Economics

2018年6月CFA一级培训

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CFA Level One Exam Topic Structure
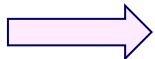
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Economics

1. **Topics in Demand and Supply Analysis**

2. **The Firm and Market Structures**

3. **Aggregate Output, Prices, and Economic Growth**

4. **Understanding Business Cycles**

5. **Monetary and Fiscal Policy**

6. **International Trade and Capital Flows**

7. **Currency Exchange Rates**

融通智慧 跃升未来

Topics in Demand and Supply Analysis

The Demand Function and the Demand Curve

- **$Q_D = f(P_x, I, P_y)$**
  - ✓ P_x=Price of Good X
  - ✓ I= individual or average income
  - ✓ P_y=price of related goods

- *Other things equal, the quantity of demand is the function of price, income and the price of other related goods.*

- *Demand Function:* $Q_x^D = 9 - 0.8P_x + 0.12I - 0.03P_y$

- *Given I=100,P_y=10* $Q_x^D = 20.7 - 0.8P_x$

- *Inverse demand function:* $P_x = 25.875 - 1.25Q_x^D$

- ***Law of demand:*** *the quantity demanded typically increases at lower prices.*
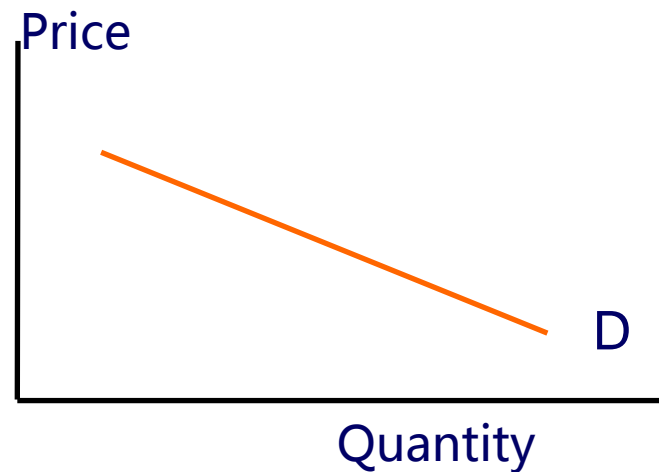
Shifts in and Movement along Demand Curve

In general, the only thing that can cause a movement along the demand curve is a change in a good's own-price. A change in the value of any *other* variable will shift the entire demand curve. The former is referred to as a *change in quantity demanded*, and the latter is referred to as a *change in demand*.

