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CFA一级培训项目

Economics

单晨玮

金程教育资深培训师

Topic Weightings in CFA Level I

Study Session 1	Ethics & Professional Standards	15
Study Session 2-3	Quantitative Methods	12
Study Session 4-6	Economic Analysis	10
Study Session 7-10	Financial Statement Analysis	20
Study Session 11	Corporate Finance	8
Study Session 12	Portfolio Management	5
Study Session 13-14	Equity Analysis	10
Study Session 15-16	Fixed Income Analysis	12
Study Session 17	Derivative Investments	5
Study Session 18	Alternative Investments	3
	Total:	100

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Framework of Economics

➢ **SS 4 Microeconomic Analysis**
- R13 demand and supply: introduction
- R14 demand and supply: consumer demand introduction
- R15 demand and supply: the firm
- R16 the firm and the market structure

➢ **SS 5 Macroeconomic Analysis**
- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➢ **SS 6 Economics in a Global Context**
- R20 international trade and capital flow
- R21 currency exchange rate

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R13 Demand and Supply: Introduction

➤ Types of markets

➤ Demand & Supply model

➤ Auctions

➤ Consumer & Producer surplus

➤ Market interference

➤ Elasticity

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Types of Markets

➢ Goods markets: for output of production (finished goods & services)

- buyer: households firm
- seller: firm

➢ Intermediate goods: used in the production of final goods

- eg: computer chips

➢ Factor markets: for factors of production

- buyer: firm
- seller: households
  - ✓ eg: land, labor, physical capital, materials

➢ Capital markets：used by firms to sell debt or equity to raise long-term capital to finance the production

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Demand

- The Demand Function
  - the quantity of demanded depends on income, the prices of other goods, as well as other factors
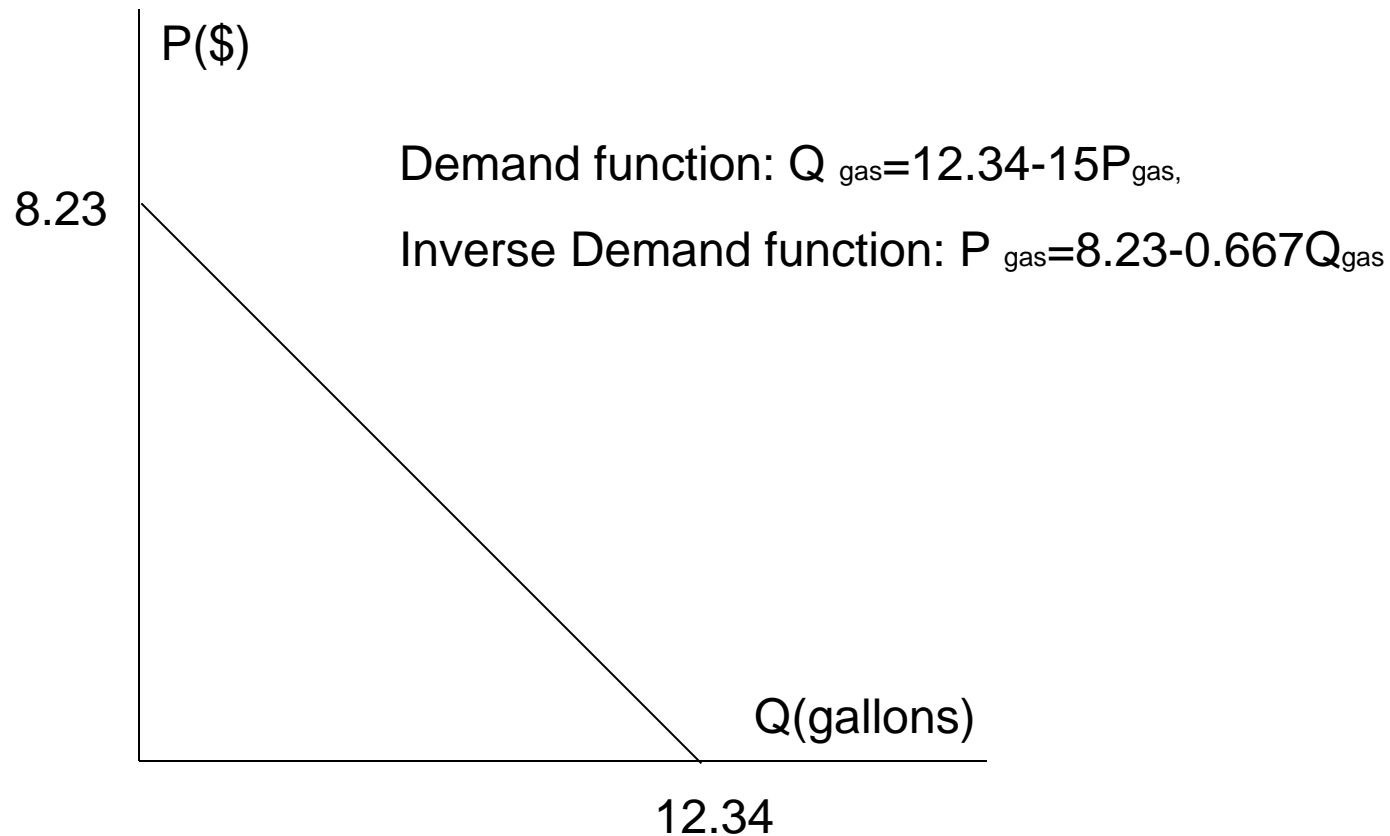 - $Q^d{}_x = f(p_X, I, p_Y...)$
- **Example:**
  - $Q_{D\ gas} = 9 - 1.5P_{gas} + 0.02I + 0.11\ P_{BT} - 0.008P_{auto}$(BT:Bus Travel)
  - Assuming I=40, P_{BT}=25, P_{auto}=26
    - ✓ $Q_{D\ gas} = 12.34 - 1.5P_{gas}$ (demand function)
  - Invert the function
    - ✓ $P_{gas} = 8.23 - 0.667Q_{D\ gas}$ (***inverse demand function***)
    - ✓ The graph of the inverse demand function is called the ***demand curve***.
    - ✓ The ***slope of demand curve*** is -0.667.
- ***Law of Demand***
  - ✓ demand decreased as the price increased

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Demand Curve

P($)

Demand function: $Q_{gas}=12.34-15P_{gas,}$

Inverse Demand function: $P_{gas}=8.23-0.667Q_{gas}$

8.23

Q(gallons)

12.34

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Supply

- The Supply Function
  - The quantity supply depends on the selling price ,the costs of production which depend 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***)
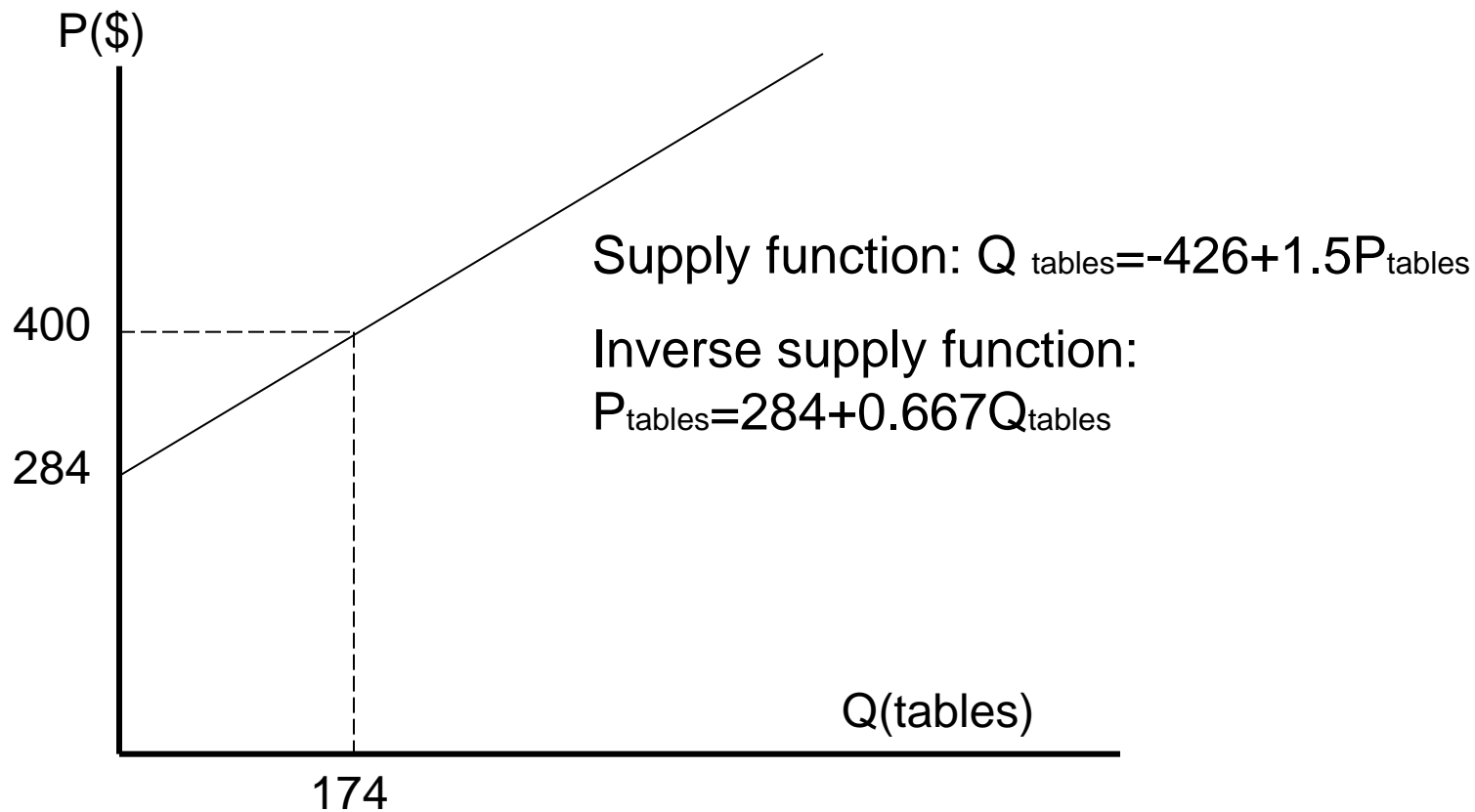   - ✓ The graph of the inverse supply function is called the ***supply curve***.
    - ✓ The ***slope of the supply curve*** is 0.667.
- ***Law of supply***
  - ✓ supply increased as the price increased

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Supply Curve

P($)

Supply function: $Q_{tables} = -426 + 1.5P_{tables}$

Inverse supply function:
$P_{tables} = 284 + 0.667Q_{tables}$

400

284

Q(tables)

174
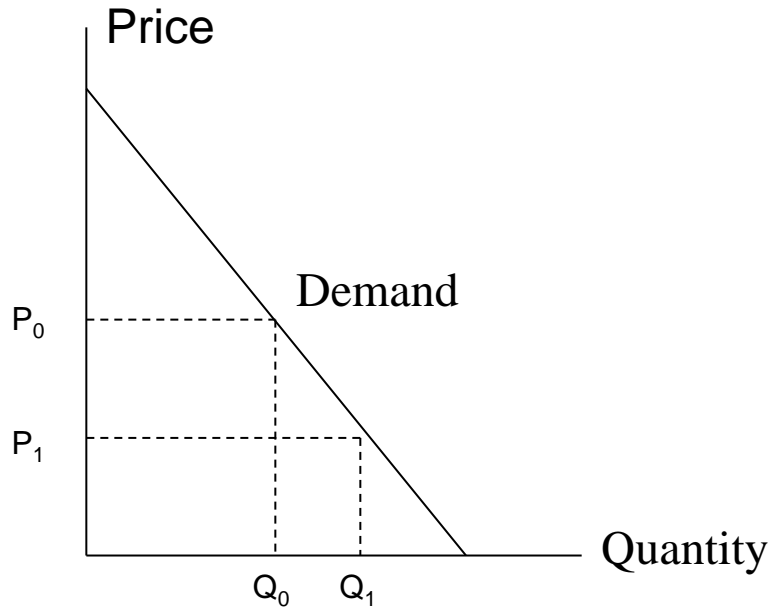
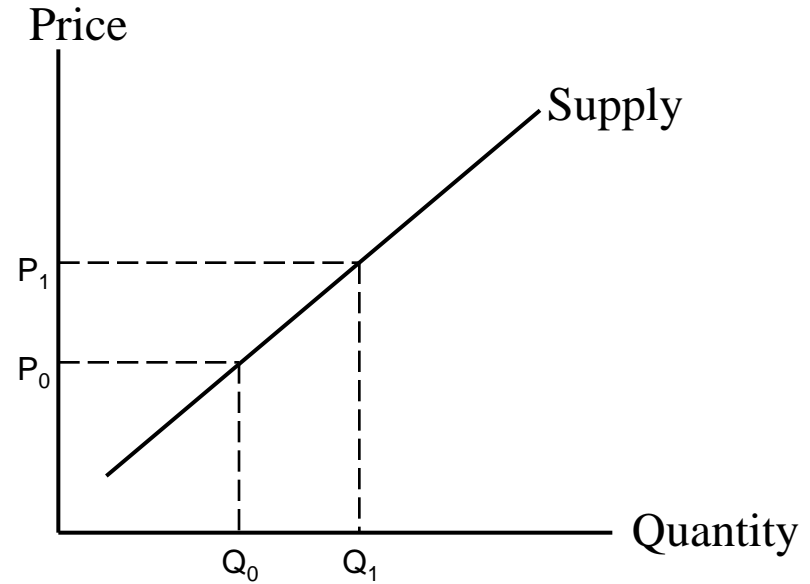101% Contribution Breeds Professionalism

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Shifts in and Movements along Demand and Supply Curves

- **Movements along demand and supply curves.**沿着需求（供给）曲线移动

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

- **Shifts in demand and supply curves.**需求（供给）曲线本身发生移动

    - A change in one of the independent variables other than price will result in a shift of the curve itself.

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Movements along Demand and Supply Curves

Change in Quantity Demand

Change in Quantity Supplied

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Shifts in Demand and Supply Curves

Price

An increase in demand

A decrease in demand

Original demand

Quantity

Price

A decrease in supply

Original supply

An increase in supple

Quantity

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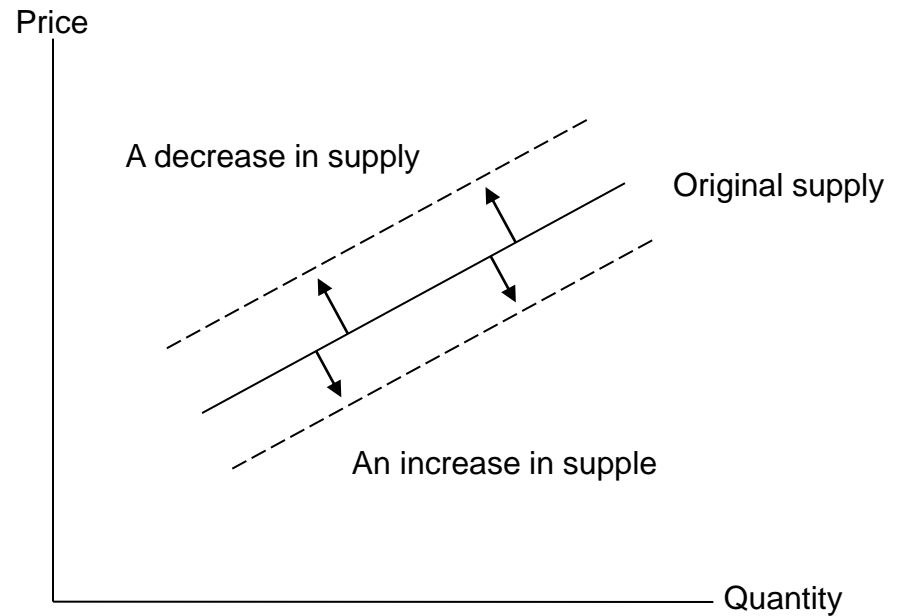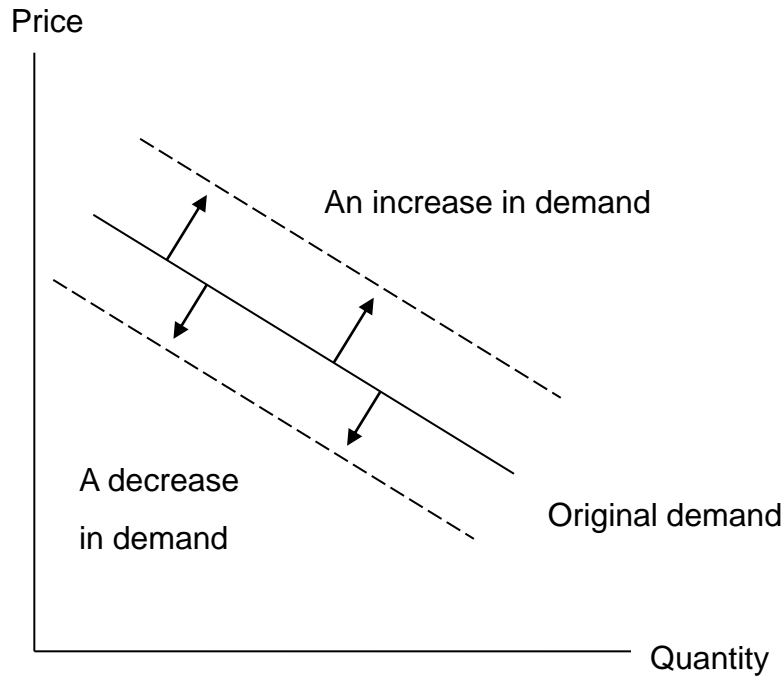
Aggregating Demand and Supply Curves

> ## *Aggregating demand and supply curves*
>   - Add the firms that comprise market supply together to get the <u>market supply function</u>.
>   - Add the many individual demand curves to get <u>the market demand function</u>

> **Example:**
>   - If 10,000 consumers have the demand function for gasoline:
> $$Q_D \text{ gas} = 9\text{-}3P_{gas} + 0.021 + 0.11P_{BT} - 0.008P_{auto}$$
>   - If the price of bus travel is \$20, income is \$50,000, and the average automobile price is \$30,000.
>   - Determine the slope of the market demand curve.

> **Answer:**
>   - Market demand is: $Q_{D\ gas} = 90{,}000\text{-}30{,}000P_{gas} + 2001 + 1{,}100P_{BT} - 80P_{auto}$
>   - $Q_{D\ gas} = 90{,}000\text{-}30{,}000P_{gas} + 200*50 + 1{,}100*20 - 80*30$
>   - $Q_{D\ gas} = 119{,}600 - 30{,}000P_{gas}$
>   - Inverting this function, $P_{gas} = 3.987\text{-}0.00003333\ Q_{D\ gas}$
>   - The slope of the demand curve is -0.00003333, or if we measure quantity of gas in thousands of gallons, we get -0.0333.

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Market Equilibrium
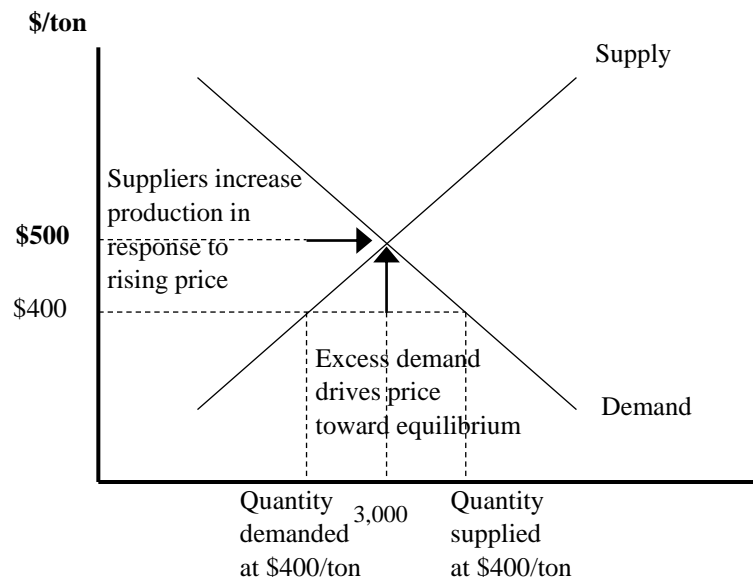
➢ Equilibrium price and the equilibrium quantity

- 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.
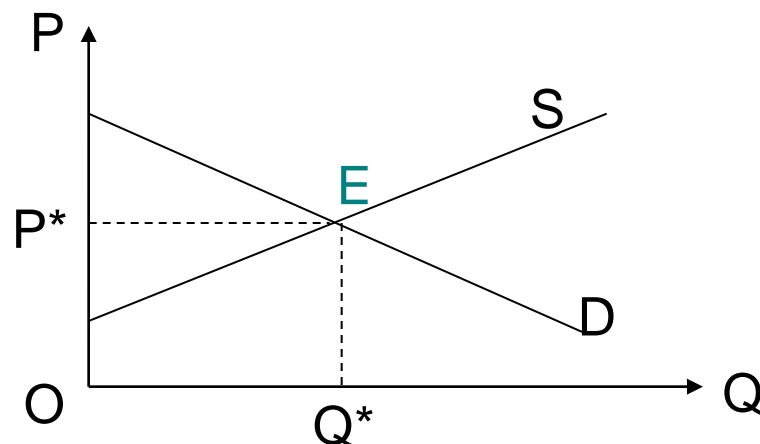
- E: market equilibrium. At the price, the quantity of supply=the quantity of demand.
- D:买方对每个产量愿意支付的最高价格；S:卖方对每个产量愿意出售的最低价格;E:买方愿意支付的最高价格=卖方愿意出售的最低价格(结合MB/MC分析)

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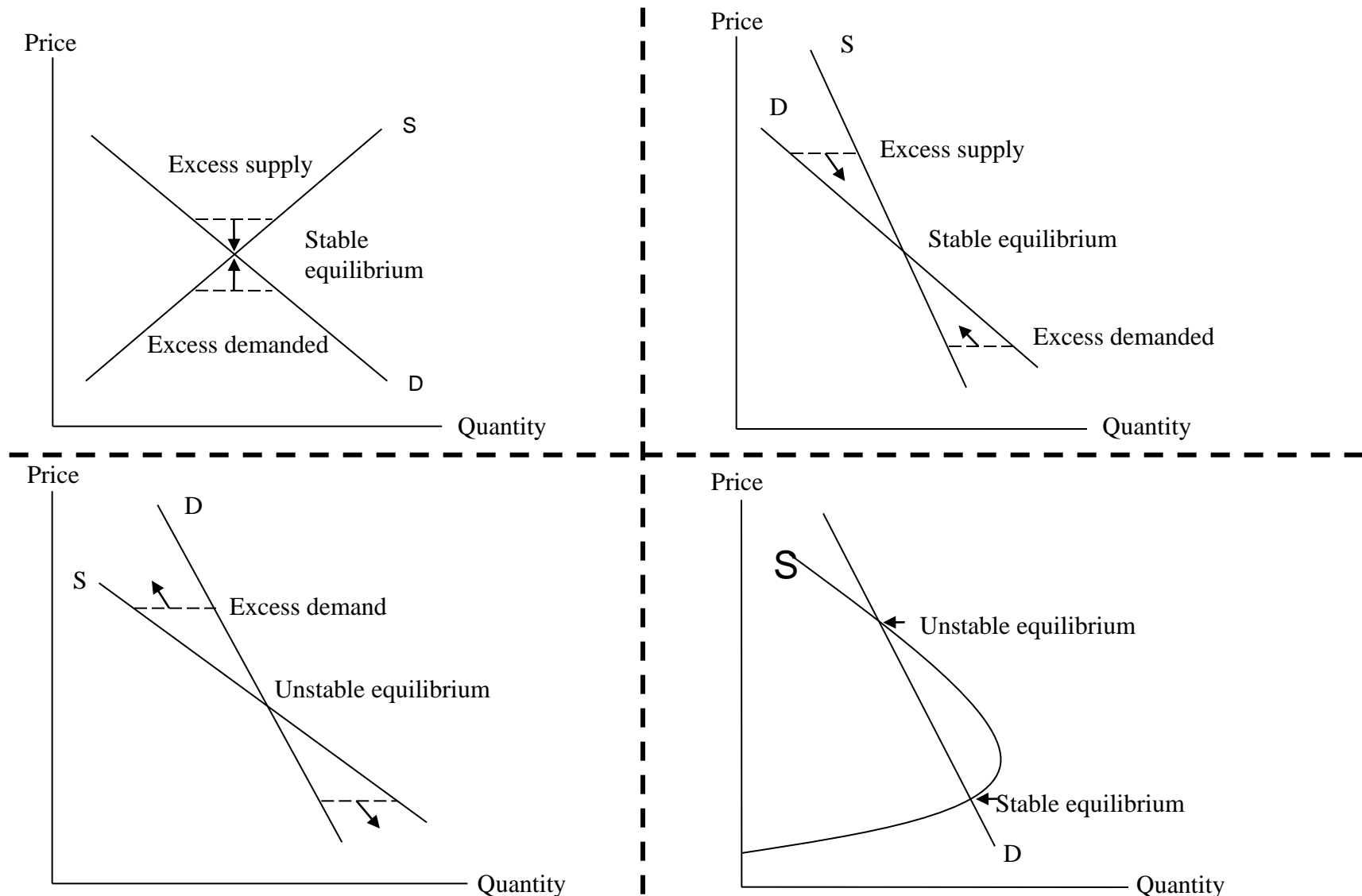
Movement toward Equilibrium

➢ If the price is above its equilibrium level, the quantity willingly supplied exceeds the quantity consumers are willing to purchase, and we have ***excess supply***. Suppliers willing to sell at lower price will offer those prices to consumers, driving the market price down towards the equilibrium level.

➢ If the market price is below its equilibrium level, the quantity demanded at that price exceeds the quantity supplied, and we have ***excess demand***. Consumers will offer higher prices to compete for the available supply, driving the market price up towards its equilibrium level.

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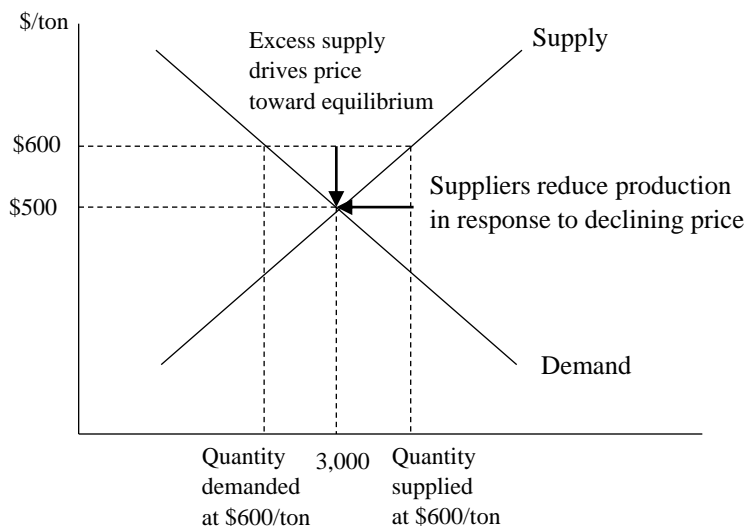
Stable and Unstable Equilibrium

➢ An equilibrium is termed **stable** when <u>there are forces that move price and quantity</u> back towards equilibrium <u>values</u> when they deviate from those values

   ● as long as <u>supply curve cuts through the demand curve from above</u>, the equilibrium will be stable

➢ If the supply curve is less steeply sloped than the demand curve, and prices above (below) equilibrium will tend to get further from equilibrium. We refer to such an equilibrium as **unstable.**

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Stable and Unstable Equilibrium

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Types of Auctions

➢ Auction is an alternative to markets for determining an equilibrium price.

➢ **Types of Auction:** Common value auction VS Private value auction

- common value auction

  - ✓ value of the item to be auctioned will be <u>the same to any bidder</u>

  - ✓ bidder must estimate what that value is

  - ✓ <u>bidder most overestimates the value</u>

    - ◆ winner's curse

- private value auction: The value that each bidder places on an item is the value it has to him, and we assume that no bidder will bid more than that. (e.g., art, collectibles)

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Types of Auctions

➢ **common type of auctions:**
- ● *ascending price auction (English auction):*
  - ✓ bidders can bid an amount greater than the previous high bid
  - ✓ bidder that <u>first offers the highest bid of the auction</u> wins the item and pays the amount bid.
  - ✓ Winner's curse: bid more than the ultimate value of the asset for common goods.
- ● *sealed bid auction*
  - ✓ bids are elicited from potential buyers
  - ✓ there is no ability to observe bids by other buyers until the auction has ended.
  - ✓ reservation price: refers to the highest price that a bidder is willing to pay.
- ① *the first sealed bid auction*
  - ✓ Bids are opened simultaneously and the item is <u>sold to the highest bidder for the actual bid price</u>.
  - ✓ Typically, some overly optimistic bidders will value the asset higher than its ultimate realizable value, and they might submit bids above that true value.
  - ✓ Because the highest bidder wins the auction and must pay his full bid price, he may find that he has fallen prey to the winner's curse of having bid more than the ultimate value of the asset.
  - ✓ In recognition of the possibility of being overly optimistic, bidders might bid very conservatively below their expectation of the true value.
- ② *second price sealed bid auction (Vickrey auction）*
  - ✓ the bidder submitting <u>the highest bid wins the item but pays the amount bid by the second highest bidder</u>
  - ✓ Induces buyers to reveal their true valuation of the item

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Types of Auctions

- ***descending price auction (Dutch auction)***

  - ✓ begins with a price greater than what any bidder will pay, and this offer price is reduced until a bidder agrees to pay it.

  - ✓ ***Modified Dutch auction***: establishing a single price for all purchasers. It is commonly used in securities markets.

  - ✓ ***Single price auction*** is used in selling U.S. Treasury securities. But bidders may also submit a noncompetitive bid. Such a bid indicates that those bidders will accept the amount of Treasuries indicated at the price determined by the auction, rather than specifying a maximum price in their bids.

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Example: Single Price Auction

> **Example:**

Auctioning Treasury Bills with a Single Price Auction

The U.S. Treasury offers to sell $115 billion of 52-week T-bills and requests competitive and non-competitive bids. Non-competitive bids total $10 billion, and competitive bidders in descending order of offer price are as given in the table below:

Discount Rate Bid (%)	Bid Price per $100	Competitive Bids ($ billions)	Cumulative Competitive Bids ($ billions)	Non-competitive Bids ($ billions)	Total Cumulative Bids ($ billions)
0.1575	99.8425	12			
0.1580	99.8420	20			
0.1585	99.8415	36			
0.1590	99.8410	29			
0.1595	99.8405	5			
0.1600	99.8400	15			
0.1605	99.8395	10			

1. Determine the winning price if a single price Dutch auction is used to sell these T-bills.

2. For those bidders at the winning price, what percentage of their order would be filled?

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Example: Single Price Auction

➢ **Solution to 1:** Enter the non-competitive quantity of $10 billion into the table. Then find the cumulative competitive bids and the total cumulative bids in the respective columns:

Bid Price Per $100	Competitive Bids ($ billions)	Cumulative Competitive Bids ($ billions)	Non-competitive Bids ($ billions)	Total Cumulative Bids ($ billions)
99.8425	12	12	10	22
99.8420	20	32	10	42
99.8415	36	68	10	78
99.8410	29	97	10	107
99.8405	5	102	10	112
99.8400	15	117	10	127
99.8395	10	127	10	137

➢ Note that at a bid price of 99.8400 there would be excess demand of $12 billion (i.e., the difference between $127 billion bid and $115 billion offered), but at the higher price of 99.8405 there would be excess supply. So the winning bid would be at a price of 99.8400.

➢ **Solution to 2:** At a price of 99.8400, there would be $15 billion more demanded than at 99.8405 ($127 billion minus $112 billion), and at 99.8405 there would be excess supply equal to $3 billion. So the bidders at the winning bid would have only 3/15, or 20 percent, of their orders filled.

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Marginal Benefit and Marginal Cost

➢ Marginal benefit is the benefit derived from consuming one additional unit of a good or service

  ● MB (MU): to consumer　MR: to producer

  ● MB (MU) curve == Demand curve

➢ Marginal cost, the cost of producing one more unit of a good or service

  ● MC curve == Supply curve

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Marginal Benefit and Marginal Cost

Efficiency and Inefficiency

➢ When MB > MC or MB < MC, the quantity of good is inefficiency.

➢ When MB=MC, the quantity of good is efficiency and the sum of consumer surplus and producers surplus is maximized.

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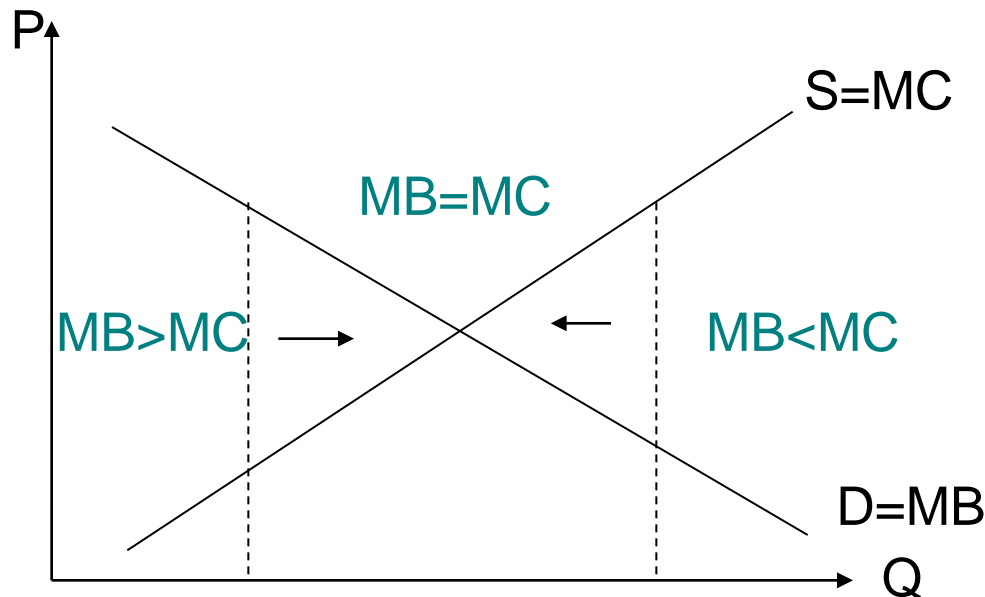
Consumer Surplus, Producer Surplus, and Total Surplus

➢ 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***

➢ ***Producer surplus*** is the excess of the market price above the opportunity cost of production

➢ ***Total surplus*** = consumer surplus + producer surplus

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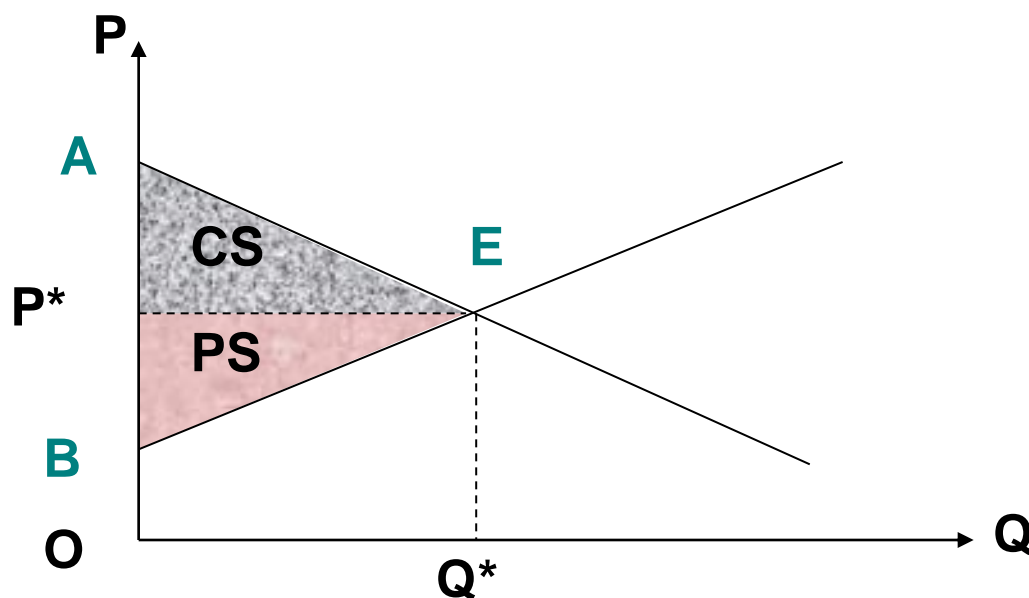
Calculating Consumer and Producer Surplus

➢ Calculating Consumer and Producer Surplus when demand and supply are linear (assume: demand curve and supply curve have the same steepness.)

