.
- **In summary**, central banks **cannot control** the amount of money that households and corporations put in banks on deposit, nor can they easily control the willingness of banks to create money by expanding credit.

Limitation of Monetary Policy

- If an economy is experiencing **deflation** even though money supply policy has been expansionary, **liquidity trap** conditions may be present.
  - ✓ **Deflation** is more difficult for central banks to reverse.
    - Deflation raise the real value of debt.
    - Persistent fall in prices can encourage consumers to put off consumption today, leading to a fall in demand that leads to further deflationary pressure.
    - With **short-term rates near zero**, economic growth still poor, central bank **cannot cut interest rate further.**
- Central banks began a policy termed **quantitative easing**.
  - ✓ Central banks' buying the treasury is actually "printing the money".

Monetary Policy in Developing Economies

- **Developing economies often face additional challenges when implementing monetary policy**
  - **Absence of liquid government bond markets** through which to conduct open market operations.
  - **Lack of credibility** resulting from prior poor track record in controlling inflation.
  - **Rapid changes in the economy**, making it difficult to ascertain the trend rate (and, hence, the neutral interest rate).
  - **Rapid financial innovation** resulting in changes in the money supply definition.
  - **Political interference** resulting in a lack of central bank independence.

Example

Limitation of Monetary Policy

- Which of the following statements best describes a fundamental limitation of monetary policy? Monetary policy is limited because central bankers:
  A. cannot control the inflation rate perfectly.
  B. are appointed by politicians and are therefore never truly independent.
  C. cannot control the amount of money that economic agents put in banks, nor the willingness of banks to make loans.

Solution: C

Central bankers do not control the decisions of individuals and banks that can influence the money creation process.

Example

Monetary Policy in Developing Economies

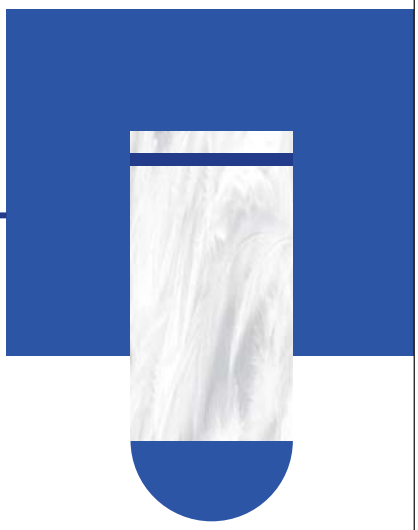
- Which of the following is least likely to be an impediment to the successful implementation of monetary policy in developing economies?
  A. Fiscal deficits
  B. Rapid financial innovation
  C. Absence of a liquid government bond market

Solution: A

Note that the absence of a liquid government bond market through which a central bank can enact open market operations and/or repo transactions will inhibit the implementation of monetary policy—as would rapid financial innovation because such innovation can change the relationship between money and economic activity. In contrast, fiscal deficits are not normally an impediment to the implementation of monetary policy, although they could be if they were perceived to be unsustainable.

Interaction of Monetary and Fiscal Policy

- Tight Monetary Policy / Easy Fiscal Policy
- Easy Monetary Policy / Tight Fiscal Policy



Interaction of Monetary and Fiscal Policy

Monetary policy	Fiscal policy	Interest rate	Private spending	Public spending	Output
Tight	Tight	higher	lower	lower	lower
Easy	Easy	lower	higher	higher	higher
Tight	Easy	higher	lower	higher	higher
Easy	**Tight**	lower	higher	lower	**varies**

- Tight monetary policy/easy fiscal policy: if taxes are cut or government spending rises, the expansionary fiscal policy will lead to a rise in aggregate output. If this is accompanied by a reduction in money supply to offset the fiscal expansion, then interest rates will rise and have a negative effect on private sector demand. We have higher output and higher interest rates, and government spending will be a larger proportion of overall national income.
- Easy monetary policy/tight fiscal policy: if a fiscal contraction is accompanied by expansionary monetary policy and low interest rates, then the **private sector** will be stimulated and will rise as a share of GDP, while the **public sector** will shrink.

Example

Interaction of Monetary and Fiscal Policy

- If fiscal policy is easy and monetary policy tight, then:
  A. interest rates would tend to fall, reinforcing the fiscal policy stance.
  B. the government sector would tend to shrink as a proportion of total GDP.
  C. the government sector would tend to expand as a proportion of total GDP.

Solution: C

With a tight monetary policy, real interest rates should rise and reduce private sector activity, which could be at least partially offset by an expansion in government activity via the loosening of fiscal policy. The net effect, however, would be an expansion in the size of the public sector relative to the private sector.

Example

Interaction of Monetary and Fiscal Policy

- Which policy alternative is most likely to be effective for growing both the public and private sectors?
  A. Easy fiscal/easy monetary policy
  B. Easy fiscal/tight monetary policy
  C. Tight fiscal/tight monetary policy

Solution: A

If both fiscal and monetary policies are "easy," then the joint impact will be highly expansionary, leading to a rise in aggregate demand, low interest rates, and growing private and public sectors.

Summary

Module: Monetary and Fiscal Policy

Central Banks

Monetary Policy Tools and Monetary Transmission

Limitation of Monetary Policy

Interaction of Monetary and Fiscal Policy

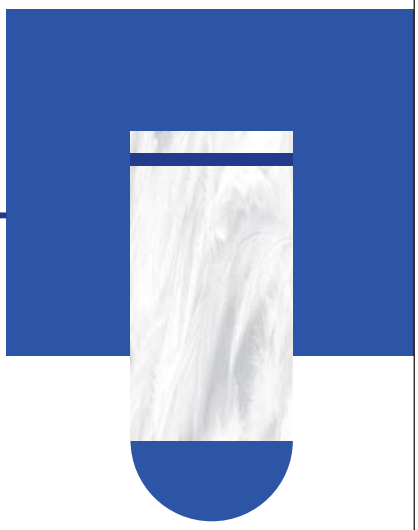
Module

Introduction to Geopolitics

1. National Government and Political Cooperation
2. Forces of Globalization
3. International Trade Organizations
4. Assessing Geopolitical Actors and Risk
5. The Tools of Geopolitics
6. Incorporating Geopolitical Risk into the Investment Process

National government and political cooperation

- Two Types of Actors
- Features of Political Cooperation
- Motivations for Cooperation
- Factors affecting cooperation

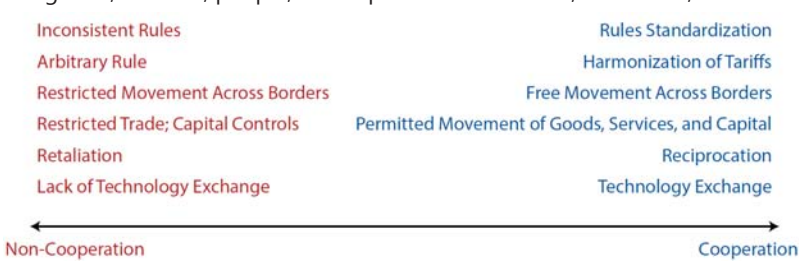


Two Types of Actors

- This definition can be split into **two types of actors** relevant for geopolitical risk:
  - **State actors**
    - ✓ National governments, political organizations, or country leaders
    - ✓ State actors can be **cooperative** or **non-cooperative**.
      - A country may want to cooperate with its neighbors or with other state actors for many reasons. These reasons are typically defined by a country's **national interest**—whether they be **military, economic, or cultural**.
  - **Non-state actors**
    - ✓ Participate in global political, economic, or financial affairs but do not directly control national security or country resources，such as business leaders and cultural icons.
    - ✓ **Globalization** is marked by economic and financial cooperation, including the active trade of goods and services, capital flows, currency exchange, and cultural and information exchange. By contrast, anti-globalization or **nationalism** is the promotion of a country's own economic interests to the exclusion or detriment of the interests of other nations. Nationalism is marked by limited economic and financial cooperation.

Features of Political Cooperation

- **Political Cooperation**
  - Relations between countries can be **cooperative** or **competitive** in nature.
    - ✓ **Cooperation** is the process by which countries work together toward **some shared goal or purpose,** varying from strategic or military concerns to economic influence or cultural preferences.
  - **Cooperative country** is one who **engages and reciprocates in rules standardization**, harmonization of tariffs, international agreements on trade, immigration, or regulation, allows for the free flow of information, including technology transfer.
  - **Non-cooperative country** is one **with inconsistent and even arbitrary rules**, restricted movement of goods, services, people, and capital across borders, retaliation, limited technology exchange.



