Economics

CFA一级培训项目

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Topic Weightings in CFA Level I

Session NO.	Content	Weightings
Study Session 1	**Ethics & Professional Standards**	**15**
Study Session 2-3	Quantitative Analysis	12
Study Session 4-5	Economics	10
Study Session 6-9	Financial Reporting and Analysis	20
Study Session 10-11	Corporate Finance	7
Study Session 12	Portfolio Management and Wealth Planning	7
Study Session 13-14	Equity Investment	10
Study Session 15-16	Fixed Income	10
Study Session 17	Derivatives	5
Study Session 18	Alternative Investments	4

Framework

Economics

- Microeconomics and Macroeconomics
  - R14 Topics in Demand and Supply Analysis
  - R15 The Firm and Market Structures
  - R16 Aggregate Output, Prices, and Economic Growth
  - R17 Understand Business Cycles
- Monetary and Fiscal Policy, International Trade, and Currency Exchange Rates
  - R18 Monetary and Fiscal Policy
  - R19 International Trade and Capital Flows
  - R20 Currency Exchange Rates

Reading 14

Topics in Demand and Supply Analysis

Framework

1. Demand and Supply
2. Elasticity
3. Substitution and Income Effects
4. Profit, Revenue, Product, and Cost
5. Breakeven Point and Shutdown Point
6. Economies and Diseconomies of scale

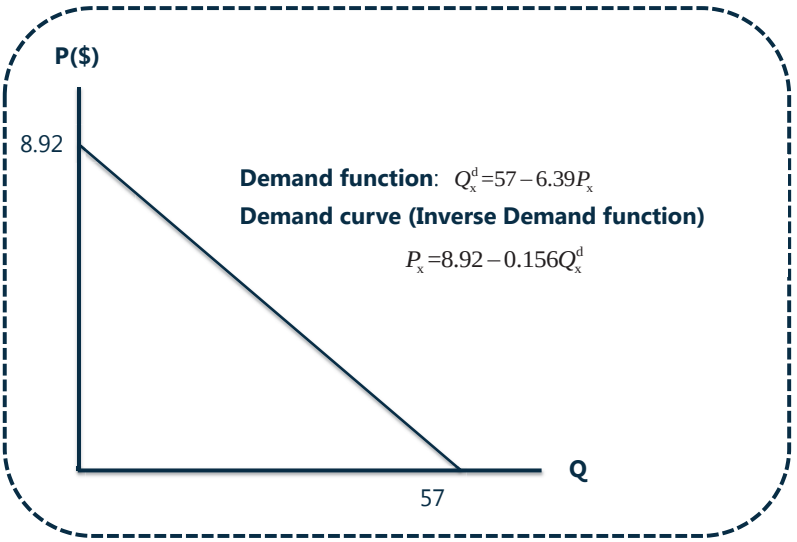
Demand

- **The Demand Function**
  - The quantity demanded of good X depends on (is a function of) the price of good X, consumers' income, and the price of good Y:

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

- **Example:** $Q_x^d = 84.5 - 6.39P_x + 0.25I - 2P_y$
  - Assuming consumers' income in €50 (I), and the average price of an automobile in €20 (P_Y).
    - ✓ $Q_x^d = 57 - 6.39P_x$ (demand function)
  - Invert the function
    - ✓ $P_x = 8.92 - 0.156Q_x^d$ (**inverse demand function**)
    - ✓ The graph of the inverse demand function is called the **demand curve.**
- **Law of Demand**
  - Demand decreased as the price increased

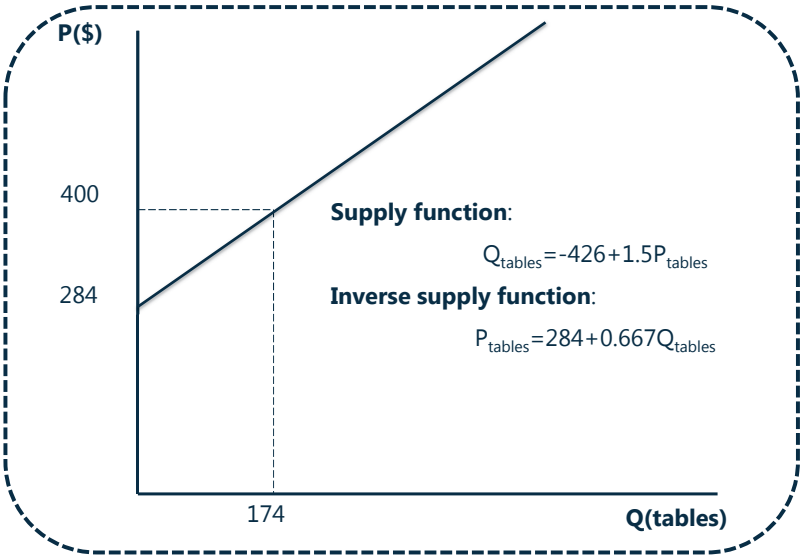
Demand Curve



Supply

- **The 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.
  - $Q^s_x = f(P_X, W...)$
- **Example:**
  - $Q^S_{tables} = -300 + 1.5P_{tables} - 8W - 0.2P_{wood}$
  - Assuming W=12, $P_{wood} = 150$
    - ✓ $Q^S_{tables} = -426 + 1.5P_{tables}$ (**Supply Function**)
  - Invert the function
    - ✓ $P_{tables} = 284 + 0.667Q_{tables}$ (**Inverse Supply Function**)
    - ✓ The graph of the inverse supply function is called the **supply curve**.
- **Law of supply**
  - Supply increased as the price increased

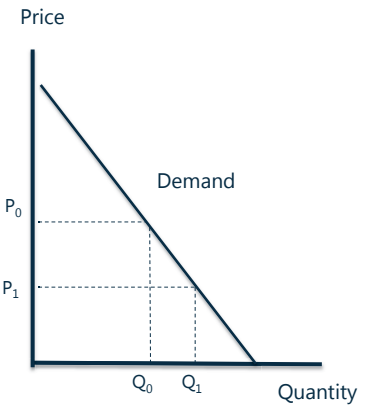
Supply Curve



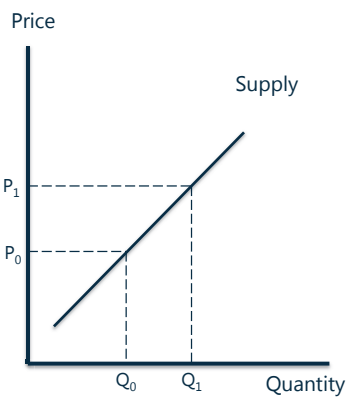
Demand and Supply Curves

- **Movements along demand and supply curves.**
  - Changes in quantity demanded or supplied of product X caused by changes in market price of the product X.
- **Shifts in demand and supply curves.**
  - Changes in quantity demanded or supplied of product X caused by other independent variables other than the changes in market price the product X.
    - ✓ For example: A change of the income; A change of the price for substitute goods or complementary goods.

Movements along Demand and Supply Curves

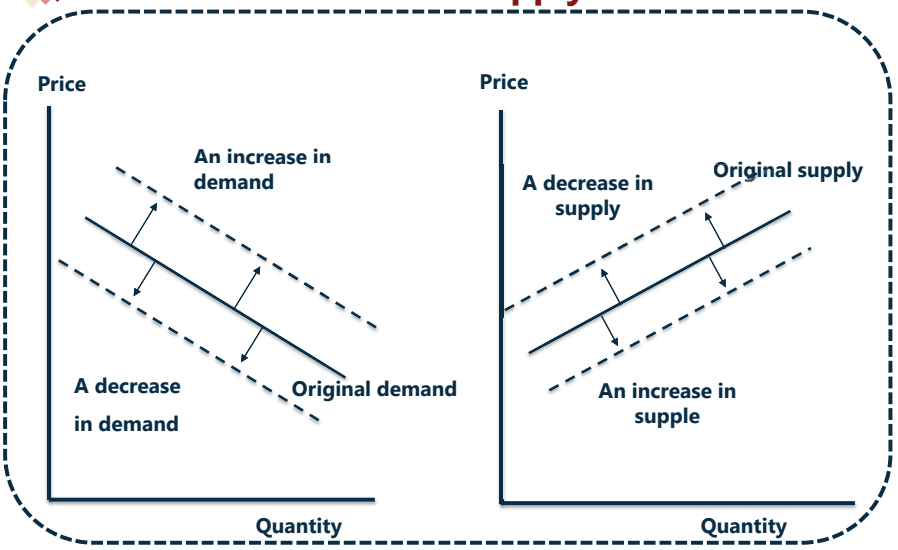


Change in Quantity Demand



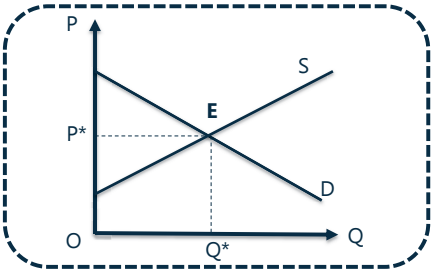
Change in Quantity Supplied

Shifts in Demand and Supply Curves



Market Equilibrium

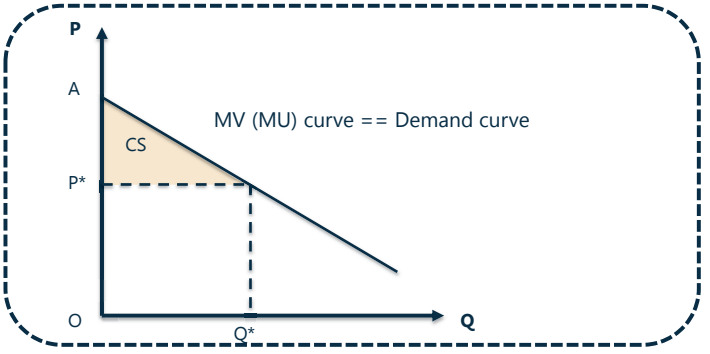
- **Equilibrium price and the equilibrium quantity**
  - When have a market supply and market demand curve for a good, we can solve for the price at which the quantity supplied equals the quantity demanded. We define this as the equilibrium price and the equilibrium quantity.



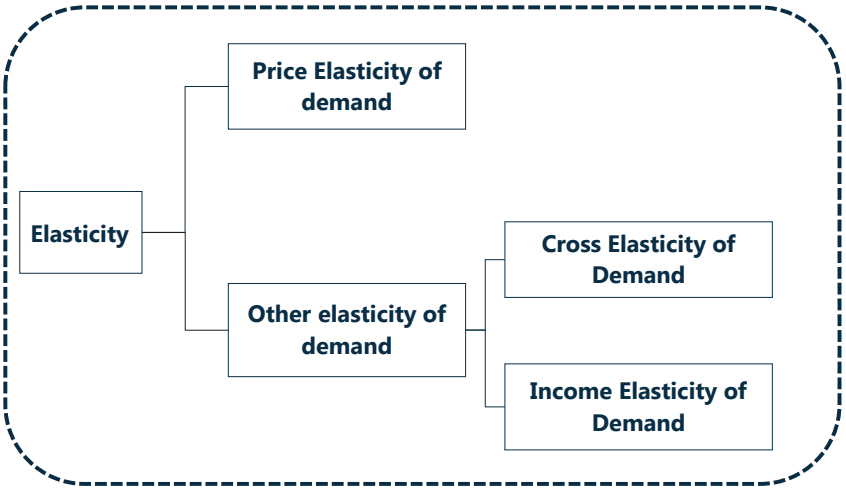
  - E: market equilibrium. At the price, the quantity of supply=the quantity of demand.

Consumer Surplus

- **Marginal value (MV or MB or MU)** is the benefit derived from consuming one additional unit of a good or service.
- 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 is called **consumer surplus**.



Elasticity



Price Elasticity of Demand

➢ **Definition**

- A measure of how sensitive changes in quantity demanded to a change in price, and it is expressed as the ratio of percentage changes in each variable
- The price elasticity of demand:

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

where:

$$\text{Percent change} = \frac{\text{change in value}}{\text{average value}} = \frac{\text{ending value - beginning value}}{\left(\frac{\text{ending value + beginning value}}{2}\right)}$$

Example

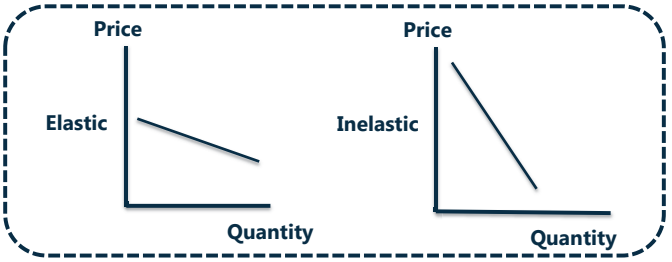
➢ **Example:**

- $Q_x^d = 8{,}400 - 400P_x + 60I - 10P_y$
- choose \$3 for P_x
- \$50 (thousands) for I
- \$20 (thousands) for P_y

$$E_{p_x}^d = \frac{\Delta Q_x^d}{\Delta P_x} \times \frac{P_x}{Q_x^d} = -400 \times \frac{3}{10000} = -0.12 \rightarrow \text{own-price elasticity of demand}$$

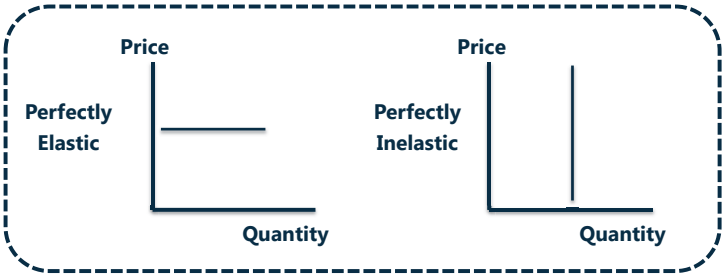
Price Elasticity of Demand

- **Price elasticity**
  - When elasticity<1, the demand is said to be inelastic;
  - When elasticity>1, the demand is said to be elastic;
  - When elasticity=1: demand is said to be unit elastic, or unitary elastic.



Price Elasticity of Demand

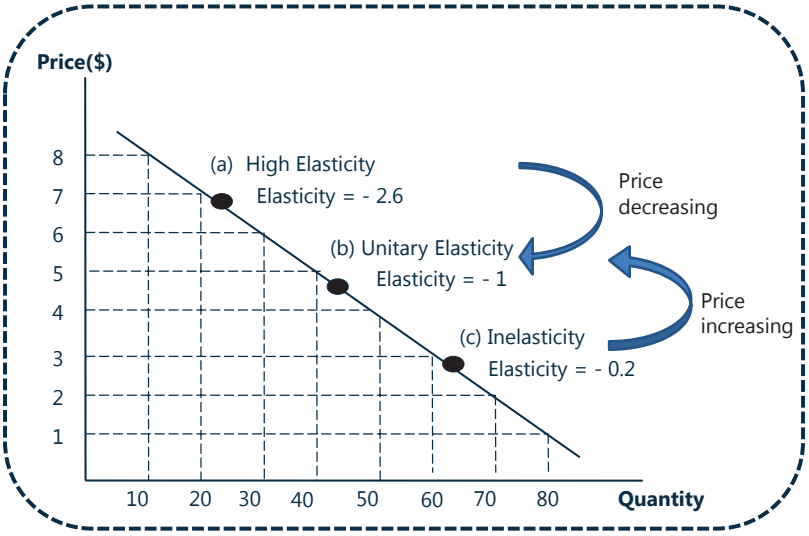
- **Perfectly elastic**
  - Demand curve is horizontal at some given price. It implies that even a minute price increase will reduce demand to zero.
- **Perfectly inelastic**
  - Demand curve is vertical, quantity demanded is not sensitive to price at all.



Price Elasticity of Demand

- **The relationship between price elasticity of demand and total revenue.**
  - When demand is elastic
    - ✓ Price and total expenditure move in opposite directions.
    - ✓ The price decrease, but the sales volume increase in a higher percentage, total expenditure increase, the total revenue will decrease.
  - When demand is inelastic
    - ✓ Price and total expenditure move in the same direction.
    - ✓ The price decrease, and the sales volume increase in a lower percentage, total expenditure decrease with total revenue decrease.
  - When demand is unit elastic
    - ✓ The total revenue of the company is maximized.

Price Elasticity of Demand



Factors that Influence the Elasticity of Demand

- **Availability of substitutes**
  - If there are close substitutes for the good, then if its price rises even slightly, a consumer would tend switch to the less costly substitute.
- **The relative amount of income spent on the good**
  - If consumers tend to spend a very small portion of their budget on a good, their demand tends to be less elastic than if they spend a very large part of their income.
- **Time period since the price change**
  - For most goods and services, the long-run demand is much more elastic than the short-run demand.

Cross-Price Elasticity of Demand

- **Cross-price elasticity:** it measures how sensitive the demand for good X is to changes in the price of some other good, Y, holding all other things constant.

$$E_{P_y}^{d} = \frac{\%\Delta Q_x^{d}}{\%\Delta P_y}$$

  - If two goods, X and Y, has **positive** cross-price elasticity, the goods X and Y are referred to as **substitutes**.
    - ✓ Example: pen and pencil.
  - If two goods, X and Y, has negative cross-price elasticity, the goods X and Y are referred to as **complements**.
    - ✓ Example: pencil and eraser.

Income elasticity of demand

- Income elasticity of demand is defined as the percentage change in quantity demanded ($\%\Delta Q_x^d$) divided by the percentage change in income ($\%\Delta I$), holding all other things constant, as shown:

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

- **Positive income elasticity** means that as income rises, the demand for the good also rises.
  - Goods with positive income elasticity are called **"normal goods".**
    - ✓ **Luxuries**: high positive elasticity (elasticity >1).
    - ✓ **Necessities**: normal but have lower elasticity (elasticity between 0~1).
- **Negative income elasticity** means that as income rises, the demand for the good decreases.
  - Goods with negative income elasticity are called **"inferior" goods.**
    - ✓ Rice, potatoes, or less expensive cuts of meat.