- Example:
  - ✓ Demand function Q = 48 -3P
  - ✓ P=8 Q=24
  - ✓ the consumer surplus =1/2(8 × 24) = 96 units.
- Example:
  - ✓ Supply function Q =-24+6P
  - ✓ P=8 Q=24
  - ✓ The producer surplus = 1/2(4 × 24) = 48

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Relationship between Consumer Surplus and Producer Surplus

➤ When the efficient quantity (MB=MC) is produced, the sum of consumer surplus and produces surplus is <u>maximized</u>. Buyers and sellers acting in their self-interest end up promoting the social interest.

➤ If the supply curve is steeper than the demand curve, more of the surplus is being captured by producers. If the demand curve is steeper, consumers capture more of the surplus.

➤ Total surplus is a measure of society's gain from the voluntary exchange of goods and services.

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Deadweight Loss

- ➤ Deadweight Loss
  - The reduction in consumer and producer surplus due to underproduction or overproduction is called a ***deadweight loss***.

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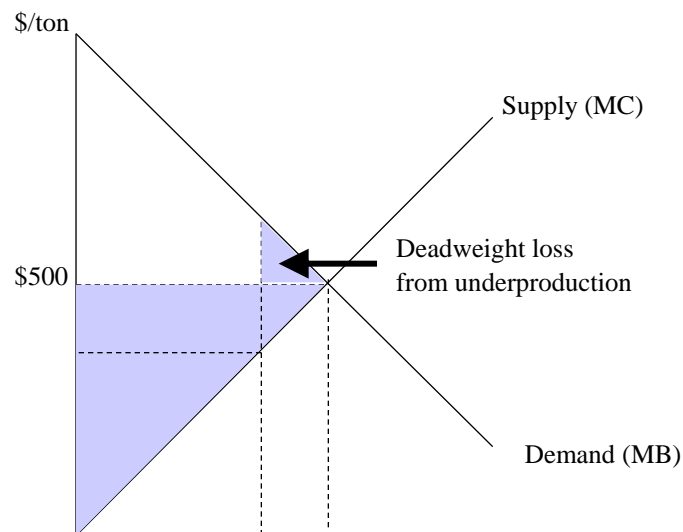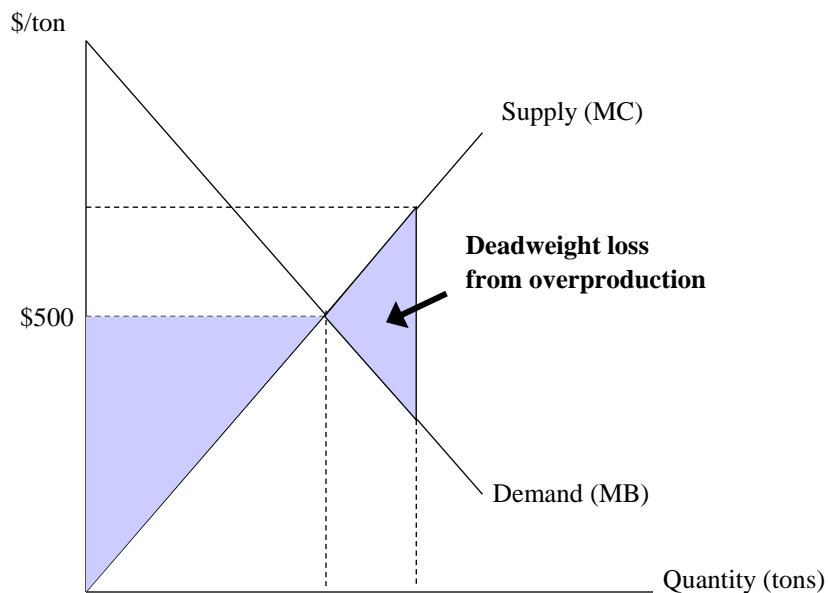
Obstacles to Efficiency

> ## **Obstacles to Efficiency**
>
> - Price controls: price ceiling (underproduction, e.g. rent control) and price floor (overproduction, e.g. minimum wage)
> - Tax: buyers pay a higher price, sellers receive a lower price
> - Subsidies: overproduction
> - Quotas: underproduction
> - Monopoly: underproduction
> - External costs: overproduction
> - External benefits: underproduction
> - Public goods: underproduction
> - Common resources: overproduction

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Price Ceiling

➢ A ***price ceiling*** is an upper limit on the price which a seller can charge. If the ceiling is above the equilibrium price, it will have no effect.

➢ **After imposition of a price floor at Pc**
   ● Consumer surplus: a+c
   ● Producer surplus: e
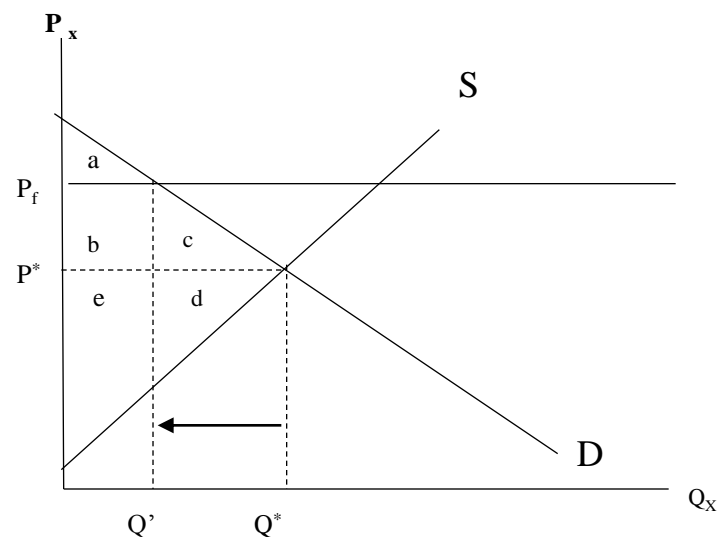   ● Deadweight loss: b+d

➢ **In the long run, price floors lead to inefficiencies:**

   ● Consumers may have to <u>wait in long lines</u> to make purchases. They pay a price (an opportunity cost) in terms of the time they spend in line.

   ● Suppliers may engage in <u>discrimination</u>, such as selling to friends and relatives first.

   ● Suppliers "officially" sell at the ceiling price but <u>take bribes</u> to do so.

   ● Suppliers may also <u>reduce the quality</u> of the goods produced to a level commensurate with the ceiling price.
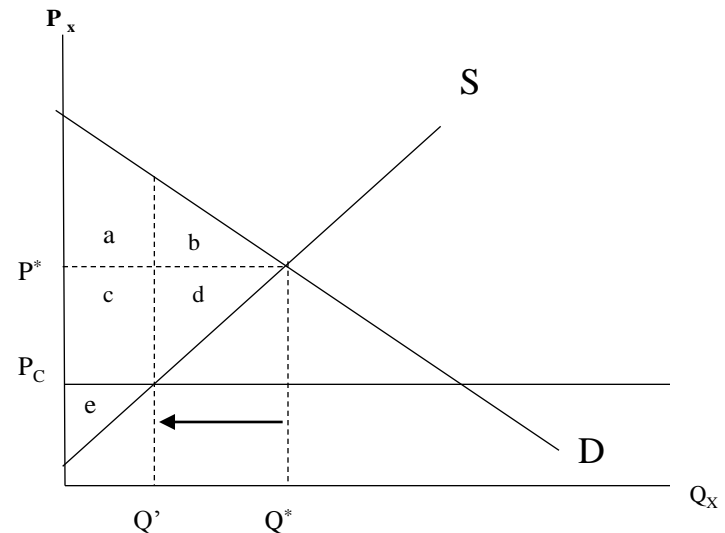
Note: **A price ceiling transfers surplus equal to area c from sellers to buyers, but it destroys surplus equal to area b + d, called a deadweight loss.**

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Price Floor

➢ **_Price floor_** is a minimum price that a buyer can offer a good, service, or resource. If the price floor is below the equilibrium price, it will have no effect on equilibrium price and quantity.

➢ **After imposition of a price floor at Pf**
  ● Consumer surplus: a
  ● Producer surplus: b+e
  ● Deadweight loss: c+d

➢ **In the long run, price floors lead to inefficiencies:**
  ● Suppliers will divert resources to the production of the good with the anticipation of selling the good at the floor price, but then will not be able to sell all they produce.
  ● Consumers will buy less of a product if the floor is above the equilibrium price and substitute other, less expensive consumption goods for the good subject to the price floor.

Note: **A price floor transfers surplus equal to area b from buyers to sellers, but it destroys surplus equal to area c + d, called a deadweight loss**

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Minimum wage

➢ The ***minimum wage*** in the United States is an example of a price floor

- minimum wage rate (*living wage)* that prevents employers from hiring workers at a wage less than the legal minimum.

- minimum wage >equilibrium wage will be an excess supply of workers

- The result is increased unemployment because even when there are workers willing to work at a wage lower than the minimum, firms cannot legally hire them.

- firms may decrease the quality or quantity of the nonmonetary benefits they previously offered to workers, such as pleasant, safe working conditions and on-the-job training

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Impact of Taxes

➢ The incidence of a tax is allocation of this tax between buyers and sellers.

Tax on producers

Tax on buyers

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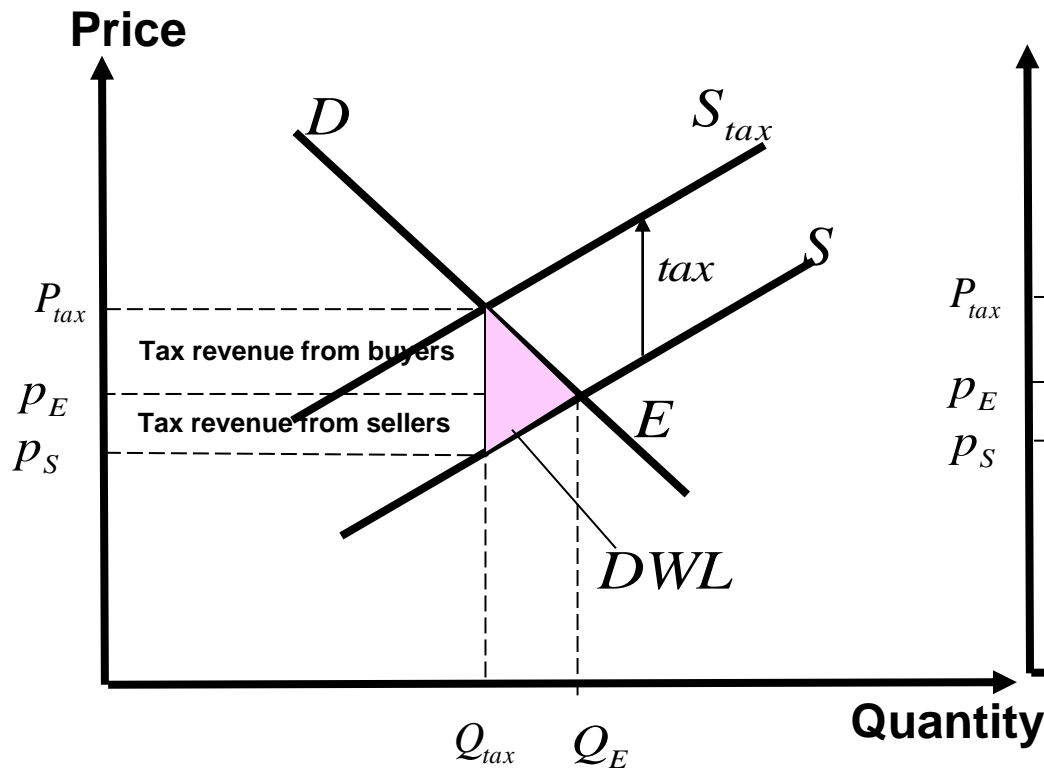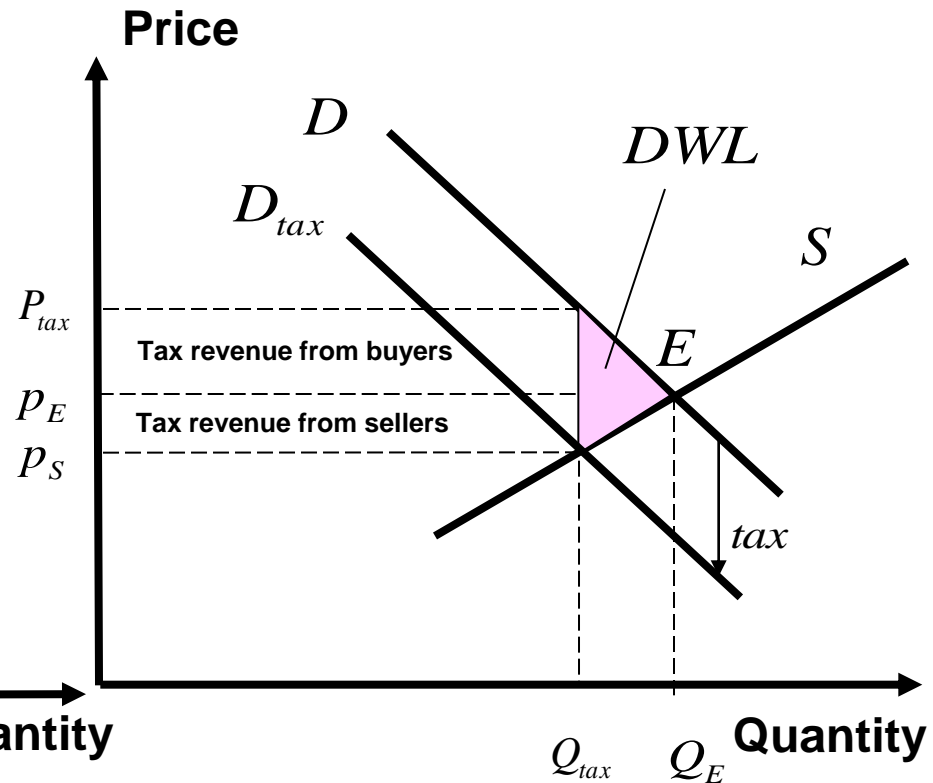
Impact of Taxes

➤ Actual and Statutory Incidence of a Tax

- ● **_Statutory incidence_** refers to who is legally responsible for paying the tax.

- ● The **_actual incidence_** of a tax refers to who actually bears the cost of the tax through an increase in the price paid (buyers) or decrease in the price received (sellers)

➤ Tax on producers:

- ● Statutory incidence: sellers

- ● Actual incidence: sellers and buyers

➤ Tax on buyers:

- ● Statutory incidence: buyers

- ● Actual incidence: buyers and sellers

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Subsidies

> *Subsidies* are payments made by governments to producers, often farmers.
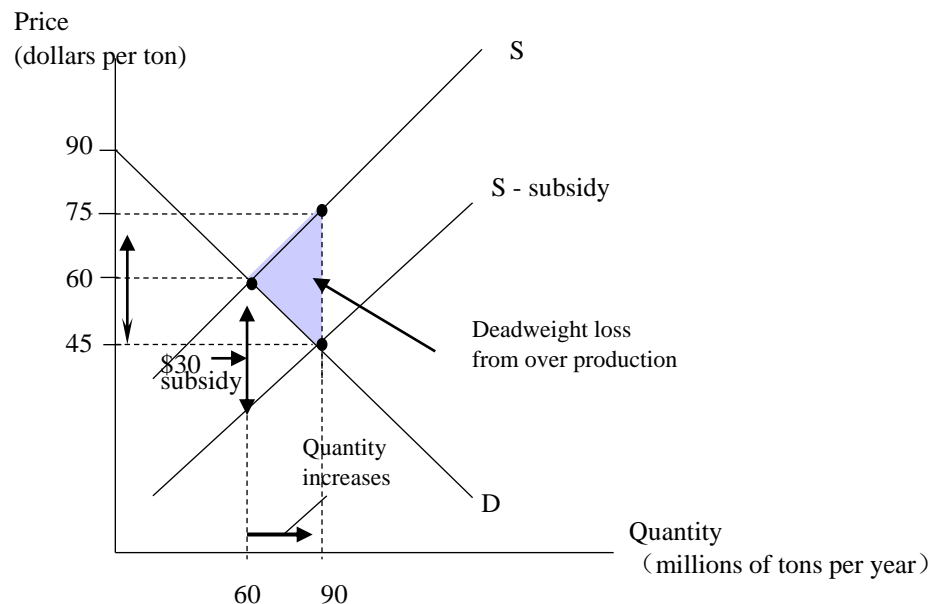
- After imposition of subsidies, supply will increase, which lead to an increase in quantity, overproduction.

- Buyers will pay a lower price. Sellers will receive a higher price.

Quotas

➤ **Production quotas** are used to regulate markets by imposing an upper limit on the quantity of a good that may be produced over a specified time period. Quotas are often used by governments to regulate agricultural markets.

- After imposition of quotas, the quantity will decrease, underproduction.
- Buyers will pay a higher price.
- At the quota amount, marginal benefit (price) exceeds marginal cost. This explains why producers often seek the imposition of quotas.

Price
(dollars per ton)

Gain in producer surplus

75 MB Quota

60

45 Deadweight loss from underproduction

Loss of producer surplus

30 MC Quota

Quantity producer decreases to Quota amount =60

60   90

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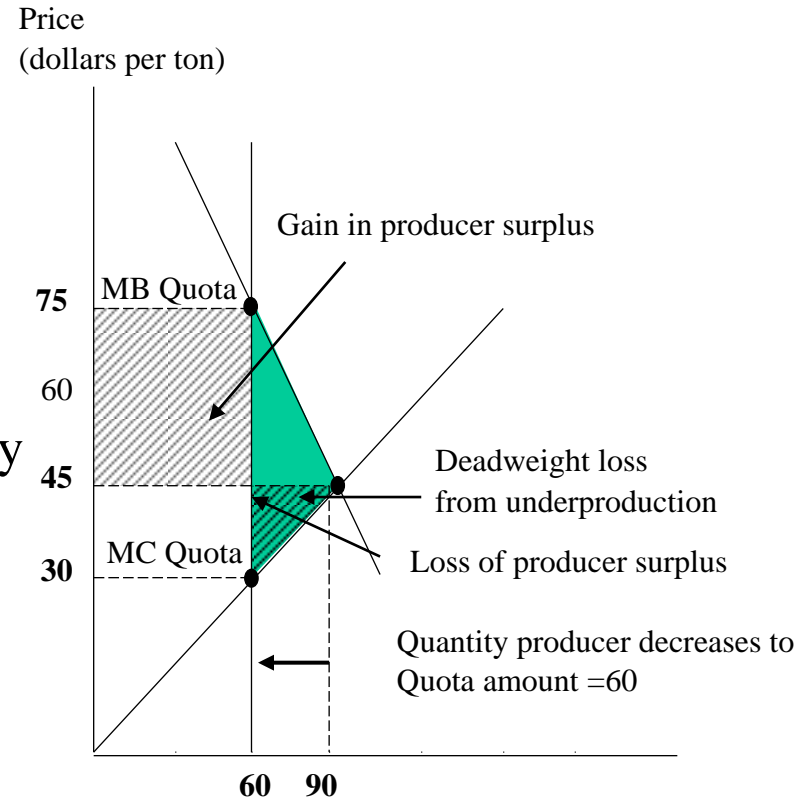
Elasticity

```
Elasticity ─┬─ Price Elasticity of demand
            │
            └─ Other elasticity of demand ─┬─ Cross Elasticity of Demand
                                           │
                                           └─ Income Elasticity of Demand
```

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Price Elasticity of Demand

> ***Price elasticity*** is a measure of the responsiveness of the quantity demanded to a change in price.

- The formula used to calculate the price elasticity of demand is :

$$\text{price elasticity of demand} = \frac{\text{percent change in quantity demand}}{\text{percent change in price}} = \frac{\Delta Q / Q}{\Delta P / P}$$

where:

$$\text{percent change} = \frac{\text{change in value}}{\text{average value}} = \frac{\text{ending value - beginning value}}{(\dfrac{\text{ending value + beginning value}}{2})}$$

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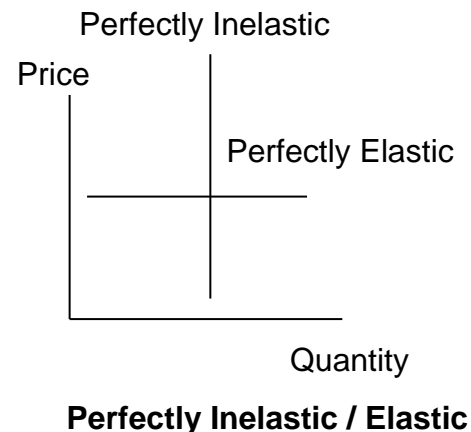# Example: Calculating Point Elasticity

> **Example：**

- Qxd, = 8,400 - 400Px+ 60I - 10Py

-   choose \$3 for *Px*

- \$50 (thousands) for I

- \$20 (thousands) for Py

$$E^d_{p_x} = \frac{\Delta Q^d_x}{\Delta P_x} \times \frac{P_x}{Q^d_x} = -400 \times \frac{3}{10000} = -0.12 \rightarrow \text{own} - \text{price elasticity of demand}$$

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Price Elasticity of Demand

- If a *small* percentage price change results in a *large* percentage change in quantity demanded, the demand for that good is said to be ***highly elastic***. The absolute value of price elasticity is greater than one.

- If a *large* percentage price change results in a *small* percentage change in quantity demanded, demand is ***relatively inelastic***. The absolute value of price elasticity is less than one.

- A ***perfectly elastic*** demand curve is horizontal, and its elasticity is infinite. If the price increases, quantity demanded goes to zero.

- A ***perfectly inelastic*** demand curve is vertical, and elasticity is zero. If the price changes, there will be no change in the quantity demand.

Price

Quantity

Elastic

Price

Quantity

Inelastic

Perfectly Inelastic

Price

Perfectly Elastic

Quantity

Perfectly Inelastic / Elastic

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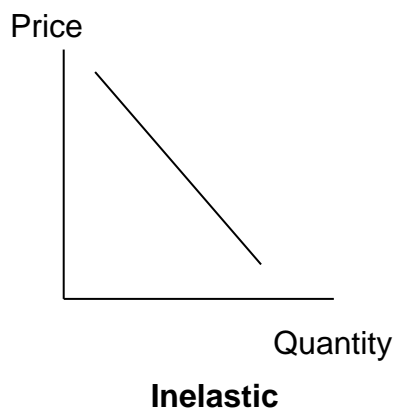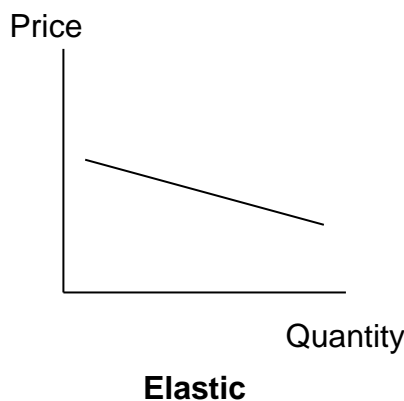
Price Elasticity of Demand is Different Along a linear Demand Curve

➢ The relation between price elasticity of demand and total revenue.
  ● Total revenue is maximized at the price and quantity where demand is unit elastic (price elasticity = −1) and so decreases with both price increases or price decreases from that level.
  ● When price is in the <u>elastic</u> (inelastic) region of the demand curve, <u>a price increase will decrease</u> (increase) total revenue.
➢ Note:
  ● When Ep >1, if price increases, the quantity will decrease, and the change in quantity is greater than that in price. As a result, the total revenue will decrease.
  ● TR = P*Q, △R/R = △P/P + △Q/Q
  ● △P↑, △Q↓, but ｜△Q｜>｜△P｜
  ● So △R/R = △P/P + △Q/Q < 0.
  ● TR decreases.

Price($)

(a) high elasticity
     elasticity = - 2.6

(b) unitary elasticity
     elasticity = - 1

(c) unitary elasticity
     elasticity = - 0.2

8
7
6
5
4
3
2
1

10 20 30 40   50 60   70 80

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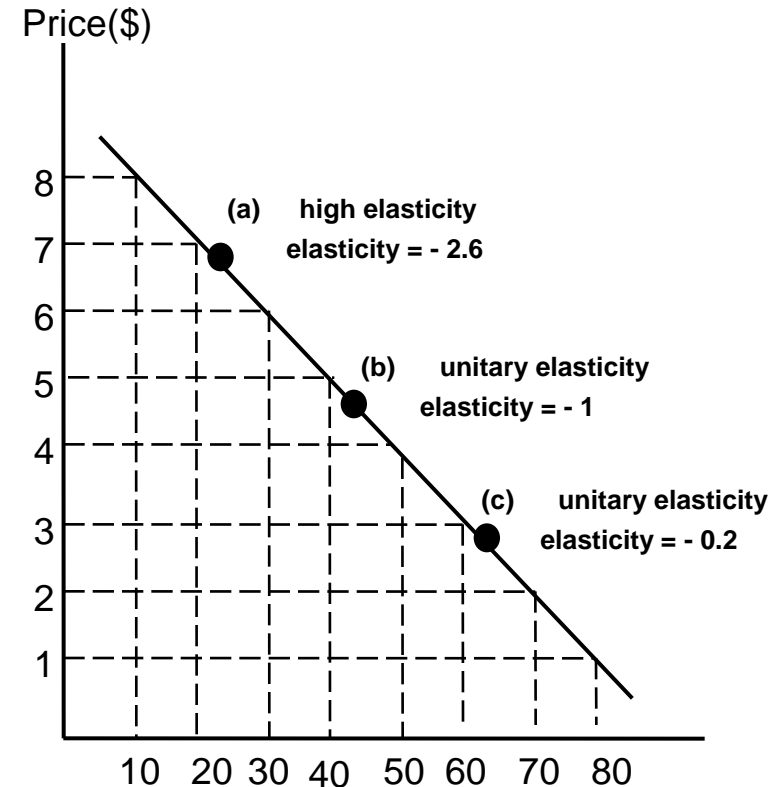
Elasticity of Supply and Demand and Tax Incidence

(a) Inelastic Supply Curve

Price
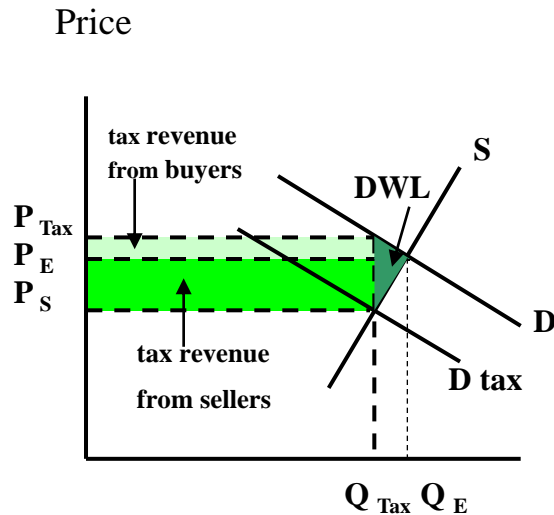
(b) Inelastic Demand Curve

Price
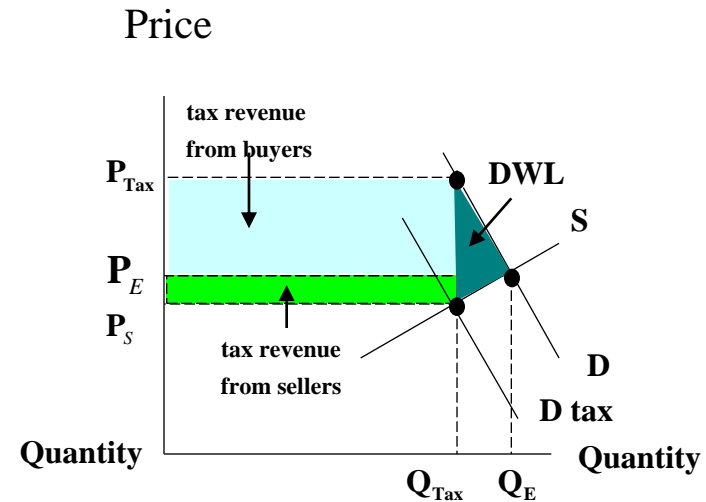
- If the supply curve is less elastic, sellers will bear a higher tax burden. (Figure a)

- If the demand curve is less elastic, buyers will bear a higher tax burden. (Figure b)

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Factors that Influence the Elasticity of Demand

➢ ***Availability of substitutes***. If good substitutes are available, a price increase in one product will induce consumers to switch to a substitute good.

➢ ***Relative amount of income spent on the good***. When the portion of consumer budgets spent on a particular good is relatively small, demand for that good will tend to be relatively inelastic.

➢ ***Time since the price change***. The price elasticity of demand for most products is greater in the long run than in the short run.

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Cross Elasticity

➢ **Cross elasticity of demand** measures the change in the demand for a good in response to the change in price of a substitute or complementary good.

- The formula for calculating cross elasticity of demand is:

$$\text{cross elasticity of demand} = \frac{\text{percent change in quantity demanded}}{\text{percent change in price of substitute or complement}} = \frac{\Delta Q_A / Q_A}{\Delta P_B / P_B}$$

- Cross elasticity of demand is *positive* for *substitute goods*. (Example: apple and pear)
- Cross elasticity of demand is *negative* for *complement goods*. (Example: car and gas)

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Income Elasticity of Demand

➢ ***Income elasticity of demand*** measures the sensitivity of the quantity of a good or service demanded to a change in a consumer's income.

- The formula for income elasticity of demand is:

$$\text{income elasticity of demand} = \frac{\text{percent change in quantity demanded}}{\text{percent change in income}} = \frac{\Delta Q / Q}{\Delta I / I}$$

➢ **The application of Income elasticity**

- **Normal Goods**: positive income elasticity, demand rises with income. (> 0)

   ✓ ***Luxuries***: high positive elasticity, demand rises strongly with income. (>1)

   ✓ ***Necessity goods***: normal but low elasticity (between 0 ~ 1)

- ***Inferior Goods***: negative income elasticity, demand falls with income (<0)

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Example: Calculating Point Elasticity

➢ **Example**：

- Qxd, = 8,400 - 400Px+ 60I - 10Py

- choose \$3 for *Px*

- \$50 (thousands) for I

- \$20 (thousands) for Py

$$E^d_{p_x} = \frac{\Delta Q^d_x}{\Delta P_x} \times \frac{P_x}{Q^d_x} = -400 \times \frac{3}{10000} = -0.12 \rightarrow \text{own} - \text{price elasticity of demand}$$

$$E^d_I = \frac{\Delta Q^d_x}{\Delta I} \times \frac{I}{Q^d_x} = 60 \times \frac{50}{10000} = 0.3 \rightarrow \text{income elasticity of demand}$$

$$E^d_{p_y} = \frac{\Delta Q^d_x}{\Delta P_y} \times \frac{P_y}{Q^d_x} = -10 \times \frac{20}{10000} = -0.02 \rightarrow \text{cross} - \text{price elasticity}$$

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Framework of Economics

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R14 Consumer Choice Theory and Utility Theory

➢ Utility theory

➢ Budget constraint

➢ Substitution and income effects

➢ Normal goods and inferior goods

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Consumer Choice Theory and Utility Theory

➢Framework: consumer choice theory

Utility theory	Budget constraints
Like to do	Can do
Consumer equilibrium	
Should do	
Demand curve	

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Consumer Choice Theory

➢ ***Consumer choice theory***: relates consumers' wants and preferences to the goods and services they actually buy.

- It models what the consumer would like to consume.
- It examines what the consumer can consume with limited income.
- By superimposing what the consumer would like to do onto what the consumer can do, we arrive at a model of what the consumer would do under various circumstances.
- **Assumption:** the consumer knows his or her **own tastes** and preferences and tends to take **rational bundle**.

➢ **Axioms of the theory of consumer choice**

- ***Complete preferences***: A > B or A < B or A = B
- ***Transitive preferences***: A > B and B > C $\Longrightarrow$ A > C
- ***Non-satiation***: "more is better", A+1 > A

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Utility Theory

➢ ***Utility theory*** explains consumer behavior based on preferences for various alternative combinations of goods, in terms of the relative level of satisfaction they provide.

➢ ***Utility function***: utility = $U(Q_A, Q_B, \ldots, Q_N)$, where the variables are quantities consumed of goods A through N.

➢ Utility is an ordinal measure, rather than a cardinal measure.

 ● Ordinal rankings are weaker measures than cardinal rankings because they do not allow the calculation and ranking of the differences between bundles.

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Indifference Curve

➤ ***Indifference curve*** represents all the combinations of two goods such that the consumer is entirely indifferent among them.

➤ ***Characteristics of indifference curve***:

  ● Indifference curves for two goods slope downward

  ● Indifference curves cannot cross

  ● Indifference curves are convex towards the origin
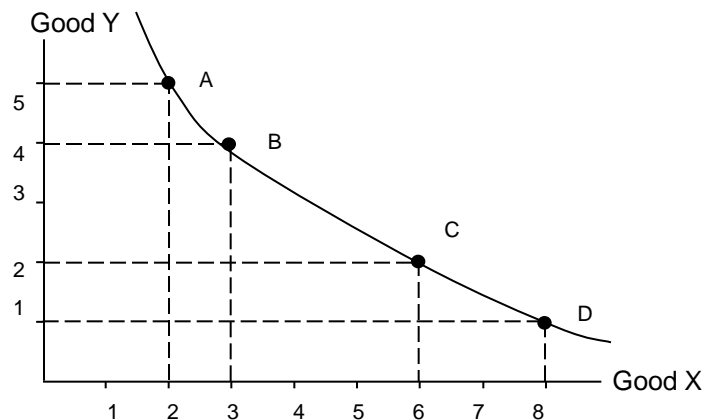
Indifference curves slope downward

Indifference curves cannot cross

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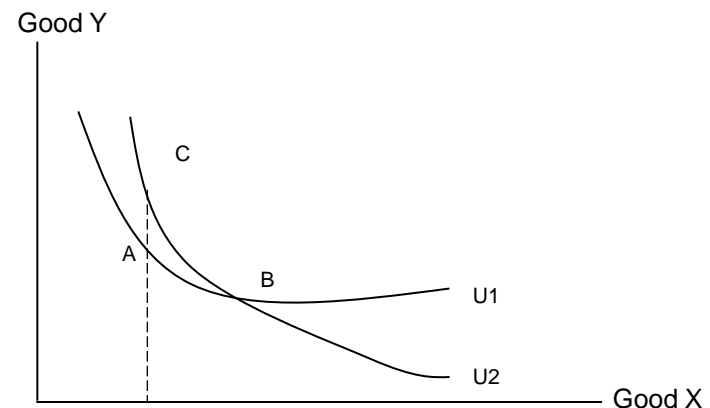
Marginal Rate of Substitution (MRS)

➢ ***Marginal rate of substitution (MRS)***

- the rate at which the consumer is willing to give up one goods to obtain another goods, holding utility constant.