Motivations for Cooperation

- Defined by a country's national interest-its goals and ambitions—whether they be **military, economic, or cultural**.
  - **1. National Security or Military Interest**
    - ✓ Protect the country from external threat from military attacks, terrorism, crime, cyber-security, and even natural disasters.
    - ✓ Geographic factors play an important role.
      - Landlocked countries rely extensively on their neighbors for access to vital resources. This reliance may make cooperation more important for sustaining international access and growth, or even for survival.
      - Countries highly connected to trade routes or countries acting as a conduit for trade may use their geographic location as a lever of power in broader international dynamics. (**non-cooperative**)

Motivations for Cooperation

- **2. Economic Interest**
  - ✓ Over time, the concept of national security has expanded to include economic factors, including access to such resources as energy, food, or water.
    - **On a domestic level**, growing national wealth and limiting income inequality can contribute to social **stability**.
    - **On the international level**, the **ability** of national firms to operate on a global scale is increasingly important as well.
  - ✓ Countries that choose to cooperate in support of their economic interest are likely focused on one of **two factors**:
    - Either they would like to secure essential resources through trade.
    - They would like to have a fair global competitive environment for their companies or industries through standardization.

Motivations for Cooperation

- **3. Cultural Considerations and "Soft Power"**
  - ✓ Countries may have cultural reasons for cooperating with others.
    - These could be historical in nature, such as long-standing political ties, immigration patterns, shared experiences, or cultural similarities.
  - ✓ Countries may engage in soft power, a means of influencing another country's decisions without force or coercion.
    - Soft power can be built over time through such actions as cultural programs, advertisement, travel grants, and university exchange.
    - Example of **non-cooperative behavior**, a less extreme means to influence another country's decision without force.

Factors affecting cooperation

- **1. Resource Endowment**
  - Geophysical resource endowment is **highly unequal** among countries.
  - The different geophysical resource endowment creates **power dynamics** that can impact the terms of engagement between states.
    - ✓ A country heavily endowed with a resource→more political leverage when dealing with another country in desperate need of that resource.
    - ✓ A resource-rich country may become **vulnerable** if the use or sale of the resource benefits certain groups more than others, therefore contributing to internal political instability.

Factors affecting cooperation

- **2. The Role of Institutions**
  - An **institution** is an established organization or practice in a society or culture.
    - ✓ Generally, **strong** institutions contribute to **more stable** internal and external political forces, and **longer maturity** of cooperative relationship.
    - ✓ Countries with strong institutions, including organizations and structures promoting government accountability, rule of law, and property rights, allow them to act with more authority.
- **3. Hierarchy of Interests**
  - A country's national interest is thought 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.
      - They will choose to cooperate where it benefits the nation-state, but when two needs result in conflicting cooperation tactics, those higher on the hierarchy are prioritized.
      - In summary, **interest prioritization** determine **the depth and nature** of political cooperation.

Example

Hierarchy of Interests

- Typically, national security is **key** to a country's interest. Cultural consideration is important but likely lower priority compared to national security and economic interest.
- Some may prioritize access to food and water, like Country A. Others might prioritize independence from foreign influence, like Country B.

Factors affecting cooperation

- **4. Power of the Decision Maker**
  - As basic societal needs are met, the hierarchy of national interests can become more **subjective**.
    - ✓ One government may treat the prioritization of some interests **very differently from its predecessor**.
  - The length of a country's **political cycle** has an important impact on priority designation.
    - ✓ Many countries have political cycles of just a few years, which means that **long**-term risks like climate change or addressing income inequality can be difficult to prioritize against projects or goals that can be achieved in a **short**-term horizon.
  - For the purpose of geopolitical risk analysis, **decision makers' motivations** can impact a country's cooperative and non-cooperative choices.
    - ✓ This introduces a factor of psychology and non-predictability into choices along the hierarchy of a nation's needs that can shape geopolitical relationships.

Example

Features of Political Cooperation

- Which of the following actions by a country is most likely a form of geopolitical cooperation?
  A. Acting as a conduit for trade
  B. Engaging in rules standardization
  C. Opting to use soft power over military retaliation

Solution: B

Political cooperation is associated with anything related to agreements of rules and standardization, with countries working together toward some shared goal. A cooperative country is one that engages and reciprocates in rules standardization. A is incorrect because acting as a conduit of trade, like Panama, involves non-cooperatively using a country's geographic location as a lever of power in broader international dynamics. C is incorrect because both soft power and military retaliation are examples of non-cooperative behavior, with the former being a less extreme means to influence another country's decisions without force or coercion.

Example

Factors affecting cooperation

- Which of these is likely lowest on a country's hierarchy of interests?
  A. Tariff harmonization
  B. Military determination
  C. Cultural program development

Solution: C

Cultural program development is likely lowest on a country's hierarchy of interests. Military determination (B) is often a primary source of national security and key to a country's national interest. Tariff harmonization (A) may improve economic activity and improve cooperation. Cultural programs are important and influential but likely lower priority compared with A and B.

Example

Factors affecting cooperation

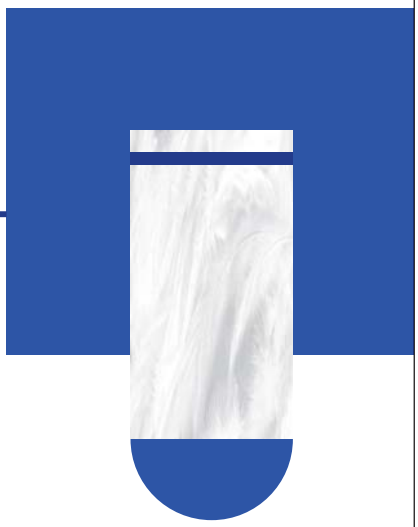
- Which of the following statements represents an aspect of geopolitical risk?
  A. Modeling geopolitical risk is relatively easy to standardize.
  B. An engaged country can be considered cooperative, even if it does not reciprocate.
  C. The strength of a country's institutions is relevant to the durability of its cooperative relationships.

Solution: C

The strength of a country's institutions can make cooperative relationships more durable. A is incorrect because modeling geopolitical risk is not easily standardized. B is incorrect because a cooperative country is one that is both engaged and reciprocates.

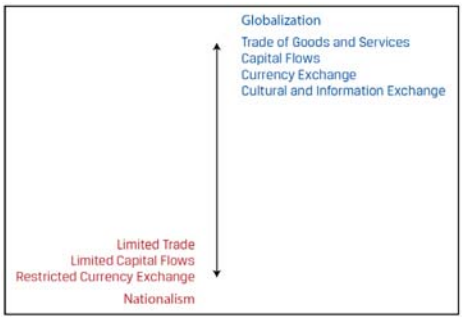
Forces of Globalization

- Features of Globalization
- Motivations for Globalization
- Costs of Globalization and Threats of Rollback



Features of Globalization

- **Globalization** is the process of **interaction and integration** among people, companies, and governments worldwide.
  - **Mostly** by non-state actors, such as corporations, individuals, or organizations.
  - Globalization can be accelerated by political cooperation, but globalization is also an independent process. Organic private sector forces can drive the exchange of products or ideas even without government support or harmonized rules.
- **Anti-globalization** or **nationalism** is marked by **limited economic and financial cooperation**.
  - Globalization **increase political and economic cooperation** and **reduce geopolitical risk**.
    - ✓ Provides opportunities for companies to find the best inputs for their product.
    - ✓ The process of globalization also opens opportunities for investors worldwide.



Motivations for Globalization

- **Non-state actors** choose to participate in globalization consider three potential gains:
  - **1. Increasing profits**
    - ✓ Increasing sales: engage in globalization in order to access new customers for their goods and services.
    - ✓ Reducing costs: access lower tax-operating environments, reduce labor costs, or seek other supply chain efficiency gains.
  - **2. Access to resources and markets**
    - ✓ A non-state actor may also seek market access or investment opportunities abroad.
    - ✓ Two important types of flows: portfolio investment flows or foreign direct investments.
      - **Portfolio investment flows** are short-term investments in foreign assets, such as stocks or bonds.
      - **Foreign direct investments (FDI)** are long-term investments in the productive capacity of a foreign country.

Motivations for Globalization

- **Non-state actors** choose to participate in globalization consider three potential gains:
  - **3. Intrinsic gain**
    - ✓ It is a side effect or consequence of an activity that generates a benefit beyond profit itself. Individuals may receive from expanding their horizons, experiencing new places, or learning new ideas.
    - ✓ The process of reducing barriers between global businesses and organization can also provide **aggregate economic benefits**, such as increased choice, higher quality goods, increased competition among firms, higher efficiency, and increased labor mobility.
    - ✓ It can be a **stabilizing force**, increasing empathy between actors and reducing the likelihood that a geopolitical threat is levied.