Figure 5: Shift in Demand
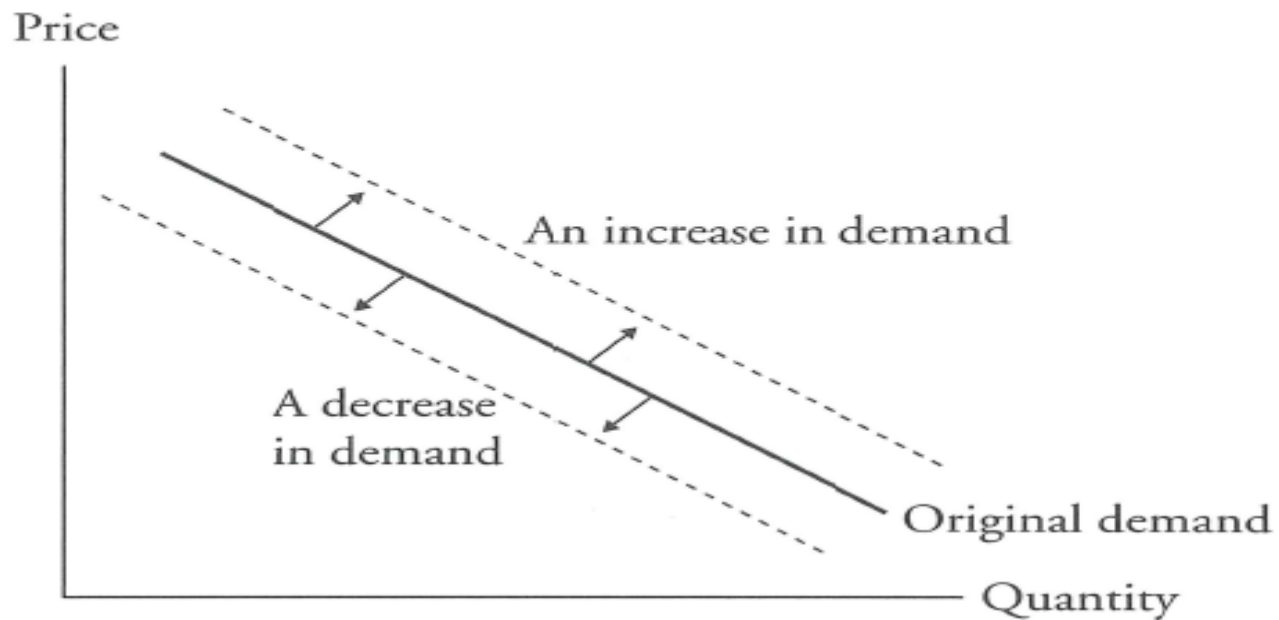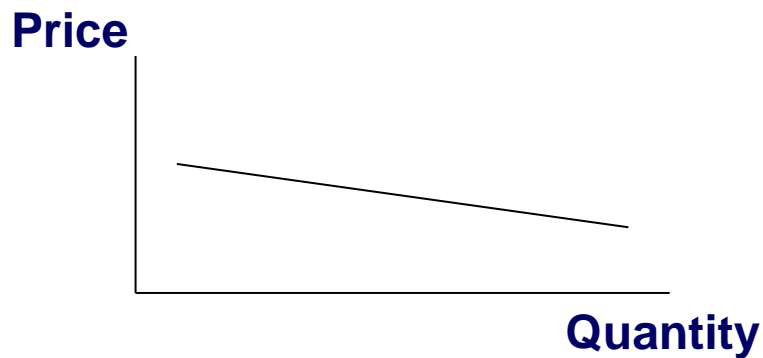
Price Elasticity of Demand

$$\text{price elasticity of demand}$$
$$= \frac{\text{percent change in quantity demanded}}{\text{percent change in price}}$$
$$= \frac{\%\Delta Q}{\%\Delta P} = \frac{\Delta Q/Q}{\Delta P/P} = \left(\frac{\Delta Q}{\Delta P}\right)\left(\frac{P}{Q}\right)$$

- ***Elastic demand:*** *the good's quantity demanded changes a lot when the price changes. (great than 1)*

- ***Inelastic demand:*** *the good's quantity demanded changes a little when the price changes. (less than 1)*