Example

- **Example:**
  - Q_x^d = 8,400 - 400P_x+ 60I - 10P_y
  - choose \$3 for P_x
  - \$50 (thousands) for I
  - \$20 (thousands) for P_y

$$E_{P_y}^d = \frac{\Delta Q_x^d}{\Delta P_y} \times \frac{P_y}{Q_x^d} = -10 \times \frac{20}{10000} = -0.02 \rightarrow \text{cross-price elasticity}$$

$$E_I^d = \frac{\Delta Q_x^d}{\Delta I} \times \frac{I}{Q_x^d} = 60 \times \frac{50}{10000} = 0.3 \rightarrow \text{income elasticity of demand}$$

Substitution and Income Effects

- **Substitution effect**
  - When the price of Good X decreases, the relative price of Good X against other goods will decrease. Consumer equilibrium moves along the indifference curve, which leads to an increase in the demand of Good X.
- **Income effect**
  - When the price of Good X decreases, consumer's real purchasing power will change. Real income increases, and budget constraint moves, which lead to a change in the demand of Good X.

Normal and inferior goods

- The **substitution effect** for goods will always be positive.
  - A change in the price of a good will always be in the direction of buying more at a lower price or less at a higher price.
- The **income effect** for goods depends on the nature of the goods.
  - For **normal good**, its **income effect is positive**, and the income effect reinforces the substitution effect, both leading to a negatively sloped demand curve.
  - For **inferior good**, its **income effect is negative**, and the income effect and the substitution effect work in opposite directions.
    - ✓ The income effect tends to mitigate the substitution effect.

Substitution and Income Effects

- **Income effect & Substitution effect**
  - The change of demand is affected by both income effect and substitution effect.
- **When decrease in the price of Good X:**
  - The substitution effect is positive, and the income effect is also positive—consumption of Good X will increase. (normal good)
  - The substitution effect is positive, and the income effect is negative but smaller than the substitution effect—consumption of Good X will increase. (Inferior good)
  - The substitution effect is positive, and the income effect is negative and larger than the substitution effect—consumption of Good X will decrease (Giffen good)

Giffen Goods and Veblen Goods

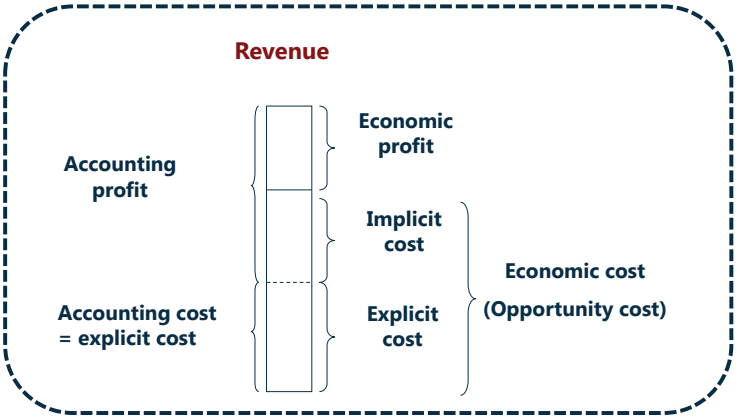
- **Giffen goods:**
  - Income effect （inferior goods） > Substitution effect
  - Demand curve has positive slope
- **Veblen goods (Conspicuous goods):**
  - Consumer cannot truly value a good until the price is known.
  - Price is used by the consumer to signal the status in the society.
  - High price→ high value → high demand quantity (extremely)
    - ✓ Have a positively sloped demand curve (eg: luxury automobile or very expensive piece of jewelry) firstly.
    - ✓ But when price increases, the slope may be negative.
- **Two important distinctions between Giffen goods and Veblen goods.**
  - **First**, Giffen goods are inferior goods (negative income effect), while Veblen goods certainly are not.
  - **Second**, the existence of Giffen goods is theoretically supported by our rules of consumer choice, while the existence of Veblen goods is not.

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. It is equal to accounting profit less implicit opportunity costs.
  - **Economic profit= accounting profit - implicit opportunity costs**
  - **Implicit costs** are the opportunity costs of resources supplied to the firm by its owners.
    - ✓ 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.
  - **Economic profit = total revenue – total economic costs**

Normal Profit

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



Total, average, and marginal product of labor

- To measure **the operating efficiency** of the labor, the total, average and marginal products of labor can be used.

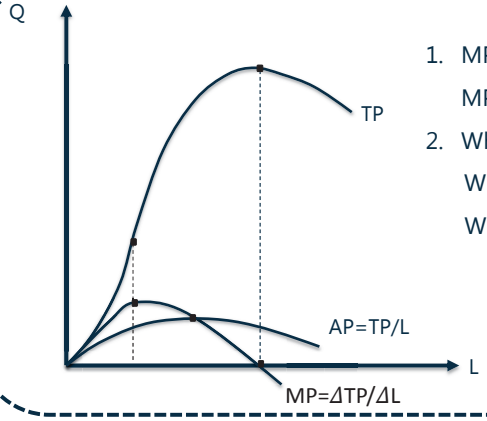
Term	Calculation
Total product	Sum of the output from all inputs during a time period; usually illustrated as the total output (Q) using labor quantity (L)
Average product	Total product divided by the quantity of a given input; measured as total product divided by the number of worker hours used at that output level (Q/L)
Marginal product	The amount of additional output resulting from using one more unit of input assuming other inputs are fixed; measured by taking the difference in total product and dividing by the change in the quantity of labor (ΔQ/ΔL)

Total, Average, Marginal Products

L	TP (Q_L)	AP_L	MP_L
0	0	-	-
1	100	100	100
2	210	105	110
3	300	100	90
4	360	90	60
5	400	80	40
6	420	70	20
7	350	50	-70

Law of Diminishing Returns

- **The law of diminishing marginal returns** states that as more and more resources (such as labor) are devoted to a production process, they increase output but at an ever decreasing rate.



1. MP is the slope of TP, when MP=0, TP is maximized.
2. When MP > AP, AP increase;
   When MP > AP, AP decrease;
   When MP= AP, AP is maximized.

Total, Average, and Marginal Revenue

- To measure the **return of the investment for the company**, total, average and marginal revenue are used.

Term	Calculation
Total revenue	The total quantity sold multiplied by the price per unit, or ∑P*Q
Average revenue	Calculated by dividing total revenue by the number of items sold, AR=TR/Q
Marginal revenue	The change in total revenue divided by the change in quantity sold; simply, the additional revenue from selling one more unit, MR= ΔTR/ΔQ.

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

Total, Average, and Marginal Revenue

- **Under perfect competition**
  - The individual firm is a **price taker**. It must take the market price of its output as given, so it faces a perfectly elastic, horizontal demand curve.
  - Under conditions of perfect competition, price is dictated by the market; the firm has no control over price. As the firm sells one more unit, its TR rises by the exact amount of price per unit.
  - The firm's MR and the price of its product are identical. Additionally, the firm's average revenue (AR), or revenue per unit, is also equal to price per unit. **MR=P=AR**

Total, Average, and Marginal Revenue

- **Under imperfect competition**
  - Under conditions of imperfect competition, price is a variable under the firm's control, and therefore price is a function of quantity: P = f(Q), and TR = f(Q)*Q.
  - Firm that faces a negatively sloped demand curve must lower its price to sell an additional unit, so its MR is less than price (P).
  - Average revenue (AR) and marginal revenue (MR) will decline as quantity of goods sold increase. AR is not equal to MR for any quantities greater than zero. **Total revenue (TR) is maximized when MR=0.**
  - The relationship between MR, P, and price elasticity of demand: **MR=P[1-1/Ep]**

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

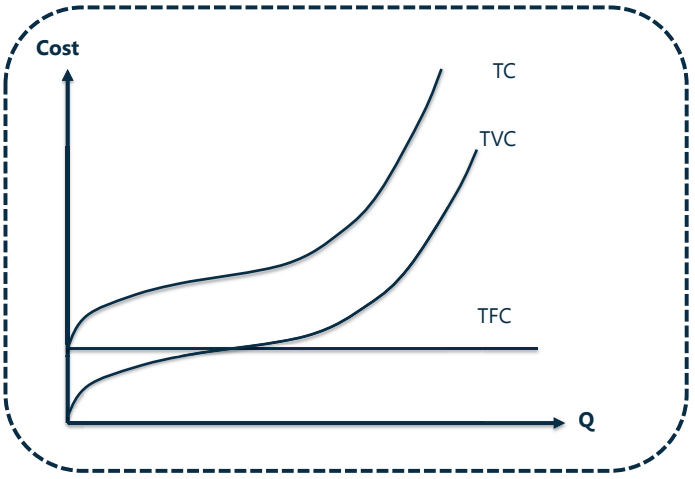
- To measure the **cost of the company**, the total cost, total fixed cost and total variable cost is used.

Term	Calculation
Total cost	The sum of all costs (fixed or variable, explicit and implicit) of producing a specific level of output.
Total fixed cost	The sum of all expenses that do not change as the level of production varies output over the period of analysis.
Total variable cost	The sum of all variable expenses; TVC rises with increased production and falls with decreased production.

Cost

- **Total cost** = total fixed cost + total variable cost
- **Marginal cost** = change in total cost / change in output
- **Average fixed cost** = total fixed cost / output
- **Average variable cost** = total variable cost / output
- **Average cost** = total cost / output = AFC+AVC

Total, Average, Marginal, Fixed, Variable costs



TC (total cost) = total fixed cost+ total variable cost

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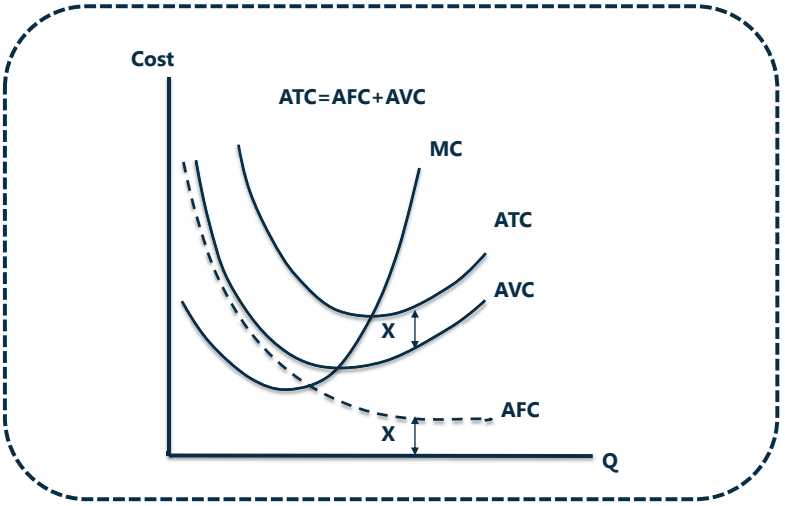
Total, Average, Marginal, Fixed, Variable costs

Average and Marginal Costs



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Total, Average, Marginal, Fixed, Variable costs

- AFC slopes downward.
- The vertical distance between the ATC and AVC curves is equal to AFC.
- **MC declines initially, then increases.**
- **MC intersects AVC and ATC at their minimum points.**
- ATC and AVC are U-shaped.
- Minimum point on the ATC curve represents the lowest cost per unit, but it is not necessarily the profit-maximizing point.
- TFC do not vary with output, so MC reflects only changes in TVC.

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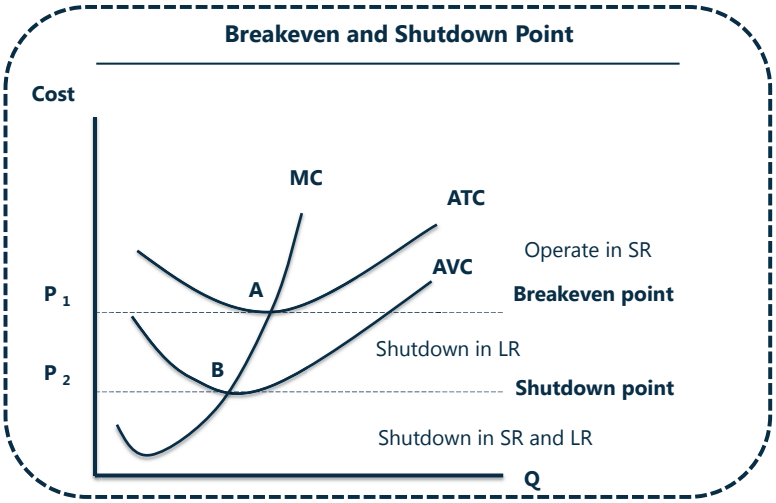
Profit Maximization

- **Profit maximization** occurs when
  - The difference between total revenue (TR) and total costs (TC) is the greatest;
  - **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.

Breakeven Point and Shutdown Point

- **Under perfect competition**



Breakeven Point and Shutdown Point

- **Under perfect competition**

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

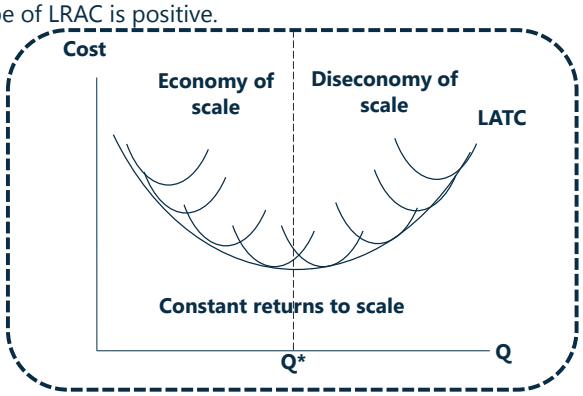
Breakeven Point and Shutdown Point

- **Under imperfect competition**

Revenue-Cost Relationship	Short-Run Decision	Long-Run Decision
TR > TC	Stay in market	Stay in market
TVC < TR < TC	Stay in market	Exit market
TR < TVC	Shut down production to zero	Exit market

Economies of Scale and Diseconomies of Scale

- **Economies of scale** occurs if cost per unit of production falls as input increases, and the slope of LRAC is negative.
- **Diseconomies of scale** occurs if cost per unit rises as input increases, and the slope of LRAC is positive.



Reading 15

The Firm and Market Structures

Framework

1. Identification of market structure
2. Perfect competition
3. Monopolistic competition
4. Oligopoly
5. Monopoly
6. Concentration measures

Market Structure Factors

- **Four types of structure**
  - Perfect competition:
  - Monopolistic competition;
  - Oligopoly;
  - Monopoly.
- **Factors that determine market structure:**
  - The number and relative size of firms supplying the product;
  - The degree of product differentiation;
  - The power of the seller over pricing decisions;
  - The relative strength of the barriers to market entry and exit;
  - The degree of non-price competition

Market Structure

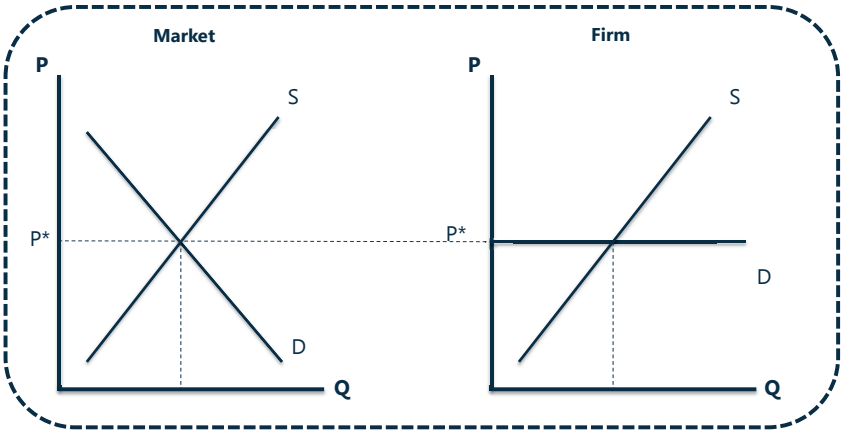
Type	Number of firms	Degree of difference of products	Difficulty to enter or leave	Pricing Power of Firm	The example in our life
Perfect competition	Many	No difference	Very easy	None	Some agricultural products
Monopolistic competition	Many	Some difference	Relatively easy	Some	Some retail products
Oligopoly	More than one, but not many	Little or no difference	Difficult	Some or Considerable	Steel, automobile, oil
Pure monopoly	Single	Sole product, nearly no substitute	No way	Considerable	Public sectors

Perfect Competition

- **The assumption of perfect competition**
  - There are a large number of potential buyers and sellers
  - The products offered by the sellers are virtually identical
  - There are few or easily surmountable barriers to entry and exit
  - Sellers have no market-pricing power
  - Non-price competition is absent
- 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 = Demand = Marginal Revenue = Average revenue).