Costs of Globalization and Threats of Rollback

- Some of the potential disadvantages of globalization include the following:
  - **1. Unequal Accrual of Economic and Financial Gain.**
    - ✓ Improvement on the aggregate does not mean improvement for everyone.
    - ✓ Some actors will benefit from this exchange, but others may suffer.
  - **2. Lower Environmental, Social, and Governance Standards.**
    - ✓ If standards on environmental protection, social benefit, or corporate governance are lower in one country compared to another and companies ultimately reduce their standards of production in that context, then globalization can create a drain on human, administrative, and environmental resources.
  - **3. Political Consequences.**
    - ✓ Globalization can contribute to income and wealth inequality, as well as differences in opportunity, within and between countries.
    - ✓ These dynamics can manifest in countries' local politics, resulting in a force not only for **reduced political and economic cooperation** but also **for a rollback in political cooperation**.

Costs of Globalization and Threats of Rollback

- **Costs of Globalization and Threats of Rollback**
  - **4. Interdependence**
    - ✓ Globalization can result in the nation itself becoming dependent on other nations for certain resources.
    - ✓ If there is a disruption to the supply chain, including via a moment of political non-cooperation, then firms may not be able to produce the good themselves.
    - ✓ Tactics to fortify their supply chains.
      - **1) Re-shoring the essentials**: Shortages of prescription medication, personal protective equipment, and other essential items during the pandemic highlighted the need for **certain 'essential' supply chains to be rebuilt domestically for emergency situations**.
        - Companies seeking to reduce manufacturing and procurement risk may relocate back to their home countries.
        - E.g., USA、Canada、Mexico，NAFTA

Costs of Globalization and Threats of Rollback

- ✓ Tactics to fortify their supply chains.
  - **2) Re-globalizing production**: the same concerns about production disruptions, rising labor costs, or political risk may instead prompt companies to **duplicate or fortify their supply chains**.
  - **3) Doubling down on key markets**:
    - Labor costs in some trading partners have risen over time, so too has the productivity of those workers. Add large market size, physical infrastructure supporting coordination, sophisticated supply chains, and the investment required to rebuild supply chains elsewhere, and some companies may consider doubling down on key markets.
    - Developing production "In country, for the country," in combination with external supply chains, may be required.

Example

Features of Globalization

- Which of these actions would do the most to increase geopolitical risk?

A. Increase capital flows

B. Restrict foreign currency exchange

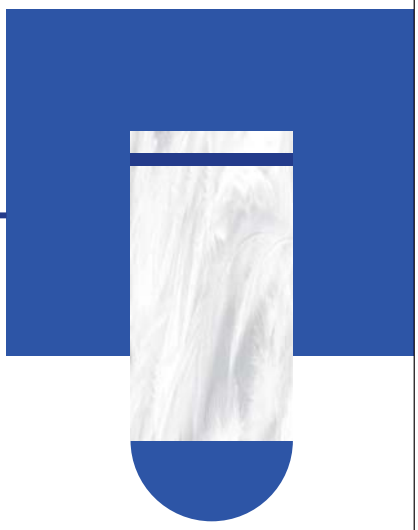
C. Engage in trade of goods and services

Solution: B

Restricted foreign currency exchange—a characteristic of antiglobalization—would likely reduce political and economic cooperation and thus increase geopolitical risk. A is incorrect because an increase in capital flows would reduce geopolitical risk. C is incorrect because an increase in trade would reduce geopolitical risk.

International Trade Organization

- International Monetary Fund
- World Bank Group
- World Trade Organization



International Monetary Fund (IMF)

- **International Monetary Fund (IMF)** : main mandate is to ensure the **stability** of the international monetary system, the system of exchange rates and international payments.
  - Provides a forum for cooperation on international monetary problems.
  - Facilitates the growth of international trade and promotes employment, economic growth, and poverty reduction.
  - Supports exchange rate stability and an open system of international payments.
  - Lends foreign exchange to members when needed, on a temporary basis and under adequate safeguards, to help them address balance of payments problems.
- **After the global financial crisis of 2007-2009, the IMF has redefined and deepened its operations by**
  - Enhancing its lending facilities.
  - Improving the monitoring of global, regional, and country economies.
    - ✓ providing advice to member countries on macroeconomic policies and warning member countries of risks and vulnerabilities in their economies.
  - Helping resolve global economic imbalances.
  - Analyzing capital market developments.
  - Assessing financial sector vulnerabilities.

World Bank Group

- **World Bank Group's** main objective is to help developing countries ***fight poverty*** and enhance environmentally sound economic growth. For developing countries to grow and attract business, they have to:
  - Strengthen their governments and educate their government officials.
  - Implement legal and judicial systems that encourage business.
  - Protect individual and property rights and honor contracts.
  - Develop financial systems robust enough to support endeavors ranging from micro credit to financing larger corporate ventures.
  - Combat corruption.

World Trade Organization (WTO)

- **World Trade Organization (WTO)**
  - The only international organization dealing with the global rules of trade between nations.
  - Its main function is to ensure that trade flows as smoothly, predictably and freely as possible.
  - Trade friction is channeled into the WTO's dispute settlement process where the focus is on interpreting agreements and commitments, and how to ensure that countries' trade policies conform with them.
  - At the heart of the system – know as the multilateral trading system – are the WTO's agreements, negotiated and signed by a large majority of the world's trading nations, and ratified in their parliaments.
  - They also bind governments to keep their trade policies within agreed limits to everybody's benefit.
  - WTO replaced the General Agreement on Tariffs and Trade **(GATT)** since 1995.
    - ✓ The GATT was the only multilateral body governing international trade from 1947 to 1995.

Example

International Trade Organization

- Which of the following international trade organizations regulates cross-border exchange among nations on a global scale?
  A. World Bank Group (World Bank)
  B. World Trade Organization (WTO)
  C. International Monetary Fund (IMF)

Solution: B

The WTO provides the legal and institutional foundation of the multinational trading system and is the only international organization that regulates cross-border trade relations among nations on a global scale. The WTO's mission is to foster free trade by providing a major institutional and regulatory framework of global trade rules. Without such global trading rules, today's global transnational corporations would be hard to conceive.

Example

International Trade Organization

- Which of the following international trade organizations has a mission to help developing countries fight poverty and enhance environmentally sound economic growth?
  A. World Bank Group (World Bank)
  B. World Trade Organization (WTO)
  C. International Monetary Fund (IMF)

Solution: A

The World Bank's mission is to help developing countries fight poverty and enhance environmentally sound economic growth. The World Bank helps to create the basic economic infrastructure essential for creation and maintenance of domestic financial markets and a well-functioning financial industry in developing countries.

Example

International Trade Organization

- Which of the following organizations helps to keep global systemic risk under control by preventing contagion in scenarios such as the 2010 Greek sovereign debt crisis?
  A. World Bank Group (World Bank)
  B. World Trade Organization (WTO)
  C. International Monetary Fund (IMF)

Solution: C

From an investment perspective, the IMF helps to keep country-specific market risk and global systemic risk under control. The Greek sovereign debt crisis in 2010, which threatened to destabilize the entire European banking system, is a recent example. The IMF's mission is to ensure the stability of the international monetary system—that is, the system of exchange rates and international payments that enables countries to buy goods and services from each other.

Example

International Trade Organization

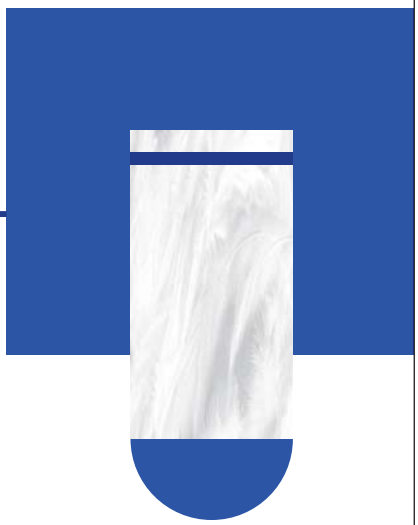
- Which of the following international trade bodies was the only multilateral body governing international trade from 1948 to 1995?
  A. World Trade Organization (WTO)
  B. International Trade Organization (ITO)
  C. General Agreement on Tariffs and Trade (GATT)

Solution: C

The GATT was the only multilateral body governing international trade from 1948 to 1995. It operated for almost half a century as a quasi-institutionalized, provisional system of multilateral treaties and included several rounds of negotiations.