- $MRS_{XY} = -\triangle Y / \triangle X$

    ✓ Example：$MRS_{XY} = 3$，increase 1 unit of Good X, have to give up 3 units of Good Y, holding utility constant.

➢ ***the law of diminishing marginal rate of substitution***: as one moves down a (standardly convex) indifference curve, the marginal rate of substitution decreases (as measured by the absolute value of the slope of the indifference curve, which decreases).

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Budget Constraints

> ➢ ***Budget constraint*** can be constructed based on the consumer's income and the prices of the available goods.

- The ***budget line*** shows all combinations of Good X and Good Y that will just exhaust the consumer's income.
- $P_X*Q_X+P_Y*Q_Y \leqq I$
- Slope of Budget constraint is negative
- Slope of Budget constraint is the ***price ratio***

Budget Constraint

Units of Good Y

Income = $90

P_X = $6
P_Y = $15

6

15

Units of Good X

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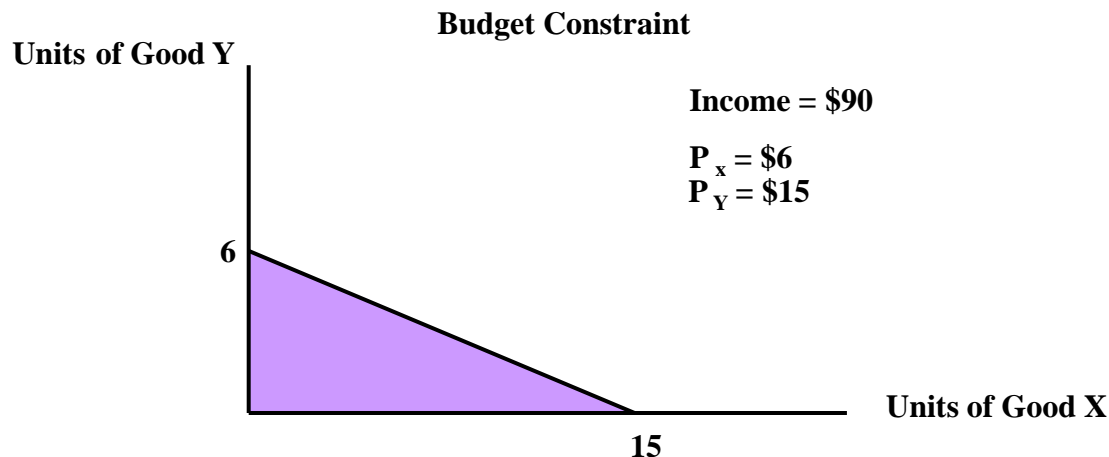
Budget Constraints

➢ Changing prices:

  ● The price of Good Y keeps constant: <u>an increase in the price of Good X</u> pivots the budget constraint inward, becoming steeper.

  ● The price of Good X keeps constant: <u>an increase in the price of Good Y</u> pivots the budget constraint downward, becoming less steep.

➢ Changing income: <u>an increase in income</u> shifts the budget constraint outward, parallel to the original constraint.

Panel A　　　　*Panel B*　　　　*Panel D*

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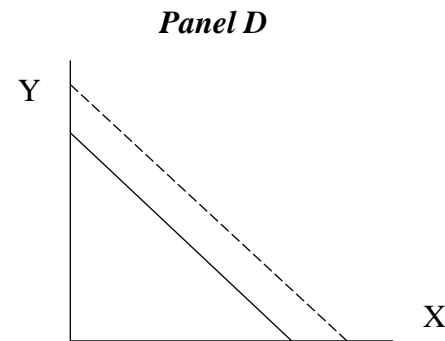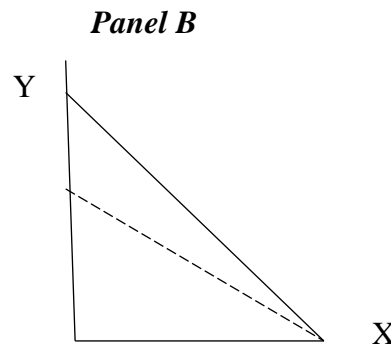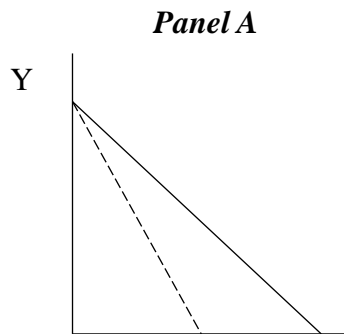
Consumer's Equilibrium

> ## *Consumer equilibrium*

- Utility is maximized, subject to the budget constraint

- Tangency between budget constraint & the highest attainable indifference curve

- At tangent point, MRS$_{XY}$（边际替代率，消费者意愿）= Price ratio （相对价格，市场意愿）

$$MRS_{XY} = -\frac{\Delta Y}{\Delta X} = \frac{MU_X}{MU_Y} = \frac{P_X}{P_Y}$$

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Consumer's Equilibrium

I/P$_X$为横坐标截距

I/P$_Y$为纵坐标截距

P$_X$/P$_Y$为预算线斜率

$$\mathbf{MRS_{XY}} = -\frac{\Delta Y}{\Delta X} = \frac{MU_X}{MU_Y} = \frac{P_X}{P_Y}$$

Good Y

Most preferred affordable combination

I/P$_Y$

5

6

I/P$_X$

Good X

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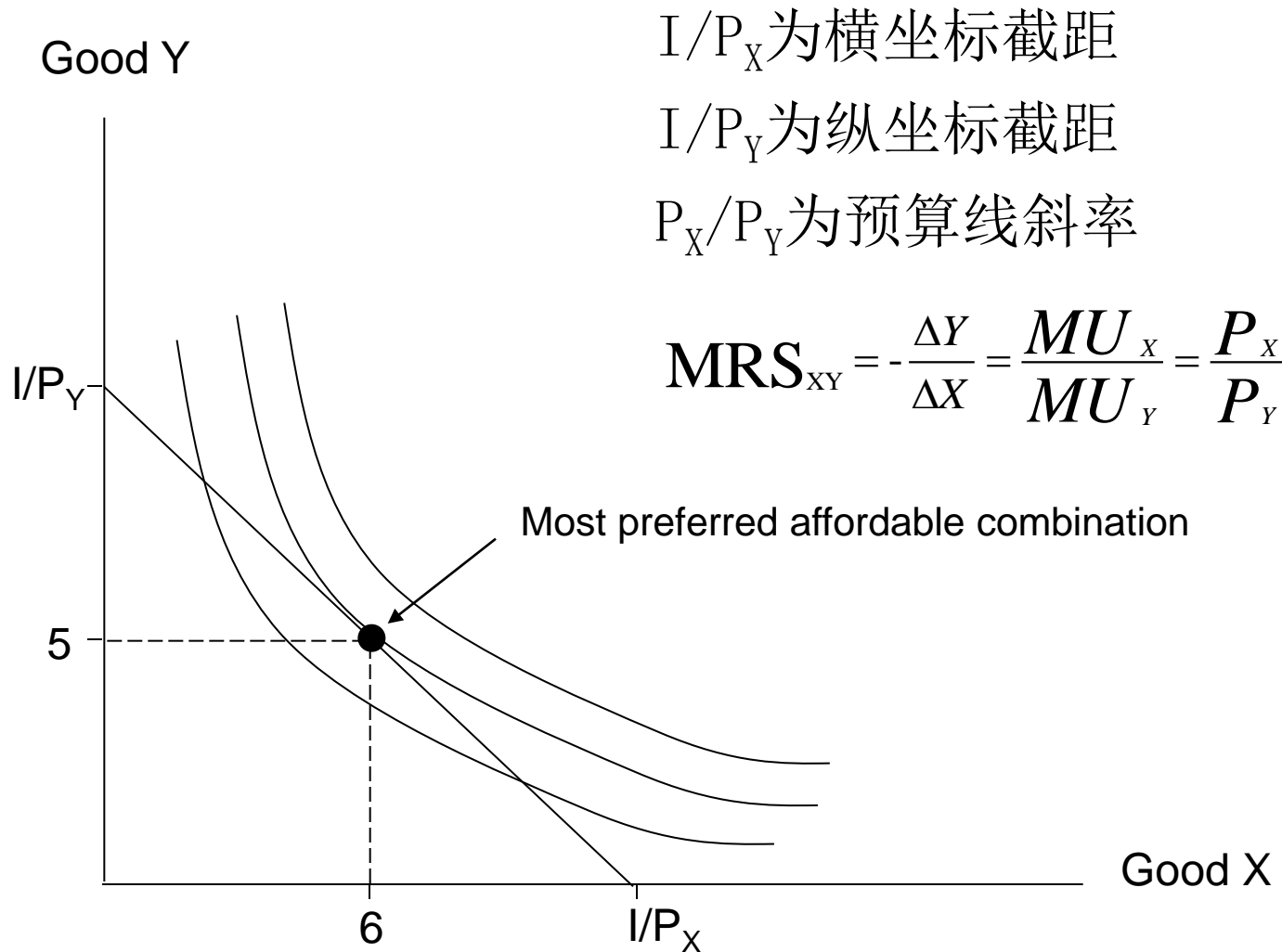
Substitution and Income Effects

➢ **_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.

➢ Income effect & Substitution effect共同作用决定需求量变化

➢ 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.
  ● The substitution effect is positive, and the income effect is negative but smaller than the substitution effect—consumption of Good X will increase.
  ● The substitution effect is positive, and the income effect is negative and larger than the substitution effect—consumption of Good X will decrease

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Normal Goods and Inferior Goods

➢ ***Normal good*** is one for which the income effect is positive.

➢ ***Inferior good*** is one for which the income effect is negative.

➢ ***Giffen goods*** (吉芬商品):

  ● Income effect （inferior goods） > Substitution effect

  ● demand curve has positive slope

➢ ***Veblen goods*** (韦伯伦商品, Conspicuous goods):

  ● Consumer can not 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: Gucci bag) 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.

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R15 Demand and Supply: the Firm

➤ Accounting profit, economic profit, normal profit and economic rent

➤ Total, average, and marginal revenue

➤ Total, average, marginal, fixed, and variable costs

➤ Breakeven and shutdown points of production

➤ Economies of scale and diseconomies of scale

➤ Profit maximization

➤ Total, marginal, and average product of labor

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Accounting Profit, Economic Profit and Normal Profit

- ➤ ***Accounting profit*** may be referred to as net income, net profit, net earnings, or the "bottom line" (of the firm's income statement).
  - 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 costs.
  - **Implicit costs** are the opportunity costs of resources supplied to the firm by its owners.
  - For private firms, these costs may include (1) the opportunity cost of owner-supplied capital and (2) the opportunity cost of the time and (3) entrepreneurial ability of the firm's owners.
  - For publicly traded firms, implicit costs are typically only the opportunity cost of equity owners' investment in the firm.
  - Economic profit = accounting profit – implicit opportunity costs
  - Or economic profit = total revenue – total economic costs
- ➤ ***Normal profit*** is the accounting profit that makes economic profit zero.
  - Accounting profit = economic profit + normal profit

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Relationship of Accounting, Normal, and Economic Profit to Equity Value

Relationship between Accounting Profit and Normal Profit	Economic Profit	Firm's Market Value of Equity
Accounting profit > Normal profit	Economic profit > 0 and firm is able to protect economic profit over the long run	Positive effect
Accounting profit = Normal profit	Economic profit = 0	No effect
Accounting profit < Normal profit	Economic profit < 0 implies economic loss	Negative effect

Revenue

Economic profit

Accounting profit

Implicit cost

economic cost

Accounting cost = explicit cost

Explicit cost

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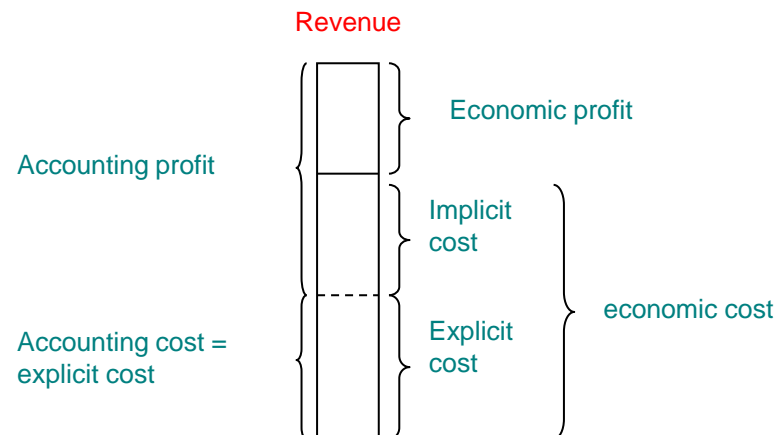
Economic Rent

➢ ***Economic rent*** is used to describe a payment to a factor of production above its value in its next highest-valued use (its opportunity cost).

- If we think of a supply curve as the marginal opportunity cost of an input, a <u>perfectly inelastic supply curve</u> would indicate that any payment to the factor is greater than its opportunity cost and would be economic rent.

- In the case of a <u>perfectly elastic supply curve</u> for a factor, there is no economic rent.

(a) Perfectly elastic supply　　**(b) Perfectly inelastic supply**

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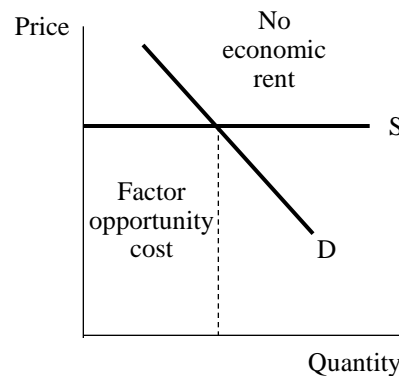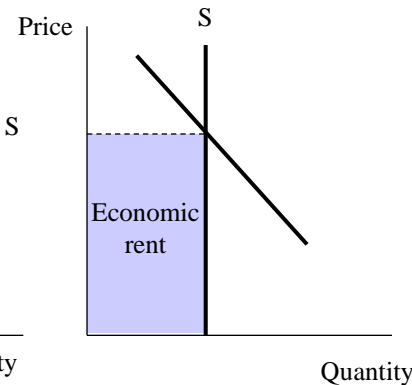
Analysis of Revenue and Cost

(Economic) profit	Total revenue minus total economic cost; ($TR - TC$)
Total revenue (TR)	Price times quantity $(P * Q)$, or the sum of individual units sold times their respective prices; $\sum P_i * Q_i$)
Average revenue (AR)	Total revenue divided by quantity; (TR / Q)
Marginal revenue (MR)	Change in total revenue divided by change in quantity; ($\triangle TR / \triangle Q$)
Costs	
Total fixed cost (TFC)	Sum of all fixed expenses; here defined to include all opportunity costs
Total variable cost (TVC)	Sum of all variable expenses, or per unit variable cost times quantity; (per unit VC * Q)
Total costs (TC)	Total fixed cost plus total variable cost; $(TFC + TVC)$
Average fixed cost (AFC)	Total fixed cost divided by quantity; (TFC/Q)
Average variable cost (AVG)	Total variable cost divided by 'quantity; (TVC /Q)
Average total cost (ATC)	Total cost divided by quantity; (TC/Q) or $(AFC + AVG)$
Marginal cost (MC)	Change in total cost divided by change in quantity; ($\triangle TC / \triangle Q$)

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Total Revenue, Average Revenue, and Marginal Revenue

➢ **_Total revenue (TR)_** for any firm that charges a single price to all customers is calculated as price multiplied by quantity sold, or TR=P*Q.

➢ **_Average revenue (AR)_** is equal to total revenue divided by the quantity sold, AR=TR/Q.

➢ **_Marginal revenue (MR)_** is the increase in total revenue from selling one more unit of a good or service.

Quantity	Price	Total Revenue	Average Revenue	Marginal Revenue
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

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Total Revenue, Average Revenue, and Marginal Revenue

➢ Under imperfect competition

- Firms face <u>downward-sloping demand curve, price searchers</u>.

- <u>Average revenue (AR) and marginal revenue (MR) will decline as sold increase.</u>

- AR is not equal to MR for any quantities greater than one.

- The decrease in MR is more than the decrease in price or AR.

- Total revenue (TR) is maximized when MR=0.

➢ Under perfect competition

- The individual firm has virtually no impact on market price, <u>price taker</u>.

- The individual seller faces a <u>horizontal demand curve</u> over relevant output ranges at the price level established by the market.

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Factors of Production

- ➤ ***Factors of production***, the inputs to the production of goods and services, include:
  - ● ***Land***, as in the site location of the business;
  - ● ***Labor***, which consists of the inputs of skilled and unskilled workers as well as the inputs of firms' managers;
  - ● ***Capital***, which in this context refers to physical capital – such tangible goods as equipment, tools, and buildings. Capital goods are distinguished as inputs to production that are themselves produced goods;
  - ● ***Materials***, which in this context refers to any goods the business buys as inputs to its production process.
- ➤ For economic analysis, we often consider only two inputs, <u>capital and labor</u>.
- ➤ ***Production function***: the quantity of output that a firm can produce can be thought of as a function of the amounts of capital and labor employed and represented as Q=f(K,L).

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Total, Average, and Marginal Product of Labor

Term	Calculation
Total product	Sum of the output from all inputs during a time period; usually illustrated as the total output (TP or Q) using labor (L)
Average product	Total product divided by the quantity of a given input; measured as total product divided by the number of workers used at that output level; (TP/L) or (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; ($\Delta TP / \Delta L$) or ($\Delta Q / \Delta L$)
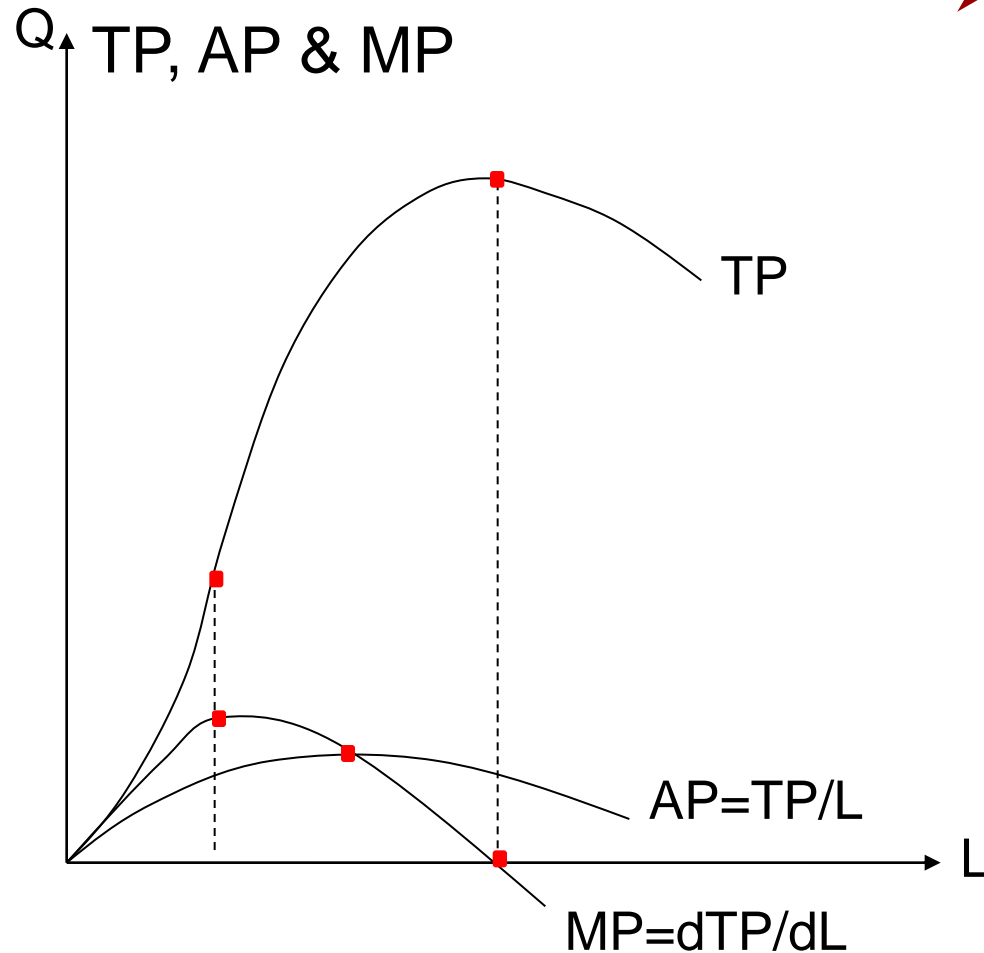
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Law of Diminishing Returns

> The **law of diminishing 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.

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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, <u>economists treat labor and raw materials as variable in the short run</u>, holding plant size, capital equipment, and technology constant. <u>All of these factors become variable in the long run</u>.

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Total, Average, Marginal, Fixed, and Variable costs

➢ ***Total fixed cost (TFC)*** is the cost of inputs that do not vary with the quantity of output and cannot be avoided over the period of analysis.

➢ ***Total variable cost (TVC)*** is the cost of all inputs that vary with output over the period of analysis.

➢ ***Total cost (TC)*** is the sum of all costs (fixed or variable, explicit and implicit) of producing a specific level of output.

- 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

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Total, Average, Marginal, Fixed, and Variable costs

Short-run Costs
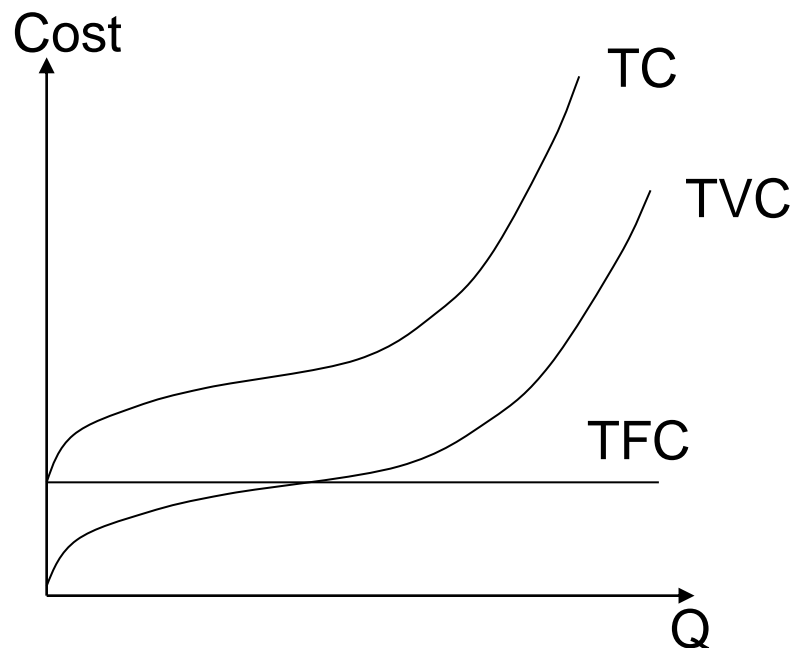
TC (total cost) = total fixed cost + total variable cost

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Total, Average, Marginal, Fixed, and Variable Costs

Average and Marginal Costs
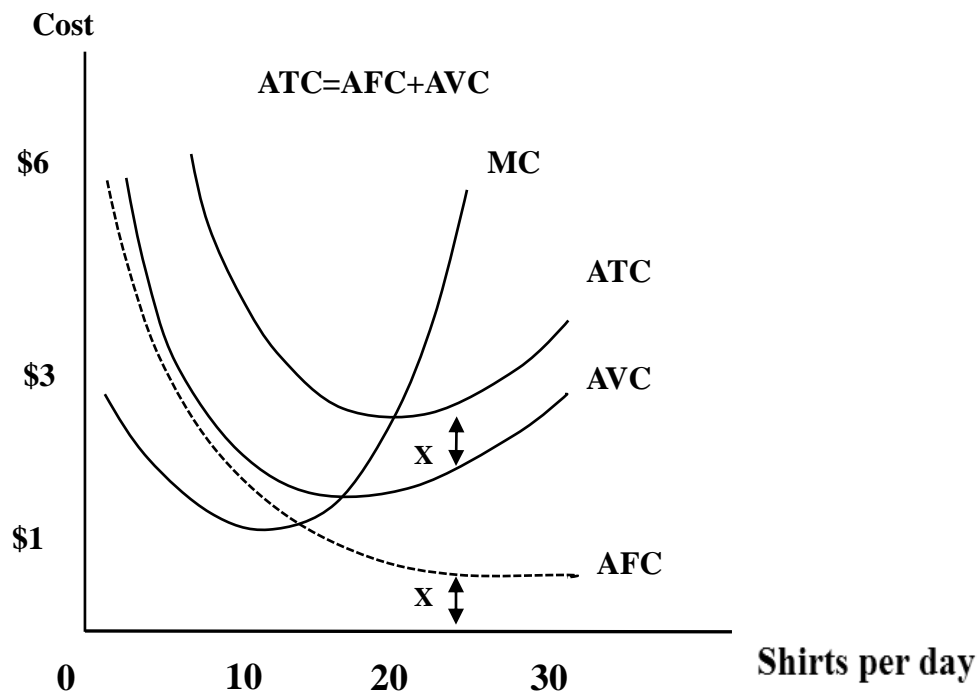
- (1) AFC slopes downward.
- (2) The vertical distance between the ATC and AVC curves is equal to AFC.
- (3) **MC declines initially, then increases.**
- (4) **MC intersects AVC and ATC at their minimum points.**
- (5) ATC and AVC are U-shaped.
- (6) Minimum point on the ATC curve represents the lowest cost per unit, but it is not necessarily the profit-maximizing point.
- (7) The MC curve above AVC is the firm's short-run supply curve in a perfectly competitive market.

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Total, Average, Marginal, Fixed, and Variable Costs

Product and Cost Curves
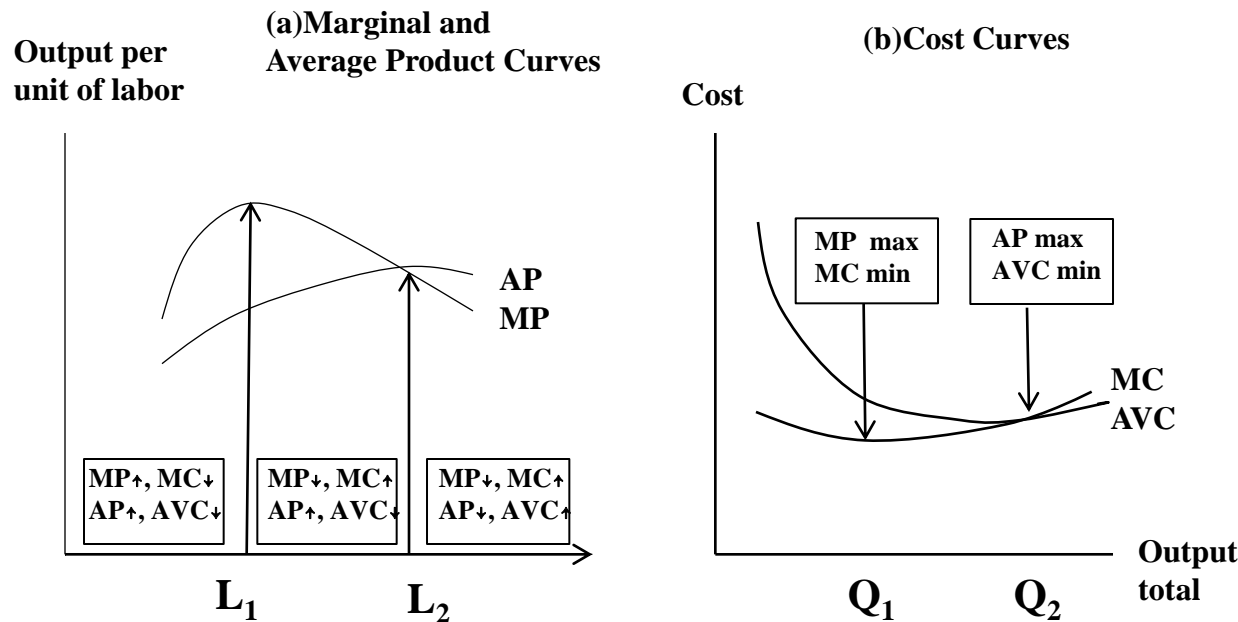
The law of diminishing returns **states that as more and more resources (such as labor) are devoted to a production process, they <u>increase output but at an ever decreasing rate</u>.**

➤ As labor and output increase, <u>AP reaches a maximum at the same output for which AVC is at a minimum</u>.

➤ As labor and output increase, <u>the MP curve reaches a maximum at the output where the MC curve is at its minimum</u>.

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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

➢ Summary of profit maximization and loss minimization under perfect competition

Revenue-Cost Relationship	Actions by Firm
TR = TC and MR > MC	Firm is operating at lower breakeven point; increase A to enter profit territory.
TR ≧ TC and MR = MC	Firm is at maximum profit level; no change in Q.
TR < TC and TR ≧ TVC but (TR-TVC) < TFC (covering TVC but not TFC)	Find level of Q that minimizes loss in the short run; work toward finding a profitable Q in the long run; exit market if losses continue in the long run.
TR < TVC (not covering TVC in full)	Shut down in the short run; exit market in the long run.
TR = TC and MR < MC	Firm is operating at upper breakeven point; decrease Q to enter profit territory.

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Profit Maximizing Output under Perfect Competition
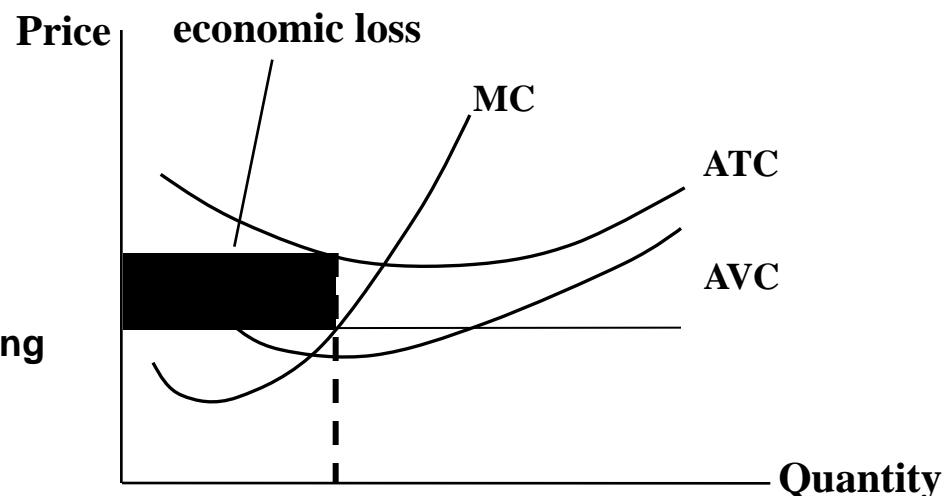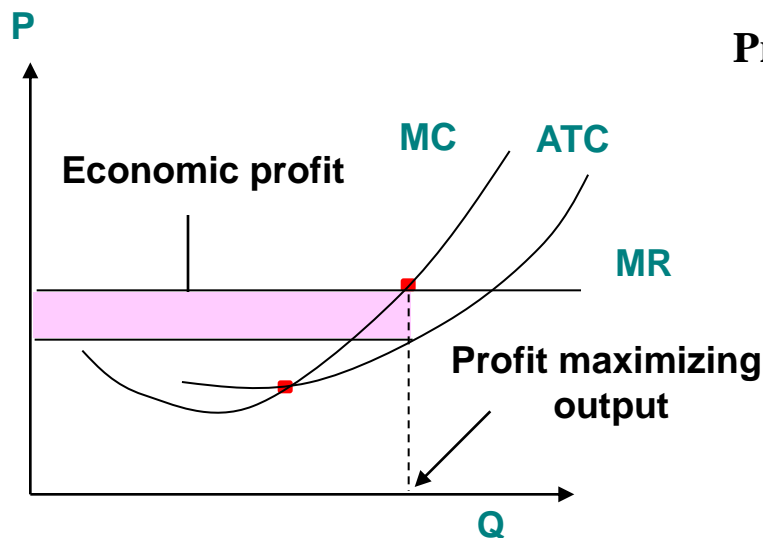
- ➤ *Economic profit* equals **total revenue less the opportunity cost of production**, which includes the cost of a normal return to all factors of production, including invested capital.

- ➤ In the short run, economic profit is maximized when **marginal revenue=marginal cost =price (MR=MC=P)**

- ➤ **Economic loss** occurs if P<ATC. The firm will be generating losses on its marginal production and will reduce output to where MR=MC

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Shutdown Point and Breakeven Point

➢ If average revenue is less than average variable cost in the short run, the firm should shut down. This is its **_short-run shutdown point_**.

➢ If average revenue is greater than average variable cost in the short run, the firm should continue to operate, even if it has losses.

➢ In the long run the firm should shut down if average revenue is less than, average total cost. This is the **_long-run shutdown point_**.

➢ If average revenue is just equal to average total cost, total revenue is just equal to total (economic) cost, and this is the firm's **_breakeven point_**.

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Shutdown and Breakeven under Perfect Competition

➢ If AR ≥ATC, firm should stay in the market in both the short and long run.
 Notes: in another way, we can compare TR to TC

➢ If AR ≥ AVC, but AR < ATC, the firm should stay in market in the short run but will exit the market in the long run

➢ If AR < AVC, the firm should shut down in the short run and exit the market in the long run. *Notes: in another way, we can compare TR to TVC*

shutdown and Breakdown

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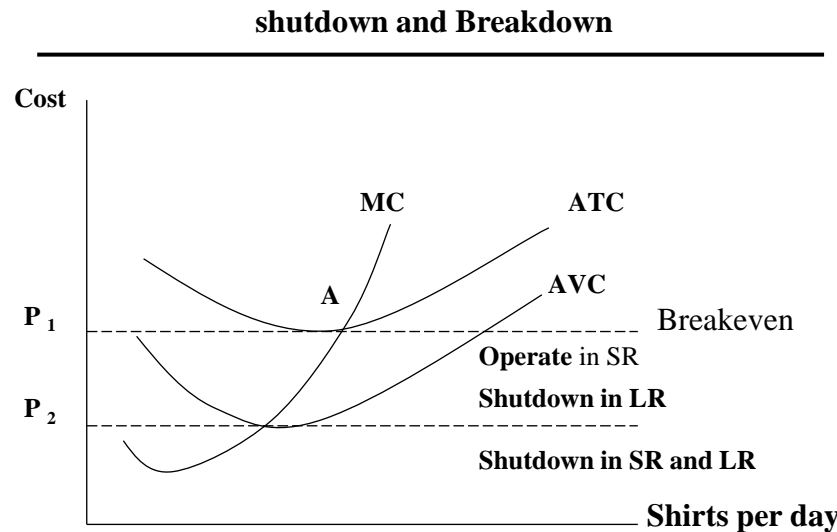
Conclusion for Perfect Competition

➢ Specifically, the conclusion for pure competition is as follows:

- If P >ATC, the firm can realize economic profit

- If ATC > P >AVC, the firm will face a loss, but he can compensate some fixed cost more or less

- If P < AVC, the firm can't compensate even variable cost, so he will leave this industry.