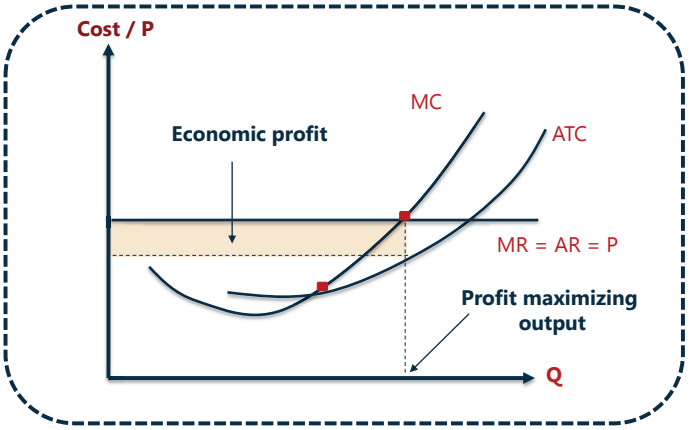
Perfect Competition

- **Firm and Market in Perfect Competition**



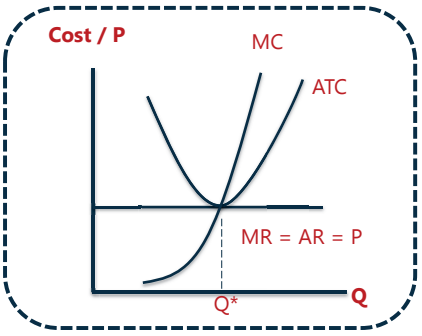
Perfect Competition

- **Perfectly competition firm's short-run equilibrium**
  - Profit max: MR=MC
  - MR=P=AR=D（price taker）



Perfect Competition

- **Individual firm's long-run equilibrium under perfect competition**
  - In the long-run, economic profit will attract other entrepreneurs to the market ➔more output
  - The long-run, firms operate at the point where MC= minimum ATC
  - So firms operate at the point **P=MR=MC=ATC**, no firms earn excess profit.



Monopolistic Competition

- **The following market and product features define monopolistic competition:**
  - There are a large number of independent sellers
    - ✓ Firms have small market shares in the market;
  - Each firm tries to make its products look different
    - ✓ The products offered by each seller are close substitutes for the products offered by other firms, but they are differentiated.
  - Firms have some pricing power;
  - Entry into and exit from the market are possible with fairly low costs.;
  - Firms in monopolistic competition has highly elasticity because each competing products are close substitutes.
  - Firms have a downward-sloping demand curves

Monopolistic Competition

- **Product development and marketing**
  - **Innovation and product development**
    - ✓ In short term, the demand is less elastic than demand in perfect competition firms, companies can earn economic profit;
    - ✓ In long term, close substitutes and imitations makes the market perform more like a perfect competition market with no economic profit left eventually;
    - ✓ To earn continuous economic profit, continuous innovation is needed.
  - **Brand recognition**
    - ✓ Firms can increase its economic profit by increasing its brand recognitions.

Monopolistic Competition

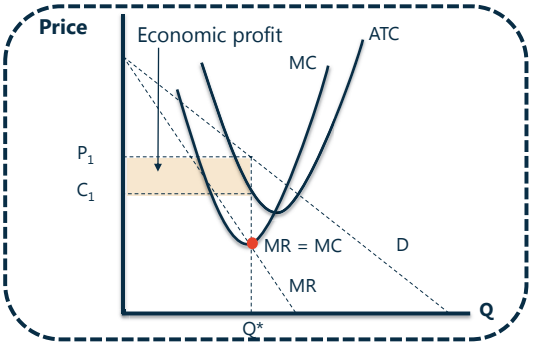
➢ **Product development and marketing**

- **Advertising**
  - ✓ Significant costs for monopolistic competition;
  - ✓ Tell customers about its uniqueness;
  - ✓ Advertising costs increase the ATC for monopolistic competition firms;
  - ✓ Increasing outputs;
  - ✓ If advertising increases the output of firms, it can reduce the ATC by decreasing the average fixed cost for firms.

Monopolistic Competition

➢ **Short-run equilibrium in monopolistic competition**

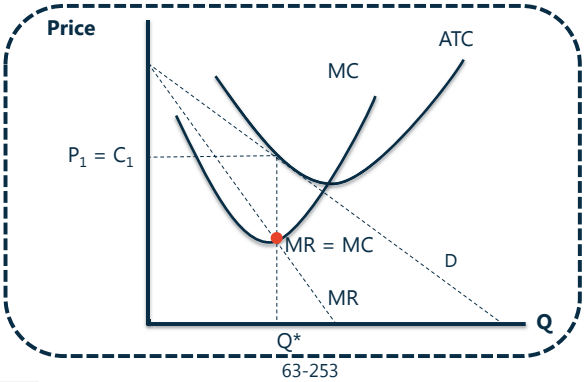
- In the short-run, the **monopolistic competition** perform like the **monopolistic market**, economic profit can earned by firms.
  - ✓ The **profit-maximizing** output is achieved where **MR = MC**.
- Because the product is somewhat different from that of the competitors, the firm can charge the price determined by the demand curve.



Monopolistic Competition

➢ **Long-run equilibrium in monopolistic competition**

- In the long run for the monopolistic competitive firm, the market perform like a perfect competition market.
  - ✓ **Economic profit will fall to zero**.
- In long-run equilibrium, output is still optimal at the level where **MR=MC**.



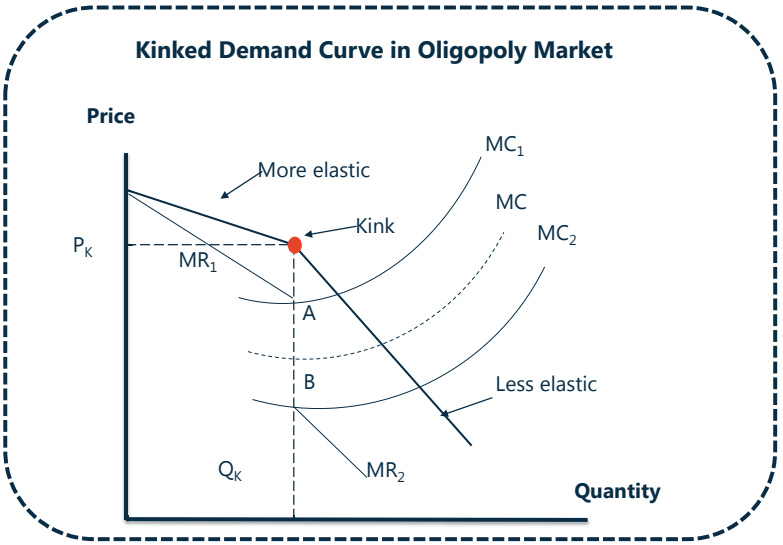
Oligopoly

- **Oligopoly** is a form of market competition characterized by:
  - A small number of sellers
  - Interdependence among competitors
  - Large economies of scale
  - Significant barriers to entry
  - Either similar or differentiated products
- Compared to monopolistic competition, an oligopoly market includes fewer firms, has higher barriers to entry, and its products are less elastic.
- In contrast to a monopolist, **oligopolies are highly dependent upon the actions of their rivals when making business decisions.**
- **Four models of oligopoly**
  - Kinked demand curve model
  - Cournot duopoly model
  - Nash equilibrium model (prisoner's dilemma)
  - Stackelberg dominant firm model

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 is constant, can't determine price.
  - 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: the factor which determines the market price is not included in the model, and it makes the model incomplete.

Kinked Demand Curve Model



Nash Equilibrium Model

- **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 Y is silent	**Prisoner Y confesses**
Prisoner X is silent	X gets 5 months Y gets 5 months	X gets 8 years Y goes free
Prisoner X confesses	X goes free Y gets 8 years	X gets 3 years Y gets 3 years

Collusion

- When collusive agreements are made openly and formally, the firms involved are called a **cartel**.
  - In some cases, collusion is successful; other times, the forces of competition overpower collusive behavior.
  - There are six major factors that affect the chances of successful collusion :
    - ✓ The number and size distribution of sellers;
    - ✓ The similarity of the products;
    - ✓ Cost structure;
    - ✓ Order size and frequency;
    - ✓ The strength and severity of retaliation;
    - ✓ The degree of external competition.

Dominant Firm Model

- **Dominant firm model**
  - A single firm that generally have 40% or greater market share.
    - ✓ Greater capacity;
    - ✓ Greater customer loyalty.
  - The dominant firm is the price maker
  - The other firms in the market follow the pricing pattern of the dominant firm.
- 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.
- Over time, the dominant company's market share tends to decrease as profit attract entry by other companies.

Monopoly

- **A monopoly is characterized by:**
  - There is a single seller of a highly differentiated product.
  - The product offered by the seller has no close substitute.
  - Entry into the market is very difficult, with high costs and significant barriers to competition.
  - The firm has considerable pricing power.
  - The product is differentiated through non-price strategies such as advertising.

Monopoly

- **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: radio and television station
  - 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

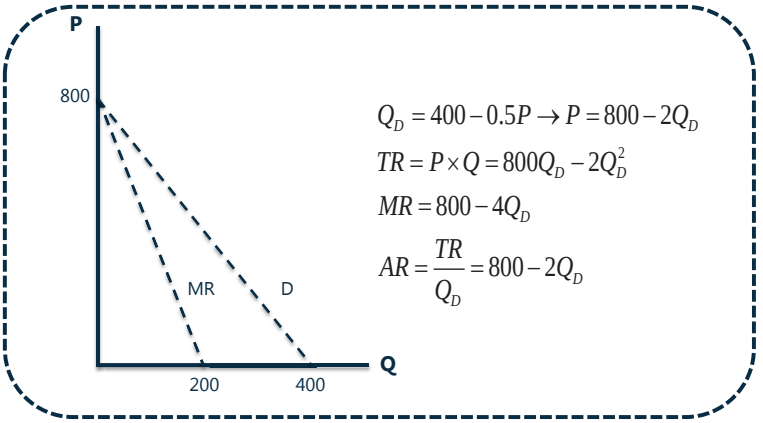
Monopoly

- The monopolist's demand schedule is the aggregate demand for the product in the relevant market. The slope of the demand curve is negative and therefore downward sloping.
- The **profit-maximizing** level of output occurs where marginal revenue equals marginal cost, **MR = MC.**
- The monopolists search to realize the maximum profit, instead of the maximum prices.
- To maximize its total profits, monopolists will produce less product and charge higher price for its product, compared to the perfect competition market.

Monopoly

➢ **Monopolist's demand and marginal revenue**

- Suppose a company operating on a remote island is the single seller of natural gas.

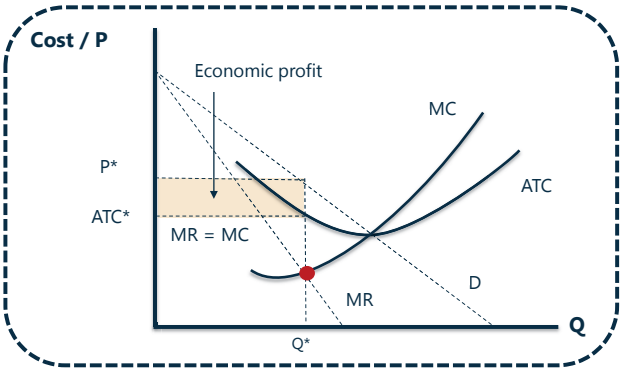


$$Q_D = 400 - 0.5P \rightarrow P = 800 - 2Q_D$$
$$TR = P \times Q = 800Q_D - 2Q_D^2$$
$$MR = 800 - 4Q_D$$
$$AR = \frac{TR}{Q_D} = 800 - 2Q_D$$

Monopoly

➢ **Monopolist's demand, marginal revenue, and cost structure**

- To maximize profit, monopolists will expand output until marginal revenue (MR) equals marginal cost (MC). (MR=MC)
- The relationship between MR and price elasticity, Ep, is: MR=P[1-1/Ep]
- Economic profit = (P*- ATC*) ×Q*



Price Discrimination

➢ **Price discrimination** is the practice of charging different consumers different prices for the same product or service.

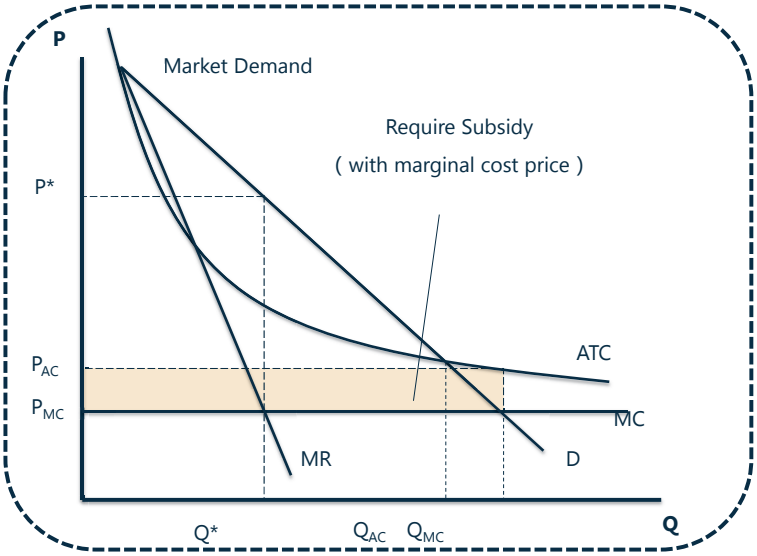
- **First-degree price discrimination**, where a monopolist is able to charge each customer the highest price the customer is willing to pay.
- **In second-degree price discrimination**, the monopolist offers a menu of quantity-based pricing options designed to induce customers to self-select based on how highly they value the product.
  - ✓ producers can use not just quantity but also the quality to charge more to customers that value the product highly.
- **Third-degree price discrimination** happens when customers are segregated by demographic or other traits.

Government Regulation

➢ **Government regulation**

- **Average cost pricing** is the more common form of regulation at the point where ATC=Demand. This will:
  - ✓ Increase output of monopolists to the demand, and decrease price.
  - ✓ Ensure the monopolist a normal profit with less social welfare reduced.
- **Marginal cost pricing** forces the monopolists to reduce its price to marginal price. This will:
  - ✓ Increase output and reduce price, the pricing method is similar in competitive market.
  - ✓ The monopolist suffer a loss for the price is below ATC.
  - ✓ Government subsidy is needed in order to provide the firm with a normal profit.

Government Regulation



Concentration Measures

➢ **Concentration measures**

- **The N-Firm Concentration Ratio:** the sum of the market share for largest N firms in a market in percentage aspect..
  - ✓ advantage: simple to compute, and easy to be understood
  - ✓ disadvantage: does not directly quantify market power
  - ✓ **limitation: the ratio is insensitive to the merger of two firms with large market shares.**
- **The Herfindahl-Hirschman Index (HHI):** summing the squares of the market shares for each company in an industry.
  - ✓ **limitation: either case do not consider the barrier to entry for the industry.** If the barriers to entry are low, even a firm is with high market share, it may not have too much pricing power.

Reading 16

Aggregate Output, Prices, and Economic Growth

Framework

1. GDP
2. IS curve and LM curve
3. Aggregate demand and aggregate supply
4. Economic growth and sustainability

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).

Gross Domestic Product (GDP)

- **Included：**
  - As a general rule, only the value of goods and services whose value can be determined by being sold in the market are included in the measurement of GDP.
    - ✓ Newly produced goods and services
    - ✓ Final goods and services
  - Two examples of services that are not sold in the marketplace but are still included in the measurement of GDP.
    - ✓ Owner-occupied housing: value from estimated rents
    - ✓ Government services: service provided by police officers, firemen, judges, and other government officials

Gross Domestic Product (GDP)

- **Excluded**(Non-market activity is excluded from GDP)
  - Activities performed for one's own benefit.
    - ✓ Babysitting own children
    - ✓ Clearing
  - Underground economic activities. Usually illegal activities or for the purpose of evading taxation. For example
    - ✓ Undocumented laborers who are paid "off the books" .
    - ✓ The illegal drug trade.
  - Barter transactions, such as neighbors exchanging services with each other.

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
  - 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.

Nominal and Real GDP

- **Nominal GDP:** Measures the value of goods and services measured at current prices

$$\text{Nominal GDP}_t = \sum P_t \times Q_t$$

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 in terms of a base-year if prices were unchanged.

$$\text{Real GDP}_t = \sum P_B \times Q_t$$

where

P_B = Prices in the base year

Q_t = Quantity produced in year t

- **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.

GDP Deflator

- In order to evaluate an **economy's health**, it is often useful to remove the effect of changes in the general price level on GDP because higher (lower) income driven solely by changes in the price level is not indicative of a higher (lower) level of economic activity.

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

GDP Measurement

- **The Value-of-Final-Output Method (以最终产品的价格计算OUTPUT)**
  - Expenditure Approach—summing the values of all final goods and services produced.
- **The Sum-of-Value-Added Method (以原材料和中间附加值累和计算OUTPUT)**
  - Add the additional value created at each stage of production and distribution.

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	

GDP Measurement

- GDP can be calculated with two approaches
  - **Expenditure approach**, GDP is equal to the sum of the amounts spent on goods and services produced during the period.
  - **Income approach**, GDP is equal to the sum of the amounts earned by households and companies during the period.
  - Since Total expenditures = total income. The equation will be hold for the whole economy. Hence expenditure approach and income approach will have same results.