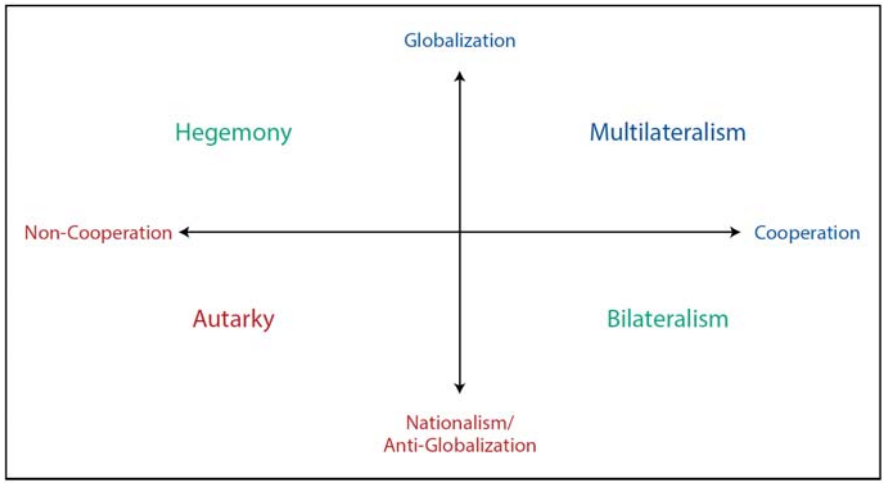
Assessing Geopolitical Actors and Risk

- Autarky
- Hegemony
- Multilateralism
- Bilateralism



Archetypes of Globalization and Cooperation

- **Archetypes of Globalization and Cooperation**



Archetypes of Globalization and Cooperation

- **Four archetypes of country behavior:**
  - **Autarky** countries seeking **political self-sufficiency** with little or no external trade or finance.
    - ✓ State-owned enterprises control strategic domestic industries.
    - ✓ Stronger politically, including the ability to exercise complete control over the supply of technology, goods, and services, as well as media and political messaging.
    - ✓ In some cases, periods of autarky can provide a country with swifter economic and political development.
  - **Hegemony** countries tend to be regional or even global leaders and use their political or economic influence of others to control resources.
    - ✓ For itself, economic and political dominance may provide important influence on global affairs.
    - ✓ For the global system, countries aligning with the hegemon's rules and standards may enjoy the rewards provided by the leader.

Archetypes of Globalization and Cooperation

- **Four archetypes of country behavior:**
  - **Multilateralism:** countries that participate **in mutually beneficial trade relationships** and **extensive rules harmonization**.
  - **Bilateralism:** the conduct of political, economic, financial, or cultural cooperation **between two countries**.
    - ✓ One-at-a-time agreements without multiple partners.
    - ✓ It is noteworthy that relatively few countries perfectly fit the bilateral mold.
    - ✓ Typically, countries exist on a spectrum between bilateralism and multilateralism.
      - ☐ This is **regionalism**, in which a group of countries cooperate with one another.
  - For geopolitical risk analysis, it matters not only **which quadrant** a country falls in today but also **its stability within that quadrant**.
    - ✓ A hegemon who is working to build more political cooperation **may be less of a threat** to investment results than a multilateral actor trying to break them.

Example

Assessing Geopolitical Actors and Risk

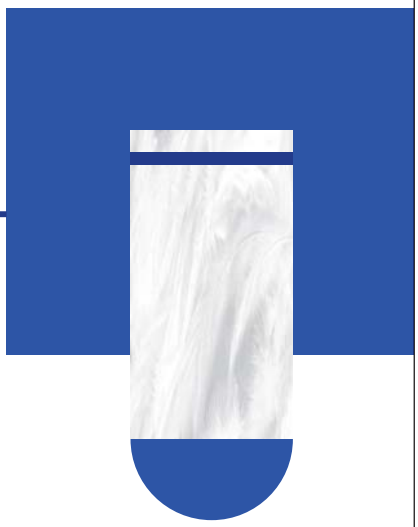
- For the following contrasting pairs of archetypes of globalization and cooperation, which one reflects the greatest differences in country behavior?
  A. Bilateralism versus autarky
  B. Multilateralism versus autarky
  C. Multilateralism versus hegemony

Solution: B

Multilateralism describes countries that participate in mutually beneficial trade relationships and extensive rules harmonization. Autarky describes countries seeking political self-sufficiency with little or no external trade or finance.

The Tools of Geopolitics

- National Security Tools
- Economic Tools
- Financial Tools



The Tools of Geopolitics

- **The tools of geopolitics** may be separated into three types:
  - **1. National security tools**: used to influence or coerce a state actor through direct or indirect impact on the country's resources, people, or borders.
    - ✓ **Armed conflict** is a direct and active national security tool. It and has two major impacts:
      - The disruption or destruction of physical infrastructure, which can inflict long-term damage on a country's capital stock and ability to rebuild that stock.
      - On migration away from areas of armed conflict, which can reshape international flows of goods, services, capital, and labor.
    - ✓ **Espionage** is a necessarily indirect national security tool.
  - Not all national security tools are used in a non-cooperative way.
    - ✓ For example: the North Atlantic Treaty Organization

The Tools of Geopolitics

- **The tools of geopolitics** may be separated into three types:
  - **2. Economic tools**:
    - ✓ Cooperative economic tools:
      - The **multilateral trade agreements**, e.g., Southern Common Market
      - The **global harmonization of tariff rules**, e.g., World Trade Organization.
    - ✓ Non-cooperative economic tools:
      - **Nationalization** is a process of transferring an activity or industry from private to state control.
      - **Voluntary Export Restraints**.

The Tools of Geopolitics

- **The tools of geopolitics** may be separated into three types:
  - **3. Financial tools**: financial mechanisms.
    - ✓ Cooperative financial tools: may decrease geopolitical risk as well as create vulnerabilities in the international system.
      - The **free exchange of currencies across borders**, allowing foreign investment.
    - ✓ Non-cooperative financial tools:
      - **Limiting access to local currency markets**, restricting foreign investment.
- **Multi-Tool Approaches.**
  - The tools of geopolitics are **multi-faceted** and includes many types of actors and features.
    - ✓ Systems of political, economic, and financial cooperation can be **intertwined**.
    - ✓ Example： Allowing **cabotage** requires coordination on multilateral physical security and economy，a highly multilateral process.

The Tools of Geopolitics

- **Cooperative financial tool may create vulnerabilities in the international system**
  - Cooperative financial tools may reduce geopolitical risk if they encourage cooperation in security, economic, or financial arenas. However, the same tools may also create vulnerabilities in the international system.
    - ✓ The dominance of the US dollar is one such example.
      - The international interbank market transactions heavily denominated in US dollars. The market facilitates financial activity and cooperation more broadly.
      - US dollar's importance to exchange also makes other countries vulnerable to changes in US monetary policy. Specifically, tighter US monetary policy can contribute to liquidity shortages in countries that do not or cannot maintain US dollar reserves.

Example

The Tools of Geopolitics

- In the following table, match the geopolitical tool with the most appropriate example of each tool.

Geopolitical Tool	Example
1. Financial	A. Nationalization
2. Economic	B. Espionage
3. National security	C. Free exchange of currency across borders

Solution:

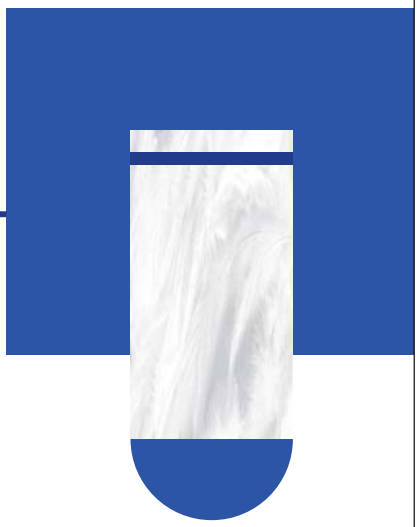
Option 1 (Financial) matches with C (Free exchange of currency across borders).

Option 2 (Economic) matches with A (Nationalization).

Option 3 (National security) matches with B (Espionage).

Incorporating Geopolitical Risk into the Investment Process

- Types of Geopolitical Risk
- Assessing Geopolitical Threats
- Analysis Approach for Geopolitical risks
- Geopolitical Risk Index



Types of Geopolitical Risk

- **Three basic types of geopolitical risk**
  - **1. Event risk** evolves around set dates known in advance.
    - ✓ Elections, new legislation, holidays or political anniversaries.
      - Often result in changes to investor expectations related to a country's cooperative stance.
        - Example: Brexit. The United Kingdom's vote to end its European Union membership came as a surprise to many investors. Several asset classes were immediately affected, including equities, the national currency, and government bonds. Investors became concerned about what a rollback in political cooperation might mean for long-term economic growth.
    - ✓ It is useful to note that the predictability of an event **does not necessarily** change its likelihood, its speed of impact, or the size of impact on investors; however, it does give investors **more time to prepare a response**.

Types of Geopolitical Risk

- **Three basic types of geopolitical risk**
  - **2. Exogenous risk**: a sudden or unanticipated risk.
    - ✓ Examples: sudden uprisings, invasions, or the aftermath of natural disasters.
    - ✓ On 11 March 2011, Japan was struck with an earthquake. The natural disaster also caused a significant nuclear accident that resulted in environmental damage and also disrupted supply chains. The initial market response reflected market concern: Equities fell, the currency depreciated, and bond prices rose.
  - **3. Thematic risk**: known risks that evolve and expand over a period of time.
    - ✓ Examples: Climate change, pattern migration, rise of populist forces, ongoing threat of terrorism and cyber risks.
      - Cyber risks include any attempt to expose, alter, disable, destroy, steal, or gain information through **unauthorized access to** or **unauthorized use of computer systems**. These threats began with the expansion of internet and computer use and have increased in number and scale.