- **Therefore, if the price is more than average variable cost, the firm will continue his operation.**

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Shutdown and Breakeven under Imperfect Competition

➢ TR=TC: breakeven.

➢ TC > TR > TVC: firm should continue to operate in the short run but shutdown in the long run.

➢ TR < TVC: firm should shut down in the short run and the long run.

- Because price does not equal average revenue (or marginal revenue) for a firm in imperfect competition, analysis based on total costs and revenues is better suited for examining breakeven and shutdown points.

Revenue-Cost Relationship	Short-Run Decision	Long-Run Decision
TR $\geqq$ TC	Stay in market	Stay in market
TR > TVC but TR < TFC + TVC	Stay in market	Exit market
TR < TVC	Shut down production to zero	Exit market

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Economies of Scale and Diseconomies of Scale

➢ The downward sloping segment of the long-run average total cost curve indicates the **_economies of scale_**.

➢ The upward sloping segment of this long-run average total cost curve indicates that **_diseconomies of scale_** are present when average unit costs rise as the scale of the business

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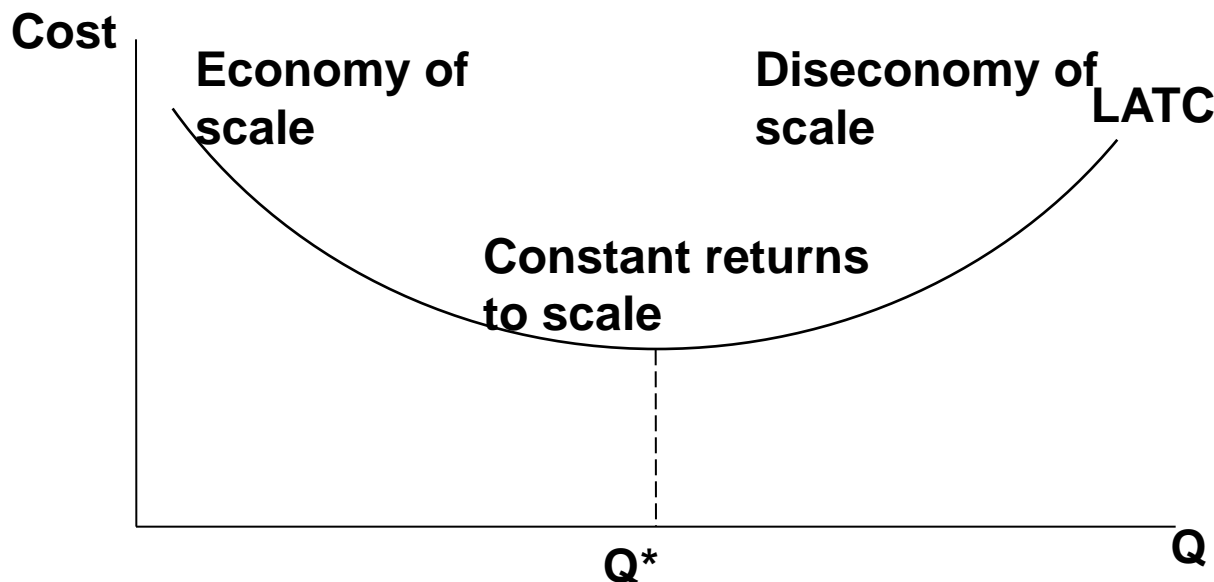
Profit-maximizing Utilization of an Input

➤ For a firm with N productive inputs, <u>cost minimization</u> requires

$$\frac{MP_1}{P_1} = \frac{MP_2}{P_2} = \cdots = \frac{MP_N}{P_N}$$

● 厂商可以通过对要素投入量的不断调整，使得<u>最后一单位的成本支出</u>无论用来购买哪一种生产要素所获得的<u>边际产量都相等</u>，从而实现<u>既定成本条件下的最大产量</u>

● The condition for cost minimization does not tell us how much of either input to use to maximize profit.

➤ ***Marginal revenue product (MRP)*** is the monetary value of the marginal product of an input.

➤ Based on the condition for the profit-maximizing utilization of each factor, $MRP_f = P_f$, for <u>profit maximization</u>, a firm must employ inputs in quantities

$$MRP = MP \times MR$$

$$\frac{MRP_1}{P_1} = \frac{MRP_2}{P_2} = \cdots \frac{MRP_N}{P_N} = 1$$

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Long-Run Industry Supply Curves

- ➤ Increasing-cost industry：
  - ✓行业产量↑成本↑
  - ✓产品价格与供给量成同方向变动
- ➤ Decreasing-cost industry：
  - ✓行业产量↑成本↓
  - ✓产品价格与供给量成反方向变动
- ➤ Constant-cost industry：
  - ✓行业产量↑成本→
  - ✓以不变的均衡价格提供产量

(a) Increasing-cost industry
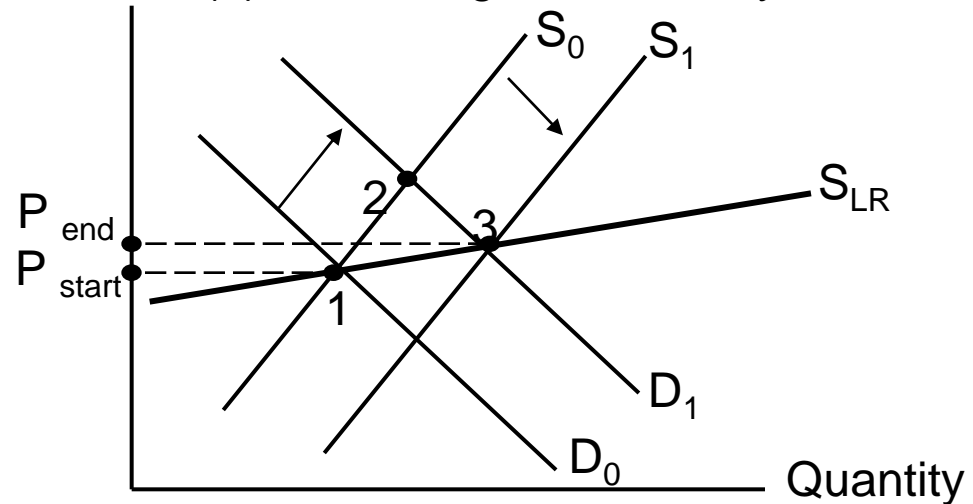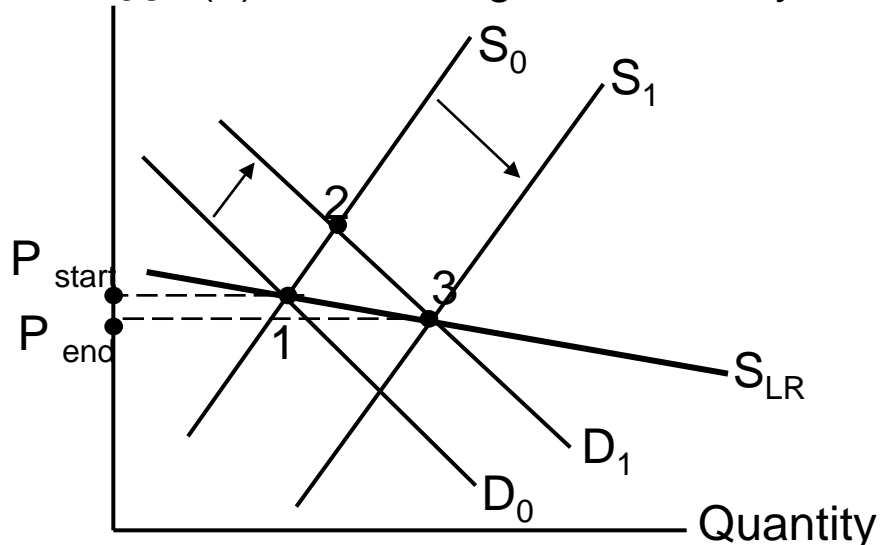
Price

S_0　S_1

S_{LR}

P_{end}
P_{start}

2
3
1

D_1

D_0

Quantity

(b) Decreasing-cost industry

Price

S_0　S_1

P_{start}
P_{end}

2
3
1

S_{LR}

D_1

D_0

Quantity

(c) Constant-cost industry

Price

S_0　S_1

P

2
1　3

S_{LR}

D_0　D_1

Quantity

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Framework of Economics

➤ **SS 4 Microeconomic Analysis**
- R13 demand and supply: introduction
- R14 demand and supply: consumer demand introduction
- R15 demand and supply: the firm
- R16 the firm and the market structure

➤ **SS 5 Macroeconomic Analysis**
- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➤ **SS 6 Economics in a Global Context**
- R20 international trade and capital flow
- R21 currency exchange rate

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R16 Market Structure

➢ Identification of market structure

➢ Perfect competition

➢ Monopolistic competition

➢ Oligopoly

➢ Monopoly

➢ Concentration measures

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Factors that Determine Market Structure

➢ Factors that determine market structure:

- Number of firms and their relative sizes

- Elasticity of the demand curves they face

- Ways that they compete with other firms for sales

- Ease or difficulty with which firms can enter or exit the market

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Market Structure

Type	Number of firms	Degree of difference of products	Degree of price control	Difficulty to enter or leave	The example in our life
Perfect competition	many	No difference	No price control	Very easy	Some agricultural products
Monopolistic competition	many	Some difference	Some tiny price control	Relatively easy	Some retail products
Oligopoly	More than one, but not many	Little or no difference	Some control to some extent	difficult	Steel, automobile, oil
Pure monopoly	single	Sole product, nearly no substitute	perfectly control	No way	Public sectors

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Framework

Perfect competition

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Perfect Competition

➤ **The assumption of perfect competition**
  - All the firms in the market produce identical products
  - There is a large number of independent firms
  - Each seller is small relative to the size of the total market
  - There are no barriers to entry or exit

➤ 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, <u>Price = Demand = Marginal Revenue = Average revenue</u>)

➤ The key reason why a perfectly competitive firm is that it produces a tiny proportion of the total output of a particular good and buyers are well informed about the prices of other firms.

Determine the profit maximizing output:
MC=MR maximize economic profit

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Short-Run Profit Maximization under Perfect Competition

> ## Short-run equilibrium output

- MR=MC

- MR=P=D（price taker）

- DWL=0, 市场实现最优配置

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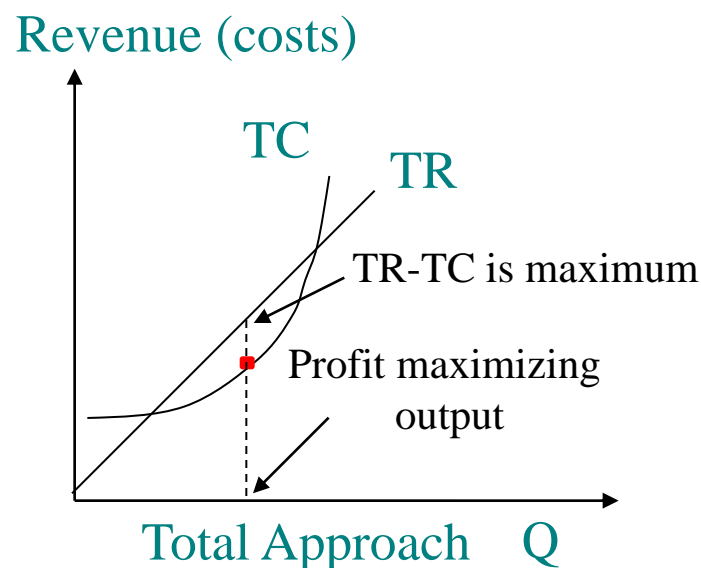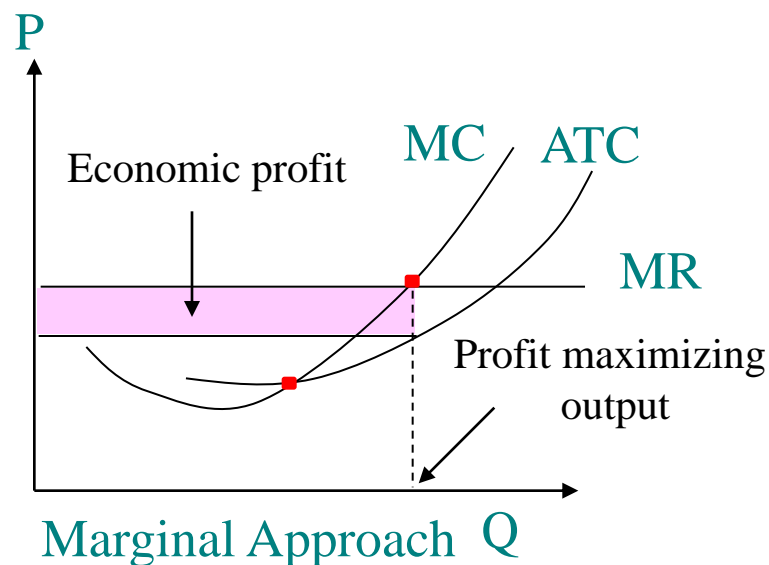
Short-Run Loss under Perfect Competition
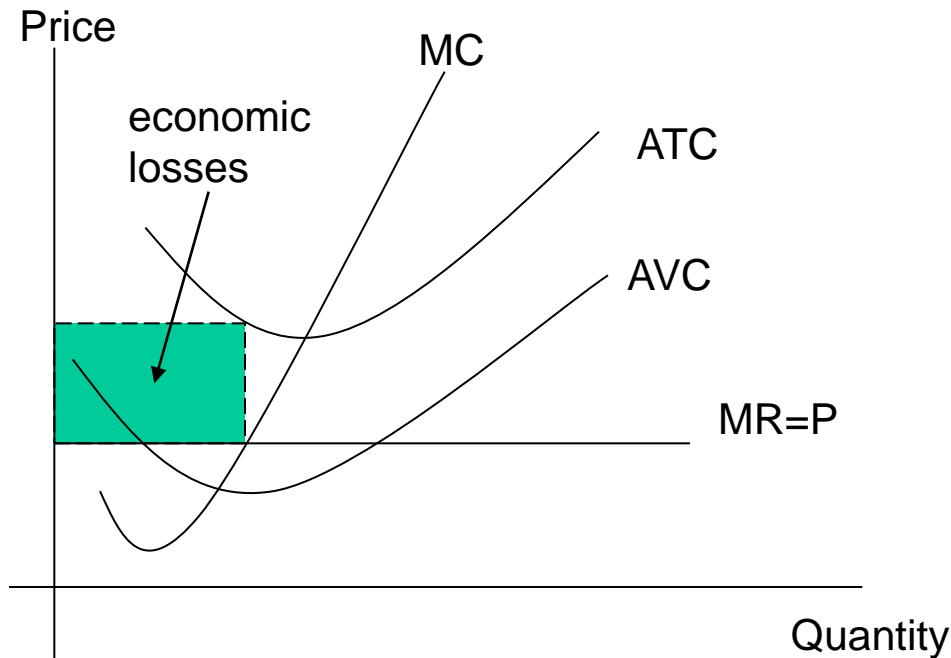
➢ Short-run loss

- P < ATC: economic loss
- AVC < P < ATC: operating in the short-run, exit in the long run
- P = AVC: shutdown point
- P < AVC: exit in both short-run and long-run

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Equilibrium in a Perfectly Competitive Market

(a) Market

(b) Firm
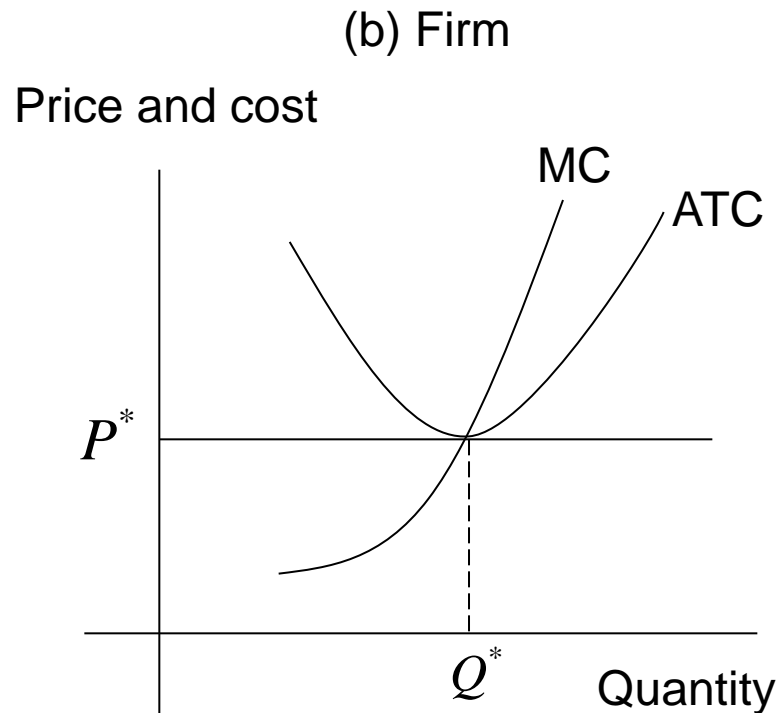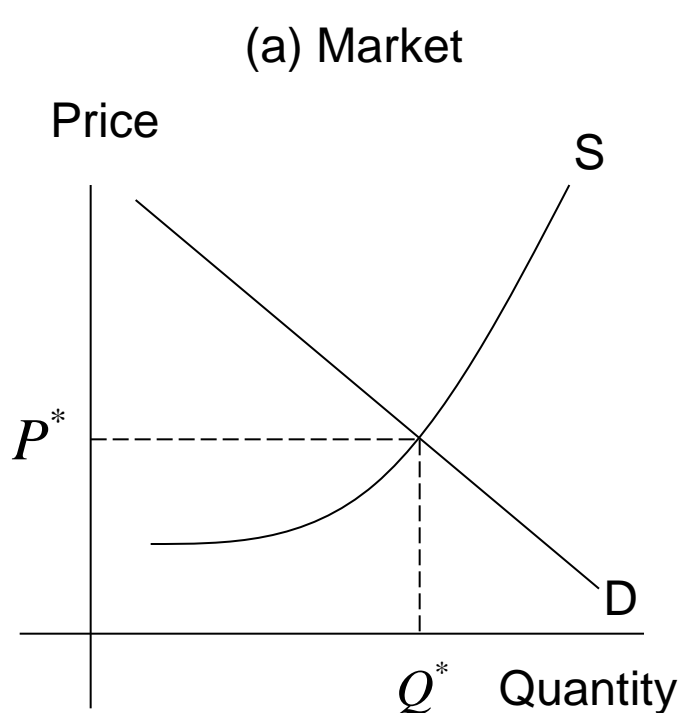
- The long-run equilibrium output level for perfectly competitive firms is where **MR=MC=ATC**, which is where ATC is at a minimum. At this output, economic profit is zero and only a normal return is realized.

- In equilibrium, each firm is producing the quantity for which P=MR=MC=ATC, so that no firm earns economic profits.

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Framework

Monopolistic competition

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Characteristics of Monopolistic Competition

➢ The following market and product features define monopolistic competition:
- There are a <u>large number of independent sellers</u>.
  - ✓ each firm has relative small market share
  - ✓ firm need only pay attention to average market price
  - ✓ too many firms for collusion to be possible
- Each seller produces a <u>differentiated product</u>.
  - ✓ The most distinctive factor in monopolistic competition is product differentiation.
- Firms compete on product quality, price and marketing
- Firms are <u>free to enter and exit</u>
- Firms in monopolistic competition face <u>downward-sloping demand curves</u> and the curves are <u>highly elastic</u> because competing products are perceived by consumers as close substitutes

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Short-Run and Long-Run Output under Monopolistic Competition

Short-run output decision for a firm
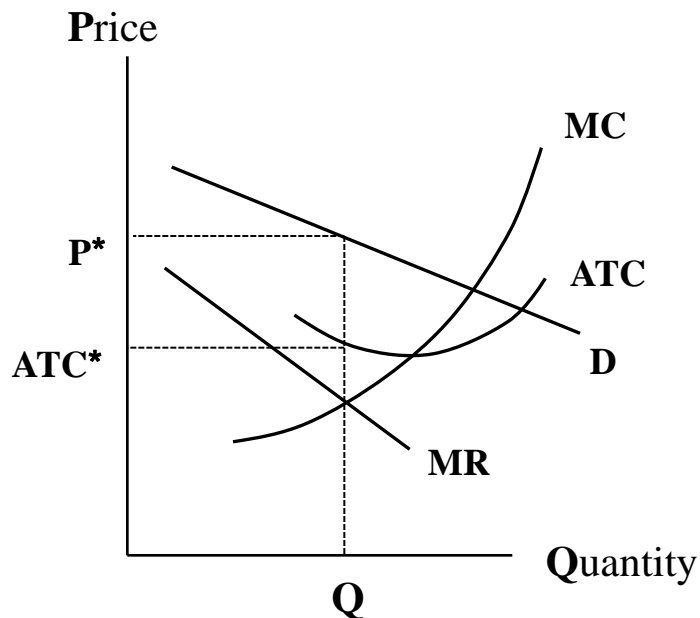
Economic profit

Long-run output decision for a firm
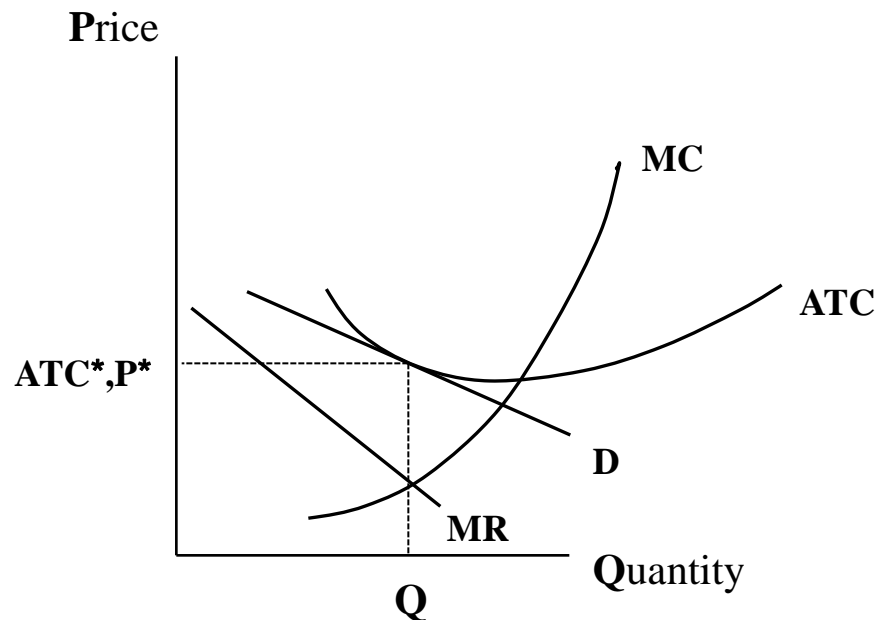
➤ The entry of new firm shifts the demand curve faced by each individual firm down to the point where P=ATC

➤ No economic profit

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Firm Output under Monopolistic and Perfect Competition

Monopolistic Vs. Perfect Competition

- **P>MC, suggesting inefficient allocation of resources.**
- **Price is slightly higher than under perfect competition.**
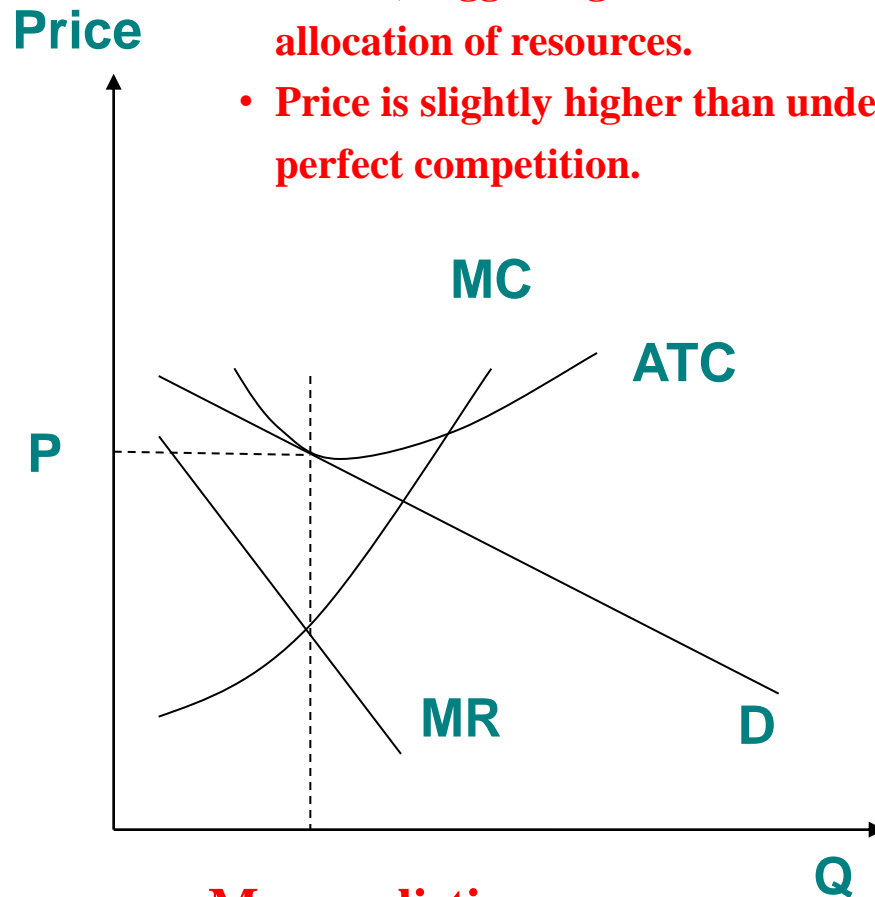
Monopolistic

Perfect competition

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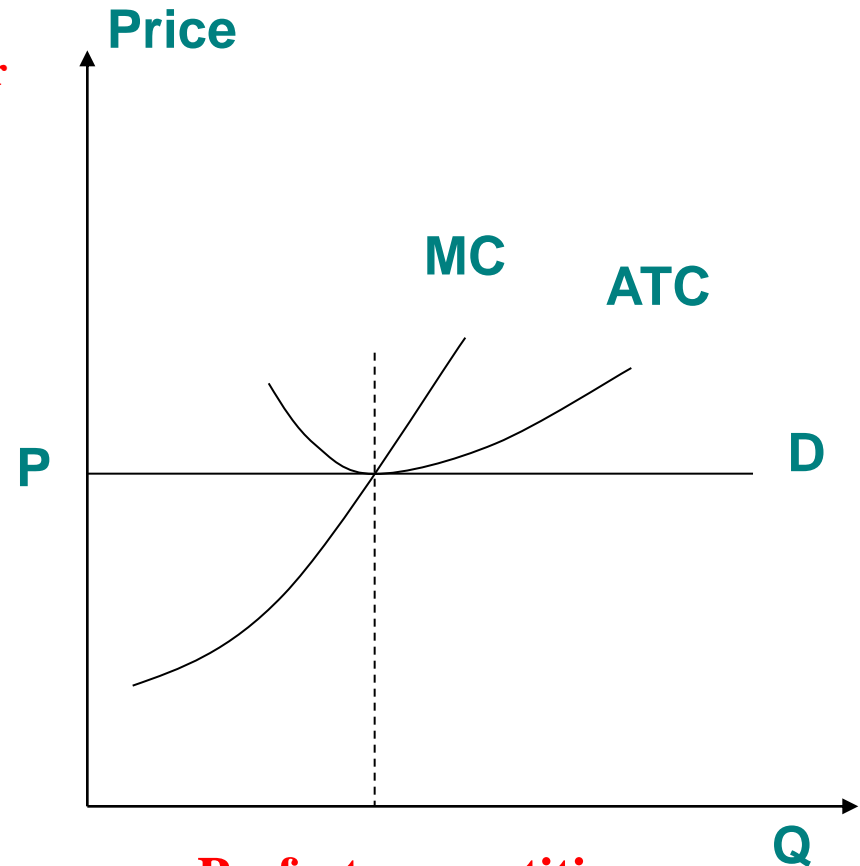
Product Development and Marketing

> **Product development and marketing**

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

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Framework

Oligopoly

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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 has higher barriers to entry, fewer firms, and, typically, less elastic firm demand curves.

➢ 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

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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: it is incomplete because what determines the market price (where the kink is located) is outside the scope of the model.

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Nash Equilibrium Model (Prisoner's Dilemma)

➢ ***Nash equilibrium*** is reached when the choices of all firms are such that there is no other choice that makes any firm better off (increases profits or decrease loss)

➢ ***Prisoners' Dilemma*** is a game that illustrates that the best course of action for an oligopoly firm, when engaging in collusion with another oligopoly firm, is to cheat.

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

● Best overall outcome is for both to remain silent and get sentences of six months. But it is not equilibrium.

● **The Nash equilibrium is for both prisoners to confess**, and for each to get a sentence of two years.

● Confess/confess is the Nash equilibrium since neither prisoner can unilaterally reduce his sentence by changing to silence.

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Collusion

➢ ***Collusion*** is when firms make an agreement among themselves to avoid various competitive practices, particularly price competition.

- If the two parties comply with the collusion, the market is just like a monopoly firm, which will make less outputs and higher price.

- Collusive agreements to increase price in an oligopoly market will be more successful (have less cheating) when:

  ✓ **There are fewer firms**

  ✓ **Products are more similar (less differentiated)**

  ✓ Cost structures are more similar

  ✓ Purchases are relatively small and frequent

  ✓ Retaliation by other firms for cheating is more certain and more severe

  ✓ There is less actual or potential competition from firms outside the cartel

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Collusion vs. Perfect Competition
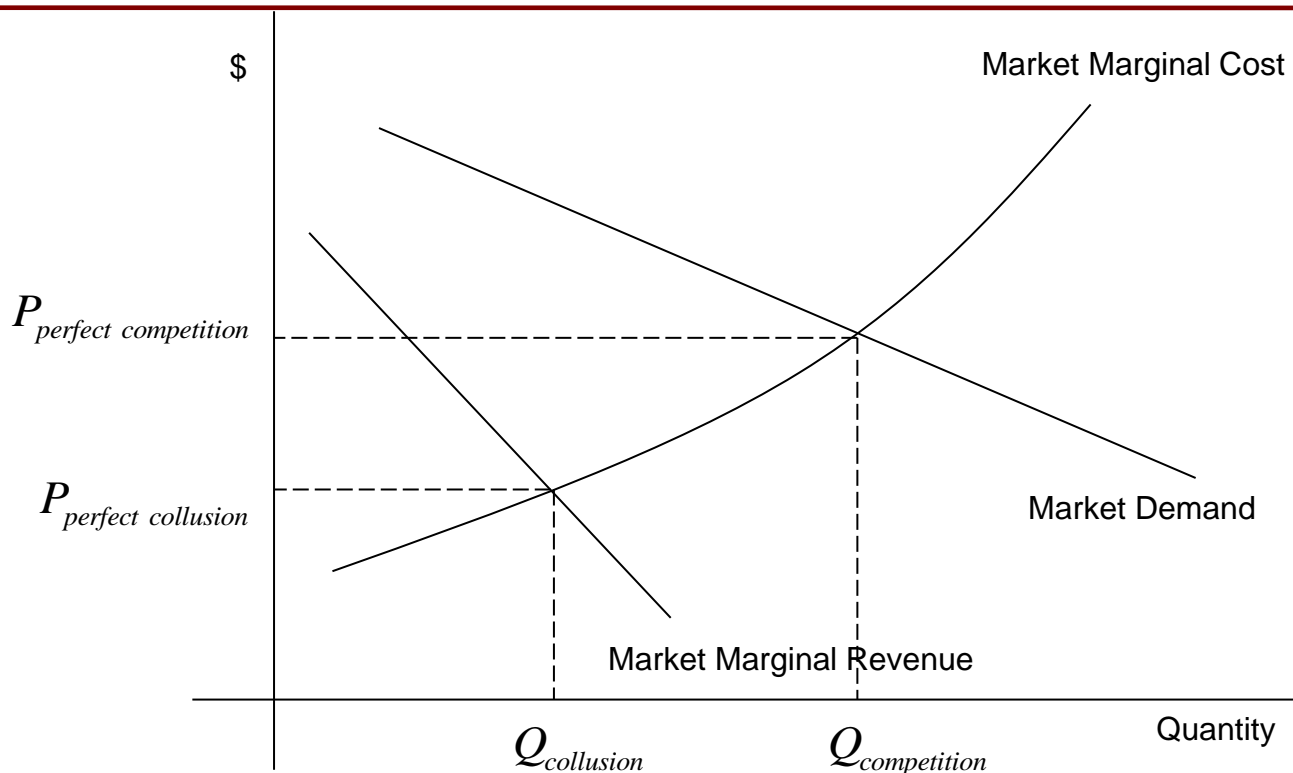
➢ The resulting price will between the price based on perfect collusion that would maximize total profits to all firms in the market (actually the monopoly price) and the price that would result from perfect competition and generate zero economic profits in the long run.

- Two limiting outcomes: $P_{collusion}$ with $Q_{collusion}$ for perfect collusion and $P_{competition}$ and $Q_{competition}$ for perfect competition

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Dominant Firm Model

> **Dominant firm model**

- ● a single firm has a significantly large market share

    - ✓ greater scale

    - ✓ lower cost structure

- ● market price is essentially determined by the dominant firm

- ● the other competitive firms take this market price as given.

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Framework

Monopoly

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Monopoly

➢ **A monopoly is characterized by:**

- a single seller of a well-defined product for which there are no good substitutes
- high barriers to the entry of other firms into the market for the product

➢ **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

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Monopoly

➢ A monopolist faces a **<u>downward sloping demand curve</u>**. Just as price searchers with low entry barriers will expand output until marginal revenue equals marginal cost, so do monopolists. This will <u>maximize profit</u>. Positive economic profits can exist in the long run due to the high entry barriers.

➢ The monopolists want to **<u>maximize profits, not price</u>**, So they will not charge the highest possible price.

➢ Monopolists will not make profits if the ATC line is always above the demand curve.

➢ Compared to a perfect competitive industry, the monopoly firm will produce <u>less total output and charge a higher price</u>.

➢ Two pricing strategies that possible for a monopoly firm are <u>single-price</u> and <u>price discrimination</u>.