GDP Measurement

- **Income approach**
  - GDP = National income + Capital consumption allowance (CCA) + Statistical discrepancy
    - ✓ CCA: measure of the wear and tear (**depreciation**) of the capital stock that occurs in the production of goods and services.
- **National income:** the income received by all factors of production used the generation of final output.
  - National income
    - = Compensation of employees 工人
    - + Corporate and government enterprise profits before taxes 企业，税前
    - + Interest income 资本
    - + Unincorporated business net income (proprietor's income) 企业家
    - + Rent 租金
    - + Indirect business taxes less subsidies 间接税

GDP Measurement

- **Personal income**

  = National income

  - Indirect business taxes
  - Corporate income taxes
  - Undistributed corporate profits
  + Transfer payments

  - One of the key determinants of consumption spending, measuring
    - ✓ Household income
    - ✓ Ability of consumers to make purchases. As such, it is Personal income
- **Personal disposable income** = personal income - personal taxes

GDP Measurement

- **Expenditure approach**
  - GDP = C +I+G+(X-M)
- where
  - 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 spending on final goods and services
  - X = Exports
  - M = Imports

Components of GDP

- To derive the aggregate demand curve, we need to understand the factors that determine each of the components of GDP:

1. **Consumption:** function of disposable income.
   - PI ↑ or taxes ↓ ⟶ both consumption and saving ↑
   - marginal propensity to consume (MPC): The proportion of additional income spent on consumption
   - MPC + MPS =1
2. **Investment:** a function of expected profitability and the cost of financing
   - Expected profitability depends on the overall level of economic output.
   - Financing costs are reflected in real interest rates
3. **Government purchases :** be viewed as independent of economic activity
4. **Net exports** are a function of domestic disposable incomes (which affect imports), foreign disposable incomes (which affect exports)

Saving, Investment, Fiscal and Trade Balance

- Total expenditures can be stated as
  GDP = C + I + G + (X - M) ①
- Total income, which must equal total expenditures, can be stated as
  GDP=C+S+T ②
  where:
  C = consumption spending
  S = household and business savings
  T = net taxes (taxes paid minus transfer payments received)
  ① = ② → S = I + (G - T) + (X - M)

Fiscal balance

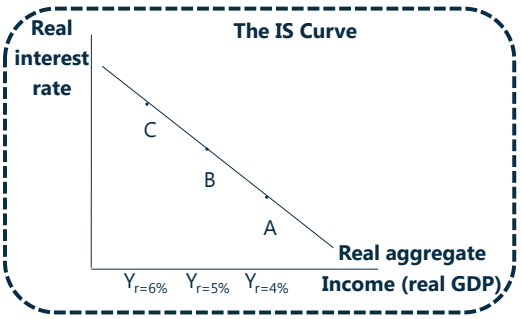
Trade balance

Also we can get: **(G - T) = (S - I) - (X - M)**

- A government deficit (G - T > 0) must be financed by some combination of a trade deficit (X - M < 0) or an excess of private saving over private investment (S - I > 0).

IS Curves

- **The IS Curve (income-savings)**



- Equilibrium in goods market:
  Y = C+I+G+NX
- r↑→I↓→Y↓
- Changes in r → **movements along** IS curve
- **Shift** in IS curve
  - G↑, expansionary, rightward
  - T ↑, contractionary, leftward

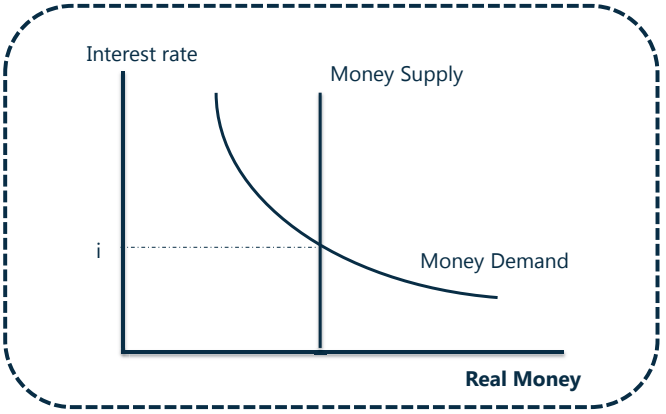
- The inverse relationship between r and Y is called the IS curve. Investment (I) and savings (S) are the primary variables that adjust to maintain the balance between expenditure and income.

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:
  - **Transactions money balances** that are held to finance transactions increase as the GDP grows. The ratio of transactions balances and GDP remains fairly stable.
  - **Precautionary money balances**: that are held to provide a buffer against unforeseen events that might require money.
  - **Speculative money balances** (portfolio demand for money): relates to the demand to hold speculative money balances based on the potential opportunities or risk that are inherent in other financial instruments (e.g., bonds). The speculative demand for money will tend to fall as the returns available on other financial assets rises.

Money Supply

- **Money Supply**
  - The supply of money remains constant, since it is predetermined by the central bank, resulting in vertical graph of money supply.



Classification of Money

- **Narrow money** is the amount of notes (currency) and coins in circulation in an economy plus balances in checkable bank 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.

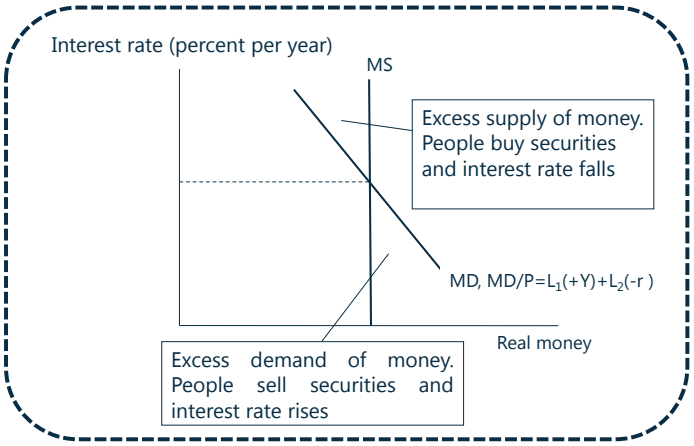
Classification of Money

- The European Central Bank describes their monetary aggregates as follows:

	M1	M2	M3
Currency in circulation	X	X	X
Overnight deposits	X	X	X
Deposits with an agreed maturity of up to 2 years		X	X
Deposits redeemable at notice of up to 3 months		X	X
Repurchase agreements			X
Money market fund shares / units			X
Debt securities issued with a maturity of up to 2 years			X

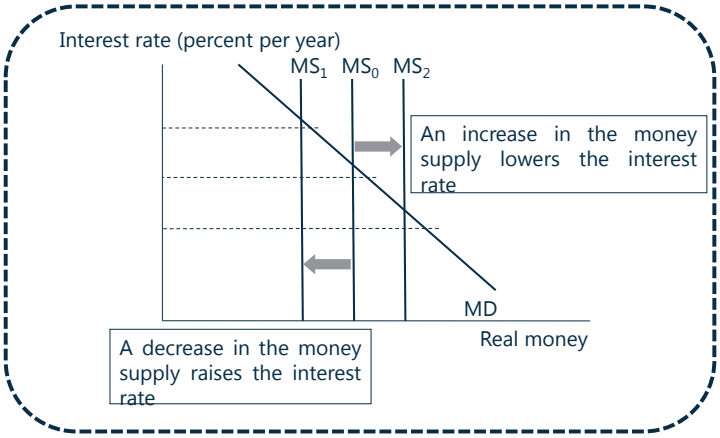
Determinants of Money Demand and Supply

- **Short-term interest rates are determined by the equilibrium between money supply and money demand**



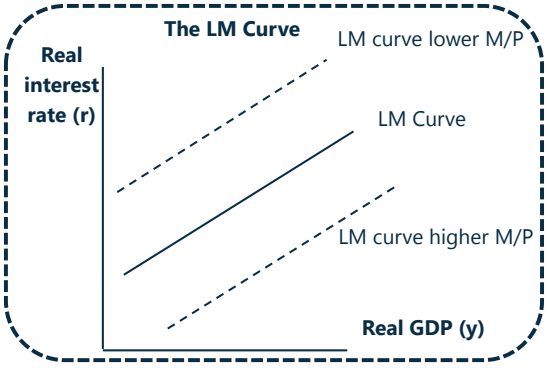
Determinants of Money Demand and Supply

- **Central bank can affect short-term interest rates by increasing or decreasing the money supply.**



LM Curves

- **The LM Curve (liquidity-money)**

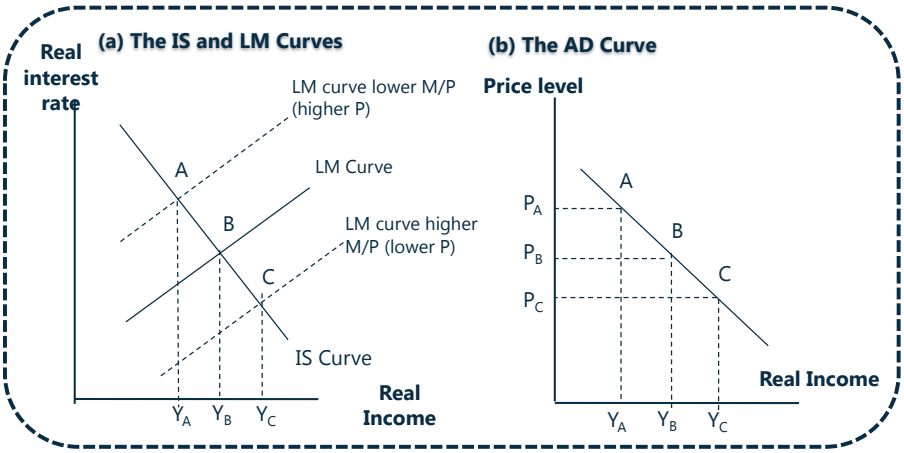


- Equilibrium in capital market: $M_D=M_S$, $M_S/P=L_1+L_2$
- $Y\uparrow \rightarrow L_1\uparrow \rightarrow L_2\downarrow \rightarrow r\uparrow$
- Changes in r → **movements along** LM curve
- **Shift** in LM curve
  - M↑ or P↓, M/P ↑, expansionary, rightward
  - M ↓ or P ↑, M/P ↓, contractionary, leftward

- Positive relationship between real income (Y) and the real interest rate (r) for a given level of the real money supply (M/P).

Aggregate Demand Curve

- **Deriving the Aggregate Demand Curve**

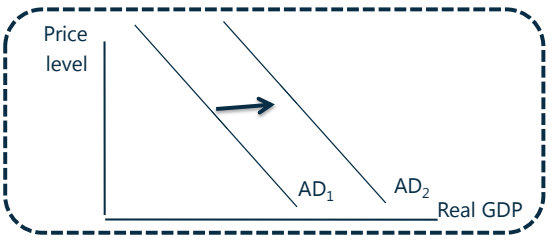


Aggregate Demand Curve

- **Holding the nominal money supply (MS) constant:**
  - Price level (P) ↓→ real money supply (MS/P) ↑
  - To increase real money demand to the new level of real money supply, Real income (Y)↑→ interest rate (r)↓. Vise versa.
- **Definition:**
  - The inverse relationship between P and Y is presented on aggregate demand curve (AD curve).
- **Representation of points on AD curve (Y, P)**
  - A combination of real interest rate (r) and income (Y) at the equilibrium of
    - ✓ goods market: points along IS curve that makes planned expenditures and actual income equal;
    - ✓ capital market: points along LM curve that makes the real money demand equals to real money supply.

Aggregate Demand Curve

- **Movement along AD curve**
  - Change in price level
- **Shifts in AD curve**
  - Household wealth;
  - Consumer and business expectations;
  - Capacity utilization;
  - Monetary policy;
  - Growth in global economy;
  - Exchange rate;
  - Fiscal policy.



Shifts in the Aggregate Demand Curve

- **Capacity Utilization**
  - Companies with excess capacity have little incentive to invest in new property, plant, and equipment. In contrast, when companies are operating at or near full capacity, they will need to **increase investment** spending in order to expand production.
- **Fiscal Policy**
  - Expansionary fiscal policy with fiscal deficit (G>T) will prompt aggregate demand. **(C increases as tax cut, G increases for spending increase)**
- **Monetary Policy**
  - Money is generally defined as currency in circulation plus deposits at commercial banks.
  - Monetary policy refers to action taken by a nation's central bank to affect aggregate output and prices through changes in bank reserves, reserve requirements, or its target interest rate.

Shifts in the Aggregate Demand Curve

- **Monetary Policy (cont.)**
  - The central bank can increase the money supply by
    - ✓ buying securities from banks,
    - ✓ lowering the required reserve ratio, and/or
    - ✓ reducing its target for the interest rate at which banks borrow and lend reserves among themselves.
  - In each case, the opposite action would decrease the money supply.
  - When the money supply increases, more money is available for commercial banks to lend, hence pushing interest rate to decline. The real cost of borrowers will decline in consequence, thus prompting **investments (I) and consumptions (C)**, especially for buying long-term assets (e.g. cars).

Shifts in the Aggregate Demand Curve

- **Exchange Rate**
  - **The price of one currency relative to another**.
  - Depreciation in domestic currency results in increase in exports (X) and decrease in imports (M), since the domestic products are relatively cheaper than foreign ones.
  - **Net export (NX) increases** and pushes AD rightward.
- **Growth in the Global Economy**
  - The increasingly development of the rest of the world will stimulate domestic demands as well, pushing AD curve rightward.
  - Demand of domestic products increases, thus increasing aggregate demand. **(NX increases).**

Shifts in the Aggregate Demand 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)	Leftward: Decrease in AD	Lower exports and higher imports
Global growth	Rightward: Increase in AD	Higher exports

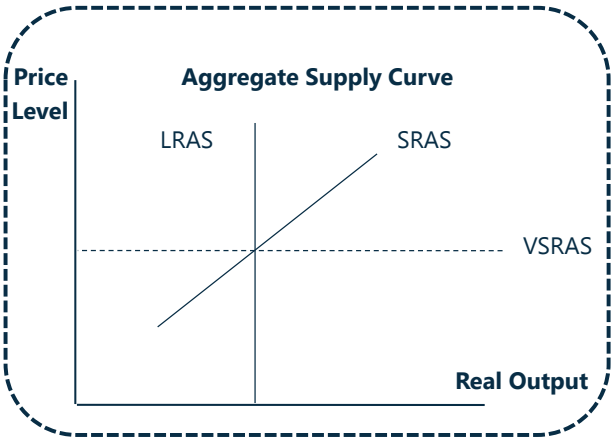
Aggregate Supply Curve

- **Aggregate supply curve (AS curve):** the level of domestic output (Y) that companies will produce at each price level (P).
- **Very short-run aggregate supply (VSRAS) curve**
  - Horizontal, Perfectly elastic, since in the very short run, companies will increase or decrease output to some degree without changing price.
  - Demand increases. To maintain higher profits, companies
    - ✓ Increase output as long as they can cover their variable costs
    - ✓ Run PPE more intensively
    - ✓ Increase the working hours of employees
  - Vise versa.
- **Short-run aggregate supply (SRAS) curve**
  - Upward sloping, because of inflexibility of wages and other input costs in the short run.
  - As the price level **rises** →**higher** profit margins → **expand** production.

Aggregate Supply Curve

- **Long-run aggregate supply (LRAS) curve**
  - Vertical, perfectly inelastic, since
    - ✓ **wages and input** prices change proportionately with **price** level over the long run.
    - ✓ Thus **price level** has no impact on **aggregate supply**.
  - Position of the LRAS curve is determined by
    - ✓ potential output of the economy (long-run equilibrium level of output, full employment, or natural, level of output)
      - ◆The amount of output produced depends on the fixed amount of capital and labor and the available technology.
      - ◆At this level of output, the economy's resources are deemed to be fully employed and (labor) unemployment is at its natural rate.

Aggregate Supply Curve



VSRAS: Price level will not affect real output.

LRAS: Prices adjust proportionally with the price of input. Price level will not affect real output.

SRAS: downward stickiness of wages

- P↑, constant nominal wage→ real wage↓ →cost↓→employ more workers → Y↑. Vise Versa.

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Shifts in the SR Aggregate Supply Curve

- **Shifts in the Short-Run Aggregate Supply Curve (SRAS)**
  - **nominal wages** increases
    - ✓ cost of production increases, shift leftward.
  - **input prices**, including the price of natural resources, increases,
    - ✓ cost of production increases, shift left ward.
  - **expectations about future output prices and the overall price level** increases, (shift, current price can only cause movements along curve)
    - ✓ the expected future cost of production increases, increase short-term production, shift rightward.
    - ✓ However, need to trade off between storage costs and expected future production costs.
  - **business taxes and subsidies**
    - ✓ Tax increases, cost of production increases, shift leftward.
    - ✓ Subsidies increases, production costs decrease, shift rightward.
  - **exchange rate**
    - ✓ Appreciation of domestic currency, cost of imported material decrease, shift rightward.

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Shifts in the LR Aggregate Supply Curve

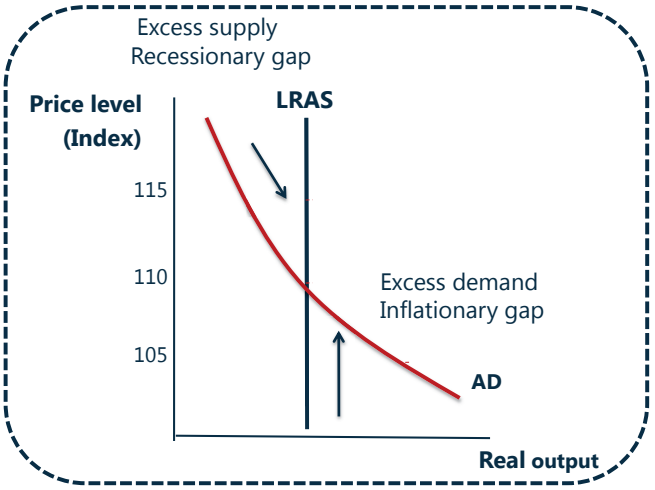
- **Shift in Long-Run Aggregate Supply (LRAS):** measures the potential GDP, real GDP under full employment, that reflects the productivity of a region.
- **Influencing factors**
  - **Drivers of labor productivity**
    - ✓ physical capital per worker
      - ◆Increases in **availability of resources** shift rightward.
    - ✓ quality of the workforce
      - ◆Improvement in the **quality of the labor force** shifts the LRAS curve to the right.
    - ✓ Technology
      - ◆Advances in **technology** shift the LRAS curve to the right.
  - Increases in the **labor supply,** shift rightward.
  - Strong growth in **business investment**, which increases the supply of physical capital, shifts the LRAS curve to the right.