Assessing Geopolitical Threats

- To make an **assessment**, an investor considers geopolitical risk in terms of the following three areas:
  - **1. Likelihood:** The likelihood of a risk is **the probability** that it will occur.
    - Highly collaborative and globalized countries are **less likely** to experience geopolitical risk.
    - That same interconnectedness may also make multilateral countries **more vulnerable** to certain risks.

Assessing Geopolitical Threats

- **An investor considers geopolitical risk in terms of the three areas:**
  - **2. Velocity: the pace** at which it impacts an investor portfolio.
    - ✓ We explore **short-term or "high velocity"** impacts, medium-term, and **long-term or "low velocity"** impacts.
    - ✓ **Short term**, it may be seen volatility in the markets affecting entire industries or even the entire market.
      - Exogenous or "black swan" events tend to fit into this category, causing market **volatility** and investor flight to quality.
        - Investors with the appropriate time horizon and risk tolerance may make tactical changes to their investment choices as a result of these events. **NO need the long-term change.**
    - ✓ **Long-term** risks may have important environmental, social, governance, and other impacts.
      - This can impact an investor's **asset allocation**—including choice of **asset classes** and **investment styles**—for a long-term horizon; however, the immediate impact on portfolios is likely to be more **limited**.

Assessing Geopolitical Threats

- **An investor considers geopolitical risk in terms of the three areas:**
  - 3. A risk's **impact** on investor portfolios can manifest in many different ways.
    - ✓ Impact may also be **discrete** or **broad in nature**. Discrete impacts are those that affect only one company or sector at a time, whereas broad impacts are felt more holistically by a sector, a country, or the global economy.
    - ✓ **A high-impact risk** may **merit extensive study** of its **drivers and motivations**, whereas a low-impact risk may not.
    - ✓ In addition, the size of a risk's impact may also be compounded by external factors.
      - For example, risk tends to have a greater impact on markets experiencing a **general contraction or economic downturn.**

Assessing Geopolitical Threats

- Assessing geopolitical risk for portfolio management, investors should consider **all three geopolitical risk factors**:
  - A highly likely risk with very little impact to the portfolio may not merit extensive analysis and investor attention.
  - **A highly impactful risk with a low likelihood of occurring** may merit building a scenario for response but **not** regular monitoring and assessment.
  - Between these extremes, investors must consider their goals and risk tolerance to **identify high-priority risks.**

Analysis Approach for Geopolitical risks

- Geopolitical risks seldom develop in linear fashion, making it **difficult to monitor and forecast** their likelihood, velocity, and size and nature of impact on a portfolio.
- As a result, many investors **deploy an approach** that includes **scenario building** and **signposting** rather than a single point forecast.
  - **1. Scenario analysis** is the process of evaluating portfolio outcomes across potential circumstances or states of the world.
    - ✓ The form of qualitative analysis, quantitative measurement, or both.
    - ✓ Good scenario building can prompt investors to alter their risk prioritization, making it a useful tool not only for tracking risks but also for deciding which portfolio actions may be valuable to take.

Analysis Approach for Geopolitical risks

- **2. Signposting**: an indicator of market level, data piece, or event.
  - ✓ A risk is **low** in likelihood, velocity, or impact, then the signposts are flashing "**green**";
  - ✓ A risk is **medium** in likelihood, velocity, or impact, then the signposts are flashing "**amber**";
  - ✓ Identifying signposts should equip a team to differentiate signal from noise and react when signposts flash **red.**
    - A basic rule of thumb for distinguishing signal from noise is the distinction between politics and policy.
    - For example, there can be a big difference in "politics" between two leaders, but the "policies" they enact are what create larger or more durable portfolio impacts.
- Some combinations of economic and financial market circumstances serve **as strong warnings of potential trouble**.
  - ✓ For example, high inflation and deteriorating employment can signal political unrest.

Geopolitical Risk Index (GPR)

- **Geopolitical Risk Index (GPR)**
  - The purpose of the index is to **measure real-time geopolitical risk** as perceived by the press, the public, global investors, and policymakers in a way that is consistent over time
  - Through the construction of the GPR, it found **three important observations**:
    - ✓ High levels of geopolitical risk reduce US investment, employment, and price level of the stock market.
    - ✓ Individual firm's investment falls more in industries positively exposed to geopolitical risk and that firms reduce investment in the wake of **idiosyncratic geopolitical risk events**.
    - ✓ The adverse effect of geopolitical events themselves as well as the threat of adverse events, finding that the threat of events had a **larger** impact over time.

Summary

Module: Introduction to Geopolitics

National Government and Political Cooperation
Forces of Globalization
International Trade Organizations
Assessing Geopolitical Actors and Risk
The Tools of Geopolitics
Incorporating Geopolitical Risk into the Investment Process

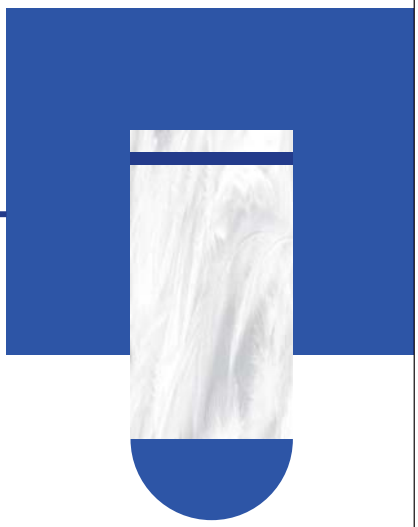
Module

International Trade

1. Benefit and Cost of Trade
2. Trade Restrictions
3. Trading Blocs and Regional Integration

Prerequisite Reading : Comparative Advantage

- Absolute and Comparative Advantage



Absolute and Comparative Advantage

- A country is said to **have an absolute advantage** in the production of a good if it can produce the good at ***lower cost*** in terms of resources than that of another country.
- A country is said to **have a comparative advantage** in the production of a good if its ***opportunity cost*** is lower than that of another country.
  - Opportunity cost: in terms of other goods that could be produced instead.
- **The law of comparative advantage** holds that trading partners can be made better off if they specialize in the production of goods for which they are the low-opportunity cost producer and trade for those goods for which they are the high-opportunity cost producer.

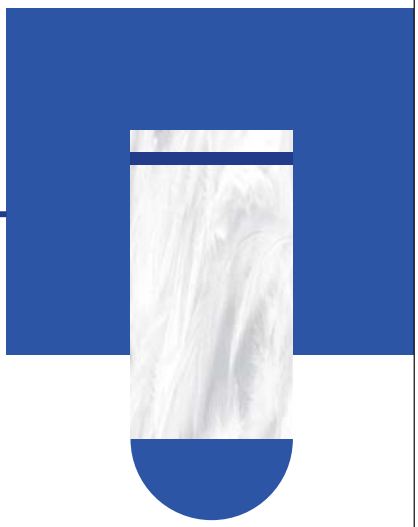
Absolute and Comparative Advantage

- When each country specializes in the good for which they have a **comparative advantage** and trades each other, there are clear gains existed.
- **Price of exports:** more closer to counter party's autarkic price, more gain.
  - The terms of trade are defined as the ratio of the price of exports to the price of imports, representing those prices by export and import price indexes, respectively. The terms of trade capture the relative cost of imports in terms of exports.
  - Autarkic price: price in a country that does not trade with others.

Country / Product	A	B
X	10	9
Y	5	3

Benefit and Cost of Trade

- Benefit and Cost of Trade



Benefit and Cost of Trade

- **Benefit of international trade**
  - Countries gain **from exchange** and **specialization**, industries experience greater economies of scale, households and firms have greater product variety, competition is increased, and resources are allocated more efficiently.
- **Cost of international trade**
  - Import **competition**
    - ✓ Resources may need to be **reallocated** into or out of an industry depending on whether that industry is expanding (exporters) or contracting (face import competition).
    - ✓ Less-efficient firms may be forced to exit the industry.
      - Lead to **higher unemployment** and the need for displaced workers to be retrained for jobs in expanding industries.
  - Counter argument: there may be short-term or even medium-term costs, these resources are likely to be **more effectively re-employed in other industries in the long run**.