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Monopoly

Monopolistic short-run costs and revenues
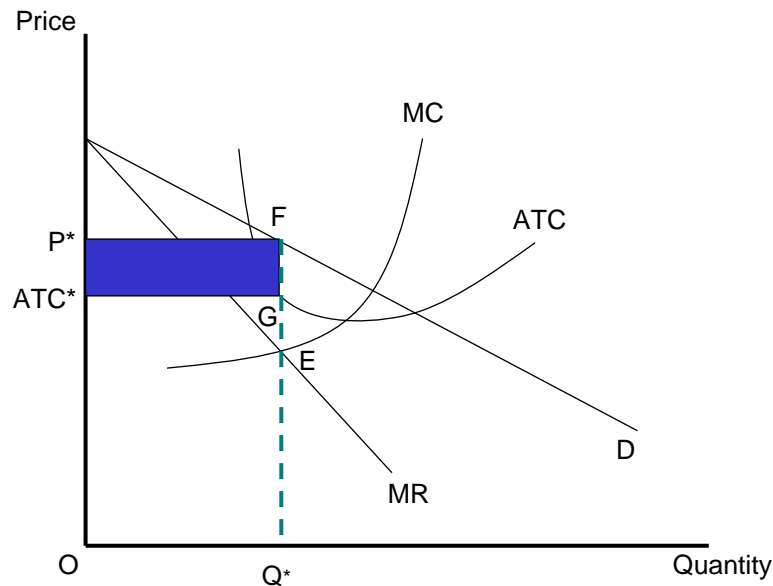
- ➢ Monopolists are <u>price searchers</u> (face downward sloping demand curves) and have imperfect information about demand, so they must experiment with different prices (search) to find the profit maximizing price/quantity.
- ➢ To maximize profit, monopolists will expand output until <u>marginal revenue (MR) equals marginal cost (MC).</u>
- ➢ **<u>The relationship between MR and price elasticity, Ep, is: MR=P[1-1/Ep]</u>**
- ➢ Economic profit = (P*- ATC*) $\times$ Q*

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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 practice, the monopolist is able to measure how often the product is used and charges the customer the highest price the consumer is willing to pay for that unit of good.
  - ✓ Another possibility is that public price disclosure is non-existent, so that no customer knows what the other customers are paying.
  - ✓ not every consumer is worse off in this case, because some consumers may be charged a price that is below that of perfect competition, as long as the marginal revenue exceeds the marginal cost.
- **_In second-degree price discrimination_**, the monopolist uses the quantity purchased to establish whether the consumer values the product highly (and therefore is willing to pay a higher per unit price to purchase a large amount of it) or not very highly (and therefore is willing to pay only a low price and buy only a small amount).
  - ✓ the producer would sell small quantities at the marginal price but large quantities at a higher per unit price.
- **_Third-degree price discrimination_** happens when customers are segregated by demographic or other traits.

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Price Discrimination

- ➢ **For price discrimination to work the seller must:**

  - Downward sloping demand curve (price searcher)

  - At least two identifiable groups of customers with different price elasticities of demand for the product

  - Prevent the customers paying the lower price from reselling the product to the customers paying the higher price (no arbitrage)

- ➢ **Price discrimination reduces this inefficiency** by increasing output toward the quantity where marginal benefit equals marginal cost, and the deadweight loss is smaller.

> ➢ Extreme Case: If it were possible for the monopolist to charge each consumer the maximum they are willing to pay for each unit, where would be no deadweight loss, since a monopolist would produce the same quantity as under perfect competition. With perfect price discrimination the consumer surplus would all be captured by the monopolist.

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Price Discrimination

(a)Without price discrimination　　　(b)With price discrimination
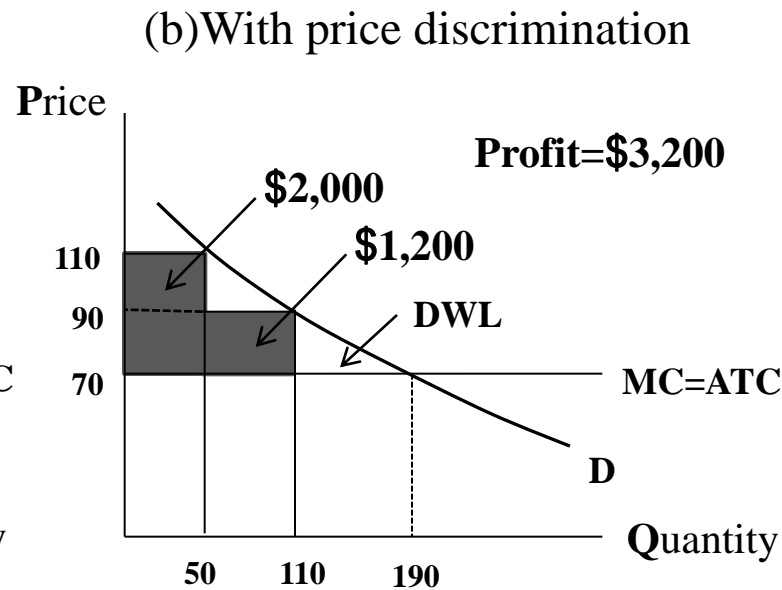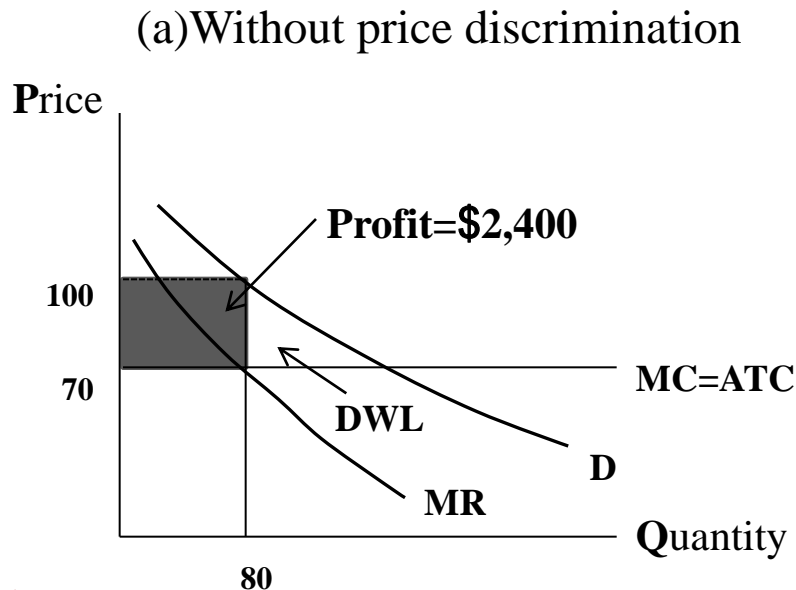
> Company gains from price discrimination: As long as a firm has groups of customers with downward facing demand curves, profits can be increased through price discrimination.

> Winners and losers:

 ● Price discrimination reduces the allocative inefficiencies that result from pricing above marginal cost.

 ● The major benefit is more output and profit. The firm gains from those customers with inelastic demand curves while still providing goods to customers with more elastic demand curves. This may even cause production to take place when it would not otherwise.

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Perfect Competition vs. Monopoly

➢ Compared with a perfectly competitive industry, the monopoly firm will produce less total output and charge a higher price.

➢ Monopoly creates a deadweight loss relative to perfect competition.

➢ A further loss of efficiency results from rent seeking when producers spend time and resources to try to acquire or establish a monopoly.

Perfect competition vs. monopoly

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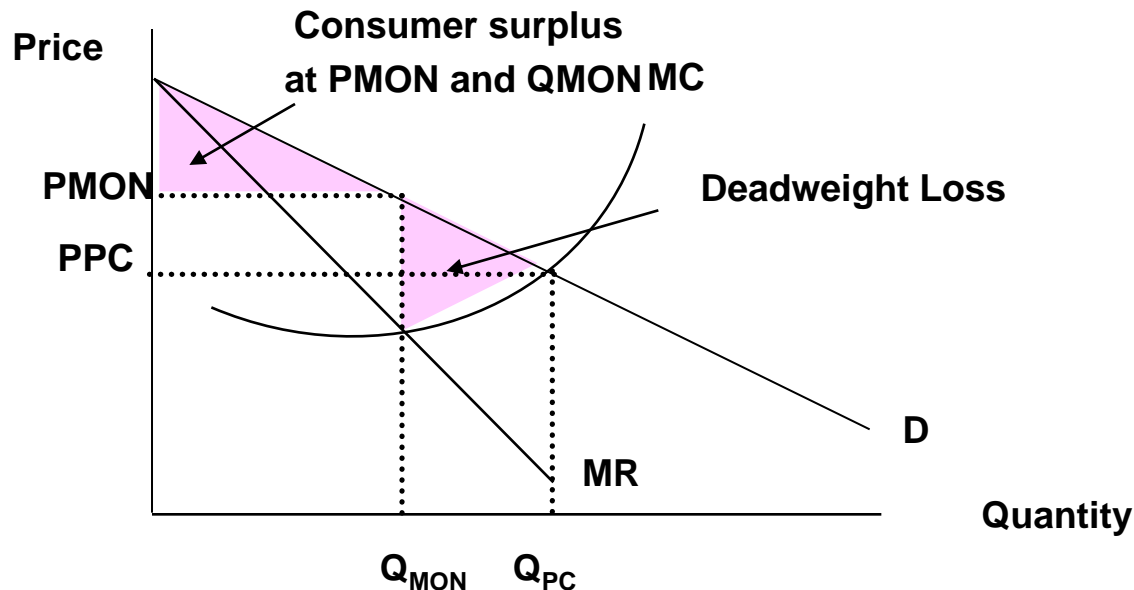
Government Regulation

➢ Regulators often attempt to increase competition and efficiency through efforts to reduce artificial barriers to trade, such as licensing requirement, quotas, and tariffs.

➢ **Government regulation**
- _**Average cost pricing**_ is the **more common form of regulation** at the point where ATC=D. This will:
  - ✓ Increase output and decrease price.
  - ✓ Increase social welfare (allocative efficiency).
  - ✓ Ensure the monopolist a normal profit (but no economic profit) since price=ATC.
- _**Marginal cost pricing**_ which is also referred to us efficient regulation, forces the monopolist to reduce price to the point where MC=D. this will:
  - ✓ Increase output and reduce price.
  - ✓ Causes the monopolist to incur a loss since price is below ATC.
  - ✓ Such a solution requires a government subsidy in order to provide
  - ✓ the firm with a normal profit.
- Another way of "regulating" a monopoly is for the government to _**sell the monopoly right to the highest bidder**_.

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Natural Monopoly

➢ When the average cost of production for a single firm is falling throughout the relevant range of consumer demand, we say that the industry is a ***natural monopoly***.

● Large economies of scale in an industry present significant barriers to entry.

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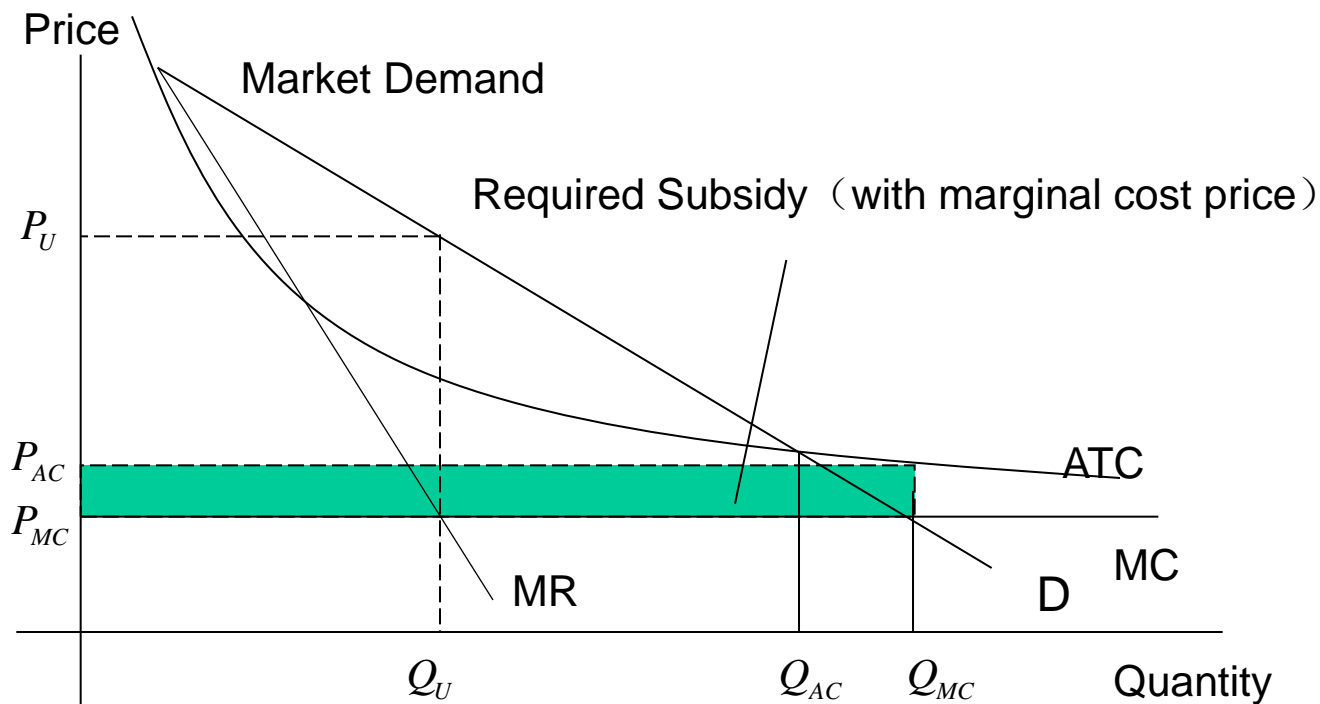
Monopoly

➢ Some reasons make government go astray when dealing with problems associated with markets with high barriers to entry.

- Lack of information (not know the ATC, MC)

- Cost shifting. The firm has no incentive to reduce costs. (If the firm allows costs to rise, the regulator will allow prices to increase)

- Quality regulations (It's easier to regulate price than it is to regulate quality)

- Special interest effect. The firm may try to influence regulation by political manipulation. (rent-seeking)

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Concentration Measures

➢ **Concentration measures**
- **Elasticity of demand**, difficult
- ***The N-Firm Concentration Ratio***: the sum or the percentage market shares of the largest N firms in a market.
  - ✓ advantage: simple to compute
  - ✓ disadvantage: does not directly quantify market power
  - ✓ limitation: it may be relatively insensitive to mergers of two firms with large market shares.
- ***The Herfindahl-Hirschman Index (HHI):*** the sum of the squares of the market shares of the largest firms in the market.
  - ✓ limitation: both of our simple concentration measures is that barriers to entry are not considered in either case. Even a firm with high market share may not have much pricing power if barriers to entry are low and there is potential competition.

competitive 1000　　　　　　1800 Not competitive 10000

moderately competitive　　　　　　　　　monopoly

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Framework of Economics

➢ SS 4 Microeconomic Analysis
- R13 demand and supply: introduction
- R14 demand and supply: consumer demand introduction
- R15 demand and supply: the firm
- R16 the firm and the market structure

➢ SS 5 Macroeconomic Analysis
- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➢ SS 6 Economics in a Global Context
- R20 international trade and capital flow
- R21 currency exchange rate

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R17 Aggregate Output, Prices and Economic Growth

➢ GDP

➢ IS curve and LM curve

➢ Aggregate demand and aggregate supply

➢ Economic growth and sustainability

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Gross domestic product (GDP)

➢ ***Gross domestic product (GDP)*** is the <u>total</u> **market value** of the **final goods and services produced in a country** within **a certain time period**.
  - <u>Include:</u>
    - ✓ Purchases of newly produced goods and services
    - ✓ Final goods and services
    - ✓ Goods and services provided by government at cost to government (e.g. the services provided by police and the judiciary, and goods such as roads and infrastructure improvements)
    - ✓ The value of owner-occupied housing, just as including the value of rental housing service.
  - <u>Exclude:</u>
    - ✓ The sale or resale of goods produce in precious period
    - ✓ Transfer payments made by the government (e.g. unemployment, retirement, and welfare benefits)
    - ✓ In-process goods
    - ✓ The value of labor not sold (e.g. homeowner's repairs to his own home)
    - ✓ By-products of production (e.g. environmental damage)
    - ✓ Underground economy
    - ✓ Barter transaction (e.g. neighbors exchanging services with each other)
    - ✓ Illegal trade

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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.

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Nominal and Real GDP

➢ ***Nominal GDP*** is simply GDP as we have described it under the <u>expenditures approach</u>: the total value of all goods and services produced by an economy, valued at current market prices. For an economy with N different goods and services, we can express nominal GDP as:

$$\text{nominal GDP}_t = \sum_{i=1}^{N} P_{i,t} Q_{i,t}$$

$$= \sum_{i=1}^{N} (\text{price of good } i \text{ in year } t) \times (\text{quantity of good } i \text{ produced in year } t)$$

➢ ***Real GDP*** is calculated relative to a *<u>base year</u>*. By using base-year prices and current-year output quantities, real GDP growth reflects only increases in total output, not simply increases (or decreases) in the money value of total output.

$$\text{real GDP}_t = \sum_{i=1}^{N} P_{i,t\text{-}5} Q_{i,t}$$

$$= \sum_{i=1}^{N} (\text{price of good } i \text{ in year } t-5) \times (\text{quantity of good } i \text{ produced in year } t)$$

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GDP Deflator

➢ **_Implicit price deflator for GDP(GDP deflator)_** is a price index that can be used to <u>convert nominal GDP into real GDP</u>, taking out the effects of changes in the overall price level.

➢ GDP deflator for year $t = \dfrac{\sum\limits_{i=1}^{N} P_{i,t} Q_{i,t}}{\sum\limits_{i=1}^{N} P_{i,t\text{-}5} Q_{i,t}} \times 100$

$$= \dfrac{\text{nominal GDP in year t}}{\text{value of year t output at year } t-5 \text{ prices}} \times 100$$

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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)
  ● summing the additions to value created at each stage of production and distribution. An example of the calculation for a specific product is presented in the following figure.

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	<u>1.00</u>	<u>0.22</u>	Value added by retailer
	1.00	1.00	
	Value of final output	Total value added = Total income created	

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GDP Calculation

➢ GDP can be calculated as the sum of all <u>the spending on newly produced goods and services</u>, or as the sum of <u>the income received as a result of producing these goods and services</u>.

- Under the ***expenditure approach***, GDP is calculated by summing the amounts <u>spent on goods and services produced during the period</u>.

- Under the ***income approach***, GDP is calculated by <u>summing the amounts earned by households and companies during the period</u>, including wage income, interest income, and business profits.

➢ For the whole economy, <u>total expenditures and total income must be equal</u>, so <u>the two approaches should produce the same result</u>.

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GDP Calculation

➢ Using the **expenditure approach**, the major components of real GDP are <u>consumption</u>, <u>investment</u>, <u>government spending</u>, and **<u>net exports</u>** (exports minus imports). These components are summarized in the equation:

$$GDP = C + I + G + (X - M)$$

➢ Under **the income approach**, we have the following equation for GDP:

GDP = national income + capital consumption allowance

    + statistical discrepancy

- ● <u>A **capital consumption allowance (CCA)**</u> measures the depreciation (i.e., wear) of physical capital from the production of goods and services over a period. **CCA** can be thought of as the amount that would have to be reinvested to maintain the productivity of physical capital from one period to the next.

- ● <u>The ***statistical discrepancy***</u> is an adjustment for the difference between GDP measured under the income approach and the expenditure approach because they use different data.

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National Income, Personal Income, and Personal Disposable Income

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

- national income = compensation of employees (wages and benefits) 工人

       + corporate and government enterprise profits before taxes 企业，税前

       + interest income 资本

       + unincorporated business net income (business owners' incomes) 企业家

       + rent 租金

       + indirect business taxes less subsidies* 间接税

  indirect taxes and subsidies that are included in final prices, 产品中的税主要包括sales taxes, fuel taxes, and import duties;要素生产中的税主要包括property taxes and payroll taxes.

➢ *Personal income* = national income - indirect business tax - corporate income tax - undistributed corporate profit + Transfer payment

➢ *Personal disposable income* = personal income - personal taxes

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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)

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Saving, Investment, the Fiscal Balance and the 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:

$$GDP = C + S + T \qquad\qquad ②$$

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).

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IS Curves

➢ **The IS Curve**

➢ **Y = C+I+G+(X-M)**

- **C和Y有关，I和i（利率）有关，其他都看成常数，以上方程可以写成i和Y的函数，这就是IS曲线；**

- **IS曲线的shift：**

  - ✓ **G**

  - ✓ **X－M**

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IS Curves

➢ **The IS Curve**

(b) The IS Curve

Real interest rate — points C, B, A along a downward-sloping line.

$Y_{r=6\%}$ $Y_{r=5\%}$ $Y_{r=4\%}$ Real aggregate Income
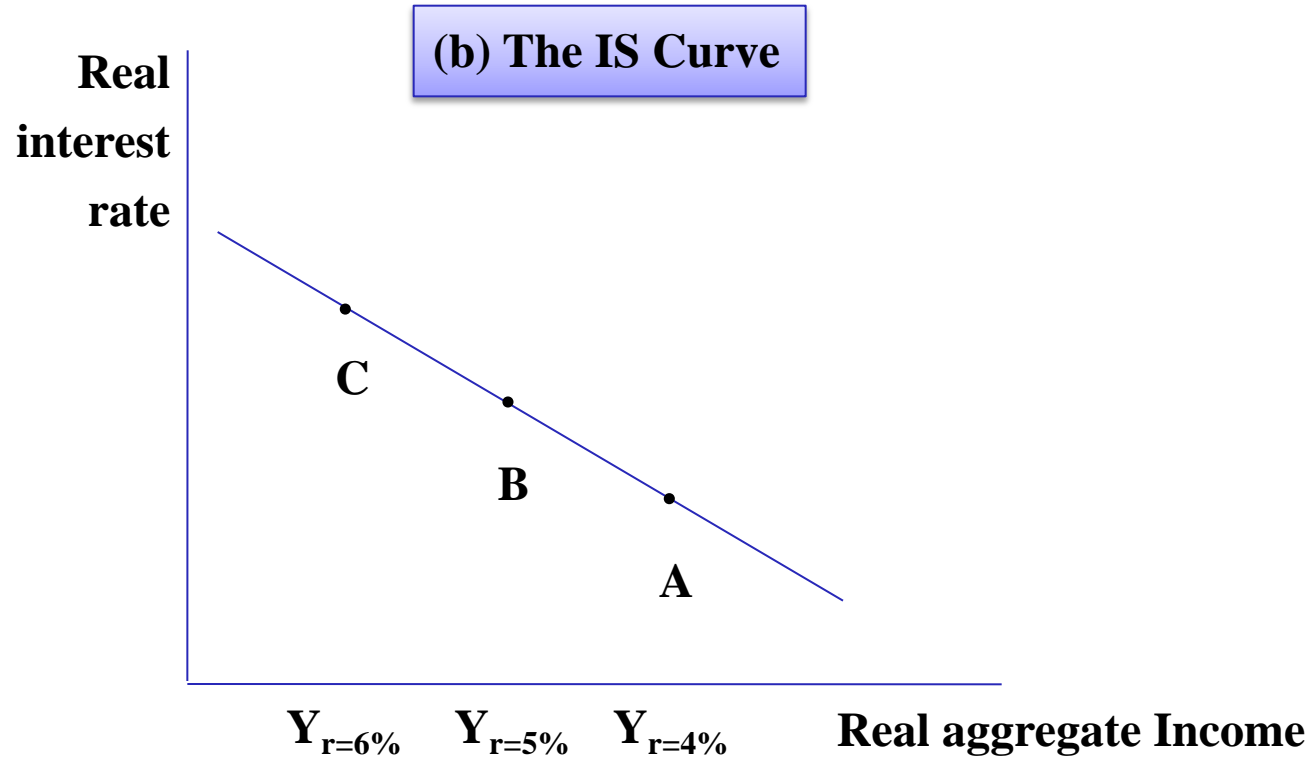
If income and expenditure are to remain in equilibrium, there must be an *inverse relationship between the real interest rate and income*. In economics, this relationship is called the IS curve, because investment (I) and savings (S) are the primary variables that adjust to maintain the balance between expenditure and income.

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LM Curves

➢ **The LM Curve**
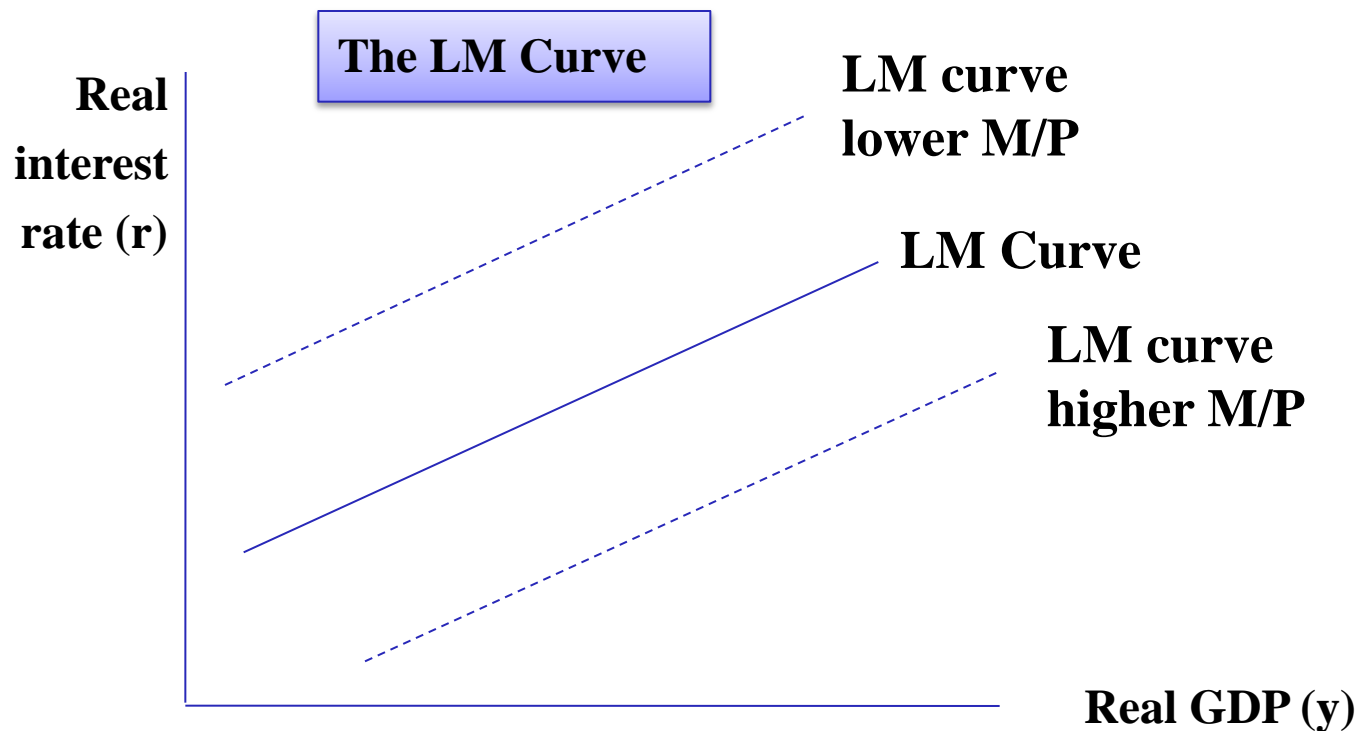
In equilibrium, there is a *positive relationship between real income and the real interest rate* for a given level of the real money supply.

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Money Demand

➢ ***The Demand for money*** is largely determined <u>by interest rates</u> and it is also influenced <u>by income level and price level</u>

➢ Three reasons for holding money:

- ***Transaction demand*****:** Money held to meet the need for undertaking transactions. As the level of <u>real GDP increases</u>, the size and number of transactions will increase, and the demand for money to carry out transactions increases

- ***Precautionary demand:*** Money held for unforeseen future needs. In the aggregate, the total amount of precautionary demand for money increases <u>with the size of the economy</u>

- ***Speculative demand:*** Money that is available to take advantage of investment opportunities that arise in the future. <u>It is inversely related to returns</u> available in the market.

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Money Supply

➢ The ***supply of money*** is determined by the central bank and is not affected by changes in interest rates. Thus the supply of money curve is vertical

➢ **At lower interest rates, firms and households choose to hold more money. At higher interest rates, the opportunity cost of holding money increases, and firms and households will desire to hold less money and more interest-bearing financial assets.**

➢ Notice that as the Fed increases the money supply, the interest rate falls, which reduces the opportunity cost of holding money.

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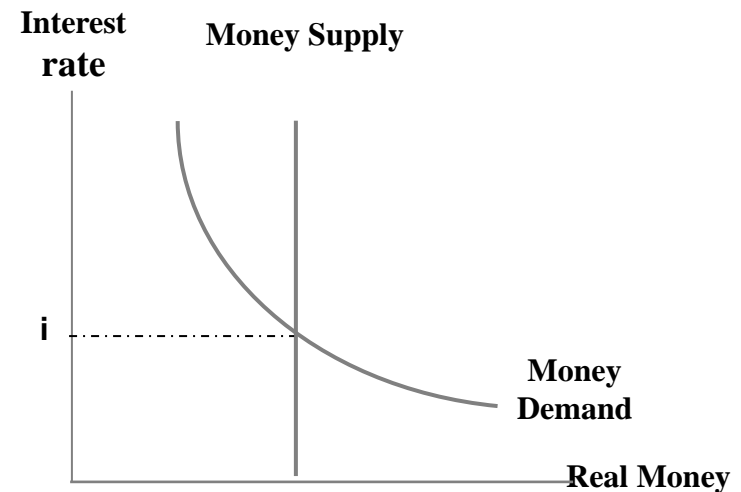
Classification of Money

➢ **_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 <u>Federal Reserve Bank of New York</u>:

- **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.

➢ The <u>European Central Bank</u> 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

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Determinants of Money Demand and Supply

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

Interest rate (percent per year)

MS

Excess supply of money. People buy securities and interest rate falls

MD, MD/P=L_1(+Y)+L_2(-r)

Real money

Excess demand of money. People sell securities and interest rate rises

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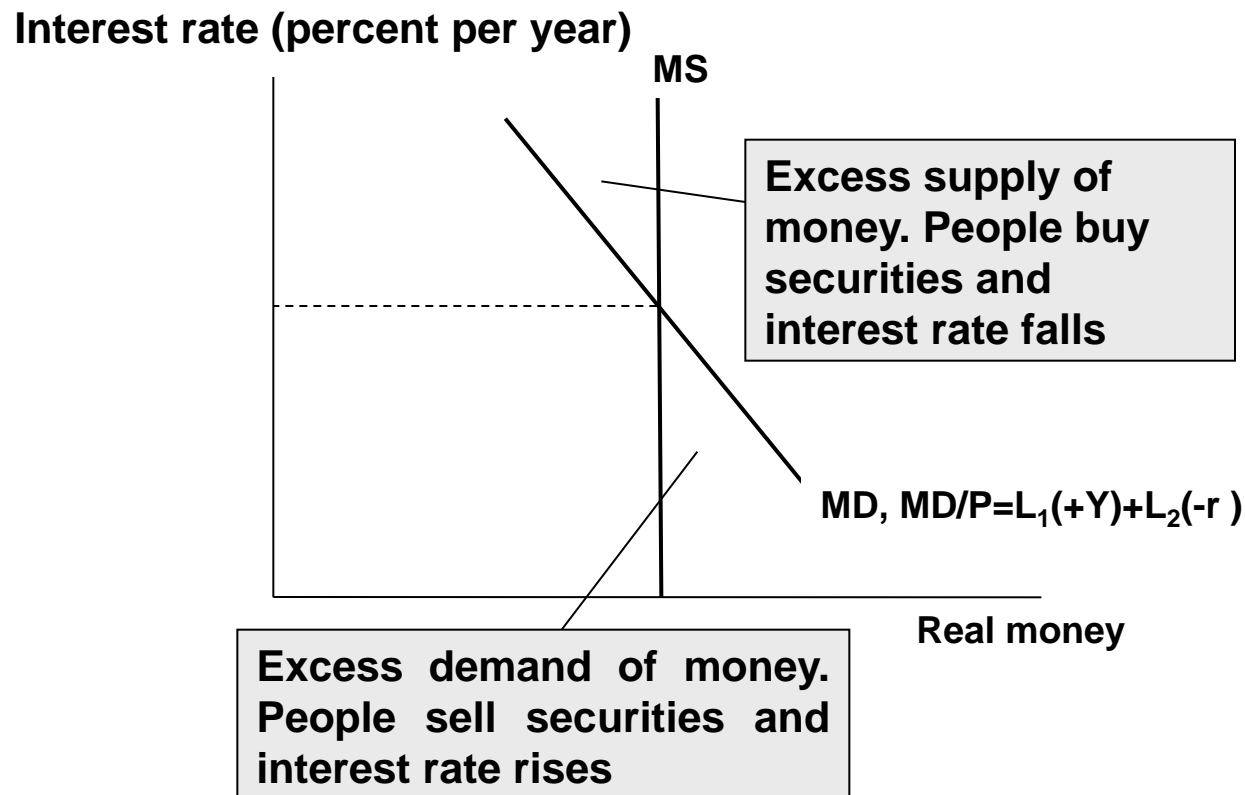
Determinants of Money Demand and Supply

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

Interest rate (percent per year)

MS₁ MS₀ MS₂

An increase in the money supply lowers the interest rate

MD

Real money

A decrease in the money supply raises the interest rate

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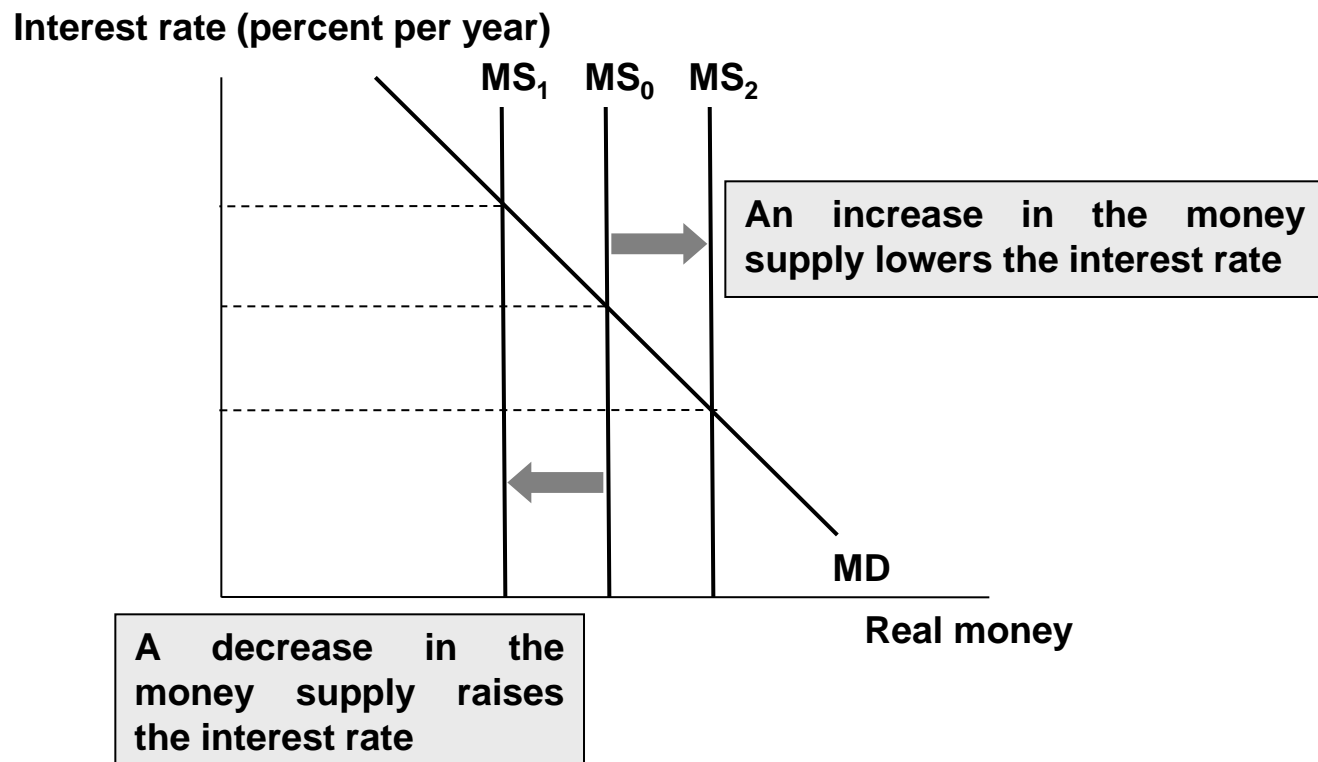
LM Curves

➢ The LM Curve

- By examining the relationships between supply and demand in the financial markets, we can derive the ***LM curve***. The LM curve shows the combinations of GDP or real income (Y) and real interest rate (r) that keep the quantity of real money demanded equal to the quantity of real money supplied.