- ***Perfectly inelastic demand****: (equal to 0)*

- ***Perfectly elastic demand****: (equal to ∞）*

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Price Elasticity of Demand

Price

Quantity

（1）Elastic
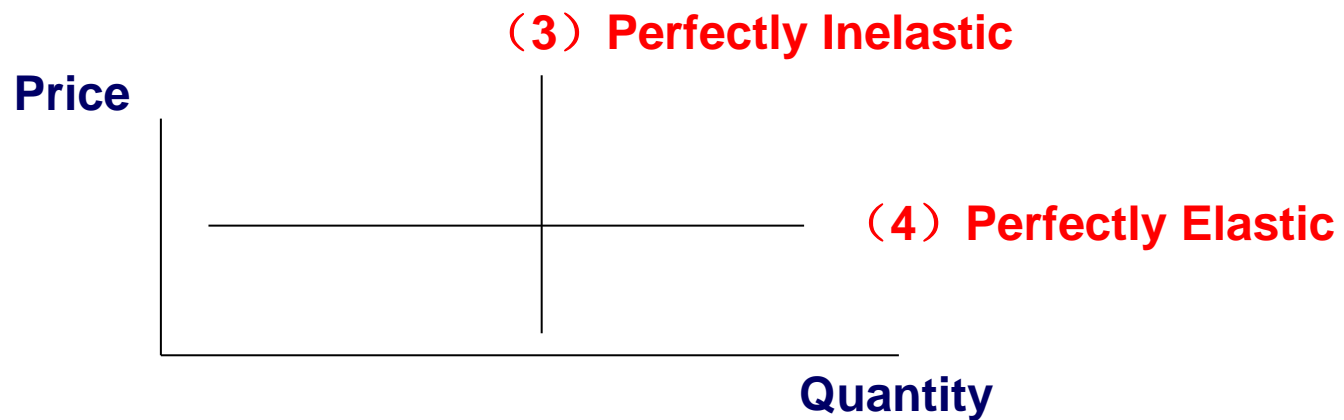
Price

Quantity
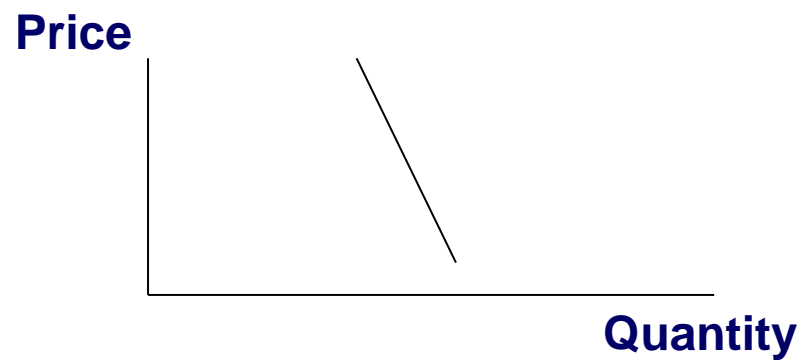
（2）Inelastic

（3）Perfectly Inelastic

Price

（4）Perfectly Elastic

Quantity

Factors Influencing the Elasticity of Demand

- *Availability and closeness of substitutes↑, higher*

- *The product is more optional, rather than necessary, higher*

- *Relative amount of spent on the good ↑, higher*

- *Time since price change ↑, higher (except durable goods)*
  The effect of time on elasticity: In general, when the price of a product increases, consumers will reduce their consumption by a larger amount in the long run than in the short run because they have more time to find the substitutes.

Elasticity and Total Expenditure

- *For lower elasticity:* *if the seller wants to maximize the revenue, she will raise the price.*

- *For higher elasticity:* *if the seller wants to maximize his revenue, she will decrease the price.*

- *For goods with constant unitary elasticity:* *whether the seller increase or decrease the price, the revenue is constant.*

- *Price elasticity of demand is different along a linear demand curve.*

- *When price is in the* **elastic (inelastic) region** *of the demand curve, a price increase will decrease (increase) total revenue.*