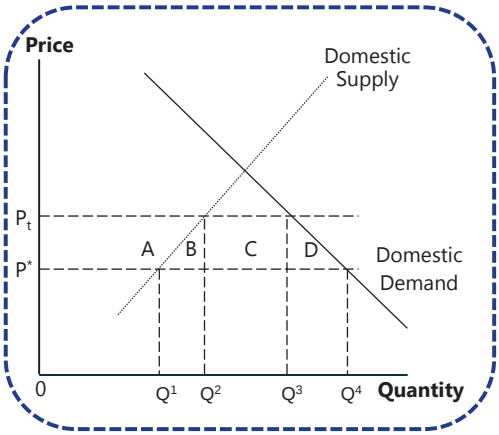
Trade Restrictions

- Tariffs
- Quotas
- Export Subsidies

Types of Trade Restrictions

- **Types of trade restrictions include**
  - **Tariffs:** taxes on imported good collected by the government.
  - **Quotas:** limits on the amount of imports allowed over some period.
    - ✓ **If the import licenses are sold**, the domestic government gains the revenue.
    - ✓ **If the import licenses are free of charge**, the revenue (quota rent) is captured by foreign producer.
  - **Export subsidies:** government payments to firms that exports goods.
    - ✓ Export subsidies benefit producers (exporters) of the good but increase prices and reduce consumer surplus in the exporting country.
  - **Minimum domestic content:** requirement that some percentage of product content must be from the domestic country.
  - **Voluntary export restraint:** 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 partner.

Welfare Effects of an Import Tariff or Quota



	Importing Country
Consumer surplus	-(A+B+C+D)
Producer surplus	+A
Tariff revenue or Quota rents	+C
National welfare	-B-D

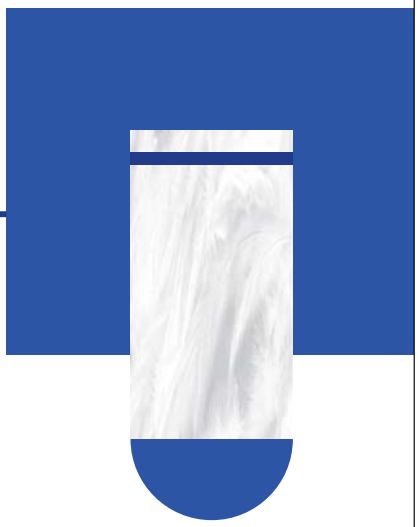
Effects of Trade Restrictions

	Tariff	Import Quota	Export Subsidy	VER
Impact on	Importing county	Importing country	Exporting country	Importing country
Producer surplus	Increases	Increases	Increases	Increases
Consumer surplus	Decreases	Decreases	Decreases	Decreases
Government revenue	Increases	The import licenses are sold, the domestic government gains the revenue. The import licenses are free of charge, the revenue is captured by foreign producer.	Falls (government spending rises)	No change (rent to foreigners)
National welfare	Decreases in small country	Decreases in small country	Decreases	Decreases
	Could increase in large country (importer)	**Could increase in large country**		

- A **small country** is one that is a price taker in the world market for a product and cannot influence the world market price. When a **large country** imposes a tariff, the exporter reduces the price of the good to retain some of the market share it could lose if it did not lower its prices.

Trading Blocs and Regional Integration

- Types Of Trading Blocs
- Regional Integration



Types Of Trading Blocs

- **Free trade areas**
  - All barriers to import and export of goods and services among member countries are removed.
    - ✓ The North American Free Trade Agreement (NAFTA) among the United States, Canada, and Mexico.
- **Customs union**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries **adopt a common** set of trade restrictions with non-members.
    - ✓ In 1947, Belgium, the Netherlands, and Luxemburg ("Benelux") formed a customs union.
- **Common market**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.
  - All barriers to the **movement of labor and capital goods** among member countries are removed.
    - ✓ The Southern Cone Common Market (MERCOSUR) of Argentina, Brazil, Paraguay, and Uruguay is an example of a common market.

Types Of Trading Blocs

- **Economic union**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.
  - All barriers to the movement of labor and capital goods among member countries are removed.
  - Member countries establish common institutions and economic policy for the union.
- **Monetary union**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.
  - All barriers to the movement of labor and capital goods among member countries are removed.
  - Member countries establish common institutions and economic policy for the union.
  - Member countries adopt a single currency.

Regional Trading Agreement

- **Regional integration**
  - Regional integration is **popular** because eliminating trade and investment barriers among a small group of countries is **easier, politically less contentious, and quicker** than multilateral trade negotiations under the World Trad Organization (WTO).
  - Regional integration results in preferential treatment for members compared with non-members and can lead to changes in the patterns of trade.
    - ✓ **Trade creation** occurs when regional integration results in the replacement of higher-cost domestic production by lower-cost imports from other members.
    - ✓ **Trade diversion** occurs when lower-cost imports from nonmember countries are replaced with higher-cost imports from members.
    - ✓ If trade creation is larger than trade diversion, then the net welfare effect is positive. However, there are concerns that this may not always be the case.

Summary

Module: International Trade

Benefit and Cost of Trade
Trade Restrictions and Agreements
Trading Blocs and Regional Integration

Module

Capital Flows and the FX market

1. Basic Concept and Calculation
2. Exchange Rate Regimes

Basic Concept and Calculation

- Foreign Exchange Market
- Foreign Exchange Quotations
- Nominal and Real Exchange Rate
- Market Participants
- Spot Rates and Forward Rates
- Market Composition
- Percentage Change in Foreign Exchange Rate

Foreign Exchange Market

- **The foreign exchange market is the largest market in the world.**
  - 10 to 15 times larger than daily turnover in global fixed-income markets and about 50 times larger than global turnover in equities
  - The FX market is a truly global market that operates 24 hours a day, each business day.
- **Basic conventions**
  - Individual currencies often are referred to by standardized three-letter codes that the market has agreed upon through the International Organization for Standardization (ISO).
    - ✓ Australian dollar – AUD
    - ✓ Canadian dollar – CAD
    - ✓ Chinese yuan – CNY
    - ✓ Euro – EUR
    - ✓ British pound sterling – GBP
    - ✓ US dollar - USD

Foreign Exchange Quotations

- **Quotation**
  - Using the convention of "A/B," referring to the number of units of currency A that one unit of currency B will buy.
    - ✓ For example, USD/EUR = 1.1700 means that 1 euro will buy 1.1700 US dollars
    - ✓ **Base currency**: the currency in which the quote represents one unit.
    - ✓ **Price currency**: the currency for which the quote represents a number of units.
    - ✓ **Decline** in this exchange rate indicates that the **US dollar** is **appreciating** against the euro or, equivalently, the **euro** is **depreciating** against the US dollar.
  - **Direct quote** is the value of one unit of a foreign currency in units of the home currency. (D/F)
  - **Indirect quote** is the amount of a foreign currency for one unit of the home currency. (F/D)
  - To convert an indirect quote to a direct quote, you simply take the reciprocal of the one that you are given (use the 1/x calculator key).
    - ✓ USD/AUD=0.6, 1AUD=0.6USD
    - ✓ AUD/USD=1/0.6=1.67, 1USD=1.67AUD

Foreign Exchange Quotations

- **Quote convention**
  - In general, however, there is a **hierarchy** for quoting conventions.
    - ✓ For quotes involving the **EUR**, it serves as the base currency (e.g., GBP/EUR).
    - ✓ Next in the priority sequence, for quotes involving the **GBP** (but not the EUR) it serves as the base currency (e.g., USD/GBP).
    - ✓ Finally, for quotes involving the **USD** (but not the GBP or EUR) it serves as the base currency (e.g., CAD/USD).
    - ✓ Exceptions among the major currencies are the **AUD** and **NZD**: they serve as the base currency when quoted against the USD (i.e., USD/AUD, USD/NZD).

Nominal and Real Exchange Rate

- **Nominal exchange rate:** the price that we observe in the marketplace for foreign exchange.
  - **Widely quoted**
- **Real exchange rate:** measures the relative purchasing power of currency.
  - FX real $_{(d/f)}$ = FX nominal $_{(d/f)}$ × P_f/P_d
    - ✓ Foreign price level in domestic currency = $S_{d/f} \times P_f$
  - $\Delta\%Real_{d/f} \approx \Delta\%Nominal_{d/f} + \Delta\%P_f - \Delta\%P_d$
  - When the real exchange rate (d/f) **increases,** it implies a **reduction** in the relative purchasing power of the domestic currency.
    - ✓ Exports of goods and services have gotten relatively less expensive to foreigners, and imports of goods and services from the foreign country have gotten relatively more expensive over time.

Example

Nominal and Real Exchange Rate

- At a base period, the CPI of the U.S. and Euro are both 100, and the exchange rate is $1.70 per euro. Three years later, the exchange rate is $1.60 per euro, and the CPI has risen to 110 in the U.S. and 112 in the Euro. What is the real exchange rate?

- **Solution:**
  - The real exchange rate = $1.60 per euro × 112/110 = $1.629 per euro.

Example

Nominal and Real Exchange Rate

- A British consumer wanting to buy goods made in the Eurozone, the real exchange rate. Assume that the nominal spot exchange rate (GBP/EUR) increases by 10 percent, the Eurozone price level increase by 5 percent, and the UK price level increase by 2 percent. What is the change in real exchange rate for UK?