    - ✓ <u>Demand for money is inversely related to the real interest rate.</u> The higher the real interest rate, the less willing people are to hold cash balances, which do not earn interest; they prefer to hold more interest-bearing securities and less cash.

    - ✓ While demand for money decreases when real interest rates increase, demand for money increases when real income increases.

- If we hold the real money supply (M/P) constant, the increase in demand for real money from an <u>increase in real income</u> must be offset by a decrease in demand for money from an <u>increase in the real interest rate</u> to keep the equation in balance.

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Aggregate Demand Curve

> ➤ **Deriving the Aggregate Demand Curve**

(a) The IS and LM Curves

(b) The AD Curve

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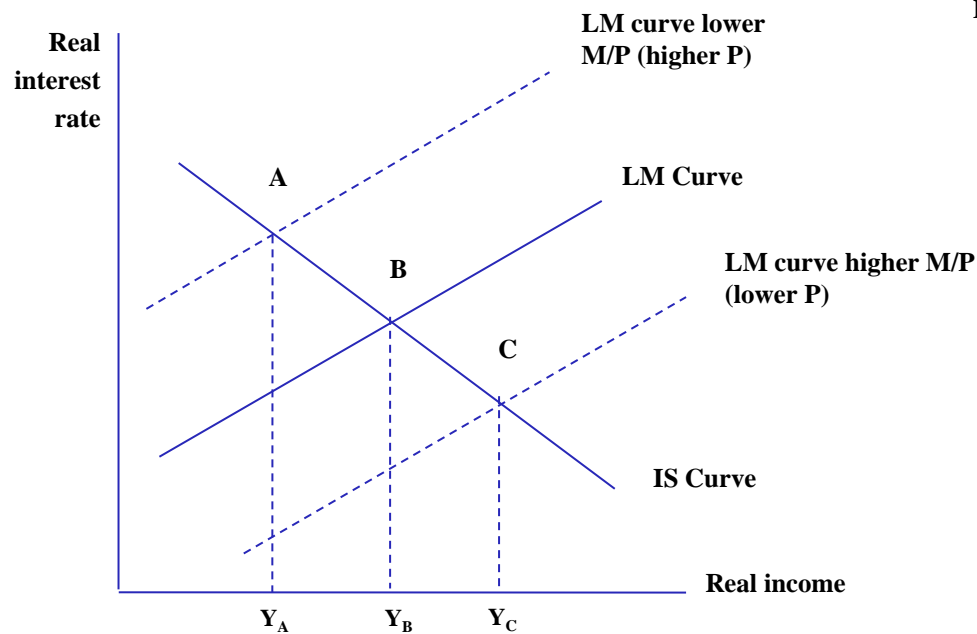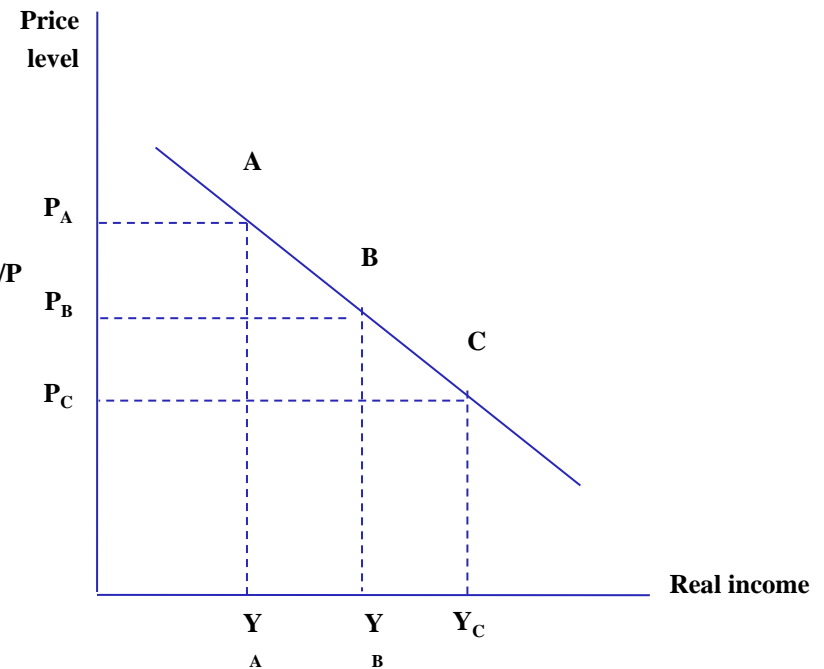
Aggregate Demand Curve

➢ When the IS and LM curves are combined, <u>the point at which they intersect represents the levels of the real interest rate and income</u> that are consistent with equilibrium between income and expenditure (points along the IS curve) and equilibrium between the real money supply and the real interest rate (points along the LM curve).

➢ The intersection between the IS and LM curves determines the <u>equilibrium levels of prices and real income</u> (real GDP) for a given level of the real money supply.

➢ The ***aggregate demand curve*** shows the relationship between the quantity of real output demanded (which equals real income) and the price level.

  ● The relationship between the price level and real income, given that income is equal to planned expenditures (the IS curve) and money demand is equal to money supply (the LM curve), must be <u>downward sloping</u>.

  ● The aggregate demand curve slopes downward because <u>higher price levels reduce real wealth, increase real interest rates, and make domestically produced goods more expensive compared to goods produced abroad, all of which reduce the quantity of domestic output demanded.</u>

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Slope of AD

➤ For simplicity, we assume there are no changes in the fiscal or trade balances so that maintaining the balance between aggregate expenditure and aggregate income requires that changes in investment spending equal changes in private saving.

- As the price level increases, the real money supply *(M/P)* declines.
- To induce a corresponding decline in money demand, the interest rate must rise so that other assets are more attractive and income must fall to reduce the transactional need for money balances.
- The higher interest rate induces companies to reduce investment spending. The decline in income reduces household saving.

➤ *The slope of the AD curve depends on the relative sensitivities of investment, saving; and money demand to income and the interest rate.* The AD curve will he flatter if

- investment expenditure is highly sensitive to the interest rate;
- saving is insensitive to income;
- money demand is insensitive to interest rates; and
- money demand is insensitive to income.
  - ✓ The first two conditions directly imply that income will have to move more to induce a large enough change in saving to match the change in investment spending.
  - ✓ All else equal, each of the last two conditions implies that a larger change in the interest rate is required to bring money demand in line with money supply. This, in turn, implies a larger change in investment spending and a correspondingly larger change in saving and incomes

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Shifts in the Aggregate Demand Curve

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

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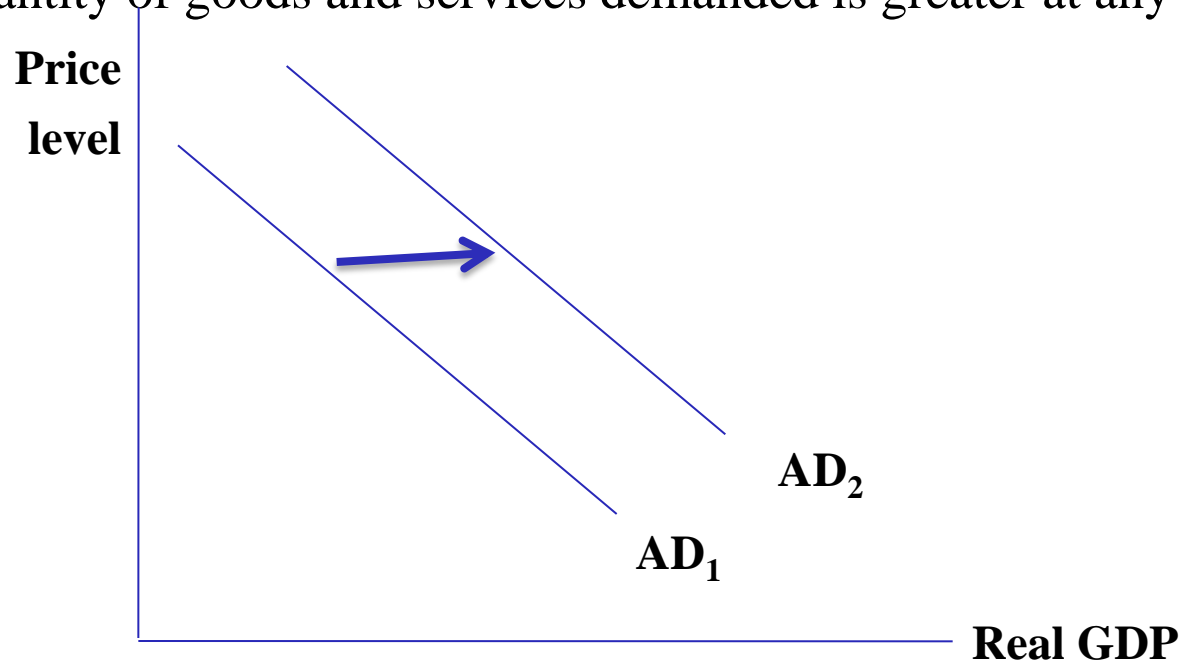
Shifts in the Aggregate Demand Curve

➢ In trying to understand and remember the factors that affect aggregate demand, it may help to recall that, from the expenditure point of view, GDP = C + I + G + NX. For changes in each of the following factors that increase aggregate demand (shift AD to the right), we identify which component of expenditures is increased.

- ***Increase in consumers' wealth:*** As the value of households' wealth increases (real estate, stocks, and other financial securities), the proportion of income saved decreases and spending increases, increasing aggregate demand (C increases).
- ***Business expectations:*** When businesses are more optimistic about future sales, they tend to increase their investment in plant, equipment, and inventory, which increases aggregate demand (I increases).
- ***Consumer expectations of future income:*** When consumers expect higher future incomes, due to a belief in greater job stability or expectations of rising wage income, they save less for the future and increase spending now, increasing aggregate demand (C increases).
- ***High capacity utilization:*** When companies produce at a high percentage of their capacity, they tend to invest in more plant and equipment, increasing aggregate demand (I increases).

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Shifts in the Aggregate Demand Curve

- ***Expansionary monetary policy:*** When the rate of growth of the money supply is increased, banks have more funds to lend, which puts downward pressure on interest rates. <u>Lower interest rates increase both investment and consumers' spending.</u> Thus, the effect of expansionary monetary policy is to increase aggregate demand (C and I increase).

  - ✓ Note that if the economy is operating at potential GDP (LRAS) when the monetary expansion takes place, <u>the increase in real output will be only for the short run.</u>

  - ✓ <u>In the long run, subsequent increases in input prices decrease SRAS and return output to potential GDP</u>.

- ***Expansionary fiscal policy***: Expansionary fiscal policy refers to a decreasing government budget surplus (or an increasing budget deficit) from decreasing taxes, increasing government expenditures, or both.

  - ✓ A decrease in taxes increases disposable income and consumption, while an increase in government spending increases aggregate demand directly (C increases for tax cut, G increases for spending increase).

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Shifts in the Aggregate Demand Curve

- ***Exchange rates:*** A decrease in the relative value of a country's currency will increase exports and decrease imports. Both of these effects tend to increase domestic aggregate demand (net X increases).

- ***Global economic growth:*** GDP growth in foreign economies tends to increase the quantity of imports (domestic exports) foreigners demand. By increasing domestic export demand, this will increase aggregate demand (net X increases).

> *Note* that for each factor, a change in the opposite direction will tend to decrease aggregate demand.

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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

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Aggregate Supply Curve

> ## *Aggregate Supply Curve*
>> ● The **aggregate supply** (AS) curve describes the relationship between the price level and the quantity of real GDP supplied, when all other factors are kept constant. That is, it represents the amount of output that firms will produce at different price levels.
>> ● We need to consider three aggregate supply curves with different time frames: the <u>very short-run aggregate supply (VSRAS)</u> curve, the <u>short-run aggregate supply (SRAS) curve</u>, and the <u>long-run aggregate supply (LRAS) curve</u>.
>>> ✓ The ***VSRAS curve*** is perfectly elastic.
>>> ✓ The ***LRAS curve*** is perfectly inelastic. In the long run, wages and other input prices change proportionally to the price level, so the price level has no long-run effect on aggregate supply. We refer to this level of output as ***potential GDP*** or ***full-employment GDP***.
>>> ✓ The ***SRAS curve*** is upward sloping.

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Aggregate Supply Curve

Aggregate Supply Curve

Price level

LRAS　　　　　　　SRAS

VSRAS

Real output

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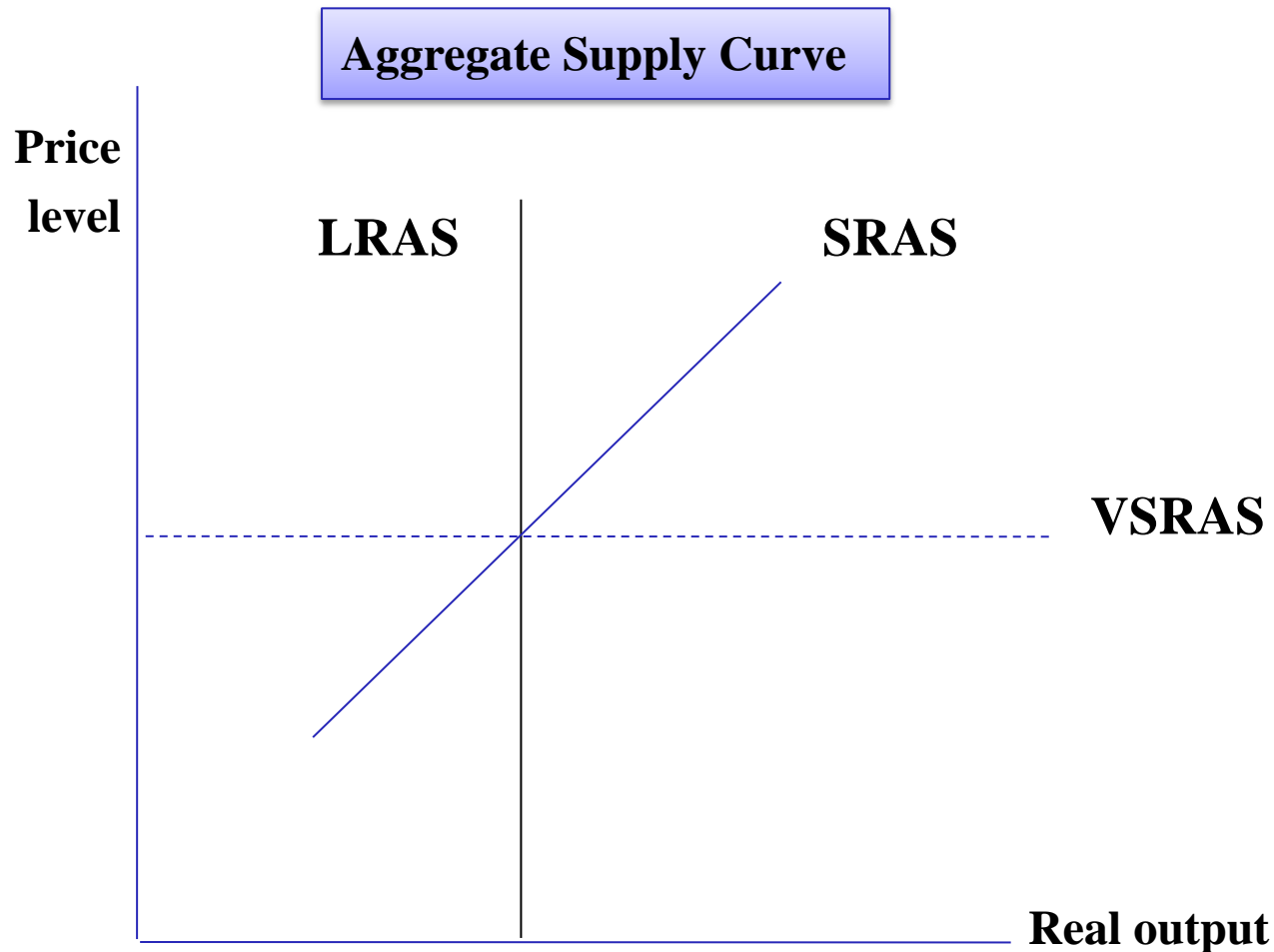
Shifts in the Short-Run Aggregate Supply Curve

> **Shifts in the Short-Run Aggregate Supply Curve**
>
> - The short-run aggregate supply (SRAS) curve reflects the relationship between output and the price level when wages and other input prices are held constant (or are slow to adjust to higher output prices). The curve shows the total level of output that businesses are willing to supply at different price levels.
> - A number of factors can affect this level of output and cause the SRAS curve to shift. See the following Figure, an increase in aggregate supply is shown by a shift to the right, as the quantity supplied at each price level increases.

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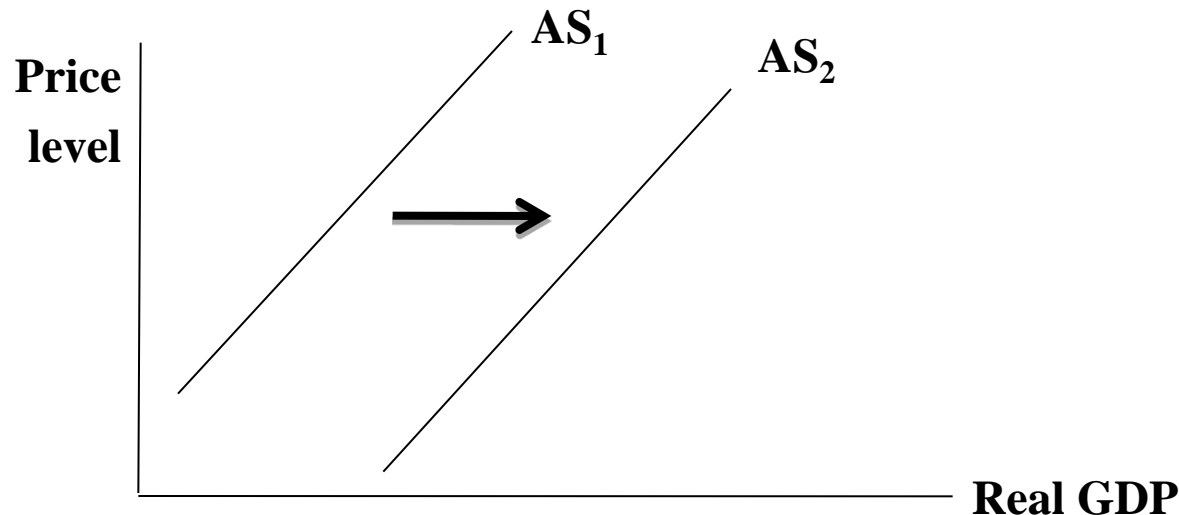
Shifts in the Aggregate Supply Curve

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

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Movement along Aggregate Demand and Supply Curves

➢ Movement along aggregate demand and supply curves

- In contrast with shifts in the aggregate demand and aggregate supply curves, movements along these curves reflect the impact of a change in the price level on the quantity demanded and the quantity supplied.

- Changes in the price level alone do no cause shifts in the AD and AS curves, although we have allowed that changes in expected future prices can.

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Long-Run Equilibrium Real Output

> ## Long-Run Equilibrium Real Output

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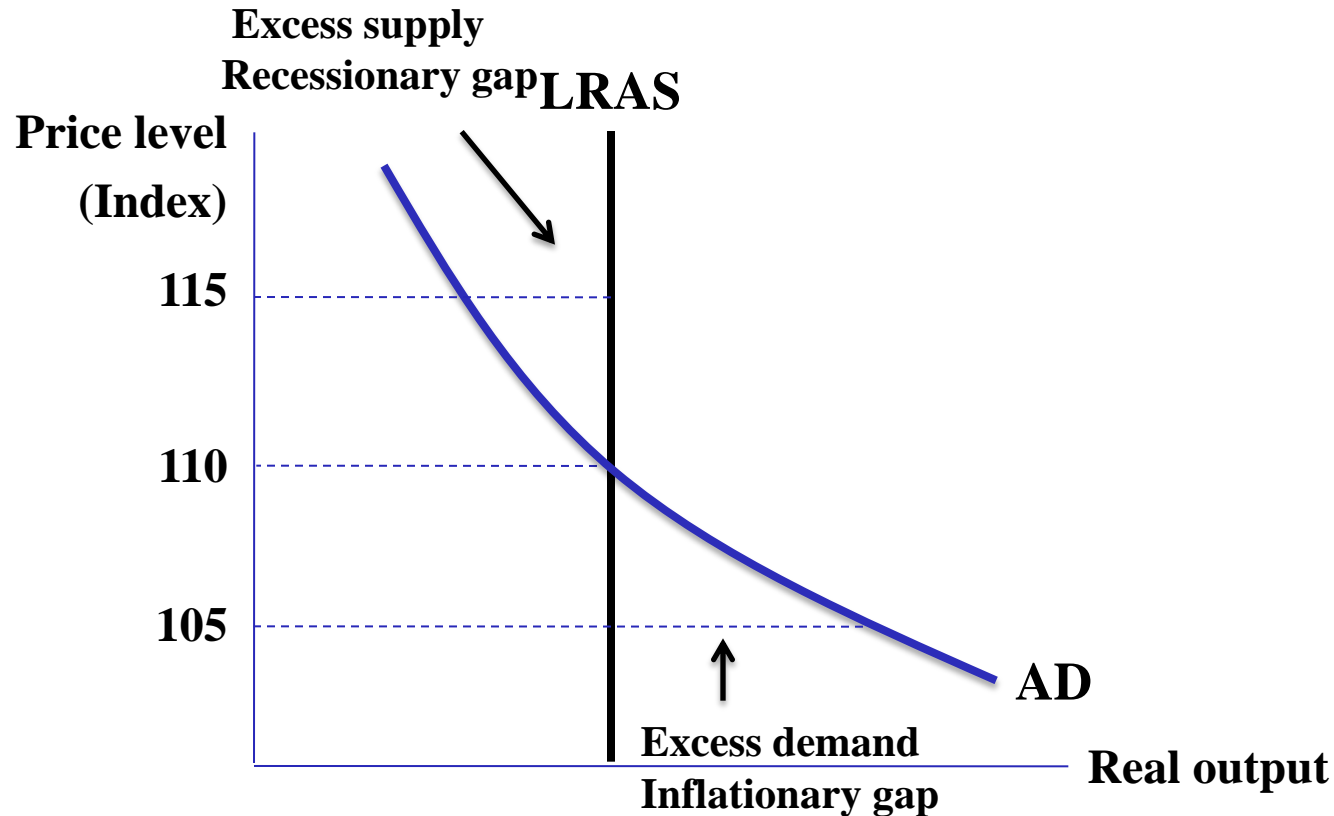
Long-Run Disequilibrium

> **Long-Run disequilibrium**

(a) Below full employment
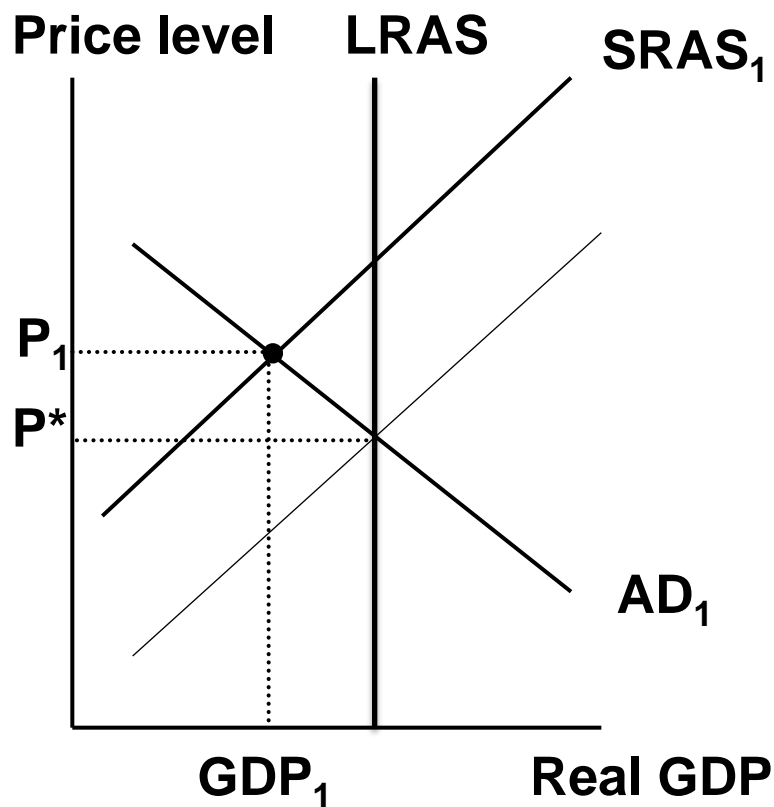
(b) above full employment
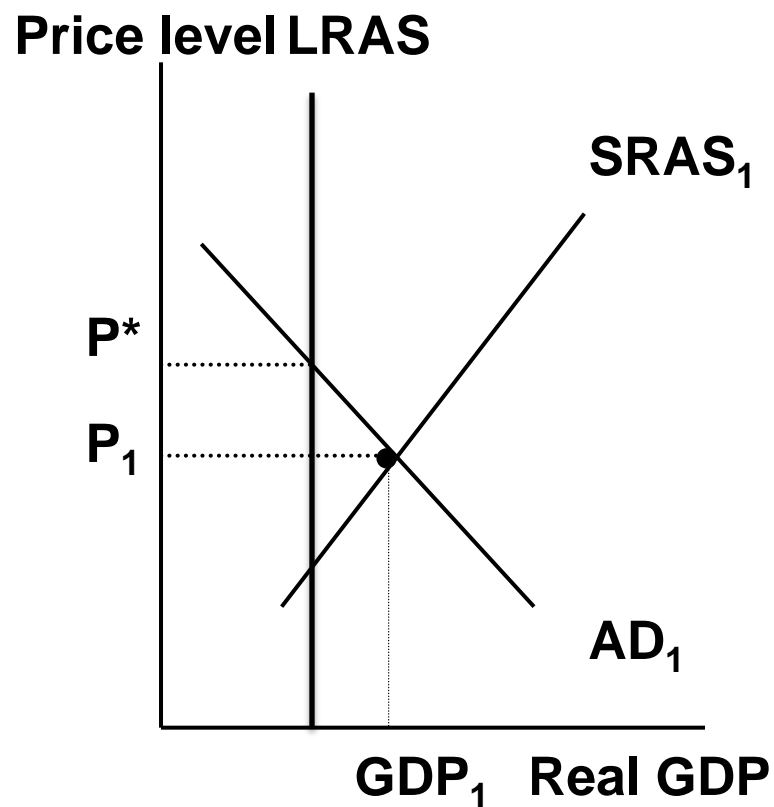
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Adjustment to an Increase in Aggregate Demand

> ## Adjustment to an Increase in Aggregate Demand

Price level LRAS SRAS$_1$

SRAS$_0$

P$_{LR}$ ···· 3

P$_{SR}$ ···· 2

P$_0$ ···· 1 AD$_1$

AD$_0$

Real Output (GDP)

GDP* GDP$_1$

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

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Adjustment to a Decrease in Aggregate Demand

> ## Adjustment to a Decrease in Aggregate Demand

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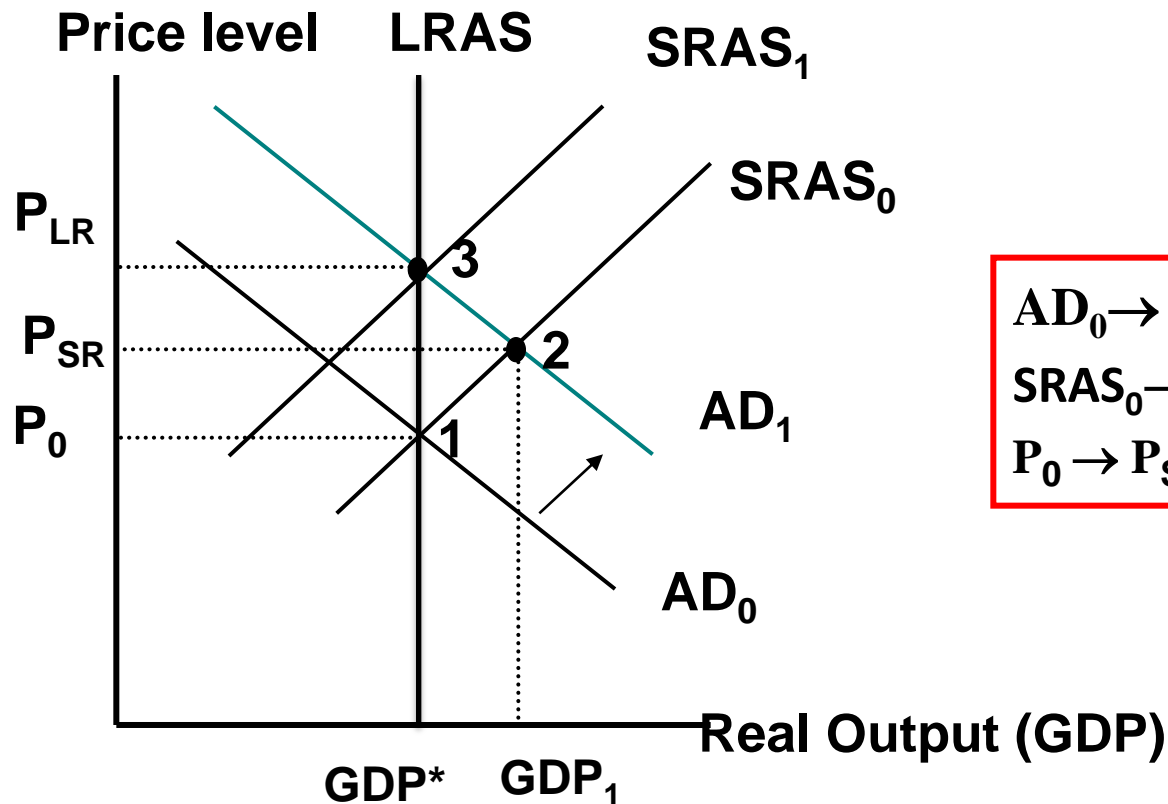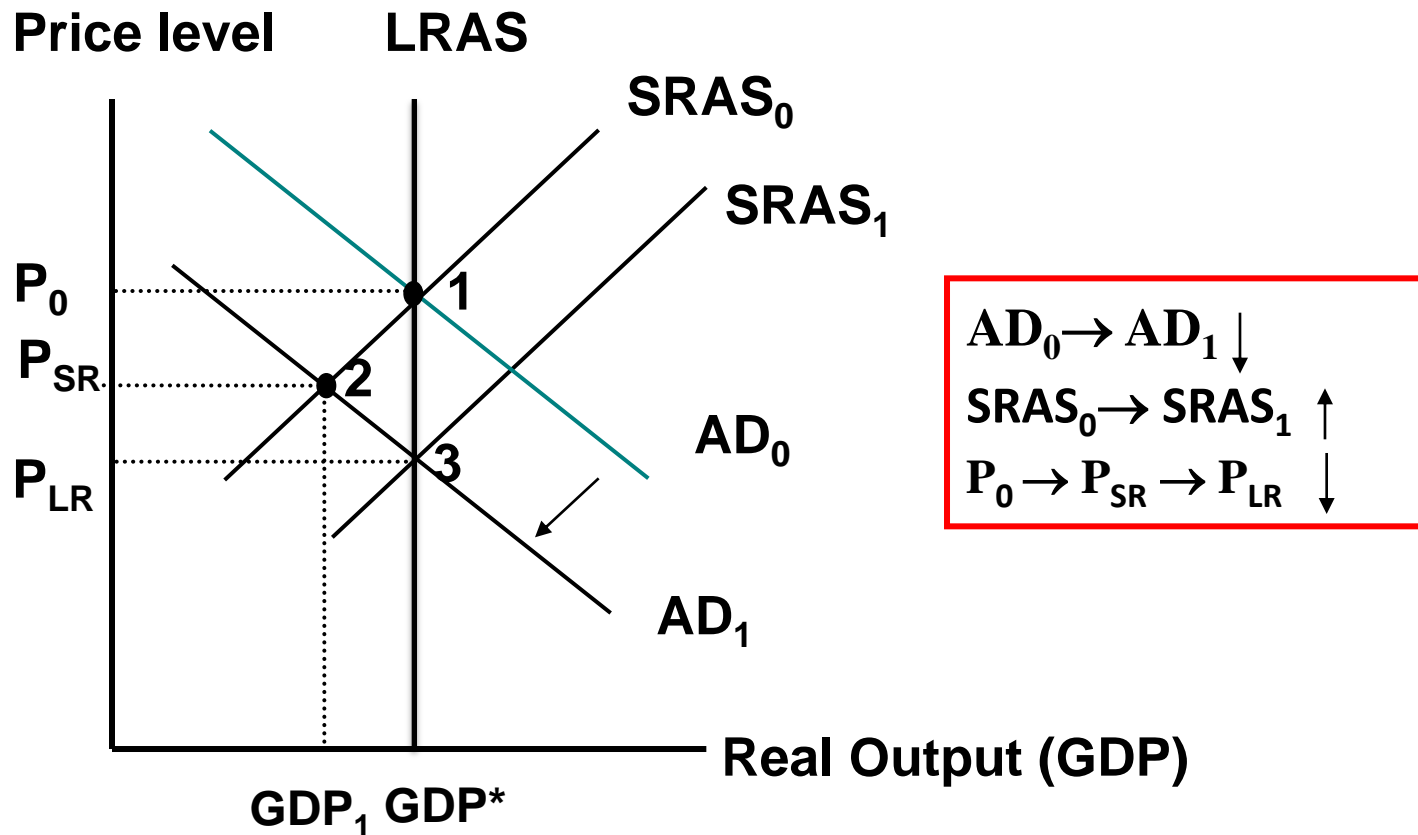
Recessionary Gap
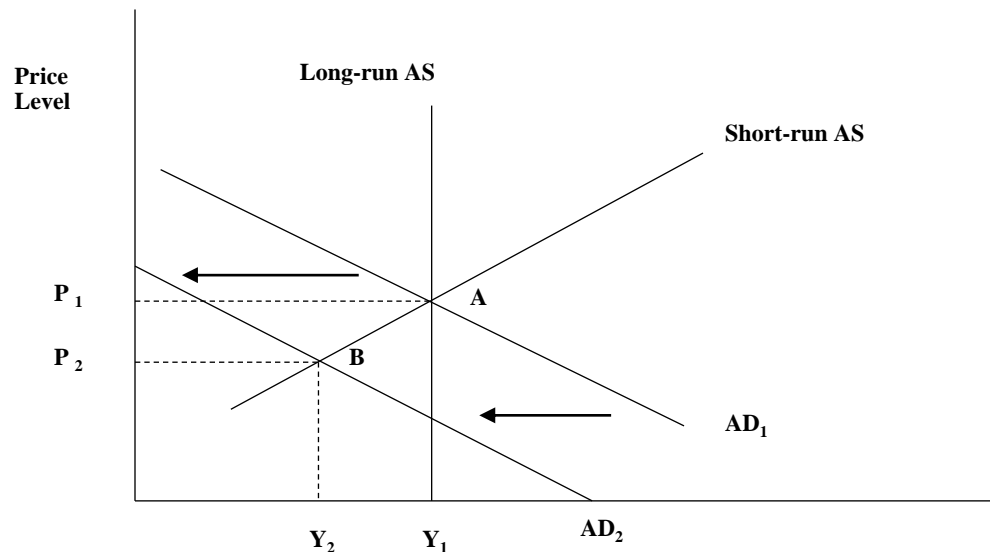
- ➤ **Investment Implications of a Decrease in AD** Aggregate demand and aggregate supply are theoretical measures that are very hard to measure directly. Most governments, however, publish statistics that provide an indication of the direction that aggregate demand and supply are moving over time.
- ➤ For example, statistics on consumer sentiment, factory orders for durable and nondurable goods, the value of unfilled orders, the number of new housing starts, the number of hours worked, and changes in inventories provide an indication of the direction of aggregate demand. If these statistics suggest that a recession is caused by a decline in AD, the following conditions are likely to occur:
  - ● Corporate profits will decline.
  - ● Commodity prices will decline.
  - ● Interest rates will decline.
  - ● Demand for credit will decline.