Price Elasticity of a Linear Demand Curve

Exhibit 4. Elasticity and Total Expenditure

In the elastic range, a fall in price accompanies a rise in total expenditure
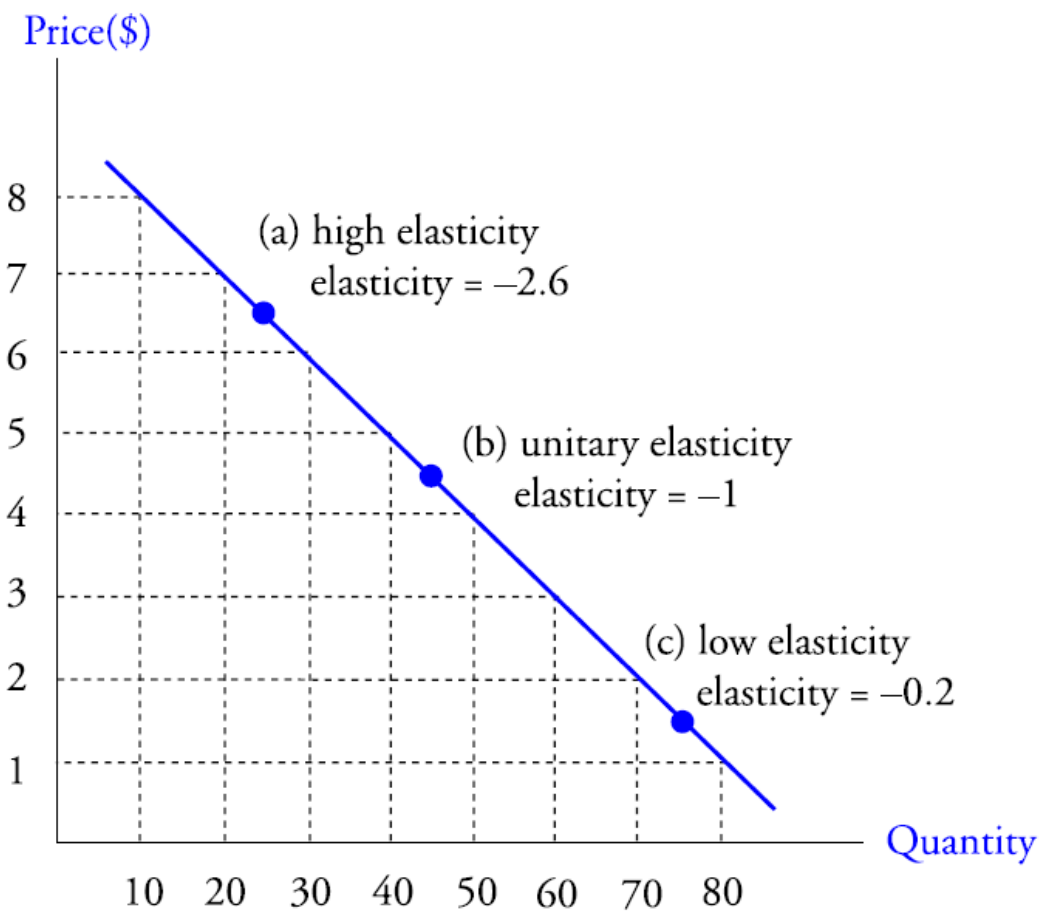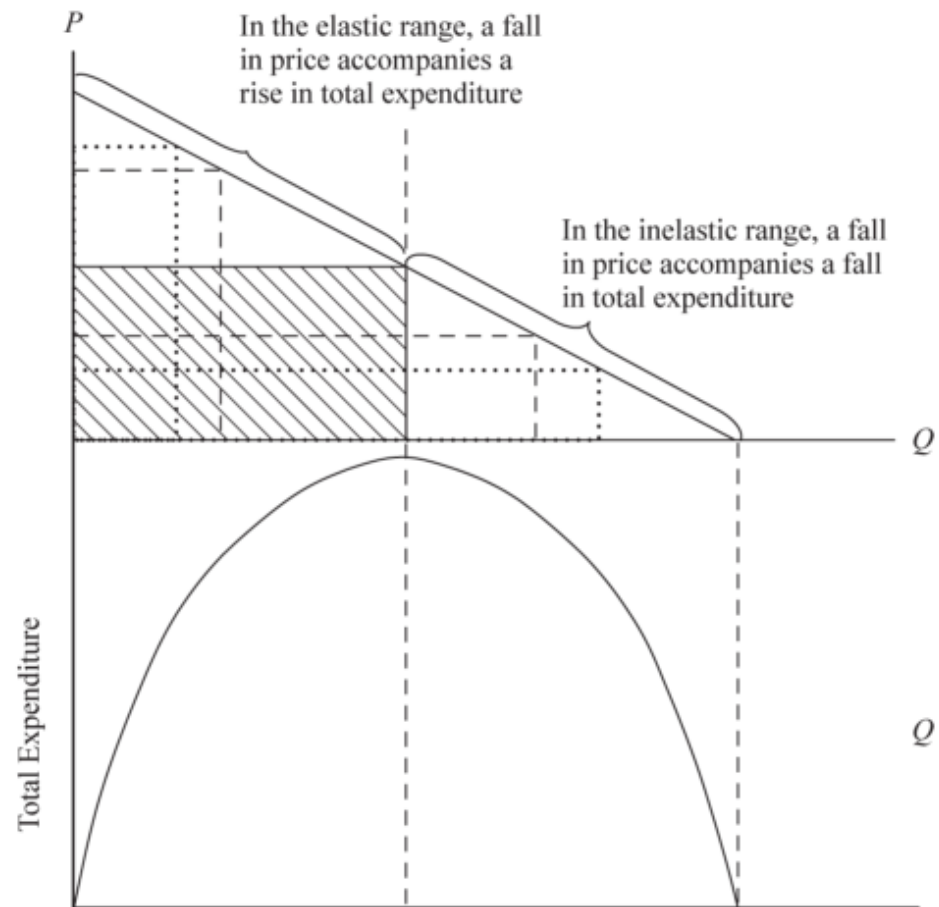
In the inelastic range, a fall in price accompanies a fall in total expenditure