- **Solution:**
  - The change in real exchange rate=

$$\Delta\%Real_{GBP/EUR} \approx \Delta\%Nominal_{GBP/EUR} + \Delta\%P_{EUR} - \Delta\%P_{GBP} \approx 10\% + 5\% - 2\% \approx 13\%$$

Market Participants

- **Sell side: large multinational banks such as Deutsche Bank, Citigroup, UBS, HSBC**
  - **Regional or local banks** with well-developed business relationships, but they **lack** the economies of scale, broad global client base, or IT expertise required to offer competitive price.
- **Buy side**
  - **Corporations:** regularly engage in cross-border transactions, purchase and sell foreign currencies as a result, and enter into FX forward contracts to hedge the risk of expected future receipts and payments denominated in foreign currencies.
  - **Investment accounts:** hold foreign securities, and may both speculate and hedge with currency derivatives.
    - ✓ Real money accounts: refer to mutual funds, pension funds, insurance companies, and other institutional accounts that do not use derivatives.
    - ✓ Leveraged accounts: refer to the various types of investment firms that do use derivatives, including hedge funds, firms that trade for their own accounts, and other trading firms of various types.

Market Participants

- **Buy side**
  - **Governments and government entities:** including sovereign wealth funds and pension funds, acquire foreign exchange for transactional needs, investment, or speculation.
    - ✓ **Central bank** sometimes engage in FX transactions to affect exchange rates in the short term in accordance with government policy.
  - **Retail market:** refers to FX transactions by households and relatively small institutions and may be for tourism, cross-border investment, or speculative trading.
- **Trade Volume**
  - Buy side: Only a minority of the daily FX flow is accounted for by corporations and individuals buying and selling foreign goods and services. **Huge investment pools and professional traders** account for a large and growing proportion of the FX business.
  - Sell side: The **largest money center banks** (e.g., Deutsche Bank, Citigroup, HSBC, UBS) are increasingly dominating the amount of trading activity routed through dealers. Regional and local banks are increasingly being marginalized in terms of their share of average daily turnover in FX markets.

Spot Rates and Forward Rates

- **Spot rates** are exchange rates for **immediate delivery** of the currency.
  - **Spot markets** refer to transactions that call for immediate delivery of the currency.
  - In practice, the settlement period is two business days after the trade date. **(T+2)**
- **Forward rates** are exchange rates for currency transactions that will occur in the future.
  - Forward markets are for an exchange of currencies that will occur in the futures. Both parties to the transaction agree to exchange one currency for another at a specific future date.
- In addition to spot transactions, the **FX market** includes forward transactions and FX swaps. These instruments are used for hedging purposes and to raise foreign currency at more favorable rates, and their trading constitutes the **largest daily volume** of the FX market.

Percentage Change in Foreign Exchange Rate

- Consider a X/Y exchange rate that has changed from 2 to 3.
  - 1Y=2X, 1Y=3X
  - The percentage change in the X price of a Y is simply:
    - ✓ (3-2)/2=50%
  - The Y has appreciated 50% with respect to the X.
- To calculate the percentage appreciation of the X, we need to convert the quotes to Y/X.
  - 1X=1/2Y, 1X=1/3Y
  - The change in the Y price of a X as:
    - ✓ (1/3-1/2)/(1/2)=-33.3%
  - The X has depreciated 33.3% with respect to the Y.
- The percentage of appreciation of one currency is **higher** than that of depreciation of another currency relatively.
  - The appreciation range is 50% and the depreciation range is 33.33%, the ratio of the two is 1.5.

Example

Foreign Exchange Market

- An exchange rate:
  A. is most commonly quoted in real terms.
  B. is the price of one currency in terms of another.
  C. between two currencies ensures that they are fully convertible.

Solution: B

The exchange rate is the number of units of the price currency that one unit of the base currency will buy. Equivalently, it is the number of units of the price currency required to buy one unit of the base currency.

Example

Market Participants

- Which of the following counterparties is most likely to be considered a sell-side FX market participant?
  A. A large corporation that borrows in foreign currencies
  B. A sovereign wealth fund that influences cross-border capital flows
  C. A multinational bank that trades FX with its diverse client base

Solution: C

The sell-side parties generally consist of large banks that sell FX and related instruments to buy-side clients. These banks act as market makers, quoting exchange rates at which they will buy (the bid price) or sell (the offer price) the base currency.

Example

Real Exchange Rate

- A decrease in the real exchange rate (quoted in terms of domestic currency per unit of foreign currency) is most likely to be associated with an increase in which of the following?
  A. Foreign price level.
  B. Domestic price level.
  C. Nominal exchange rate.

Solution: B

The real exchange rate (quoted in terms of domestic currency per unit of foreign currency) is given as follows:

$$\text{Real exchange rate}_{(d/f)} = S_{(d/f)} \times \left(P_f / P_d\right)$$

An increase in the domestic price level (Pd) decreases the real exchange rate because it implies an increase in the relative purchasing power of the domestic currency.

Example

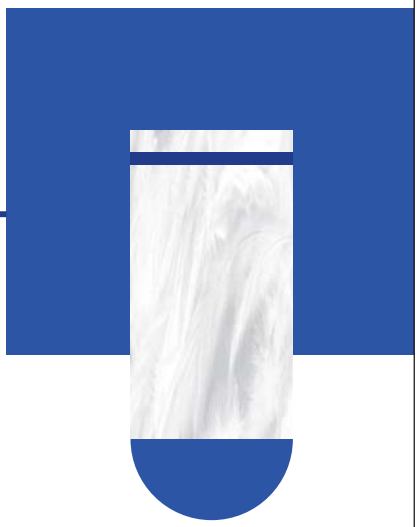
Percentage Change in Foreign Exchange Rate

- Over the past month, the Swiss Franc (CHF) has depreciated 12 percent against pound sterling (GBP). How much has the pound sterling appreciated against the Swiss Franc?
  A. 12%
  B. Less than 12%
  C. More than 12%

- **Solution: C**

Exchange Rates Regimes

- The Ideal Currency Regime
- Exchange Rate Regimes



Ideal Currency Regime

- **Three properties of the ideal currency regime**
  - **Fixed exchange rate**
    - ✓ This would **eliminate currency-related uncertainty** with respect to the prices of goods and services as well as real and financial assets.
  - **Fully convertible**
    - ✓ Currencies could be freely exchanged for any purpose and in any amount
    - ✓ This condition **ensures unrestricted mobility of capital**
  - **Fully independent monetary policy**
    - ✓ Each country would be able to undertake fully independent monetary policy in pursuit of domestic objectives, such as growth and inflation targets.

Ideal Currency Regime

- **Why adopting a fixed exchange rate will lose fully independent monetary policy**
  - If the exchange rate were credibly **fixed,** then any attempt to undertake independent monetary policy (such as expansionary monetary policy, decrease default-free interest rates) would result in a potentially unlimited outflow of capital because funds would seek the higher return.
  - Then, the central bank would be forced to sell foreign currency and **buy domestic currency** to maintain the fixed exchange rate. The loss of reserves and reduction in the domestic money supply would put upward pressure on domestic interest rates until rates were forced back to equality, negating the initial expansionary policy.

Exchange Rate Regimes

- **Arrangements with No Separate Legal Tender**
  - Use the currency of another **country (dollarization)** not create currency, such as El Salvador, Zimbabwe
  - Become a member of a **monetary union** using a common currency (e.g., Euro)
- **Countries That Have Their Own Currency**
  - A **currency board arrangement** is an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate (Hong Kong, central bank is not the last resort)
    - ✓ This implies that domestic currency will be issued only against foreign exchange and it remains fully backed by foreign assets.
    - ✓ **Limited discretion in monetary policy**
  - Conventional **fixed parity** is a country pegs its currency within margins of **±1 percent** versus another currency or a basket that includes the currencies of its major trading or financial partners
    - ✓ The difference between currency board system and fixed parity.
      - First, there is no legislative commitment to maintaining the specified parity.
      - Second, the target level of foreign exchange reserves is discretionary.

Exchange Rate Regimes

- **Countries That Have Their Own Currency**
  - **Target zone:** the permitted fluctuations in currency value relative to another currency or basket of currencies are **wider (e.g., +/-2 %)**.
  - **Crawling peg:** the exchange rate is adjusted periodically, typically to adjust for higher inflation.
    - ✓ Passive crawling peg: common in the 1980s in Latin America. To prevent a run on the USD reserves, the exchange rate was adjusted frequently (weekly or daily) to keep pace with the inflation rate.
    - ✓ Active crawling peg: aim to influence inflation expectations. Because the domestic prices of many goods is directly tied to import prices, the announced change in the exchange rate would effectively indicate future changes in the inflation rate of these goods.
  - **Fixed parity with crawling bands:** the width of the bands that identify permissible exchange rates is **increased over time.**
  - **Managed floating exchange rates:** the monetary authority attempts to influence the exchange rate in response to specific indicators such as the balance of payments, inflation rates, or employment without any specific target exchange rate or predetermined exchange rate path. Also called **dirty floating** because trading partners respond likely and potentially decreases stability in FX market as a whole.
  - **Independently floating:** the exchange rate is **market-determined**, and foreign exchange market intervention is used only to slow the rate of change and reduce short-term fluctuations, not to keep exchange rates at a certain target level.