Shifts in the SR Aggregate Supply Curve

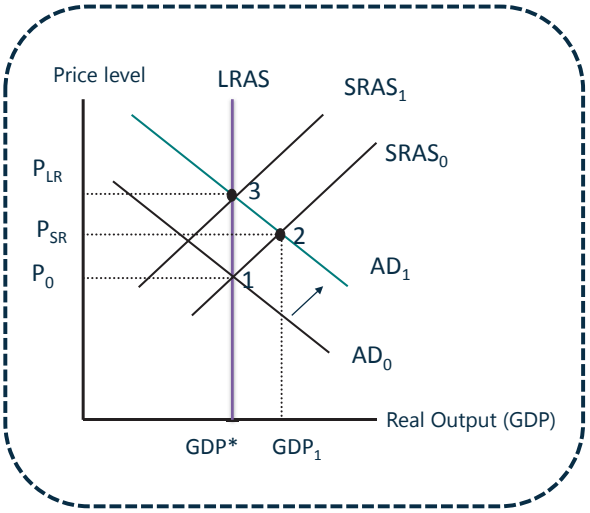
Impact of Factors Shifting Aggregate Supply			
An Increase in	Shifts SRAS	Shifts LRAS	Reason
Supply of labor	Rightward	Rightward	Increases resource base
Supply of natural resources	Rightward	Rightward	Increases resource base
Supply of human capital	Rightward	Rightward	Increases resource base
Supply of physical capital	Rightward	Rightward	Increases resource base
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	Rightward	**No impact**	Lowers cost of production

Long-Run Equilibrium Real Output

- **Long-Run Equilibrium Real Output**



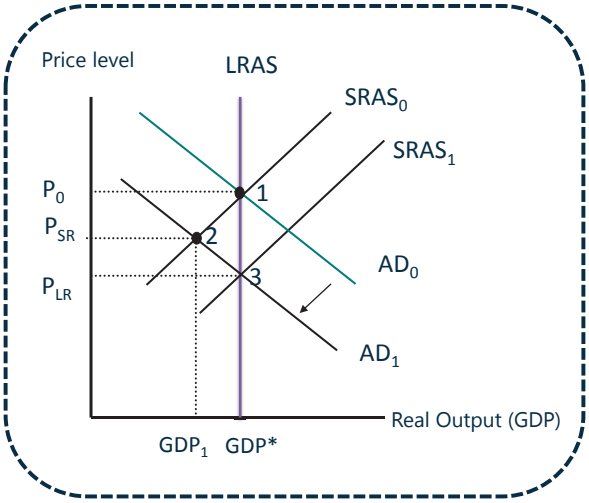
Adjustment to an Increase in AD



1 → 2: Increase in aggregate demand → Higher output and higher price
2 → 3: Increase in wages and production costs → decrease in supply

$AD_0 \rightarrow AD_1 \uparrow$
$SRAS_0 \rightarrow SRAS_1 \downarrow$
$P_0 \rightarrow P_{SR} \rightarrow P_{LR} \uparrow$

Adjustment to a Decrease in AD



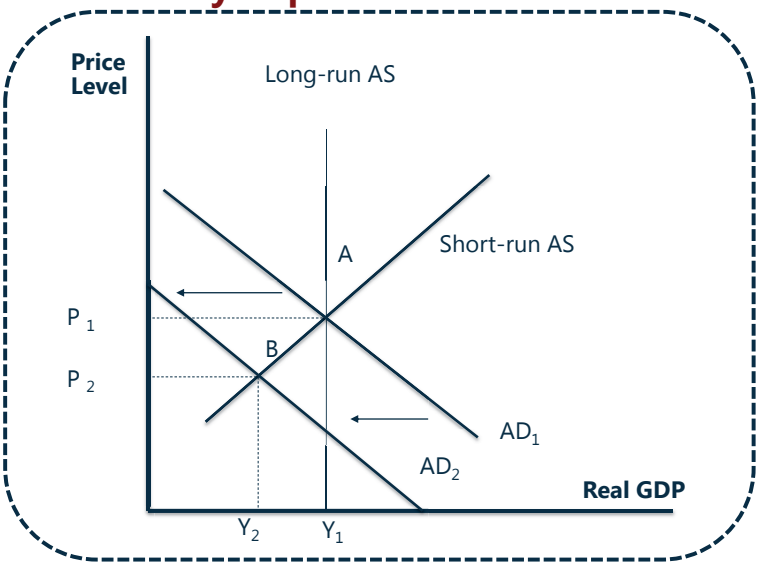
1 → 2: Decrease in aggregate demand → Lower output and lower price
2 → 3: decrease in wages and production costs → increase in supply

$AD_0 \rightarrow AD_1\downarrow$
$SRAS_0 \rightarrow SRAS_1\uparrow$
$P_0 \rightarrow P_{SR} \rightarrow P_{LR}\downarrow$

Recessionary Gap

- **Phenomenon:**
  - AD leftward shifts, employ less, increase in unemployment rate, economic recession.
  - $GDP_{Expected} < GDP_{potential}$
  - Decrease in price, and decrease in GDP
- **Solution: back to full employment**
  - Auto mechanism: prices decrease, increase in unemployment, nominal wages decrease. The decrease in price will relatively increase real purchasing power, thus pushing SRAS shifts right back to full employment. However, the mechanism will take a long term to be effective.
  - Government interference: loosening fiscal policy (increase G and decrease T) and monetary policy (decrease r), pushing AD back to potential GDP and increasing price level as well.

Recessionary Gap



Inflationary Gap

- **Phenomenon:**
  - AD rightward shifts
  - $GDP_{Expected} > GDP_{potential}$
  - Price increases.
- **Solution:** The higher than potential GDP cannot be sustainable, since the excessive usage of resources will reduce it to potential GDP.
  - Auto mechanism: The increase in wages and input costs will reduce SRAS, and push GDP to $GDP_{potential}$.
  - Government interference:
    - ✓ Fiscal policy: Decrease G, increase T.
    - ✓ Monetary policy: decrease required reserves, decrease money supply, or increase interest rate.

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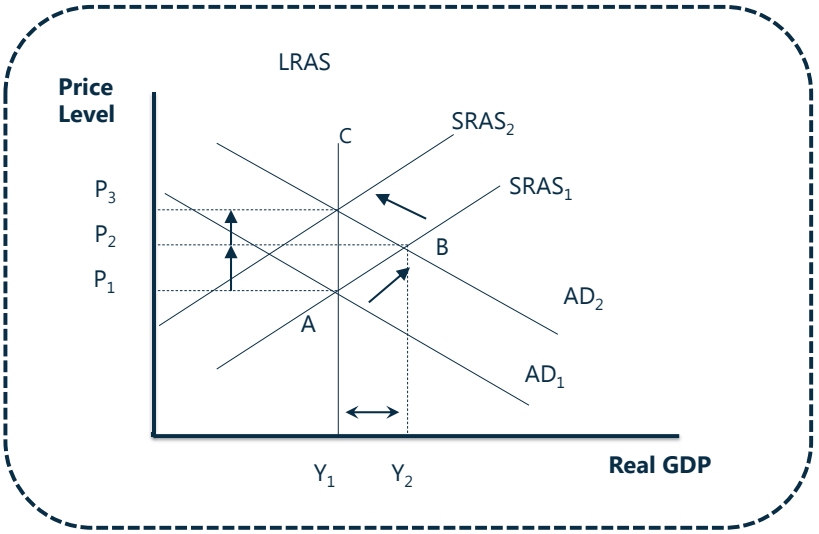
Inflationary Gap



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Stagflation

- **Phenomenon:**
  - Aggregate supply decrease, price increases, GDP decreases, inflation increases, unemployment rate increases.
- **Reasons:**
  - Increase in input costs decreases aggregate supply.
- **Solutions:**
  - Auto mechanism: (need long time to adjust)
    - ✓ Decrease in GDP, increase in unemployment.
    - ✓ Decrease in wages, decrease in input prices, SRAS shifts right, and reach full employment.
  - Government interference: (dilemma)
    - ✓ Expansionary fiscal policy: Increase G, decrease T, resulting in more inflation.
    - ✓ Contractionary monetary policy: decrease required reserves, decrease money supply, or increase interest rate, resulting in further recession.

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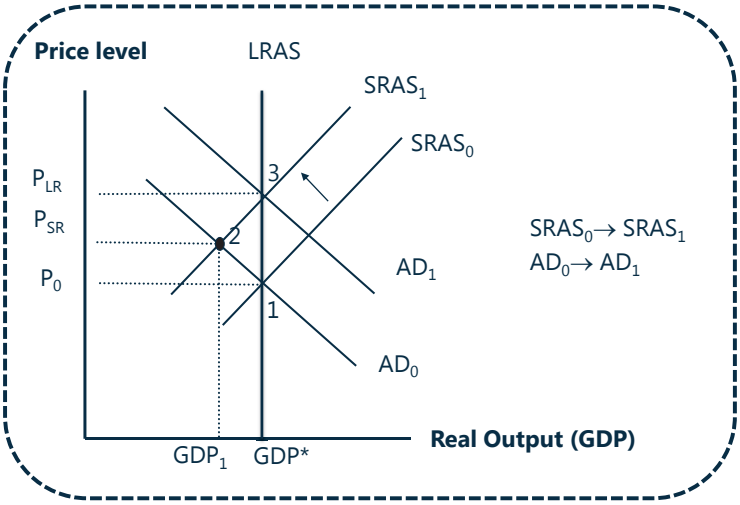
Stagflation



Effect of combined changes in AS and AD

Change in AS	Change in AD	Effect on Real GDP	Effect on Aggregate Price Level
Increase	Increase	Increase	Indeterminate
Decrease	Decrease	Decrease	Indeterminate
Increase	Decrease	Indeterminate	Decrease
Decrease	Increase	Indeterminate	Increase

Sources of Economic Growth

- **Labor supply** (people older than 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
    - ✓ have more human capital;
    - ✓ and can be more capable in keeping up with technology advance.
  - **Investment** in human capital → **greater** economic growth.

Sources of 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

Production Function

- A **production function**: relationship of output (Y) with labor (L), capital (K), and level of technology (A) that determines the productivity.

Y = A ×*f* (L, K) **($Y = TK^{\alpha}L^{(1-\alpha)}$)**

where: Cobb-Douglas production function

Y = aggregate economic output ;

L = size of labor force;

K = amount of capital available ;

A = total factor productivity

- **Total factor productivity** is a scale factor that reflects the portion of growth that is not accounted for by the capital and labor inputs.
  - ✓ The main factor influencing TFP is technological change.
  - ✓ Like potential GDP, TFP is not directly observed in the economy and must be estimated.
- It exhibits **constant returns to scale**: increasing all inputs by a fixed percentage leads to the same percentage increase in output.

Growth & Growth of Total Factor Productivity

- Using the production, economists developed a model that explained the contribution of labor, capital, and technology (total factor productivity) to economic growth:

growth in potential GDP

= growth in technology + W_L(growth in labor) + W_C (growth in capital)

where W_L and W_c are the relative shares of labor and capital in national income.

Growth & Growth of Total Factor Productivity

- 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 and a remain constant, increases in output can be gained by increasing capital per worker **(capital deepening)** or by improving technology (increasing TFP).

Growth & Growth of Total Factor Productivity

- 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 X 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

Reading 17

Understanding Business Cycles

Framework

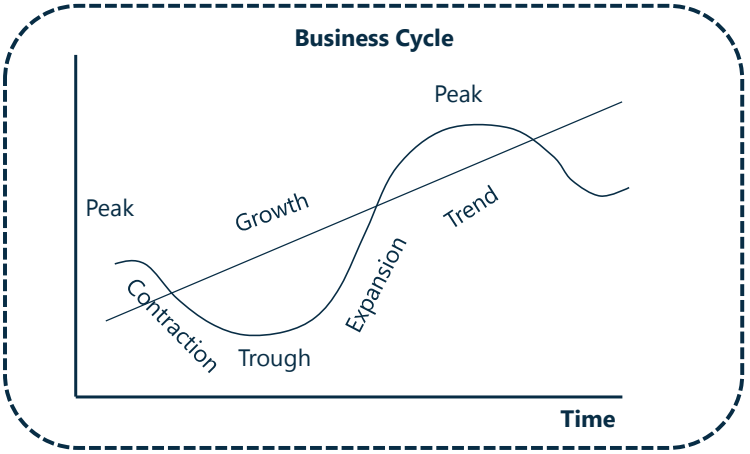
1. Business cycles
2. Theories of business cycles
3. Unemployment
4. Inflation
5. Economic indicators

Business Cycles

- **Business cycle:** A cycle found in economies that relies primarily on business enterprises. The cycle consists of four phases, including expansions, recessions, contractions, and revivals, that occur in sequence and in almost every sector in the nation. The wave appears cyclic but do not definitely have same duration. Normally, the business cycle varies from 1 to 12 years.
- **Five Characteristic of a Typical Business Cycle:**
  - Occur in economics relying on business enterprises
  - Expected sequence of phase:
    - ✓ Expansion
    - ✓ Peak
    - ✓ Contraction
    - ✓ Trough
  - Phases occurred in all sectors of the economy
  - Recurrent cycle, not periodic
  - Lasts between 1 to 12 years

Business Cycles

- **Business cycle has four phases: trough \ expansion \ peak \ contraction**



Resource use fluctuation

- **Fluctuation in Inventory**
  - Measured by **inventory-sales ratio**
  - Indicating of different stages:
    - ✓ **Expansion approaching the peak** (复苏后期)
      - ◆inventory-sales ratio increases above normal level with depressed sales, since companies lag in cutting production in response of slowing sales.
    - ✓ **Contraction reaching the trough** (衰退后期)
      - ◆inventory-sales ratio falls back or decrease below normal level with increasing sales, since productions increase after the disposal of excess inventories.

Resource use fluctuation

- **Utilization of labor levels:**
  - Changing the number of workers with business cycle costs firm through:
    - ✓ direct expenses; and
    - ✓ damage it would do to employee morale and loyalty.
  - Alternatively, firms changes the utilization of current workers
    - ✓ increases (decreases) the products produced hourly
    - ✓ adjusting the hours they work
  - Firms hire or lay off employers when they perceived the business cycle to be persistent.

Resource use fluctuation

- **Fluctuation in Capital Spending**
  - Measured by **number of orders in tangible assets**
  - **Different stages**:
    - ✓ **Early stage of contraction**:
      - ◆Capital spending, reflected by the number of orders in tangible assets, decreases as the companies' reaction of the declining aggregate demand. Moreover, the cutbacks will reinforce the economic downturn.
    - ✓ **Early stage of an expansion**:
      - ◆Capital spending may increase, despite of excess production capacity, because companies have financial ability to do so and because managers tend to reinstate orders to enhance efficiency.

Housing Sector Activity

- **Housing sector** plays a vital role in the fluctuation of economy relative to its small size.
- **Factors Impacting Housing Sector:**
  - **Interest rate**: Home buying and constructions financed by mortgages **shrank** with **highs** in interest rate and expanded with lows.
  - **Income level**: Housing demand **rises** when the **prices of real estates** are **low** relative to income.
  - **Investment**: People have an illusion of unlimited increase in housing prices, resulting in overbuilding and severe corrections.
  - **Shifts in demographics**: A country with **more** household formation, typically people aged from 25-40, can somehow **recovery more quickly** from excess inventories in the real estate market.

External Trade Sector Activity

- The **priority of external trade sector** depends on the relative reliance of the economic entity on international trades.
- **Signals in International Trades:**
  - Imports rise with the pace of domestic GDP growth.
  - Exports reflect more of the foreign economic condition. Foreign incomes increases → sales to foreigners (exports) increases ; economic growth in foreign countries decreases → domestic exports decreases.
  - Movements in the strength of currency affect imports positively and exports negatively.

Business Cycle Characteristics

	Early Expansion (Recovery)	Late Expansion	Peak	Contraction (Recession)
Economic Activity	■ Gross domestic product (GDP), industrial production, and other measures of economic activity stabilize and then begin to increase.	■ Activity measures show an accelerating rate of growth.	■ Activity measures show decelerating rate of growth.	■ Activity measures show outright declines.
Employment	■ Layoffs slow but new hiring does not yet occur and the unem-ployment rate remains high. Business turns to overtime and temporary employees to meet rising product demands.	■ Business begins full time rehiring as overtime hours rise. The unemployment rate falls.	■ Business slows its rate of hiring. The unemployment rate continues to fall but at a decreasing rate.	■ Business first cuts hours and freezes hiring, followed by outright layoffs. The unemployment rate rises.

Business Cycle Characteristics

	Early Expansion (Recovery)	Late Expansion	Peak	Contraction (Recession)
Consumer and Business Spending	■ Upturn in spending often most pronounced in housing, durable consumer items, and orders for light producer equipment.	■ Upturn in spending becomes more broad-based. Business begins to order heavy equipment and engage in construction.	■ Capital spending expands rapidly, but the growth rate of spending starts to slow down.	■ Decreased spending most evident in industrial production, housing, consumer durable items, and orders for new business equipment.
Inflation	■ Inflation remains moderate and may continue to fall.	■ Inflation picks up modestly.	■ Inflation further accelerates.	■ Inflation decelerates but with a lag.

Theories of the Business Cycle

➢ **Keynesian School**

- **Conclusion**:
  - ✓ **Business cycle is primarily caused by shifts in demand curve** and can be eased by fiscal policies.
  - ✓ A reduction in wage has **downward stickiness** in short term.
- **Limitations**:
  - ✓ Fiscal deficit is a danger to government finance.
  - ✓ Expansionary fiscal policy may cause "overheat".
  - ✓ Fiscal policy has a time lag.