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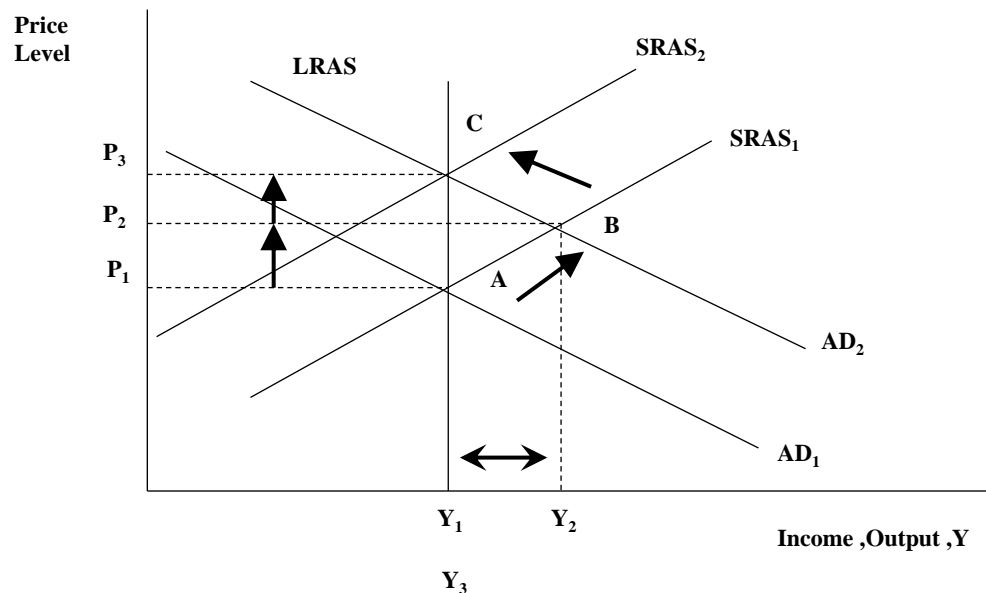
Inflationary Gap

> **Investment Implications of an Increase in AD** resulting in an inflationary gap If economic statistics (consumer sentiment, factory orders for durable and nondurable goods, etc.) suggest that there is an expansion caused by an increase in AD, the following conditions are likely to occur:
>   - Corporate profits will rise.
>   - Commodity prices will increase.
>   - Interest rates will rise.
>   - Inflationary pressures will build.

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Stagflation

➢ ***Stagflation*** refers to an environment of both high unemployment and increasing inflation. <u>Stagflation is generally associated with a sharp decrease in aggregate supply</u>.

- Stagflation is difficult for government policymakers to address because policy changes to reduce inflation tend to make unemployment worse, while policy changes to fight recession tend to make inflation worse.

- If the government does not intervene, declines in wages and other input prices should return SRAS and real GDP to long-run equilibrium. However, this may be a slow process that makes it politically risky for the government to take no immediate action.

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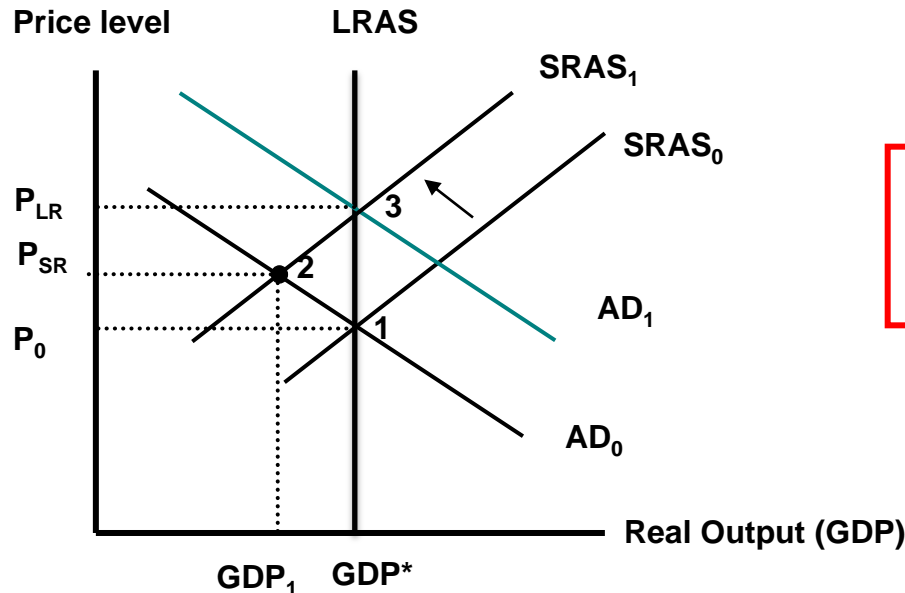
Sources of Economic Growth

➢ Economic growth can best be explained by examining five important sources of economic growth:

- **_Labor supply_**. The labor force is the number of people over the age of 16 who are either working or available for work but currently unemployed. It is affected by population growth, net immigration, and the labor force participation rate. Growth of the labor force is an important source of economic growth.

- **_Human capital._** The education and skill level of a country's labor force can be just as important a determinant of economic output as the size of the labor force. Because workers who are skilled and well-educated (possess more human capital) are more productive and better able to take advantage of advances in technology, investment in human capital leads to greater economic growth.

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Sources of Economic Growth

- ***Physical capital stock****.* A high rate of investment increases a country's stock of physical capital. A larger capital stock increases labor productivity and potential GDP. An increased rate of investment in physical capital can increase economic growth.

- ***Technology.*** Improvements in technology increase productivity and potential GDP. More rapid improvements in technology lead to greater rates of economic growth.

- ***Natural resources.*** Raw material inputs, such as oil and land, are necessary to produce economic output. These resources may be *renewable* (e.g., forests) or *nonrenewable* (e.g., coal). Countries with large amounts of productive natural resources can achieve greater rates of economic growth.

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Production Function

➢ A ***production function*** describes the relationship between output and labor, the capital stock, and productivity.

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

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

  where:

  Y = aggregate economic output ;

  L = size of labor force;

  K = amount of capital available ;

  A = total factor productivity

- ***Total factor productivity*** is a multiplier that quantifies the amount of output growth that cannot be explained by the increases in labor and capital.

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Growth and Growth of Total Factor Productivity

➢ A well-known model of the contributions of technology, labor, and capital to economic growth is:

growth in potential GDP =

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

where W_L and W_c are labor's percentage share of national income and capital's percentage share of national income.

➢ 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)

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Framework of Economics

➢ SS 4 Microeconomic Analysis

- R13 demand and supply: introduction
- R14 demand and supply: consumer demand introduction
- R15 demand and supply: the firm
- R16 the firm and the market structure

➢ SS 5 Macroeconomic Analysis

- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➢ SS 6 Economics in a Global Context

- R20 international trade and capital flow
- R21 currency exchange rate

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R18 Business cycles

- Business cycles
- Theories of business cycles
- Unemployment
- Inflation
- Economic indicators

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Business cycles

➢ ***Business cycle*** is characterized by fluctuations in economic activity.

- Real gross domestic product (GDP) and the rate of unemployment are the key variables used to determine the current phase of cycle.

➢ Business cycle has four phases: trough \ expansion \ peak \ contraction

Level of National Economic Activity

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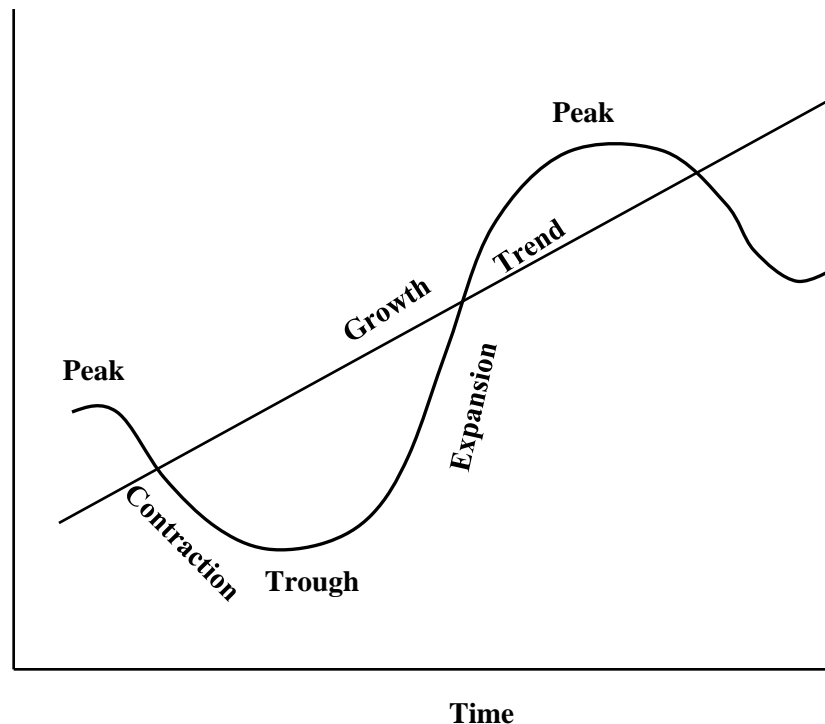
Resource use fluctuation

➢ Inventories are an important <u>business cycle indicator</u>. Firms try to <u>keep enough inventory on hand to meet sales demand</u> but do <u>not want to keep too much of their capital tied up in inventory</u>. As a result, the <u>ratio of inventory to sales</u> in many industries tends toward a <u>normal level</u> in times of steady economic growth.

➢ <u>When an expansion is approaching its peak</u>, sales growth begins to slow, and unsold inventories accumulate. This can be seen in an <u>increase in the inventory-sales ratio above its normal level</u>.

- ● Firms respond to an unplanned increase in inventory by reducing production.

➢ The opposite occurs <u>when a contraction reaches its trough</u>. Having reduced their production levels to adjust for lower sales demand, firms find their inventories becoming depleted more quickly once sales growth begins to accelerate.

- ● This causes the <u>inventory-sales ratio to decrease below its normal level</u>.
- ● To meet the increase in demand, firms will <u>increase output</u>, and the <u>inventory-sales ratio will increase toward normal levels</u>.

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Resource use fluctuation

➢ One of the ways firms react to fluctuations in business activity is by <u>adjusting their utilization of labor and physical capital</u>.

- Utilization of labor levels:
  - ✓ Adding and subtracting workers in <u>lockstep</u> with changes in economic growth would be <u>costly for firms</u>, in terms of both direct expenses and the damage it would do to employee morale and loyalty.
  - ✓ Firms typically begin by changing how they utilize their current workers, <u>producing less or more output per hour</u> or <u>adjusting the hours they work by adding or removing overtime</u>.
  - ✓ <u>Only when</u> an expansion or contraction appears likely to persist will they hire or lay off worker.
- Utilization of physical capital levels:
  - ✓ During contractions, however, firms will <u>not necessarily sell</u> plant and equipment outright. They can <u>reduce their physical capacity by spending less on maintenance or by delaying the replacement of equipment</u> that is near the end of its useful life.

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Business cycle characteristics

➢ Typical business cycle characteristics:

- **Trough:**
  - ✓ GDP growth rate changes from negative to positive
  - ✓ High unemployment rate, increasing use of overtime and temporary workers.
  - ✓ Spending on consumer durable goods and housing may increase
  - ✓ Moderate or decreasing inflation rate

- **Expansion:**
  - ✓ GDP growth rate increases
  - ✓ Unemployment rate decreases as hiring accelerates
  - ✓ Investment increases in producers' equipment and home construction
  - ✓ Inflation rate may increase.
  - ✓ Imports increase as domestic income growth accelerates

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Business cycle characteristics

- **Peak**
  - ✓ GDP growth rate decreases.
  - ✓ Unemployment rate decreases but hiring slows
  - ✓ Consumer spending and business investment grow at slower rates
  - ✓ Inflation rate increases.

- **Contraction/recession**
  - ✓ GDP growth rate is negative
  - ✓ Hours worked decrease, unemployment rate increases
  - ✓ Consumer spending, home construction, and business investment decrease
  - ✓ Inflation rate decreases with a lag.
  - ✓ Imports decrease as domestic income growth slows

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Characteristics of Different Business Cycle Phase

	Early Expansion (Recovery)	Late Expansion	Peak	Contraction (Recession)
Economic Activity	▸Gross domestic (GDP), Industrial production, and other measures of economic activity turn from decline to expansion.	▸Activity measures show an accelerating rate of growth.	▸Activity measures show decelerating rate of growth.	▸Activity measures show outright declines.
Employment	▸Layoff slow (and net Employment turns positive), but new hiring does not yet occur and the unemployment rate remains high. At first, 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 to low levels.	▸Business slows its rate of hiring; however, the unemployment rate continues to Fall	▸Business first cuts hours and freezes hiring, followed by outright layoffs. The unemployment rate rises.
Consumer and Business Spending	▸Upturn often most Pronounced in housing, durable consumer items, and orders for light producer equipment.	▸Upturn 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.	▸Cutbacks appears most in industrial production, housing, consumer durable items and orders for new business equipment, followed, with a lag, by cutbacks in other forms of capital spending.
Inflation	▸Inflation remains moderate and may continue to fall	▸Inflation picks up modestly.	▸Inflation further accelerates	▸Inflation decelerates but with a lag.

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Theories of the Business Cycle

➢ ***Neoclassical school***
  ● Believe shifts in both aggregate demand and aggregate supply are primarily <u>driven by changes in **technology** over time</u>.
  ● Believe that the economy has a strong <u>tendency toward full-employment equilibrium</u>, as recession puts downward pressure on the money wage rate, or over-full employment puts upward pressure on the money wage rate.
  ● Conclude that business cycles are <u>temporary deviations from long-run equilibrium</u>.
  技术的改变引起经济周期，主张政府不要干预经济

➢ ***Keynesian school***
  ● Believe that **<u>shifts in *aggregate demand* due to changes in expectations</u>** were the primary cause of business cycles.
  ● Believe these fluctuations are primarily <u>due to swings in the level of</u> <u>optimism of those who run business</u>.
    ✓ They overinvest and overproduce when they are too optimistic about future growth in potential GDP.
    ✓ They underinvest and underproduce when they are too pessimistic or fearful about the future growth in potential GDP
  ● Argue that wages are "**<u>downward sticky</u>**", <u>reducing the ability</u> of a decrease in money wages to increase short-run aggregate supply and move the economy from recession (or depression) back toward full employment.
  ● The policy prescription of Keynesian economists is <u>to **directly increase aggregate demand through monetary policy or through fiscal policy**</u>.
  总需求的改变导致了企业家预期的改变，从而引起了经济周期
  主张：政府直接干预经济

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Theories of the Business Cycle

➢ ***New Keynesian school***

- Added the assertion that <u>the prices of productive inputs other than labor are also "downward sticky,"</u> presenting additional barriers to the restoration of full-employment equilibrium.

➢ ***Monetarist school***（联系PPT 195页 MV=PY）

- Believe the variations in aggregate demand that cause business cycles are <u>due to</u> <u>variations in the rate of growth of the money supply</u>, likely from <u>inappropriate decisions by the monetary authorities</u>.

- Believe that recessions can be caused by <u>external shocks</u> or by <u>inappropriate decreases in the money supply</u>.

- Suggest that to <u>keep aggregate demand stable and growing</u>, the central bank should follow a policy of <u>steady and predictable increases in the money supply</u>.

  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

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Theories of the Business Cycle

- ➤ **_Austrian school_**
  - Believe business cycles are caused by <u>government intervention in the economy</u>.
  - When policymakers force interest rates down to <u>artificially low levels</u>, firms invest <u>too much capital in long-term and speculative lines of production</u>, compared to actual consumer demand.
  - When these investments <u>turn out poorly</u>, firms must decrease output in those lines, which <u>causes a contraction</u>.
    政府参与引起经济周期，主张政府不要干预经济
- ➤ **_New Classical school_** introduced **_real business cycle theory (RBC)._**
  - Emphasizes the effect of real economic variables such as <u>changes in technology and external shocks</u>, as opposed to monetary variables, as the cause of business cycles.
  - <u>Applies utility theory to macroeconomics</u>. Based on a model in which individuals and firms maximize expected utility, New Classical economists argue that <u>policymakers should not try to counteract business cycles</u> because expansions and contractions are <u>efficient market responses to real external shock</u>.
    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

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Key Terms in the Labor Market

➢ ***Employed***: number of people with a job.

- This figure normally does <u>not include people working in the informal sector</u> (e.g., unlicensed cab drivers, illegal workers, etc.)

➢ ***Labor force***: number of people who either have a job or are actively looking for a job.

- This number ***excludes*** retirees, children, stay-at-home parents, fulltime students, and other categories of people who are neither employed nor actively seeking employment.

➢ ***Participation ratio*** (also referred to as the activity ratio or labor force participation rate) is the percentage of the working-age population who are either employed or actively seeking employment

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

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Key Terms in the Labor Market

➢ ***Unemployed***: people who are actively seeking employment but are currently without a job.

- ● ***Long-term unemployed***: people who have been out of work for a long time (more than 3-4 months in many countries) but are still looking for a job.
- ● ***Frictionally unemployed***: people who are not working <u>at the time of filling out the statistical survey</u> because they just left one job and are about to start another job.

➢ ***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 <u>lagging economic indicator</u> of the business cycle.

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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. <u>When economy returns to be good, the unemployment rate will increase</u> 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.

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Inflation, Deflation and Disinflation

➢ ***Inflation*** is a persistent increase in the price level over time.
- If inflation is present, <u>the prices of almost all goods and services</u> are increasing.
- ***Inflation rate*** is the percentage increase in the price level, typically compared to the prior year.
- ***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 <u>negative inflation rate</u>.

➢ ***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).

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Inflation Measurement - CPI

➢ **The consumer price index (CPI)**

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

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

- Analysts who compare price indexes for different countries should be aware of <u>differences in their composition</u>.

- <u>The weights assigned to each good and service</u> reflect the typical consumer's purchasing patterns, which are likely to be significantly different across countries and regions.

- There can be differences in how the data are collected.

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Other Inflation Measurements

➢ Other inflation measurements:
- ● ***Price index for personal consumption expenditures***
- ● ***GDP deflator***
- ● ***Producer price index (PPI): reflect future PPI***
  - ✓ Reflect the price changes experienced <u>by domestic producers</u> in a country.
  - ✓ Include: fuels, farm products (such as grains and meat), machinery and equipment, chemical products (such as drugs and paints), transportation equipment, metals, pulp and paper, and so on.
- ● ***Wholesale price index (WPI)***
  - ✓ In some countries, the PPI is called the WPI.
- ● For both consumer and producer prices, analysts and policymaker often distinguish between <u>headline inflation</u> and <u>core inflation</u>.
  - ✓ ***Headline inflation*** refers to price indexes for all goods.
  - ✓ ***Core inflation*** refers to price indexes that exclude food and energy. Thus, core inflation can sometimes be <u>a more useful measure of the underlying trend in prices</u>.

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Inflation Measurement - CPI

Items	Quantity in base period	Price in base period	Quantity in current period	Current price
Cheeseburgers	200	2.50	205	3.00
Movie tickets	50	7.00	45	10.00
Gasoline (in gallons)	300	1.50	295	3.00
Digital watches	100	12.00	105	9.00

Reference base period:

Cheeseburgers	$205 \times 2.50 =$	512.50
Movie tickets	$45 \times 7.00 =$	315.00
Gasoline	$295 \times 1.50 =$	442.50
Watches	$105 \times 12.00 =$	1,260.00
Cost of basket		2,530.00

Current period:

Cheeseburgers	$205 \times 3.00 =$	615.00
Movie tickets	$45 \times 10.00 =$	450.00
Gasoline	$295 \times 3.00 =$	885.00
Watches	$105 \times 9.00 =$	945.00
Cost of basket		2,895.00

$$\text{Paasche index} = \frac{2,895}{2,530} \times 100 = 114.43$$

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Laspeyres Index

➢ **Laspeyres index:** uses a constant basket of goods and services. <u>Most countries</u> calculate consumer price inflation this way.

➢ Three factors cause a Laspeyres index of consumer prices to be biased upward as a measure of the cost of living:

- *New goods.* Older products are often replaced by <u>newer, but initially more expensive, products</u>. New goods are periodically added to the market basket, and the older goods they replace are reduced in weight in the index. This biases the index upward.

- *Quality changes.* If the price of a product increases because the product has improved, the price increase is not due to inflation but still increases the price index.

- *Substitution.* Even in an inflation-free economy, prices of goods relative to each other change all the time. When two goods are substitutes for each other, <u>consumers increase their purchases of the relatively cheaper good</u> and buy less of the relatively more expensive good. Over time, such changes can make a Laspeyres index's fixed basket of goods <u>a less accurate measure of typical household spending</u>.

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Hedenic Pricing, Fisher Index, and Paasche Index

➢ Solution for Laspeyres index biases:

- ● Many countries adjust for the <u>quality of the products</u> in a basket, a practice called ***hedonic pricing***.

- ● <u>New products</u> can be introduced into the basket over time.

- ● The <u>substitution bias</u> can be somewhat resolved by using <u>chained price index formula</u>.

    - ✓ One such example is the ***Fisher index***, which is the geometric mean of the Laspeyres index and the Paasche index.

$$I_F = \sqrt{I_P \times I_L}$$

- ● ***Paasche index*** is an index formula using the current composition of the basket.

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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
  - An increase in money wage rates
  - An increase in the money prices of raw materials
➤ Steps in cost-push inflation:
  - Step1: money wage rate & money prices of raw materials↑ →SAS左移 $(SAS_0 \rightarrow SAS_1)$ →stagflation (the price level increases and the economy experiences inflation)
  - Step2: the Fed increases the quantity of money → AD右移$(AD_0 \rightarrow AD_1)$
  - Step3: the price of goods↑ →the price of material↑ →stagflation→… (价格持续上涨)

A Cost-push Inflation Spiral

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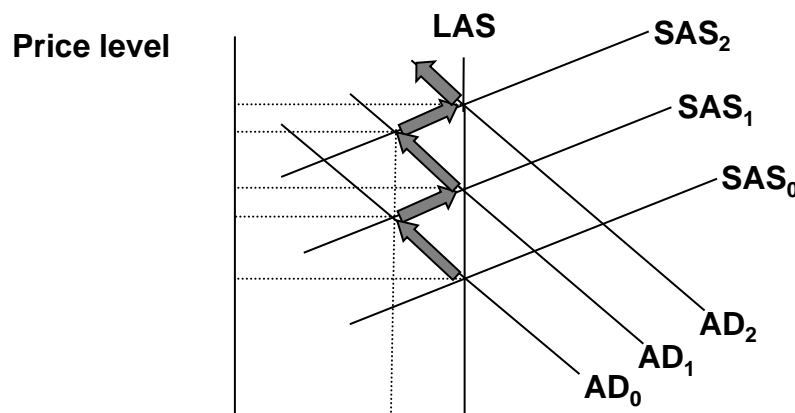
Demand-pull inflation

➢ **Demand-pull inflation:** an inflation that results from an initial increase in aggregate demand
  - Factors:
    - ✓ Increase in the quantity of money
    - ✓ Increase in government purchases
    - ✓ Increase in exports
➢ Steps in demand-pull inflation:
  - Step1: $AD_0 \to AD_1$, real GDP＞potential GDP& inflation gap (short run effect)
  - Step2: workers demand higher money wage rate, $SAS_0 \to SAS_1$ (long run effect)
  - Step3: AD increases year after year. AD puts continual upward pressure on the price level. The economy now experience demand-pull inflation. (价格的持续上涨)

A Demand-pull Inflation Spiral

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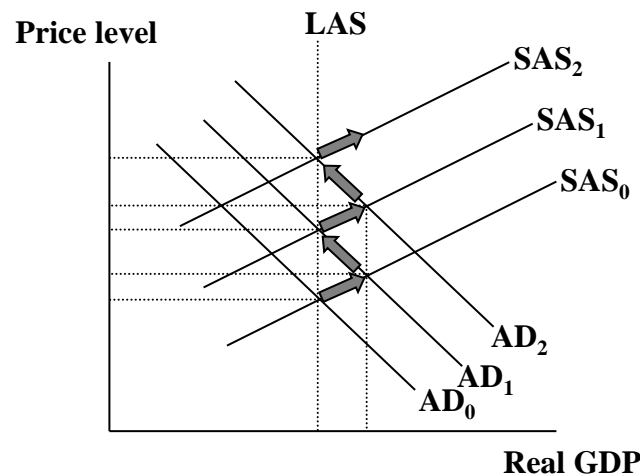
Economic Indicators

➢ ***Leading economic indicators***: have turning points <u>that usually precede</u> overall economy

➢ ***Coincident economic indicators***: have turning points that are <u>usually close to overall economy</u>

➢ ***Lagging economic indicators***: have turning points that are <u>usually later to overall economy</u>

- We should be aware that the classification leading, coincident, and lagging indicators reflect tendencies <u>in the timing of their turning points</u>, not exact relationship with the business cycle.

- <u>Not all changes in direction of leading indicator indexes</u> have been followed by corresponding changes in the business cycle, and even when they have, <u>the lead time has varied</u>.

- This common criticism is summed up in the often repeated comment, "Declines in stock prices have predicted nine of the last four recessions."

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Economic Indicators

Leading	Reason
Average weekly hours, manufacturing	Because businesses will <u>cut overtime before laying off workers in a downturn</u> and increase it before rehiring in a cyclical upturn, these measures move up and down <u>before the general economy.</u>
Average weekly initial claims for unemployment insurance	This measure offers a very <u>sensitive test of initial layoffs and rehiring</u>.
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 <u>lead at upturns and downturns</u>. Indirectly, they capture changes in <u>business sentiment as well</u>, which also often leads the cycle.
Vendor performance, <u>slower deliveries diffusion index</u>	By measuring the speed at which businesses can complete and deliver an order, this gauge offers <u>a clear signal of unfolding demands on businesses</u>.
Manufacturers' new orders for non-defense capital goods	In addition to offering <u>a first signal of movement, up or down, in an important economic sector</u>, movement in this area also <u>indirectly captures business expectations</u>.
Building permits for new private housing units	Because most localities require permits before new building can begin, this gauge <u>foretells new construction activity</u>.

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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.
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.

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Economic Indicators

Coincident	Reason
Employees on non-agricultural payrolls	Once recession or recovery is clear, businesses <u>adjust their fulltime payrolls</u>.
Aggregate real personal income (less transfer payments)	By measuring the income flow from non-corporate profits and wages, this measure <u>captures the current state of the economy</u>.
Industrial Production Index	Measures industrial output, thus <u>capturing the behavior of the most volatile part of the economy</u>. 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 <u>the current state of business activity</u>.
Lagging	**Reason**
Average Duration of Unemployment	Because <u>businesses wait until downturns look genuine to lay off</u>, and wait until recoveries look secure to rehire, this measure is important because it <u>lags the cycle on both the way down and the way up</u>.
Inventory—sales ratio	Because <u>inventories accumulate as sales initially decline and then</u>, once a business adjusts its ordering, become <u>depleted as sales pick up</u>, this ratio tends to lag the cycle.

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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 <u>a bank administered rate</u>, it tends to lag other rates that move either before cyclical turns or with them.
Commercial and industrial loans outstanding	Because <u>these loans frequently support inventory building</u>, they lag the cycle for much the same reason that the inventory—sales ratio does.
Ratio of consumer installment debt to income	Because consumers <u>only borrow heavily when confident</u>, this measure lags the cyclical upturn, but debt <u>also overstays cyclical downturns</u> 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

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Framework of Economics

➢ SS 4 Microeconomic Analysis
- R13 demand and supply: introduction
- R14 demand and supply: consumer demand introduction
- R15 demand and supply: the firm
- R16 the firm and the market structure

➢ SS 5 Macroeconomic Analysis
- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➢ SS 6 Economics in a Global Context
- R20 international trade and capital flow
- R21 currency exchange rate

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R19 Monetary and Fiscal Policy

- ➤ Definition
- ➤ Monetary policy
- ➤ Central banks
- ➤ Fiscal policy

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Monetary and Fiscal Policy

➢ ***Fiscal policy*** refers to a government's use of spending and taxation to influence economic activity.
  - The budget is said to be balanced when tax revenues equal government expenditures.
  - A budget surplus occurs when government tax revenues exceed expenditures.
  - A budget deficit occurs when government expenditures exceed tax revenues.

➢ ***Monetary policy*** refers to the central bank's actions that affect the quantity of money and credit in an economy in order to influence economic activity.
  - Monetary policy is said to be expansionary (or accommodative or easy) when the central bank increases the quantity of money and credit in an economy.
  - When the central bank is reducing the quantity of money and credit in an economy, the monetary policy is said to be contractionary (or restrictive or tight).

➢ Both monetary and fiscal policies are used by policymakers with the goals of maintaining stable prices and producing positive economic growth. Fiscal policy can also be used as a tool for redistribution of income and wealth.

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Qualities and Functions of Money

➢ ***Functions of money:***

- Medium of exchange or means of payment

- Unit of account

- Store of value

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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

$$\text{money created} = \text{new deposit} \Big/ \text{reserve requirement} = \frac{100}{0.1} = 1000$$

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

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Quantity Theory of Money

➢ ***The quantity theory of money*** states that quantity of money is some proportion of the total spending in an economy and implies the quantity equation of exchange:

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

- ***Price multiplied by real output*** is total spending so that velocity is the average number of times per year each unit of money is used to buy goods or services. The equation of exchange must hold with velocity defined in this way.

- Monetarists believe that <u>velocity and the real output of the economy change only slowly.</u>

- Assuming that velocity and real output remain constant, <u>any increase in the money supply will lead to a proportionate increase in the price level</u>.

- The belief that real variables (real GDP and velocity) are not affected by monetary variables (money supply and prices) is referred to as ***money neutrality***.

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Fisher Effect

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

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

  R_{Nom} = nominal interest rate

  R_{Real} = real interest rate

  E[I] = expected inflation

- The idea behind the Fisher effect is <u>that real rates are relatively stable, and changes in interest rates are driven by changes in expected inflation</u>. <u>This is consistent with money neutrality.</u>

➢ Investors are exposed to the risk <u>that actual inflation may differ from expected inflation</u>. Investors require an additional return (a risk premium) for bearing this risk, which we can consider a third component of a nominal interest rate.

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

  RP = risk premium for inflation uncertainty

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Role and Objectives of Central Bank

➤ Role of central bank:

- Sole supplier of currency
- Banker to the government and other banks
- Lender of last resort
- Supervise banks
- Holder of gold and foreign exchange reserves
- Conductor of monetary policy

➤ Objectives of a central bank:

- Control inflation so as to promote price stability
- Stability in exchange rates with foreign currencies
- Full employment
- Sustainable positive economic growth
- Moderate long-term interest rates

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Tools of the Central Bank

➢ ***Policy rate***

- In the United Stated, banks can borrow funds from the Fed. The rate at which banks can borrow reserves from the Fed is termed the <u>discount rate</u>. For the European Central Bank (ECB), it is called the <u>refinancing rate</u>.

- One way to lend money to banks is through a <u>repurchase agreement</u>. The Bank of England uses this method, and police rate is called the <u>two-week repo (repurchase) rate</u>.

- In the United States, the <u>federal funds rate</u> is the rate that banks charge each other on overnight loans of reserves.

- A <u>lower rate reduces banks' cost of funds encourage lending</u>, and tends to <u>decrease interest rates</u>.

- A <u>higher policy rate increases banks' cost of funds discourage lending</u>, and tends to <u>increase interest rates</u>.

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

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）

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Tools of the Central Bank

- > **_Reserve requirements_**
  - Reserve requirement↑ - available funds for lending↓ - money supply↓ - interest rate↑
  - This tool only works well to increase the money supply if banks are willing to lend and customers are willing to borrow.
    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 <u>the Fed's most commonly used tool</u> and is important in achieving the federal funds target rate (policy rate).
    央行买债券 → 扩张的货币政策
    央行卖债券 → 紧缩的货币政策

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Qualities of Effective Central Banks

➢ ***Independence***
  - It should be <u>free from political interference</u>.
  - Independence should be thought of <u>in relative terms (degrees of independence)</u> rather than absolute terms.
  - Independence can be evaluated based on both operational independence and target independence.
    - ✓ <u>Operational independence</u> means that the central bank is allowed to independently determine the policy rate.
    - ✓ <u>Target independence</u> means the central bank also defines how inflation is computed, sets the target inflation level, and determines <u>the horizon over which the target is to achieved</u>.

➢ ***Credible***
  - Central banks should follow through on their stated intentions.
  - If government with large debts, instead of a central bank, set an inflation target, the target would not be credible because the government has an incentive to allow inflation to exceed the target level.
  - A credible central bank's targets can <u>become self-fulfilling prophecies</u>. Actual inflation will then be close to that level.

➢ ***Transparent***
  - <u>Transparency on the part of central banks aids their credibility</u>. Transparency means central banks periodically disclose the state of the economic environment by issuing Inflation Reports.