Example

The Ideal Currency Regime

- Which of the following is not a condition of an ideal currency regime?
  A. Fully convertible currencies
  B. Fully independent monetary policy
  C. Independently floating exchange rates

Solution: C

An ideal currency regime would have credibly fixed exchange rates among all currencies. This would eliminate currency-related uncertainty with respect to the prices of goods and services as well as real and financial assets.

Example

Exchange Rate Regimes

- In practice, both a fixed parity regime and a target zone regime allow the exchange rate to float within a band around the parity level. The most likely rationale for the band is that the band allows the monetary authority to:
  A. be less active in the currency market.
  B. earn a spread on its currency transactions.
  C. exercise more discretion in monetary policy.

Solution: C

Fixed exchange rates impose severe limitations on the exercise of independent monetary policy. Even a narrow band around the parity level allows the monetary authority to exercise some discretionary control over these conditions. In general, the wider the band, the more independent control the monetary authority can exercise.

Example

Exchange Rate Regimes

- A fixed exchange rate regime in which the monetary authority is legally required to hold FX reserves backing 100 percent of its domestic currency issuance is best described as:
  A. dollarization.
  B. a currency board.
  C. a monetary union.

Solution: B

With a currency board, the monetary authority is legally required to exchange domestic currency for a specified foreign currency at a fixed exchange rate. It cannot issue domestic currency without receiving foreign currency in exchange, and it must hold that foreign currency as a 100 percent reserve against the domestic currency issued. Thus, the country's monetary base (bank reserves plus notes and coins in circulation) is fully backed by FX reserves.

Summary

Module: Capital Flows and the FX market

Basic Concept and Calculation
Exchange Rate Regimes

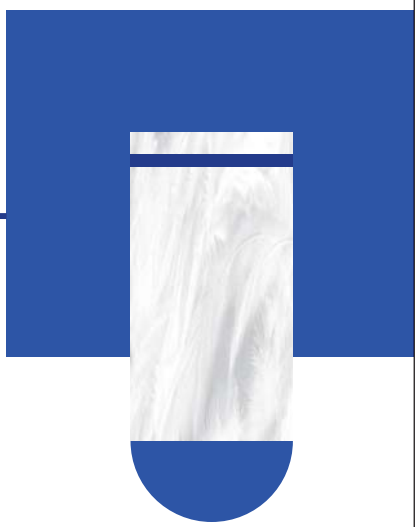
Module

Exchange Rate Calculations

1. Cross Rate Calculation
2. Forward Rate Calculation

Cross Rate Calculation

- Cross Rate Calculation



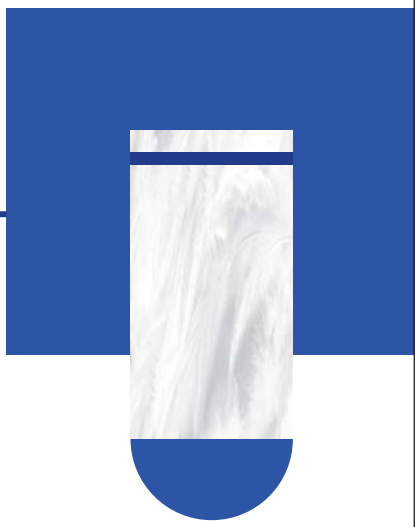
Cross Rate Calculation

- **Cross rate calculation**
  - If a particular currency pair is not explicitly quoted, it can be inferred from the quotes for each currency in terms of the exchange rate with a third nation's currency.
    - ✓ For example, given exchange rate quotes for the currency pairs A/B and C/B, we can back out the **implied cross rate** of A/C. This implied A/C cross rate must be consistent with the A/B and C/B rates.

  - Example:
    - ✓ 0.60 USD/AUD , 10.70 MXN/USD
      - MXN/AUD = USD/AUD × MXN/USD = 0.60 × 10.70 = 6.42
    - ✓ 1.7799 CHF/USD , 2.2529 NZD/USD
      - CHF/NZD = (CHF/USD) / (NZD/USD) = 1.7799 / 2.2529 = 0.7900

Forward Rate Calculations

- Forward Discounts and Premiums
- Interest Rate Parity (IRP)



Forward Discount or Premium

- **Forward discount or premium**
  - There is a **premium** on the quoted currency when the forward exchange rate is higher than the spot rate.
  - Forward exchange rates are typically quoted in terms of **points or percentage**.
    - ✓ Example: One-month forward rate EUR/USD is 1.2568, the spot rate is 1.2500, it is a forward premium for USD. The **forward point** is 68 points, or as a **percentage** at 0.544%.

  - Example:
    - ✓ The AUD/EUR spot exchange rate is 0.7313 with the 1-year forward rate quoted at +3.5 points.
      - What is the 1-year forward AUD/EUR exchange rate?
      - Is the euro trading at a forward discount or forward premium relative to the Australian dollar?
  - Correct Answer:
    - ✓ The forward exchange rate is 0.7313 + 0.00035 = 0.73165.
    - ✓ Because the price of Euros in AUD is higher in one year, the euro is trading at a forward premium.

Interest Rate Parity (IRP)

- **Interest rate parity (IRP)** holds when any forward premium or discount just offsets **differences in interest rates** so that an investor will earn the same return investing in either currency. Approximated by equating the difference between the domestic interest rate and the foreign interest rate to the forward premium or discount.
- **Interest rate parity relationship**
  - F (forward), S (spot) X/Y, r_X and r_Y is the nominal risk-free rate in X and Y, both investments are invested at risk-free interest rates, because any foreign exchange risk was eliminated (hedged) by using a forward rate.
  - $\frac{F}{S} = \frac{1+r_X}{1+r_Y}$
  - $\frac{F-S}{S} = \frac{1+r_X}{1+r_Y} - 1 = \frac{r_X - r_Y}{1+r_Y} \approx r_X - r_Y$
- The forward rate of Y will be higher than (be at a premium to) the spot rate if the nominal risk-free rate in X is higher than that in Y.
  - More generally, and regardless of the quoting convention, the currency with the higher (lower) interest rate will always trade at a discount (premium) the forward market.

Interest Rate Parity (IRP)

- **Arbitrage relationships**
  - If $\frac{F}{S} > \frac{1+r_X}{1+r_Y}$, $\frac{F}{S} \times (1 + r_Y) > 1 + r_X$
  - Then borrow X currency, profit will be $\frac{F}{S} \times (1 + r_Y) - (1 + r_X)$
  - If $\frac{F}{S} < \frac{1+r_X}{1+r_Y}$, $\frac{S}{F} \times (1 + r_X) > 1 + r_Y$
  - Then borrow Y currency, profit will be $\frac{S}{F} \times (1 + r_X) - (1 + r_Y)$

Example

Interest Rate Parity

- **Calculating the forward premium (discount)**
- The following table shows current CAD/AUD spot exchange rate as well as for AUD and CAD 270-day MRR (annualized):

Spot (CAD/AUD)	1.0145
270-day MRR (AUD)	4.87%
270-day MRR (CAD)	1.41%

- The forward premium (discount) for a 270-day forward contract for CAD/AUD would be closest to:

A. - 0.0346
B. - 0.0254
C. +0.0261

- **Correct Answer: B.**
  - The equation to calculate the forward premium (discount) is:
  - $F_{CAD/AUD} - S_{CAD/AUD} = S_{CAD/AUD} \times \left\{ \frac{(r_{CAD} - r_{AUD}) \times \frac{Actual}{360}}{1 + r_{AUD} \times \frac{Actual}{360}} \right\} = 1.0145 \times \frac{(0.0141 - 0.0487) \times \frac{270}{360}}{1 + 0.0487 \times \frac{270}{360}} = -0.0254$

Summary

Currency Exchange Rates

Cross Rate Calculation
Forward Rate Calculation

问题反馈

- 如果您认为金程**课程讲义/题库/视频**或其他资料中**存在错误，欢迎您告诉我们，**所有提交的内容我们会在最快时间内核查并给与答复。
- **如何告诉我们？**
  - 将您发现的问题通过电子邮件告知我们，具体的内容包含:
    - ✓ 您的姓名或网校账号
    - ✓ 所在班级
    - ✓ 问题所在科目(若未知科目，请提供章节、知识点和页码）
    - ✓ 您对问题的详细描述和您的见解
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- **非常感谢您对金程教育的支持，您的每一次反馈都是我们成长的动力。**

心有猛虎，细嗅蔷薇。

In me the tiger sniffs the rose.