由于对于未来的预期的改变导致了总需求的改变，从而引起了经济周期

主张：政府直接干预经济

Theories of the Business Cycle

➢ **New Keynesians (Neo-Keynesians)**

- **Conclusion**:
  - ✓ New Keynesians assume the stickiness of price in short term, so government intervention is instead necessary to push the economy back to the long-term equilibrium.
- **"Menu cost":** It is costly for companies to adjust price frequently to make markets clear.

Theories of the Business Cycle

- **Monetarist School（联系PPT 176页 MV=PY）**
  - **Conclusion**:
    - ✓ **Volatilities in growth of money supply causes business cycle**.
    - ✓ The timing of government policies is uncertain, and it is generally better to let the economy find its new equilibrium automatically.
  - **Objections to Keynesian**:
    - ✓ Keynesians ignore the importance of money supply. When M2 increases, the economy will experience a boom and vise versa.
    - ✓ Keynesians lack a complete representation of utility-maximizing agents.
    - ✓ The intervention from the government is costly in long run.
    - ✓ Time lag

由于央行无规律的货币供给导致了经济周期，主张央行不要乱发货币

Theories of the Business Cycle

- **Neoclassical School**
  - **Conclusion:**
    - ✓ **General equilibrium.** All markets will reach equilibrium because of the "invisible hand, or free market," and the price will be found for every good at which supply equals demand.
    - ✓ **Technology progress** causes cycles within industry, but no economy-wide fluctuation.
  - **Limitations:**
    - ✓ Fail to explain business cycles or a massive crisis, such as Great Depression of the 1930s.

技术的改变引起经济周期，主张政府不要干预经济

Theories of the Business Cycle

- **Austrian School**
  - **Conclusions**:
    - ✓ Share several views with **neoclassical theory**, but focus on the role of money and government.
    - ✓ The fluctuation is caused by government intervention, and money is just a way to simplify exchange.
    - ✓ Government should **not** intervene in the economy.

政府参与引起经济周期，主张政府不要干预经济

Theories of the Business Cycle

- **Real Business Cycle Theory (New classical, model without money)**
  - **Conclusions**:
    - ✓ The business cycle is an efficient reaction to external real shocks.
    - ✓ Government should **not** intervene in the economy.
    - ✓ Focus more on shift in demand curve, comparing to Keynes.
  - **Limitations**:
    - ✓ Fail to explain unemployment, along with decreasing required salaries, in labor market during recession.

实际经济变量（外部冲击&技术）影响了经济周期，主张政府不要干预

Key Terms in the Labor Market

- **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** (activity ratio/labor force participation rate)

$$\text{Labor force participation rate} = \frac{\text{labor force}}{\text{Working} - \text{age population}} \times 100$$

Key Terms in the Labor Market

- **Unemployed:**
  - **Long-term unemployed**: people who have been out of work for a long time (more than 3 to 4 months) but are still looking for jobs
  - **Frictionally unemployed**: people unemployed due to looking for a job that fits their interests, skills and other preferences or people who are **"between" jobs**
  - **Structural unemployment**: people unemployed due to **"skills gap",** a gap between the skills of workers and skills required for the positions offered
  - **Cyclical unemployment**: people unemployed due to business cycles

Key Terms in the Labor Market

- **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.
  - Because every individual provides a different type and quality of labor, some segments of the economy may have trouble finding enough qualified workers even during a contraction. As a result, **the non-accelerating inflation rate of unemployment (NAIRU)**, also called the natural rate of unemployment (NARU), can be higher than the rate associated with the absence of cyclical unemployment. (自然失业率：充分就业下的失业率 or 不会造成通胀的失业率)

Key Terms in the Labor Market

- **Underemployed**: person who has a job but has the qualifications to work a significantly higher-paying job.
- **Discouraged worker**: person who has stopped looking for a job. When economy returns to be good, the unemployment rate will increase because the discouraged workers enter the labor force and has not found the job.
- **Voluntarily unemployed**: person voluntarily outside the labor force.
  - such as a jobless worker refusing an available vacancy for which the wage is lower than their threshold or those who retired early.

Inflation, Deflation and Disinflation

- **Inflation**
  - Inflation refers to a sustainable rise of the price in all sectors in an economy.
  - **Inflation rate** is the percentage change in a price index-the speed of the overall price level movements.
- **Hyperinflation:** an extremely fast increase in aggregate price level, which corresponds to an extremely high inflation rate.
- **Deflation:** a sustained decrease in aggregate price level, which corresponds to a negative inflation rate.
- **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).

Measures of Inflation: CPI

- **CPI**
  - More weights are assigned to food in developing countries.
  - United States price indexes:
    - ✓ CPI-U covers only urban areas using a household survey.
    - ✓ Personal Consumption Expenditures (PCE) covers all personal consumptions in the United States using business survey.

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

  - Different CPI in different countries and regions results from
    - ✓ Different compositions;
    - ✓ Different weights assigned to reflect consumption patterns;
    - ✓ Different collected data.

Other Inflation Measurements

- **Producer Price Index (PPI)/ Wholesale Price Index (WPI):**
  - reflects the price changes experienced by domestic producers in a country.
- **GDP Deflator**
- **Headline and Core Inflation**
  - **Headline inflation**: basket of **all** goods and services.
    - ✓ Ultimate goal of government;
    - ✓ Represent actual cost of living.
  - **Core inflation**: basket of goods **excludes food and energy.**
    - ✓ Avoid overreactions to short-term fluctuation in food and energy sector.

Example-CPI calculation

Items	Quantity in base period	price in base period	Quantity in current period	Current price
Pizza	150	4	200	5
Movie tickets	70	9	75	12
Gasoline (in gallons)	200	3	150	3
Digital watches	300	10	270	9

Solutions:			
Reference base period:		Current period:	
Pizza	200 x 4 = 800	Pizza	200 x 5=1000
Movie tickets	75 x 9 = 675	Movie tickets	75 x 12=900
Gasoline	150 x 3 = 450	Gasoline	150 x 3 = 450
Watches	270 x 10 = 2700	Watches	270 x 9=2430
Cost of basket	4,625.00	Cost of basket	4,780.00
Paasche index = 4780/4625*100=103.35			

Measures of Inflation: Price Index

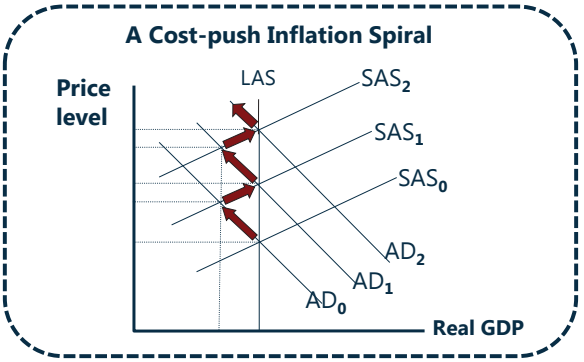
- **Price index for personal consumption expenditures.**
  - A price index represents the average prices of a basket of goods and services, and various methods can be used to average the different prices.
- **Laspeyres Index**
  - A price index created by holding the composition of the consumption **basket constant** is called a Laspeyres index.
  - **Bias:**
    - ✓ **Substitution bias**: an **upward** bias created when people shift from a good in the basket with rising price to its **substitute**.
    - ✓ **Quality bias**: an **upward** bias created when people move to **products with higher quality**.
    - ✓ **New product bias**: an **upward** bias created when people move to **new products**.

Measures of Inflation: Price Index

- **Solutions to Biases in Laspeyres Index**
  - Many countries adjust for the quality of the products in a basket, a practice called **hedonic pricing**.
  - New products can be introduced into the basket over time.
  - The **solution to substitution bias** is to use chained price index formula:
    - ✓ **Paasche index**: Using the **current composition of the basket** instead of a constant basket of products.
    - ✓ **Fisher index**: geometric mean of the **Laspeyres index** and **Paasche index.**
      - ◆**Formula:** $I_F = \sqrt{I_P \times I_L}$

Cost-push inflation

- **Cost-push inflation:** An inflation that results from an initial increase in costs is called cost-push inflation.
- The **two main sources of increases in costs are increase in money wage rates and increase in the money prices of raw materials.**



Cost-push inflation

- **Steps in Cost-push Inflation:**
  - Step1: money wage rate & money prices of raw materials↑ →SAS shifts left ($SAS_0 \rightarrow SAS_1$) → stagflation (the price level increases and the economy experiences inflation)
  - Step2: the Fed increases the quantity of money → AD shifts right($AD_0 \rightarrow AD_1$)
  - Step3: the price of goods↑ → the price of material↑ → stagflation→ Prices will continue to rise.

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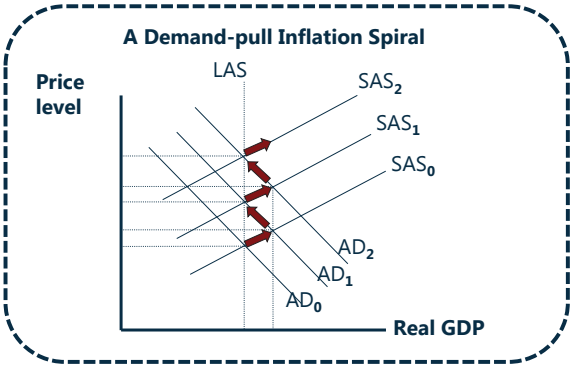
Demand-pull Inflation

- **Demand-pull inflation:** an inflation that results from an initial increase in aggregate demand
  - Increase in the quantity of money
  - Increase in government purchases
  - Increase in exports



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Demand-pull Inflation

- **Steps in Demand-pull Inflation:**
  - Step1: $AD_0 \rightarrow AD_1$, real GDP > potential GDP& inflation gap (short run)
  - Step2: workers demand higher money wage rate, $SAS_0 \rightarrow SAS_1$ (long run)
  - Step3: AD increases year after year. AD puts continual upward pressure on the price level. The economy now experience demand-pull inflation. (Prices will continue to rise.)

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Economic Indicators

- **Leading economic indicators:** have turning points that usually precede overall economy
- **Coincident economic indicators:** have turning points that are usually close to overall economy
- **Lagging economic indicators:** have turning points that are usually later to overall economy
  - We should be aware that the classification leading, coincident, and lagging indicators reflect tendencies in the timing of their turning points, not exact relationship with the business cycle.
  - Not all changes in direction of leading indicator indexes have been followed by corresponding changes in the business cycle, and even when they have, the lead time has varied.
  - This common criticism is summed up in the often repeated comment, "Declines in stock prices have predicted nine of the last four recessions."

Economic Indicators

Leading	Reason
Average weekly hours, manufacturing	Because businesses will cut overtime before laying off workers in a downturn and increase it before rehiring in a cyclical upturn, these measures move up and down before the general economy.
Average weekly initial claims for unemployment insurance	This measure offers 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, these gauges tend to lead at upturns and downturns. Indirectly, they capture changes in business sentiment as well, which also often leads the cycle.

Economic Indicators

Leading	Reason
Vendor performance, slower deliveries diffusion index	By measuring the speed at which businesses can complete and deliver an order, this gauge offers a clear signal of unfolding demands on businesses.
Manufacturers' new orders for non-defense capital goods	In addition to offering a first signal of movement, up or down, in an important economic sector, movement in this area also indirectly captures business expectations.
Building permits for new private housing units	Because most localities require permits before new building can begin, this gauge foretells new construction activity.

Economic Indicators

Leading	Reason
S&P 500 Stock Index	Because stock prices anticipate economic turning points, both up and down, their movements offer a useful early signal on economic cycles.
Money supply, real M2	Because money supply growth measures the tightness or looseness of monetary policy, increases in money beyond inflation indicate easy monetary conditions and a positive economic response, whereas declines in real M2 indicate monetary restraint and a negative economic response.

Economic Indicators

Leading	Reason
Interest rate spread between 10-year treasury yields and overnight borrowing rates (federal funds rate)	Because long-term yields express market expectations about the direction of short-term interest rates, and rates ultimately follow the economic cycle up and down, a wider spread, by anticipating short rate increases, also anticipates an economic upswing. Conversely, a narrower spread, by anticipating short rate decreases, also anticipates an economic downturn.
Index of Consumer Expectations, University of Michigan	Because the consumer is about two-thirds of the U.S. economy and will spend more or less freely according to his or her expectations, this gauge offers early insight into future consumer spending and consequently directions in the whole economy.

Economic Indicators

Coincident	Reason
Employees on non-agricultural payrolls	Once recession or recovery is clear, businesses adjust their fulltime payrolls.
Aggregate real personal income (less transfer payments)	By measuring the income flow from non-corporate profits and wages, this measure captures the current state of the economy.
Industrial Production Index	Measures industrial output, thus capturing the behavior of the most volatile part of the economy. The service sector tends to be more stable.
Manufacturing and trade sales	In the same way as aggregate personal income and the industrial production index, this aggregate offers a measure of the current state of business activity.

Economic Indicators

Lagging	Reason
Average Duration of Unemployment	Because businesses wait until downturns look genuine to lay off, and wait until recoveries look secure to rehire, this measure is important because it lags the cycle on both the way down and the way up.
Inventory—sales ratio	Because inventories accumulate as sales initially decline and then, once a business adjusts its ordering, become depleted as sales pick up, this ratio tends to lag the cycle.

Economic Indicators

Lagging	Reason
Change in unit labor costs	Because businesses are slow to fire workers, these costs tend to rise into the early stages of recession as the existing workforce is used less intensely. Late in the recovery when the labor market gets tight, upward pressure on wages can also raise such costs. In both cases, there is a clear lag at cyclical turns.
Average bank prime lending rate	Because this is a bank administered rate, it tends to lag other rates that move either before cyclical turns or with them.
Commercial and industrial loans outstanding	Because these loans frequently support inventory building, they lag the cycle for much the same reason that the inventory—sales ratio does.

Economic Indicators

Lagging	Reason
Ratio of consumer installment debt to income	Because consumers only borrow heavily when confident, this measure lags the cyclical upturn, but debt also overstays cyclical downturns because households have trouble adjusting to income losses, causing it to lag in the downturn.
Change in consumer price index for services	Inflation generally adjusts to the cycle late, especially the more stable services area

Reading 18

Monetary and Fiscal Policy

Framework

1. Definition
2. Monetary policy
3. Central banks
4. Fiscal policy

Monetary and Fiscal Policy

- **Fiscal policy** refers to the government's decisions about taxation (T) and spending (G).
  - T-G
    - ✓ >0 (budget surplus)
    - ✓ <0 (budget deficit)
    - ✓ =0 (budget balanced)
- **Monetary policy** refers to the central bank's activities that are directed toward influencing the quantity of money and credit in an economy.
  - Expansionary (or accommodative or easy): increase money supply and credit.
  - Contractionary (or restrictive or tight): decrease money supply and credit.
- **Goals for Both Policies:**
  - Maintain stable prices;
  - Produce positive economic growth.
- **Goals Solely for Fiscal Policy**: Redistribution of income and wealth.

Functions of Money

- **Functions of money:**
  - Medium of exchange or means of payment
  - Unit of account
  - Store of value

How Money is Created

- **How Do the Banks Create Money ?**

	Reserve	Loan
Bank1		100
Bank2	10	90
Bank3	9	81
…	…	…

Ms=100/(1-0.9)=1000

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

$$\text{Money multiplier} = \frac{1}{\text{reserve requirement}} = \frac{1}{0.1} = 10$$

Quantity Theory of Money

- **The Quantity Theory of Money**

$$\text{money supply} \times \text{velocity} = \text{price} \times \text{real output} \quad (MV = PY)$$

- **Assumptions:**
  - V refers to speed of money that change hands and remains constant.
  - PY, where Y=real output, thus PY represents total spending.
  - **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.
  - **Indication**: **The price level or at least the rate of inflation can be controlled by manipulating the rate of growth of the money supply.**
- **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.

Fisher Effect

- **Fisher Effect:**
  - $R_{Nom} = R_{Real} + E[I]$
  - Real rate of interest in an economy is stable over time so that changes in nominal interest rates are the result of changes in expected inflation.
  - Directly related to money neutrality
- **Improvement of Fisher Effect**
  - Risk premium (RP) is encompassed in the equation to illustrate the compensation for investors' uncertainty about future values of some economic variables, such as inflation and real growth.

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

Role and Objectives of Central Bank

- **Roles of Central Bank:**
  - Monopoly supplier of the currency
  - Banker to the government and bankers' bank
  - Lender of last resort
  - Regulator and supervisor of the payments system
  - Conductor of monetary policy
  - Supervisor of the banking system
- **Objectives of Central Bank:**
  - Maintain price stability through target inflation
  - Maintain exchange rate stability through foreign reserves
  - Prompt economic growth
  - Achieve full employment
  - Moderate long-term interest rates

Tools of the Central Bank

- **Policy Rate**
  - The most obvious expression of a central bank's intentions and views comes via the interest rate it sets.
  - The policy rate can be achieved by using short-term collateralized lending rates, known as **repo rates**.
  - The ECB's official policy rate is known as the **refinancing rate** and defines the rate at which it is willing to lend short-term money to the euro area banking sector.
  - The most important interest rate used in US monetary policy is the **federal funds rate**. The federal funds rate is the interbank lending rate on overnight borrowing of reserves.

美联储：联邦基金利率，商行和商行之间的隔夜拆借利率
欧洲：再贴现率，商行跟央行融资的利率
英国：回购协议利率
Policy rate ↓ → 融资成本低，释放流动性（扩张的货币政策）
Policy rate ↑ → 融资成本高，收紧流动性（紧缩的货币政策）

Tools of the Central Bank

- **Reserve requirements**
  - Reserve requirement ↑ → available funds for lending ↓ → money supply ↓ → interest rate ↑

    存款准备金 ↑ → 紧缩的货币政策

    存款准备金 ↓ → 扩张的货币政策
- **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.**

    央行买债券 → 扩张的货币政策

    央行卖债券 → 紧缩的货币政策

Neutral Interest Rate

- **Trend growth**: long-term, sustainable real growth rate in an entity.
- **Neutral interest rate:** the growth rate of the money supply that neither increases nor decreases the economic growth rate.
- **Neutral rate of interest=Trend growth + Inflation target**
  - Policy rate> Neutral rate: contractionary
  - Policy rate< Neutral rate: expansionary
- **Inflation will place impact on monetary policy**.
  - If the higher than normal inflation is due to increase in aggregate demand, contractionary monetary policy is appropriate.
  - Contractionary monetary policy should be reconsidered when the inflation is due to supply shocks or when the economy is below full employment.