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Determine whether a Monetary Policy is Expansionary or Contractionary

➤ An economy's long-term sustainable real growth rate is called the **_real trend rate_** or, the **_trend rate_**.

➤ The **_neutral interest rate_** of an economy is the growth rate of the money supply that neither increases nor decreases the economic growth rate:

  Neutral interest rate = real trend rate of economic growth + inflation target

  ● Policy rate> Neutral rate: contractionary
  ● Policy rate< Neutral rate: expansionary

➤ Monetary policy is often adjusted to reflect the source of inflation.

  ● If inflation is above target due to higher aggregate demand, then contractionary monetary policy may be an appropriate response to reduce inflation.

  ● If inflation is higher due to supply shocks, and the economy is already operating below full employment, a contractionary monetary policy may make a bad situation worse.

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Limitation of Monetary Policy

➢ The transmission mechanism for monetary policy does <u>not always produce the intended results</u>.

- <u>Long-term rates may not rise and fall with short-term rates</u> because of the effect of monetary policy changes on <u>expected inflation</u>.

  - ✓ If individuals and businesses <u>decrease in the money supply intended to reduce inflation</u>. The future inflation rates will be low. Because long-term bond yields include a premium for expected inflation, long-term rates could fall (tending to increase economic growth).

  - ✓ While the central bank has <u>increased short-term rates in order to slow economic activity</u> could <u>lead to an increase in expected inflation rates and long-term bond yields</u>, even as short-term rates fall.

    - ◆ Monetary tightening may be <u>viewed as too extreme</u>, <u>increasing the probability of a recession, making long-term bonds more attractive and reducing long-term interest rates.</u>

    - ◆ Bond market participants that act in this way have been called ***<u>bond market vigilantes</u>***.

  - ✓ When the central bank's policy is <u>credible and investors</u> believe that the inflation target rate will be maintained over time, this effect on long-term rates will be small.

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Limitation of Monetary Policy

- Another situation in which the transmission mechanism may not perform as expected is <u>if demand for money becomes very elastic and individuals willingly hold more money even without a decrease in short-term rates</u>. Such a situation is called a ***liquidity trap***.
  - ✓ <u>Increasing growth of the money supply</u> will not decrease short-term rates under these conditions because <u>individuals hold the money in cash balances</u> instead of investing in interest-bearing securities.
  - ✓ If an economy is experiencing deflation even though money supply policy has been expansionary, liquidity trap conditions may be present.
    - ◆ <u>Deflation is more difficult for central banks to reverse</u> (mindset)
- Another reason standard tools for increasing the money supply might not increase economic is that <u>even with increasing excess reserves, banks may not be willing to lend</u>.
  - ✓ Banks decreased their lending, even as money supplies were increased and short-term rates fell.
  - ✓ <u>With short-term rates near zero, economic growth still poor, and a real threat of deflation</u>, central banks began a policy termed ***quantitative easing***.

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Monetary Policy in Developing Economies

➢ <u>Developing economies</u> often face additional challenges when implementing monetary policy:

- <u>Absence of liquid bond markets</u> through which to conduct open market operations.

- <u>Lack of credibility</u> resulting from prior poor track record in controlling inflation.

- Rapid changes in the economy, making it <u>difficult to ascertain the trend rate</u> (and, hence, the neutral interest rate).

- Rapid financial innovation resulting in <u>changes in the money supply definition</u>.

- Political interference resulting in <u>a lack of central bank independence</u>.

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Fiscal Policy

- ➤ ***Fiscal policy*** refers to a government's use of <u>spending and taxation</u> to meet macroeconomic goals.
  - ● <u>Keynesian economists</u> believe that fiscal policy, through its effect on aggregate demand, can have a strong effect on economic growth when the economy is operating at less than full employment.
  - ● <u>Monetarists</u> believe that the effect of fiscal stimulus is <u>only temporary</u> and that monetary policy should be used to increase or decrease inflationary pressures over time. Monetarists <u>do not believe </u>that monetary policy should be used in an attempt to smooth cyclical changes in economic activity.
- ➤ <u>Objectives of fiscal policy may include:</u>
  - ● Influencing the level of economic activity and <u>aggregate demand</u>
  - ● <u>Redistributing wealth and income</u> among segments of the population
  - ● <u>Allocating resources</u> among economic agents and sectors in the economy

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Fiscal Policy Tools

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

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Fiscal Policy Tools

➤ ***Revenue Tools***
  - ***Direct taxes*** are levied on <u>income or wealth</u>. These include income taxes, taxes on income for national insurance, wealth taxes, estate taxes, corporate taxes, capital gains taxes, and Social Security taxes. Some progressive taxes (such as income and wealth taxes) generate revenue for wealth and income redistributing.
  - ***Indirect taxes*** are levied on <u>goods and services</u>. These include sales taxes, value-added taxes (VATs), and excise taxes. Indirect taxes can be used to reduce consumption of some goods and services (e.g., alcohol, tobacco, gambling). 影响更快

➤ <u>Desirable attributes of tax policy</u>
  - Simplicity to use and enforce
  - <u>Efficiency</u>, having the least interference with market forces and not acting as a deterrent to working.
  - <u>Fairness is quite subjective</u>, but two commonly held beliefs are
    - ✓ Horizontal equality: people in similar situations should pay similar taxes
    - ✓ Vertical equality: richer people should pay more in taxes
  - <u>Sufficiency,</u> in that taxes should generate sufficient revenues to meet the spending needs of the government

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Limitations of Discretionary Fiscal Policy

➢ *Limitations* of Discretionary Fiscal Policy:
  - <u>Economic forecasts might be wrong</u>, leading to incorrect policy decisions.
  - Complications arise in practice that delay both the <u>implementation of discretionary fiscal policy and the impact</u> of policy changes on the economy.
  - The lag can be divided into three types:
    - ✓ ***Recognition lag*** : Discretionary fiscal policy decisions are made by a political process. The state of the economy is complex, and it may take policymakers time to recognize the nature and extent of the economic problems.
    - ✓ ***Law-making lag:*** The time governments take to discuss, vote on, and enact fiscal policy changes.
    - ✓ ***Impact lag:*** The time between the enactment of fiscal policy changes and when the impact of the changes on the economy actually takes place. It takes time for corporations and individuals to act on the fiscal policy changes, and fiscal multiplier effects occur only over time as well.

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Macroeconomic Issues May Hinder Usefulness of Fiscal Policy

➢ Additional macroeconomic issues may ***hinder usefulness of fiscal policy***:

- ***<u>Misreading economic statistics:</u>*** The full employment level for an economy is not precisely measurable. If the government relies on expansionary fiscal policy mistakenly at a time when the economy is already at full capacity, it will simply drive inflation higher.

- ***<u>Crowding-out effect:</u>*** Expansionary fiscal policy may crowd out private investment, reducing the impact on aggregate demand.

- ***<u>Supply shortages:</u>*** If economic activity is slow due to resource constraints (low availability of labor or other resources) and not due to low demand, expansionary fiscal policy will fail to achieve its objective and will probably lead to higher inflation.

- ***<u>Limits to deficits:</u>*** There is a limit to expansionary fiscal policy. If the markets perceive that the deficit is <u>already too high as a proportion of GDP</u>, funding the deficit will be problematic. This could lead <u>to higher interest rates and actually make the situation worse</u>.

- ***<u>Multiple targets:</u>*** If the economy has <u>high unemployment coupled with high inflation</u>, fiscal policy cannot address both problems simultaneously.

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Advantages and Disadvantages of Fiscal Policy Tools

➢ **Advantages of fiscal policy tools**

- Social policies such as discouraging tobacco use can be implemented <u>very quickly via indirect taxes</u>

- Quick implementation of indirect taxes also means that government revenues can be increased <u>without significant additional costs</u>

➢ **Disadvantages of fiscal policy tools**

- Direct taxes and transfer payments <u>take time to implement</u>, <u>delaying the impact of fiscal policy</u>

- <u>Capital spending also takes a long time to implement</u>. The economy may have recovered by the time its impact is felt.

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Fiscal Multiplier

➢ **_Fiscal multiplier_**

- Fiscal multiplier $= \dfrac{1}{1-\text{MPC}(1\text{-}t)} = \dfrac{1}{1-b\times(1\text{-}t)}$

- MPC: Marginal propensity of consumption (b)

- The fiscal multiplier is inversely related to the tax rate (higher tax rate decreases the multiplier) and directly related to the marginal propensity to consume (higher MPC increases the multiplier).

➢ **Example:** consider an increase in government spending of $100, when the MPC is 80%, and the tax rate is 25%. The fiscal multiplier is 1/[1 - 0.8 (1-0.25)] = 2.5, and the increase of $100 in government spending has the potential to increase aggregate demand by $250.

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Ricardian Equivalence

➢ ***Ricardian Equivalence:*** Increases in the current deficit mean greater taxes in the future.

- To maintain their preferred pattern of consumption over time, taxpayers may increase current savings (reduce current consumption) in order to offset the expected cost of higher future taxes.

- If taxpayers reduce current consumption and increase current saving by just enough to repay the principal and interest on the debt the government issued to fund the increased deficit, <u>there is no effect on aggregate demand</u>.

➢ <u>If taxpayers underestimate their future liability</u> for servicing and repaying the debt, so that aggregate demand is increased by equal spending and tax increases, Ricardian equivalence does not hold.

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Arguments for being Concerned with the size of fiscal deficit

➢ *__Debt ratio__*: Aggregate debt to GDP
  - If the real interest rate on the government's debt is <u>higher than</u> the real growth rate of the economy, then the debt ratio will <u>increase over time (keeping tax rates constant).</u>
  - If the real interest rate on government's debt is lower than real growth in GDP, the debt ratio will decrease (i.e., improve) over time.

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

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Arguments against being Concerned with the Size of Fiscal Deficit

➢ *Arguments against being concerned with the size of fiscal deficit:*

- If the debt is primarily <u>being held by domestic citizens</u>, the scale of the problem is overstated.

- If the debt is used to <u>finance productive capital investment</u>, future economic gains will be sufficient to repay the debt.

- Fiscal deficits may prompt needed tax reform.

- <u>Deficits would not matter</u> if private sector savings in anticipation of future tax liabilities just offsets the government deficit (Ricardian equivalence holds).

- If the economy is operating at less than full capacity, deficits do not divert capital away from productive uses. On the contrary, <u>deficits can aid in increasing GDP and employment</u>.

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Implementation of Fiscal Policy

➢ Fiscal policy is implemented through changes in taxes and spending. This is called ***discretionary fiscal policy***.

- <u>During recessions</u>, actions can be taken to increase government spending or decrease taxes. Either change tends to strengthen the economy by increasing aggregate demand, putting more money in the hands of corporations and consumers to invest and spend.

- <u>During inflationary economic booms,</u> actions can be taken to decrease government spending or increase taxes. Either change tends to slow the economy by decreasing aggregate demand, taking money out the hands of corporations and consumers, causing both investment and consumption spending to fall.

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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** <u>higher output</u> **and higher interest rates, and** <u>government spending will be a larger proportion of overall national income.</u>

➢ *Easy monetary policy/tight fiscal policy*: **if a fiscal contraction is accompanied by expansionary monetary policy and low interest rates, then the** <u>private sector will be stimulated and will rise as a share of GDP,</u> **while the** <u>public sector will shrink.</u>

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➢ **SS 5 Macroeconomic Analysis**

- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➢ **SS 6 Economics in a Global Context**

- R20 international trade and capital flow
- R21 currency exchange rate

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R20 International trade and capital flows

➢ International trade

➢ Balance of Payments Components

➢ International organization

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Basic Terminology

➢ ***Imports:*** Goods and services that firms, individuals, and governments purchase from producers in other countries.

➢ ***Exports:*** Goods and services that firms, individuals, and governments from other countries purchase from domestic producers.

➢ ***Autarky or closed economy:*** A country that does not trade with other countries.

➢ ***Free trade:*** A government places no restrictions or charges on import and export activity.

➢ ***Trade protection:*** A government places restrictions, limits, or charges on exports or imports.

➢ ***World price:*** The price of a good or service in world markets for those to whom trade it's not restricted.

➢ ***Domestic price:*** The price of a good or service in the domestic country, which may be equal to the world price if trade is permitted or different from the world price when the domestic country restricts trade.

➢ ***Net exports:*** The value of a country's exports minus the value of its imports over some period.

➢ ***Trade surplus:*** Net exports are positive.

➢ ***Trade deficit:*** Net exports are negative.

➢ ***Terms of trade:*** The ratio of an index of the pries of a country's exports to an index of the prices of its imports expressed relative to a base value of 100.

➢ ***Foreign direct investment:*** Ownership of productive resources (land, factories, natural resources) in a foreign country.

➢ ***Multinational corporation:*** A firm that has made foreign direct investment in one or more foreign countries, operating production facilities and subsidiary companies in foreign countries.

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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.

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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

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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.

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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.

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Reasons for Trade Restrictions

➢ **_Infant industry:_** Protection from foreign competition is given to new industries to give them an opportunity to grow to an internationally competitive scale and get up the learning curve in terms of efficient production methods.

➢ **_National security:_** Protect producers of goods crucial to the country's national defense so that those goods are available domestically in the event of conflict.

➢ **_Protecting domestic jobs:_** While some jobs are certainly lost, and groups and regions are negatively affected by import restrictions, other jobs (in export industries or growing domestic goods and services industries) will be created, and prices for domestic consumers will be less without import restrictions.

➢ **_Protecting domestic industries:_** Industry firms often use political influence to get protection from foreign competition, usually to the detriment of consumers, who pay higher prices

➢ Other arguments for trade restrictions:
  ● Retaliation for foreign trade restrictions
  ● Government collection of tariffs (like taxes on imported goods)
  ● Countering the effects of government subsidies paid to foreign producers
  ● Preventing foreign exports at less than their cost of production (dumping)

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Types of Trade Restrictions

➢ Types of trade restrictions include:

- ***Tariffs:*** taxes on imported good collected by the government.

- ***Quotas:*** limits on the amount of imports allowed over some period.

- ***Export subsidies:*** government payments to firms that exports goods.

- ***Minimum domestic content:*** requirement that some percentage of product content must be from the domestic country.

- ***Voluntary export restraint:*** a country voluntarily restricts the amount of a good that can be exported, often in the hope of avoiding tariffs or quotas imposed by their trading partner.

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Tariffs and Quotas

> ***Tariff*** placed on imported good increases the domestic price, decreases the quantity imported, and increases the quantity supplied domestically.

- Domestic producers gain, foreign exporters lose, and the domestic government gains by the amount of the tariff revenues.

> ***Quota*** restricts the quantity of a good imported to the quota amount.

- Domestic producers gain, and domestic consumers lose from an increase in the domestic price.

- The right to export a specific quantity to the domestic country is granted by the domestic government, <u>which may or may not charge for the import licenses to foreign countries</u>.

- <u>If the import licenses are sold</u>, the domestic government gains the revenue.

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Welfare Effects of an Import Tariff or Quota

Price

Domestic
Supply

P_t

A　　　　B　　　C　　　D

P^*

Domestic
Demand

0　　　　Q^1　　Q^2　　　　Q^3　　Q^4　　**Quantity**
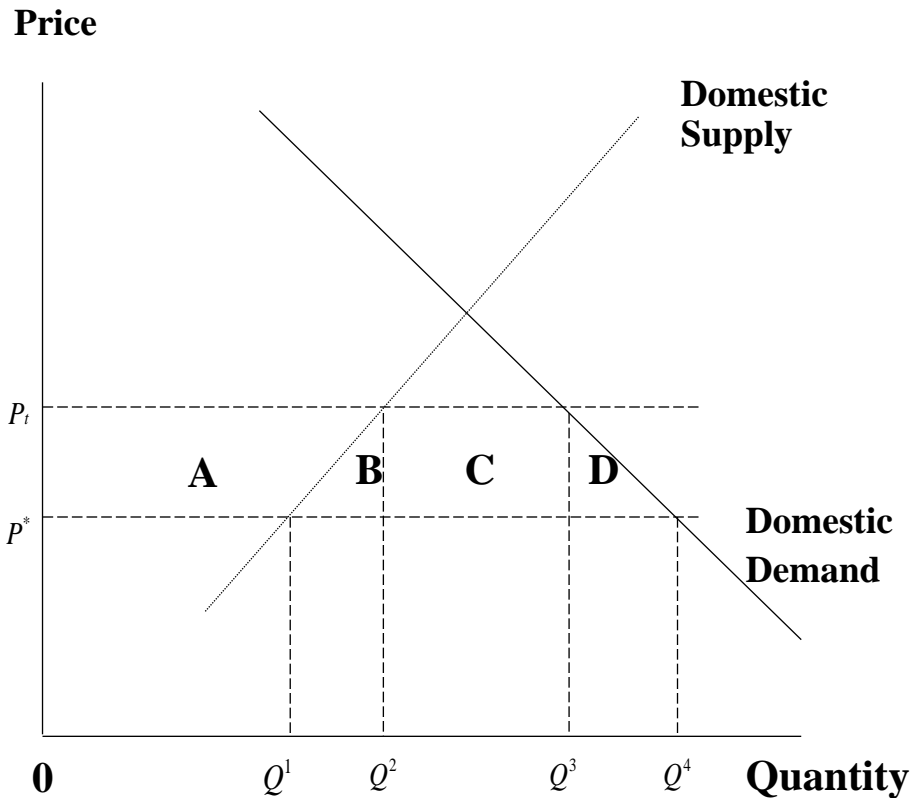
	Importing Country
Consumer surplus	-(A+B+C+D)
Producer surplus	+A
Tariff revenue or Quota rents	+C
National welfare	-B-D

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Voluntary Export Restraint and Export Subsidies

- ➢ ***Voluntary export restraint (VER)*** refers to a voluntary agreement by a government to limit the quantity of a good that can be exported.
  - It results in a welfare loss to the importing country equal to that of an equivalent quota with no government charge for the import licenses; that is, no capture of the quota rents.
- ➢ ***Export subsidies*** are payments by a government to its country's exporters.
  - Export subsidies benefit producers (exporters) of the good but increase prices and reduce consumer surplus in the exporting country.
  - In a small country, the price will increase by the amount of the subsidy to equal the world price plus the subsidy.
  - In the case of a large exporter of the good, the world price decreases an some benefits from the subsidy accrue to foreign consumers, while foreign producers are negatively affected.
- ➢ Effects of import quotas, tariffs, and VERs, with respect to the domestic (importing) country:
  - Reduce imports
  - Increase price
  - Decrease consumer surplus
  - Increase domestic quantity supplied
  - Increase producer surplus

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Effects of Trade Restrictions

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 / Could increase in large country	Decreases in small country / Could increase in large country	Decreases	Decreases

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Effects of Trade Restrictions

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

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Capital Restrictions

- Some countries impose ***capital restrictions*** on the flow of financial capital across borders.
- Restrictions include:
  - Outright prohibition of investment in the domestic country by foreigners
  - <u>Prohibition of or taxes on the income</u> earned on foreign investments by domestic citizens
  - Prohibition of foreign investment <u>in certain domestic industries</u>
  - <u>Restrictions on repatriation of earnings of foreign entities</u> operating in a country
- Overall, capital restrictions are thought to <u>decrease economic welfare</u>.
  - However, over the short term, they have <u>helped developing countries avoid the impact of great inflows of foreign capital</u> during periods of optimistic expansion and the impact of large outflows of foreign capital during periods of correction and <u>market unease or outright panic</u>.
  - Even <u>these short-term benefits may not offset longer-term costs</u> if the country is excluded from international markets for financial capital flows.

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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 <u>debit and credit</u>.
- In principle, <u>the sum of all debit entries should equal the sum of all credit entries</u>, and <u>the net balance of all entries on the BOP statement should equal zero</u>.
- In practice, however, this is rarely the case because the data used to record balance of payments transactions are <u>often derived from different sources</u>.

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

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BOP Components

➢ ***Current account*** measures the <u>flows of goods and services</u>.

- ● ***Merchandise and services***
  - ✓ <u>Merchandise</u> consists of all raw materials and manufactured goods bought, sold, or given away.
  - ✓ <u>Services</u> include tourism, transportation, and business and engineering services, as well as <u>fees from patents and copyrights on new technology</u>, software, books, and movies.

- ● ***Income receipts*** include foreign income from dividend on stock holdings and interest on debt securities

- ● ***Unilateral transfers*** are one-way transfers of assets, such as <u>money received from those working abroad and direct foreign aid</u>.

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BOP Components

➢ ***Capital account*** consists of <u>capital transfers and the acquisition and disposal</u> of non-produced , non-financial assets.
- ***Capital transfers***
  - ✓ <u>Debt forgiveness and goods and financial assets that migrants</u> bring when they come to a country or take with them when they leave.
  - ✓ <u>The transfer of title to fixed assets and of funds</u> linked to the purchase or sale of fixed assets, gift and inheritance taxes, death duties, and uninsured damage to fixed assets.
- ***Sales and purchases of non-financial assets*** that are not produced assets include rights to <u>natural resources and intangible assets</u>, such as patents, copyrights, trademarks, franchises, and leases.

➢ ***Financial account*** records investment flows.
- ***Government-owned assets abroad*** include gold, foreign currencies, foreign securities, reserve position in the IMF, credits and other long-term assets, direct foreign investment, and claims against foreign banks.
- ***Foreign-owned assets in the country*** are divided into foreign official assets and other foreign assets in the domestic country. These assets include domestic government and corporate securities, direct investment in the domestic country, domestic country currency, and domestic liabilities to foreigners reported by domestic banks.

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Decisions by Consumers, Firms, and Governments 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.

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International Monetary Fund (IMF)

➢ ***International Monetary Fund (IMF):***
- Provides <u>a forum for cooperation</u> on international monetary problems
- Facilitates <u>the growth of international trade</u> and promotes employment, economic growth, and poverty reduction
- Supports <u>exchange rate stability</u> and an open system of international payments
- <u>Lends foreign exchange</u> 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 <u>redefined and deepened its operations by</u>:
- <u>Enhancing its lending facilities</u>
- <u>Improving the monitoring</u> of global, regional, and country economies
- Helping <u>resolve global economic imbalances</u>
- <u>Analyzing capital market developments</u>
- <u>Assessing financial sector vulnerabilities</u>

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World Bank Group

➢ ***World Bank Group's*** main objective is to <u>help developing countries fight poverty and enhance environmentally sound economic growth</u>. For developing countries to grow and attract business, they have to

- <u>Strengthen their governments</u> and educate their government officials
- Implement <u>legal and judicial systems that encourage business</u>
- <u>Protect individual and property rights</u> and <u>honor contracts</u>
- <u>Develop financial systems robust enough</u> to support endeavors ranging from micro credit to financing larger corporate ventures
- <u>Combat corruption</u>

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World Trade Organization (WTO)

➢ ***World Trade Organization (WTO):***

- The only international organization dealing with the <u>global rules of trade between nations</u>

- Its main function is to ensure that <u>trade flows as smoothly, predictably and freely as possible</u>.

- <u>Trade friction is channeled into the WTO's dispute settlement process</u> where the focus is on interpreting agreements and commitments, and how to ensure that countries' trade policies conform with them.

- At the heart of the system – <u>know as the multilateral trading system</u> – are the <u>WTO's agreements</u>, negotiated and signed by a large majority of the world's trading nations, and ratified in their parliaments.

- They also bind governments to <u>keep their trade policies within agreed limits to everybody's benefit</u>.

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Trading Blocs, Common Markets and Economic Unions

- ➤ **_Free trade areas_**
  - All barriers to import and export of goods and services among member countries are removed.
- ➤ **_Customs union_**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries <u>adopt a common set</u> of trade restrictions with non-members.
- ➤ **_Common market_**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.
  - All barriers to <u>the movement of labor and capital goods</u> among member countries are removed.
- ➤ **_Economic union_**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.
  - All barriers to the movement of labor and capital goods among member countries are removed.
  - Member countries establish <u>common institutions and economic policy</u> for the union.
- ➤ **_Monetary union_**
  - All barriers to import and export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.
  - All barriers to the movement of labor and capital goods among member countries are removed.
  - Member countries establish common institutions and economic policy for the union.
  - Member countries <u>adopt a single currency</u>.

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Framework of Economics

➢ SS 4 Microeconomic Analysis
- R13 demand and supply: introduction
- R14 demand and supply: consumer demand introduction
- R15 demand and supply: the firm
- R16 the firm and the market structure

➢ SS 5 Macroeconomic Analysis
- R17 aggregate output, price, and economic growth
- R18 understand business cycles
- R19 monetary and fiscal Policy

➢ SS 6 Economics in a Global Context
- R20 international trade and capital flow
- R21 currency exchange rate

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R21 Currency Exchange Rate

➢ Foreign exchange rate

➢ Spot and forward rate

➢ Interest rate parity

➢ Exchange rate regimes

➢ Changes in exchange rate affect the balance of trade

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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) $* CPI_f/CPI_d$

   ● Changes in real exchange rates can be used *when analyzing economic changes over time*.

      ✓ <u>When the real exchange rate (d/f) increases</u>, exports of goods and services have gotten relatively less expensive to foreigners, and imports of goods and services from the foreign country have gotten relatively more expensive over time

➢ **Example:** At a base period, the CPIs of the U.S. and U.K. are both 100, and the exchange rate is $1.70 per pound. Three years later, the exchange rate is $1.60 per pound, and the CPI has risen to 110 in the U.S. and 112 in the U.K.. What is the real exchange rate?

➢ **Solution:** The real exchange rate is $1.60 per pound * 112/110 = $1.629 per pound.

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Spot Rates and Forward Rates

➢ ***Spot rates*** are exchange rates for <u>immediate delivery of the currency</u>.

- ● ***Spot markets*** refer to transactions that call for immediate delivery of the currency. <u>In practice</u>, the settlement period is <u>two business days after the trade date</u>.

➢ ***Forward rates*** are exchange rates for currency transactions that will occur in the future.

- ● ***Forward markets*** are for an exchange of currencies that will occur in the futures. Both parties to the transaction agree to exchange one currency for another <u>at a specific future date</u>.

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Participants in the Foreign Markets

➢ ***Sell side***: large multinational banks

➢ ***Buy side***:

- ***Corporations***: regularly engage in cross-border transactions, <u>purchase and sell foreign currencies</u> as a result, and <u>enter into FX forward contracts</u> to hedge the risk of expected future receipts and payments denominated in foreign currencies.

- ***Investment accounts***: hold foreign securities, and may both speculate and hedge with currency derivatives

    - ✓ ***real money accounts***: refer to mutual funds, pension funds, insurance companies, and other institutional accounts that do not use derivatives

    - ✓ ***leveraged accounts***: refer to the various types of investment firms that do use derivatives, <u>including hedge funds</u>, firms that trade for their own accounts, and other trading firms of various types.

- ***Governments and government entities***: including sovereign wealth funds and pension funds, acquire foreign exchange for transactional needs, investment, or speculation.

    - ✓ ***Central bank*** sometimes engage in FX transactions to affect exchange rates in the short term in accordance with government policy.

- ***Retail market***: refers to FX transactions by households and relatively small institutions and may be for tourism, cross-border investment, or speculative trading.

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Indirect and 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

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Cross Rate

➢ **_Cross rate_** is the exchange rate between two currencies implied by their exchange rates with a common third country.

➢ **Example:**

- 0.60 USD/AUD, 10.70 MXN/USD

  ✓ MXN/AUD = USD/AUD * MXN/USD = 0.60 * 10.70 = 6.42

- 1.7799 CHF/USD, 2.2529NZD/USD

  ✓ CHF/NZD = (CHF/USD) / (NZD/USD) = 1.7799 / 2.2529 = 0.7900

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Forward Discount or Premium

➢ ***Forward discount or premium***

- With the convention of giving the value of the quoted currency (the first currency) in terms of units of the second currency, <u>there is a premium on the quoted currency when the forward exchange rate is higher than the spot rate and a discount otherwise</u>.

➢ **Example:**

- The AUD/EUR spot exchange rate is 0.7313 with the 1-year forward rate quoted at +3.5 points.
  - ✓ What is the 1-year forward AUD/EUR exchange rate?
  - ✓ Is the euro trading at a forward discount or forward premium relative to the Australian dollar?

- Solution:
  - ✓ The forward exchange rate is 0.7313 + 0.00035 = 0.73165.
  - ✓ Because the price of euros in AUD is higher one year out, <u>the euro is trading at a forward premium</u> (and the AUD a forward discount).

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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 <u>the difference between the domestic interest rate and the foreign interest rate</u> 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 <u>if the nominal risk-free rate in X is higher than that in Y</u>.

➢ 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.

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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.

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Exchange Rate Regimes

- **_Countries That Do Not Have Their Own Currency:_**
  - **A** country can use the currency of another country **(formal dollarization)** not create money/currency.
  - A country can be a member of a **monetary union** in which several countries use a common currency (eg:Euro)
- **_Countries That Have Their Own Currency：_**
  - **_A currency board arrangement_** is an explicit commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate (notable example of such an arrangement is Hong Kong, <u>central bank is not the last resort</u>）
  - **_conventional fixed peg arrangement_** a country pegs its currency within margins of ±1 percent versus another currency or a basket that includes the currencies of its major trading or financial partners
    - ✓ **_direct intervention_**： The monetary authority can maintain exchange rates within the band by purchasing or selling foreign currencies in the foreign exchange market
    - ✓ **_indirect intervention_** : including changes in interest rate policy, regulation of foreign exchange transactions, and convincing people to constrain foreign exchange activity

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Exchange Rate Regimes

➢ ***Countries That Have Their Own Currency：***
- ***Target zone*** : the permitted fluctuations in currency value relative to another currency or basket of currencies are wider (e.g., +/-2 %)
- ***Crawling peg***: the exchange rate is adjusted periodically, typically to adjust for higher inflation
  - ✓ ***passive crawling peg*** : a series of exchange rate adjustments over time is announced and implemented
  - ✓ ***active crawling peg***: can influence inflation expectations, adding some predictability to domestic inflation
- ***Management of exchange rates within crawling bands***: the width of the bands that identify permissible exchange rates is increased over time
- ***Managed floating exchange rates***: the monetary authority attempts to influence the exchange rate in response to <u>specific indicators</u> such as the balance of payments, inflation rates, or employment without any specific target exchange rate or predetermined exchange rate path
- ***Independently floating***: the exchange rate is <u>market-determined</u>, and foreign exchange market intervention is used <u>only to slow the rate of change and reduce short-term fluctuations</u>, not to keep exchange rates at a certain target level

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Impact of Exchange Rates on Countries' International Trade and Capital Flows

➢ Exports – imports = (private savings - investment in physical capital) + (tax revenue -government spending)

➢ or $X - M \equiv (S - I) + (T - G)$

- Trade surplus: X - M > 0
  - ✓ The sum of the excess of private saving over investment plus the government surplus (government saving) must also be positive.
  - ✓ Private savings plus government savings exceed domestic investment in physical capital (plant and equipment).
  - ✓ If T-G < 0, private savings (S) must exceed investment (I) by more than the amount of government borrowing. This excess of savings goes to foreign investment, that is , a capital flow into foreign financial assets to offset the trade surplus.

- Trade deficit, X – M < 0
  - ✓ The combination of government savings and private savings will be less than domestic investment.
  - ✓ Therefore, some of that investment must be funded by other countries' purchases of domestic financial asset.

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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: $\omega_X \varepsilon_X + \omega_M (\varepsilon_M - 1) > 0$
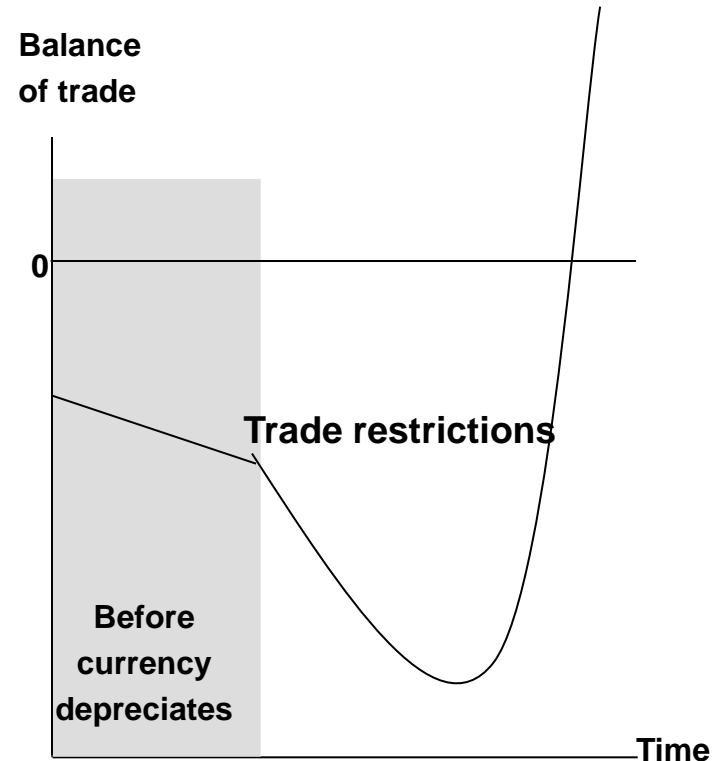
➢ When import expenditures=export revenues, $\omega_X = \omega_M \longrightarrow \varepsilon_X + \varepsilon_M > 1$

- $\varepsilon x > - (W_M / W_x)(\varepsilon_M - 1)$
- $\varepsilon_M > 1 - (W_x / W_M) \varepsilon x$

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J-Curve

> *The J-Curve*

● import and export contracts delivery and payment in the future , import and export quantities may be relatively insensitive to currency depreciation in the short run <u>means currency depreciation may worsen a trade deficit in the short run.</u>

● <u>given the existence of such contracts and the resulting insensitivity</u> of both import and export quantities to currency depreciation, <u>import expenditures may rise</u> in the short run as export prices rise, and export revenues may fall as export prices (in the domestic currency) fall, <u>even when the Marshall-Lerner condition is met</u>.

●This short-term <u>increase in the deficit followed by a decrease</u> when <u>the Marshall-Lerner condition is met</u>.

Balance of trade

0

Trade restrictions

Before currency depreciates

Time

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Absorption Approach

> ## *Absorption approach*
> - BT = Y - E
>   - ✓ Y = domestic production of goods and services or <u>national income</u>
>   - ✓ E = domestic absorption of goods and services, which is <u>total expenditure</u>
>   - ✓ BT = balance of trade
> - The economy is operating <u>at less than full employment</u>:
>   - ✓ Depreciation ⟶ price of domestic goods and assets↓ ⟶ expenditures and income↑ ⟶ saving↑ ⟶ trade balance improved
> - The economy is <u>operating at full employment</u>:
>   - ✓ 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

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It's not the end but just the beginning.

Your life can be enhanced, and your happiness enriched, when you choose to change your perspective. Don't leave your future to chance, or wait for things to get better mysteriously on their own. You must go in the direction of your hopes and aspirations. Begin to build your confidence, and work through problems rather than avoid them. Remember that power is not necessarily control over situations, but the ability to deal with whatever comes your way.

一旦变换看问题的角度，你的生活会豁然开朗，幸福快乐会接踵而来。别交出掌握命运的主动权，也别指望局面会不可思议的好转。你必须与内心希望与热情步调一致。建立自信，敢于与困难短兵相接，而非绕道而行。记住，力量不是驾驭局势的法宝，无坚不摧的能力才是最重要的。

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