Monetary Transmission Mechanism

- The **monetary transmission mechanism** refers to how the execution of monetary policy affects the overall economy.
- **Central bank controls money supply through following channels:**
  - Step 1: Short-term interest rates
    - ✓ Decrease with policy rate
  - Step 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 → decrease savings → increase expenditures (expectations for future economic growth increase)
  - Step 3: The exchange rate
    - ✓ Decrease in interest rates → depreciation of domestic currency

Qualities of Effective Central Banks

- **Independence**
  - The operation of central bank must, to a certain degree, be segregated from the involvement of the government.
  - Evaluation of independence
    - ✓ **Operational independence**: it was free to set interest rates in the way that it thought would best meet the inflation target.
    - ✓ **Target independence**: it means that central banks not only decide the level of interest rates, but they also determine the definition of inflation that they target, the rate of inflation that they target, and the horizon over which the target is to be achieved.

Qualities of Effective Central Banks

- **Credibility**
  - The **public confidence** in the central banks.
  - If highly levered government set the target inflation rate, since the government had an incentive to increase inflation to reduce real value of debt, the credibility of the policy as well as the confidence in currency would be endangered.
  - The public confidence could become self-fulfilling, prompting inflation to reach its target.
- **Transparent**
  - **Transparency in its decision-making process**. Transparency means that central banks issue Inflation Reports to express their views on the economy.

Different Targets Used by Central Banks

- **Interest Rate Targeting**
  - Increasing the money supply when market rate is above the target band and decreasing the money supply when market rate is below the target band.
- **Inflation Targeting (most widely used)**
  - Increase money supply when rate<target. Vise versa.
  - **Targets**
    - ✓ The level of rate.
    - ✓ The horizon over which the target will achieve.
- **Exchange Rate Targeting**
  - **Definition**: setting a fixed level or band of values for the exchange rate against a major currency.
  - When domestic inflation rises, central bank sells foreign currency reserves and buys domestic currency to hedge against relative depreciation in domestic currency.
  - When domestic inflation falls, central bank buys foreign currency and sells domestic one to hedge against relative appreciation in domestic currency.

Limitation of Monetary Policy

- **Long-term rate may not adjusted coincide with short-term rates.**
  - Bond market vigilantes: Decrease in short-term rate. Bond market participants might reduce their demand for long-term bonds, thus pushing up their yields, if they believe that the monetary authority is losing its grip on inflation.
  - Conversely, the increase in short-term rate sends a signal of tight monetary policy. Vigilantes may demand more for long-term bonds if they expect a sharp slowdown in the economy, thereby pushing long-term rates down.

Limitation of Monetary Policy

- **Liquidity trap:** A condition in which the demand for money becomes infinitely elastic (horizontal demand curve) so that injections of money into the economy will not lower interest rates or affect real activity.
  - When the interest rate is already at its low, and further decrease fails to control the amount of money that households and corporates put in bank.
- **Failure of control** the willingness of commercial banks to create money
  - In this extreme circumstance, monetary policy can become completely ineffective.
  - The economic conditions for a liquidity trap are associated with the phenomenon of **deflation**.
  - **Quantitative easing** will be implemented by Central bank when deflation occurs and the short-term rates are near zero.

Monetary Policy in Developing Economies

- **Developing economies often face additional challenges** when implementing monetary policy, because of
  - **Absence of liquid 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**.

Fiscal Policy

- **Fiscal policy** the use of government spending and changing tax revenue to affect a number of aspects of the economy.
  - **Keynesians** believe that fiscal policy can have powerful effects on aggregate demand, output, and employment when there is substantial spare capacity in an economy.
  - **Monetarists** believe that fiscal changes only have a temporary effect on aggregate demand and that monetary policy is a more effective tool for restraining or boosting inflationary pressures.
- **Objectives of fiscal policy**
  - Impacting economic activities and increasing demand
  - Reallocating resources across economic sectors
  - Redistributing wealth among different population classes

Fiscal Policy Tools

- **Spending Tools**
  - **Transfer payments**: welfare payments made through the social security system
  - **Current spending**: routine and continuing government purchases of goods and services
  - **Capital spending**: Cost on infrastructures by governments and prompts productivity in the future
- **Justification for Spending Tools:**
  - To provide such services as defense that benefit all citizens equally.
  - For infrastructure capital spending (e.g. roads, hospitals) to prompt a country's economic growth.
  - To guarantee a minimum level of income for poorer people and hence redistribute income and wealth (e.g. welfare and related benefits).
  - To influence a government's economic objectives of low inflation and high employment and growth (e.g. management of aggregate demand).
  - To subsidize the development of innovative and high-risk new products or markets (e.g. alternative energy sources).

Fiscal Policy Tools

- **Revenue Tools**
  - **Direct taxes** refers to revenues from income or wealth of both individual and corporate, also including capital gains taxes, national insurance taxes, property taxes, and inheritance taxes.
  - **Indirect taxes** are levied on purchasing of goods and services. Consumptions tend to react more quickly to indirect taxes. 影响更快
- **Desirable Attributes of Tax Policy**
  - **Simplicity**: final tax liability is certain and cannot be gamed.
  - **Efficiency**: minimize negative impact of tax on working incentives and consumption pattern
  - **Fairness** is quite subjective.
    - ✓ Horizontal equality: people in similar situations should pay similar taxes
    - ✓ Vertical equality: richer people should pay more in taxes
  - **Sufficiency**: taxes should generate sufficient revenues to meet the spending needs of the government. A conflict between fairness and efficiency.

Fiscal Policy Tools

- **Advantages:**
  - Indirect taxes have immediate impact on purchasing pattern, thus generating revenue for the government with low costs.
- **Disadvantages:**
  - Direct taxes are more difficult to change.
    - ✓ For instance, the change in individual income tax requires months of advanced announcement to allow for changes in payroll computer systems.
  - Capital spending plans take longer to formulate and implement, typically over a period of years.
    - ✓ Building of infrastructures involves numerous premises, such as planning, legal permissions and implementation.
    - ✓ The time lag between implementation and impact on economy compromises the effects of fiscal policy.

Fiscal Multiplier

- **Fiscal multiplier**
  - $$\text{Fiscal multiplier} = \frac{1}{1-\text{MPC}(1\text{-}t)} = \frac{1}{1-b\times(1\text{-}t)}$$
  - MPC: Marginal propensity of consumption (b)
  - The fiscal multiplier is
    - ✓ negatively related to the tax rate.
    - ✓ positively related to the MPC.

Limitations of Discretionary Fiscal Policy

- **Fiscal policy may be incorrect because of**
  - **Lags in executing fiscal policy**
    - ✓ **Recognition lag:** The time lag between the emergence of economic downturn and the recognition from the government.
    - ✓ **Action lag:** The time lag between the decision of the government and the implementation of the policy.
    - ✓ **Impact lag:** The time lag between the implementation of the policy and the emergence of results.

Limitation of Fiscal Policy

- **Other macroeconomic issues**
  - **Uncertainty of where the economy is heading** independently of these policy changes. The fiscal policy has wide range of impacts on various sectors and cannot pinpoint the exact sector it wants to influence.
  - **The target of full employment and inflation cannot be achieved simultaneously.**
  - **Large budget deficit** will hinder the implementation of further expansionary fiscal policy.
  - Full employment is difficult to measure, and **fiscal policy would be useless if the economy already reached to the point.**
  - Fiscal policy is useless when economic downturns are due to **shortage in production factors.**
  - **Crowding out effect**: Competition between government and private sectors increases borrowing cost and crowds out private firms with subsequent less investing and economic growth.

Ricardian Equivalence

- **Ricardian Equivalence:** Increases in the government spending are equal to increases in forward tax rates.
  - Consumers regard the increase in budget deficit as a signal of growing taxes in the future and thus increase present savings to offset the negative influence, therefore, the fiscal policy will not affect aggregate demand as it should be.
- However, Ricardian equivalence will **not** hold when
  - People do not correctly anticipate all the future taxes required to repay the additional government debt, then they feel wealthier when the debt is issued and may increase their spending, adding to aggregate demand.

National Debt

- **Debt Ratio**
  - Aggregate national debt to GDP.
  - If tax rates constant,
    - ✓ Real interest rate on the government's debt > real growth rate, debt ratio increases.
    - ✓ Real interest rate on the government's debt < real growth rate, debt ratio decreases (improve).

National Debt

- **Arguments for being concerned with the size of fiscal deficit:**
  - High levels of debt to GDP signal a higher tax rate to cover government's interest expenses. This may hinder the growth of the economy, since higher marginal tax reduces labor efforts and entrepreneurial activities.
  - Public may expect higher inflation, since central bank may back for the growing national debt by printing excessive money. (e.g. the economic history of Germany in the 1920s and more recently in Zimbabwe.)
  - Government borrowing may "crowd out" private sectors, because of higher interest rate for private sectors due to much severe competitiveness and government's advantages in creditworthiness.

National Debt

- **Arguments against being concerned with the size of fiscal deficit:**
  - The scale of the problem may be overstated because the debt is owed internally to fellow citizens.
  - Money borrowed was used for capital investment projects or enhancing human capital (e.g., training, education), raising future outputs and tax revenues.
  - Large fiscal deficits require tax changes which may actually reduce distortions caused by existing tax structures.
  - Given Ricardian equivalence, deficits may have no net impact, because the private sector may act to offset fiscal deficits by increasing savings in anticipation of future increased taxes.
  - If there is unemployment in an economy, then the debt is not diverting activity away from productive uses (and indeed the debt could be associated with an increase in employment).

Implementation of Fiscal Policy

- Fiscal policy is implemented through changes in taxes and spending.
- **Time to Implement Appropriate Fiscal Policy**
  - **Expansionary**: implemented in declining economy.
    - ✓ Increase in government spending.
    - ✓ Decrease tax.
  - Strengthen economy by increasing AD: more money for corporations and consumers to spend.
  - **Contractionary**: implemented in overheated economy.
    - ✓ Decrease in government spending.
    - ✓ Increase tax.
  - Slow economy down by decreasing AD.

Interaction of Monetary and Fiscal Policy

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

- 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.

Reading 19

International Trade and Capital Flows

Framework

1. International trade
2. Balance of Payments Components
3. International organization

Basic Terminology

- **Imports:** goods and services that a domestic economy purchases from other countries.
- **Exports:** goods and services that a domestic economy sells to other countries.
- **Autarky or closed economy:** a state in which a country does not trade with other countries.
- **Free trade:** Free trade occurs when there are no government restrictions on a country's ability to trade.
- **Trade protection:** Government policies that impose restrictions on trade, such as tariffs and quotas.
- **World price:** If there are no restrictions on trade, then members of an open economy can buy and sell goods and services at the price prevailing in the world market, the world price.

Basic Terminology

- **Net exports:** the difference between the value of a country's exports and the value of its imports.
- **Trade surplus:** the value of exports is greater than the value of imports.
- **Trade deficit:** the value of exports is less than the value of imports.
- **Terms of trade:** the ratio of the price of exports to the price of imports, representing those prices by export and import price indices, respectively.
- **Foreign direct investment:** direct investment by a firm in one country (the *source country)* in productive assets in a foreign country (the *host country)*.
- **Multinational corporation:** When a firm engages in FDI, it becomes a multinational corporation (MNC) operating in more than one country or having subsidiary firms in more than one country.

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 in terms of other goods that could be produced instead is lower than that of another country.
- **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.
  - A country gains from international trade when it exports those goods for which it has a comparative advantage and imports those goods for which it does not.
- As long as opportunity costs differ, two countries can both benefit from trade.

Absolute and Comparative Advantage

- If two countries have different opportunity cost of producing goods, each will have a comparative advantage in some goods, and trade will increase the total production and consumption possibilities in both countries, improving economic welfare.
- When each country specializes in the good for which they have a comparative advantage and trades each other, there are clear gains existed.

Country / Product	A	B
X	10	9
Y	5	3

Ricardian Model

- In the **Ricardian model**, labor is the only (variable) factor of production. Differences in **labor productivity**, reflecting underlying differences in **technology**, are the source of comparative advantage and hence the key driver of trade in this model.
  - In the two-country model, if countries vary in size, the smaller country may specialize completely, but may not be able to meet the total demand for the product.
  - The larger country may be incompletely specialized, producing and exporting the good in which it has a comparative advantage but still producing (and consuming) some of the good in which it has a comparative disadvantage.
  - It is important to recognize that although differences in technology may be a major source of comparative advantage at a given point in time, other countries can close the technology gap or even gain a technological advantage.

Heckscher-Ohlin Model

- In the **Heckscher—Ohlin Model** (also known as the factor-proportions theory), **both capital and labor are variable factors of production.**
  - Differences in the relative endowment of these factors are the source of a country's comparative advantage.
  - A country has a comparative advantage in goods whose production is intensive in the factor with which it is relatively abundantly endowed, and would tend to specialize in and export that good.
    - ✓ Capital is relatively more (less) abundant in a country if the ratio of its endowment of capital to labor is greater (less) than that of its trading partner.
    - ✓ For this country, labor is relatively abundant would export relatively labor-intensive goods and import relatively capital-intensive goods.
  - It allows for the possibility of income redistribution through trade.
    - ✓ The price of the relatively less scare (more available) factor of production in each country will increase.
    - ✓ The good that a country imports will fall in price (that is why they import it), and the good that a country exports will rise in price.

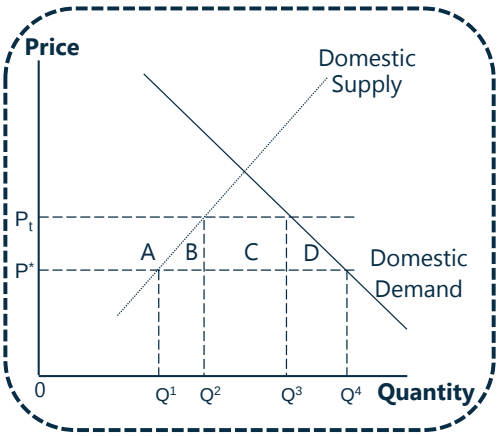
Types of Trade Restrictions

- **Types of trade restrictions include:**
  - **Tariffs:** Tariffs are taxes that a government levies on imported goods.
  - **Quotas:** restrict the quantity of a good that can be imported into a country, generally for a specified period of time.
  - **Export subsidies:** paid by the government to the firm when it exports a unit of a good that is being subsidized.
  - **Domestic content provisions**: stipulate that some percentage of the value added or components used in production should be of domestic origin.
  - **Voluntary export restraint:** a trade barrier under which the exporting country agrees to limit its exports of the good to its trading partners to a specific number of units.

Tariffs and Quotas

- **The primary objective of tariffs is to protect domestic industries that produce the same or similar goods.**
  - Tariffs reduce the demand for imported goods by increasing their price above the free trade price.
  - In the aspect of tariff, small country means price taker in the world market for a product and cannot influence the world market price. A large country is a large importer of the product and can exercise some influence on price in the world market.
- **The analysis of Quotas is similar to tariff**
  - A key difference between tariffs and quotas is that the government is able to collect the revenue generated from a tariff. This effect is uncertain under a quota. With quotas, foreign producers can often raise the price of their goods and earn greater profits than they would without the quota. These profits are called quota rents.
  - An import license specifies the quantity that can be imported.

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

Voluntary Export Restraint and Export Subsidies

- **Voluntary export restraint (VER) refers to trade barrier under which the exporting country agrees to limit its exports of the good to its trading partners to a specific number of units.**
  - The main difference between an import quota and a VER is that the former is imposed by the importer, whereas the latter is imposed by the exporter.
  - A VER results in welfare loss in the importing country.
- **Export subsidies are paid by the government to the firm when it exports a unit of a good that is being subsidized..**
  - Its goal is to stimulate exports, and it interferes with the functioning of the free market distort trade away from comparative advantage.

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	Mixed (depends on whether the quota rents are captured by the importing country through sale of licenses or by the exporters)	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.

Effects of Trade Restrictions

	Tariff	Import Quota	Export Subsidy	VER
Impact on	Importing country	Importing country	Exporting country	Importing country
Price	Increases	Increases	Increases	Increases
Domestic consumption	Decreases	Decreases	Decreases	Decreases
Domestic production	Increases	Increases	Increases	Increases
Trade	Imports decrease	Imports decrease	Exports increase	Imports decrease

Capital Restrictions

- Capital restrictions are defined as controls placed on foreigners' ability to own domestic assets and/or domestic residents' ability to own foreign assets.
- **Governments may restrict inward and outward flow of capital.**
  - Control over inward investment by foreigners results in restrictions on how much can be invested, and on the type of industries in which capital can be invested.
  - Outflow restrictions can include restrictions on repatriation of capital, interest, profits, royalty payments, and license fees.
  - Economists consider free movement of financial capital to be beneficial because it allows capital to be invested where it will earn the highest return.

Capital Restrictions

- Economists consider free movement of financial capital to be beneficial because it allows capital to be invested where it will earn the highest return.
- The free movement of financial capital help increase the competition from foreign firms in the market may force domestic firms to become more efficient.
- However, it is possible that the domestic industry may be hurt because domestic firms that are unable to compete are forced to exit the market.

Balance of Payments (BOP)

- **Balance of payments (BOP)** is a double-entry bookkeeping system that summarizes a country's economic transactions with the rest of the world for a particular period of time, typically a calendar quarter or year.
  - Every transaction involves both a debit and credit.
  - In principle, the sum of all debit entries should equal the sum of all credit entries, and the net balance of all entries on the BOP statement should equal zero.
  - In practice, however, this is rarely the case because the data used to record balance of payments transactions are often derived from different sources.

Debits	Credits
Increase in assets, decrease in liabilities	Decrease in assets, increase in Liabilities
Value of imported goods and services	Payments for imports of goods and services
Purchases of foreign financial assets	Payments for foreign financial assets
Receipt of payments from foreigners	Value of exported goods and services
Increase in debt owed by foreigners	Payment of debt by foreigners
Payment of debt owed to foreigners	Increase in debt owed to foreigners

BOP Components

- **Current account** measures the goods and service flows, and it includes four sub-accounts.
  - **Merchandise trade:** Consists of all commodities and manufactured goods bought, sold, or given away.
  - **Services** include tourism, transportation, and business and engineering services, as well as fees from patents and copyrights on new technology, software, books, and movies.
  - **Income receipts** include income derived from ownership of assets, such as dividends and interest payments; income on foreign investments is included in the current account because that income is compensation for services provided by foreign investments.
  - **Unilateral transfers** represent one-way transfers of assets, such as worker remittances from abroad to their home country and foreign direct aid or gifts.

BOP Components

- **Capital account measures transfers of capital, and it includes two sub accounts.**
  - **Capital transfers** include debt forgiveness and migrants' transfers (goods and financial assets belonging to migrants as they leave or enter the country).
  - **Sales and purchases of non-produced, non-financial assets** such as the rights to natural resources, and the sale and purchase of intangible assets, such as patents, copyrights, trademarks, franchises, and leases.

BOP Components

- **Financial account** records **investment flows, and it includes two sub-accounts.**
  - **Government-owned assets abroad** are further divided into official reserve assets, government assets, and private assets. including gold, foreign currencies, reserve position in the IMF, etc.
  - **Foreign-owned assets in the country** are further divided into foreign official assets and other foreign assets. These assets include securities issued by the reporting country's government and private sectors, direct investment, and foreign liabilities reported by the reporting country's banking sector.

Different Factors Influence the BOP

- **Relation between the trade deficit, saving, and domestic investment:**

  X-M = private savings + government savings – investment

- Lower levels of private saving, larger government deficits, and high rates of domestic investment all tend to result in or decrease a current account deficit.
  - Low private or government savings in relation to private investment in domestic capital requires foreign investment in domestic capital.
  - Borrowing from foreign countries to finance high consumption (low savings) increase the domestic country's liabilities without any increase to its future productive power.
  - Borrowing from foreign countries to finance a high level of private investment in domestic capital, the added liability is accompanied by an increase in future productive power because of the investment in capital.

International Monetary Fund (IMF)

- **International Monetary Fund (IMF):**
  - 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
  - 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 WTO provides the legal and institutional foundation of the multinational trading system. It is the only international organization that regulates cross-border trade relationships among nations on a global scale.
  - The WTO's most important functions are the implementation, administration, and operation of individual agreements; acting as a platform for negotiations; and settling disputes.
  - WTO has the mandate to review and propagate its members' trade policies and ensure the coherence and transparency of trade policies.
  - Provides technical cooperation and training to developing, least-developed, and low-income countries to assist with their adjustment to WTO rules.
  - WTO is a major source of economic research and analysis, producing ongoing assessments of global trade in its publications and research reports on special topics.
  - WTO's framework of global trade rules provides the major institutional and regulatory base.

Trading Blocs

- **Free trade areas**
  - One of the most prevalent forms of regional integration in which all barriers to the flow of goods and services among members have been eliminated ==> each countries maintains its own policies against non-members.
- **Customs union**
  - It extends the FTA by not only allowing free movement of goods and services among members but also creating a common trade policy against non-members.
- **Common market**
  - It incorporates all aspects of the customs union and extends it by allowing free movement of factors of production among member.

Trading Blocs

- **Economic union**
  - It requires a greater degree of integration.
  - It incorporates all aspects of a common market and in addition requires common economic institutions and coordination of economic policies among members.
  - The European Community became the European Union in 1993.
- **Monetary union**
  - Firstly, the monetary union should be an economic union.
  - If the members of the economic union decide to adopt a common currency, then it is also a monetary union.
  - For example, with the adoption of the euro, part of EU member countries formed a monetary union.

Reading 20

Currency Exchange Rate

Framework

1. Foreign exchange rate
2. Spot and forward rate
3. Interest rate parity
4. Exchange rate regimes
5. Changes in exchange rate affect the balance of trade

Nominal and Real Exchange Rate

- **Exchange rate** is simply the price or cost of units of one currency in terms of another.
- **Nominal exchange rate**: the price that we observe in the marketplace for foreign exchange.
- **Real exchange rate**: the focus shifts from the quotations in the foreign exchange market to what the currencies actually purchase in terms of real goods and services.
  - FX real(d/f) = FX nominal (d/f) *CPI_f/CPI_d

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 $1.90 per euro. Three years later, the exchange rate is $1.80 per euro, and the CPI has risen to 115 in the U.S. and 118 in the Euro. What is the real exchange rate?

- **Correct Answer:**
  - The real exchange rate is $1.80 per euro * 118/115 = $1.850 per euro.

Spot Rates and Forward Rates

- The exchange rate used for spot transactions is referred to as the **spot exchange rate,** and it is the exchange rate that most people refer to in their daily live.
  - Spot markets means the transactions needs immediate delivery.
- The exchange rate referred in the forward contract transactions are **forward exchange rate.**
  - Forward contracts (often referred to simply as forwards) are agreements to deliver foreign exchange at a future date at an exchange rate agreed upon today.

Participants in the Foreign Markets

- **Sell side:** generally consists of FX trading banks
- **Buy side:** clients who use these banks to undertake FX transactions from the sell side banks.
  - **Corporations:** Corporations of all sizes undertake FX transactions during cross-border purchases and sales of goods and services.
  - **Real money accounts**: These are investment funds managed by insurance companies, mutual funds, pension funds, endowments, exchange-traded funds (ETFs), and other institutional investors.
  - **Leveraged accounts**: This category, often referred to as the professional trading community, consists of hedge funds, proprietary trading shops, commodity trading advisers (CTAs), high-frequency algorithmic traders, and the proprietary trading desks at banks.

Participants in the Foreign Markets

- **Governments and government entities**: Public entities of all types often have FX needs, ranging from relatively small (e.g., maintaining consulates in foreign countries) to large (e.g., military equipment purchases or maintaining overseas military bases).
- **Central bank:** These entities sometimes intervene in FX markets in order to influence either the level or trend in the domestic exchange rate.
- **Retail accounts**: The simplest example of a retail account is the archetypical foreign tourist exchanging currency at an airport kiosk.
- **Sovereign wealth funds (SWFs):** Many countries with large current account surpluses have diverted some of the resultant international capital flows into SWFs rather than into foreign exchange reserves managed by central banks.

Indirect & Direct Foreign Exchange Quotations

- **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)
- **Base currency:** the currency in which the quote represents one unit.
- **Price currency:** the currency for which the quote represents a number of units.
  - The **foreign currency is the base currency for a direct quote**.
  - The home currency is the base currency for an indirect quote.
- 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).
  - AUD: USD=0.6 , 0.6USD/AUD , 1AUD=0.6USD
  - USD: AUD=1/0.6=1.67 , 1.67AUD/USD

Percentage Change in Foreign Exchange Rate

- Consider a CHF/EUR exchange rate that has changed from 1.34 to 1.28 CHF/EUR.
  - The percentage change in the EUR price of a CHF is simply:
    - ✓ 1.28/1.34-1=-0.0448=-4.48%
  - Because the CHF price of a euro has fallen, the euro has depreciated relative to the dollar. It is correct to say that the EUR has depreciated by 4.48% relative to the CHF.
- To calculate the percentage appreciation of the CHF, we need to convert the quotes to EUR/CHF.
  - 1/1.34 CHF/EUR = 0.7463 EUR/CHF
  - 1/1.28 CHF/EUR = 0.7813 EUR/CHF
  - The change in the euro price of a CHF as:
    - ✓ 0.7813/0.7463 -1 = 0.0448 = 4.48%
  - It is correct to say that the CHF has appreciated 4.48% with respect to the EUR.

Cross Rate

- **Cross rate** is calculated with two exchange rates involving three different currencies.

- **Example:**
  - 0.6015 USD/AUD , 10.7210 MXN/USD
    - ✓MXN/AUD = USD/AUD X MXN/USD = 0.6015 X 10.7210 = 6.4487
  - 10.7210 MXN/USD , 6.3126 MXN/AUD
    - ✓USD/AUD = (MXN/AUD) / (MXN/USD) = 6.3126 / 10.7210 = 0.5888

Forward Discount or Premium

- **Forward exchange rates** are typically quoted in terms of points, and the points on a forward rate quote are simply the difference between the forward exchange rate quote and the spot exchange rate quote, with the points scaled so that they can be related to the last decimal in the spot quote.
  - If the forward rate is higher than the spot rate ➔ the points >0 ➔ the base currency is trading at a forward premium.
  - If the forward rate is lower than the spot rate ➔ the points <0 ➔ the base currency is trading at a forward discount.
  - Occasionally, one will see the forward rate or forward points represented as a percentage of the spot rate rather than as an absolute number of points.

Forward Discount or Premium

- A BRL/MXN spot rate is listed by a dealer at 0.1378. The 6-month forward rate is 0.14193. The 6-month forward points are closest to:
  - A. -41.3.
  - B. +41.3.
  - C. +299.7
- **Correct answer: B**

- A three-month forward exchange rate in CAD/USD is listed by a dealer at 1.0123. The dealer also quotes 3-month forward points as a percentage at 6.8%. The CAD/USD spot rate is closest to:
  - A. 0.9478
  - B. 1.0550.
  - C. 1.0862.
- **Correct answer: A**

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
  - $\frac{F}{S} = \frac{1+r_X}{1+r_Y}$
  - $\frac{F-S}{S} = \frac{1+r_X}{1+r_Y} - 1 = \frac{r_X - r_Y}{1+r_Y} \approx r_X - r_Y$
- The forward rate 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.

Currency Exchange Rates

- A currency selling at a forward premium is considered "strong" relative to the second currency and is expected to appreciate.
- A currency selling at a forward discount is considered "weak" and is expected to depreciate.

- **Example**
  - 3X/Y changes to 2X/Y
  - 1Y=3X, now changing to 1Y=2X
  - Y is weak relatively; X is strong relatively.

Exchange Rate Regimes

- **Arrangements with No Separate Legal Tender:**
  - Countries do not have its own legal tender➔ dollarization
    - ✓ The country uses the currency of another nation as its medium of exchange and unit of account)
  - Monetary union: Euros
- **Countries That Have Their Own Currency：**
  - Currency board system ➔ HK

    The IMF defines a currency board system (CBS) as:

    A monetary regime based on an explicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate, combined with restrictions on the issuing authority to ensure fulfillment of its legal obligation. This implies that domestic currency will be issued only against foreign exchange and it remains fully backed by foreign assets……

Exchange Rate Regimes

- **Countries That Have Their Own Currency：**
  - Fixed parity
    - ✓ In the fixed-rate system, the exchange rate may be pegged to a single currency, or to a basket index of the currencies of major trading partners. There is a band of up to **±1 percent** around the parity level within which private flows are allowed to determine the exchange rate.
    - ✓ 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.
    - ✓ The credibility of the fixed parity depends on the country's willingness and ability to offset imbalances in private sector demand for its currency.

Exchange Rate Regimes

- **Countries That Have Their Own Currency：**
  - **Target zone:** A target zone regime has a fixed parity with fixed horizontal intervention bands that are somewhat wider, up to **±2 percent** around the parity, than in the simple fixed parity regime.
  - **Crawling peg**: the exchange rate is usually adjusted against a single currency, especially during the high inflation periods.
    - ✓ **Passive crawling peg**: The exchange rate was adjusted frequently (weekly or daily) to keep pace with the inflation rate.
      - ◆Example: Brazil
    - ✓ **Active crawling peg**: The exchange rate was pre-announced for the coming weeks with changes taking place in small steps.
      - ◆The aim of the active crawl was to manipulate expectations of inflation.
      - ◆Example: Chile

Exchange Rate Regimes

- **Countries That Have Their Own Currency：**
  - **Fixed Parity with Crawling Bands:** Initially, a country may fix its rates to a foreign currency to anchor expectations about future inflation but then gradually permit more and more flexibility in the form of a pre-announced widening band around the central parity.
  - **Managed Float**: A country may simply follow an exchange rate policy based on either internal or external policy targets.
  - **Independently Floating Rates:** The exchange rate is fully determined by the market, and the central bank is able to exercise independent monetary policy to achieve the objectives of price stability and full employment.

Impact of Exchange Rates

- Based on the balance of payment (BOP), the impact of exchange rates and other factors on the trade balance must be mirrored by their impact on capital flows. They cannot affect one without affecting the other.
- **The relationship between the trade balance and expenditure/saving decisions: X - M ≡ (S - I) + (T - G)**
  - A trade surplus (X > M) must be reflected in a fiscal surplus (T > G), an excess of private saving over investment (S > I), or both.
    - ✓ Fiscal surplus can be viewed as government saving;
    - ✓ Trade surplus means the country saves more than enough to fund its investment (I) in plant and equipment;
    - ✓ Trade surplus means the country saves more than enough to fund its investment (I) in plant and equipment.

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Elasticity Approach

- **Two approaches to exam how changes in exchange rates affect the balance of trade:**
  - Elasticity approach;
  - Absorption approach.
- **Elasticity approach**

$$\omega_M = \frac{\text{Imports}}{\text{imports} + \text{exports}} \qquad \omega_X = \frac{\text{exports}}{\text{imports} + \text{exports}}$$

ε_M : elasticities (as positive numbers) of demand for imports

ε_X : elasticities (as positive numbers) of demand for emports

- **Given Marshall-Lerner condition:** $\omega_X \varepsilon_X + \omega_M (\varepsilon_M - 1) > 0$
- **When import expenditures=export revenues,** $\omega_X = \omega_M \longrightarrow \varepsilon_X + \varepsilon_M > 1$
  - $\varepsilon_x > -(W_M/W_x)(\varepsilon_M - 1)$
  - $\varepsilon_M > 1 - (W_x/W_M)\,\varepsilon_x$

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Elasticity approach

- The elasticity of demand for any good or service depends on **at least four factors:**
  - The existence or absence of close substitutes;
  - The structure of the market for that product (e.g., a monopoly or perfect competition);
  - Its share in people's budgets;
  - The nature of the product and its role in the economy.
- According to the elasticity approach, currency depreciation ➔ trade deficit increase regardless of the elasticity of import or export demand
- Goods with close substitutes (such as luxury goods)➔ high demand elasticity
- Goods with few substitutes➔ less demand elasticity
- If import/ export goods are goods with close substitutes ➔ greater effect on trades

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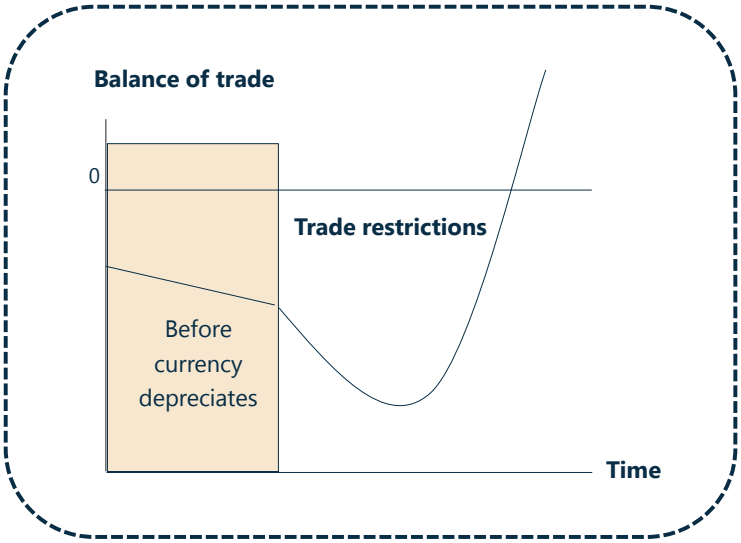
J-Curve

- Even when the Marshall-Lerner condition is satisfied, it is still possible that devaluation (in a fixed parity regime) or depreciation (in a floating regime) of the currency will initially make the trade balance worse before making it better. This effect, called the J-curve effect.
- In the very short run, the J-curve reflects the order delivery lags that take place in import and export transactions.
- A J-curve pattern may also arise if short-term price elasticities do not satisfy the Marshall-Lerner condition but long-term elasticities do satisfy it.

J-Curve



Absorption Approach

- **Absorption approach is** generally a macroeconomic view of exchange rates and trade balance.
- Y = C+ I + G + X - M ➔ X-M = Y – (C + I + G); (C + I + G) means domestic absorption of goods and services.
  - The economy is operating at less than full employment:
    Currency depreciation→ price of domestic goods and assets↓→ expenditures and income↑→saving ↑→ trade balance improved
  - The economy is operating at full employment:
    Currency depreciation→value of domestic assets↓→savers' real wealth ↓→saving ↑→wealth ↑→positive impact on saving ↓→returning the economy to its previous state and balance of trade

It's not the end but just beginning.

Life is short. If there was ever a moment to follow your passion and do something that matters to you, that moment is now.

生命苦短，如果你有一个机会跟随自己的激情去做你认为重要的事，那么这个机会就是现在。