Note: Figure depicts the relationship among changes in price, changes in quantity, and changes in total expenditure. Maximum total expenditure occurs at the unit-elastic point on a linear demand curve (the cross-hatched rectangle).

Income Elasticity of Demand

income elasticity of demand

$$= \frac{\text{percent change in quantity demanded}}{\text{percent change in income}} = \frac{\%\Delta Q}{\%\Delta I}$$

- **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)

Cross Elasticity of Demand

cross elasticity of demand

$$= \frac{\text{percent change in quantity demanded}}{\text{percent change in price of substitute or complement}}$$

$$= \frac{\%\Delta Q_A}{\%\Delta P_B}$$

- *If the cross elasticity > 0, the pair of goods are substitutes（Example: pork and beef）*

- *If the cross elasticity < 0, the pair of goods are complements（Example: car and gas）*

EXAMPLE 1

An individual consumer's monthly demand for downloadable e-books is given by the equation $Q^d_{eb} = 2 - 0.4P_{eb} + 0.0005I + 0.15P_{hb}$, where Q^d_{eb} equals the number of e-books

demanded each month, I equals the household monthly income, P_{eb} equals the price of e-books, and P_{hb} equals the price of hardbound books. Assume that the price of e-books is €10.68, household income is €2,300, and the price of hardbound books is €21.40.

1. Determine the value of own-price elasticity of demand for e-books.

2. Determine the income elasticity of demand for e-books.

3. Determine the cross-price elasticity of demand for e-books with respect to the price of hardbound books.

Solution to 1:

The own-price elasticity of demand is given by $\left(\Delta Q_{eb}^d / \Delta P_{eb}\right)\left(P_{eb}/Q_{eb}^d\right)$. Notice from the demand function that $\Delta Q_{eb}^d / \Delta P_{eb} = -0.4$. Inserting the given variable values into the demand function yields $Q_{eb}^d = 2 - (0.4)(10.68) + (.0005)(2300) + (0.15)(21.4) = 2.088$. So at a price of €10.68, the own-price elasticity of demand equals $(-0.4)(10.68/2.088) = -2.046$, which is elastic because in absolute value the elasticity coefficient is greater than 1.

Solution to 2:

Recall that income elasticity of demand is given by $\left(\Delta Q_{eb}^d / \Delta I\right)\left(I/Q_{eb}^d\right)$. Notice from the demand function that $\Delta Q_{eb}^d / \Delta I = 0.0005$. Inserting the values for I and Q_{eb}^d yields income elasticity of $(0.0005)(2,300/2.088) = 0.551$, which is positive, so e-books are a normal good.

Solution to 3:

Recall that cross-price elasticity of demand is given by $(\Delta Q_{eb}/\Delta P_{hb})(P_{hb}/Q_{eb})$, and notice from the demand function that $\Delta Q_{eb}/\Delta P_{hb} = 0.15$. Inserting the values for P_{hb} and Q_{eb} yields a cross-price elasticity of demand for e-books of $(0.15)(21.40/2.088) = 1.537$, which is positive, implying that e-books and hardbound books are substitutes.

Substitution & Income Effects

Normal Goods *The income effect is positive*

Quantity of wine

a

b

c

BC_1

BC_3

BC_2

Qa   Qb   Qc

Substitution effect   Income effect

Quantity of bread
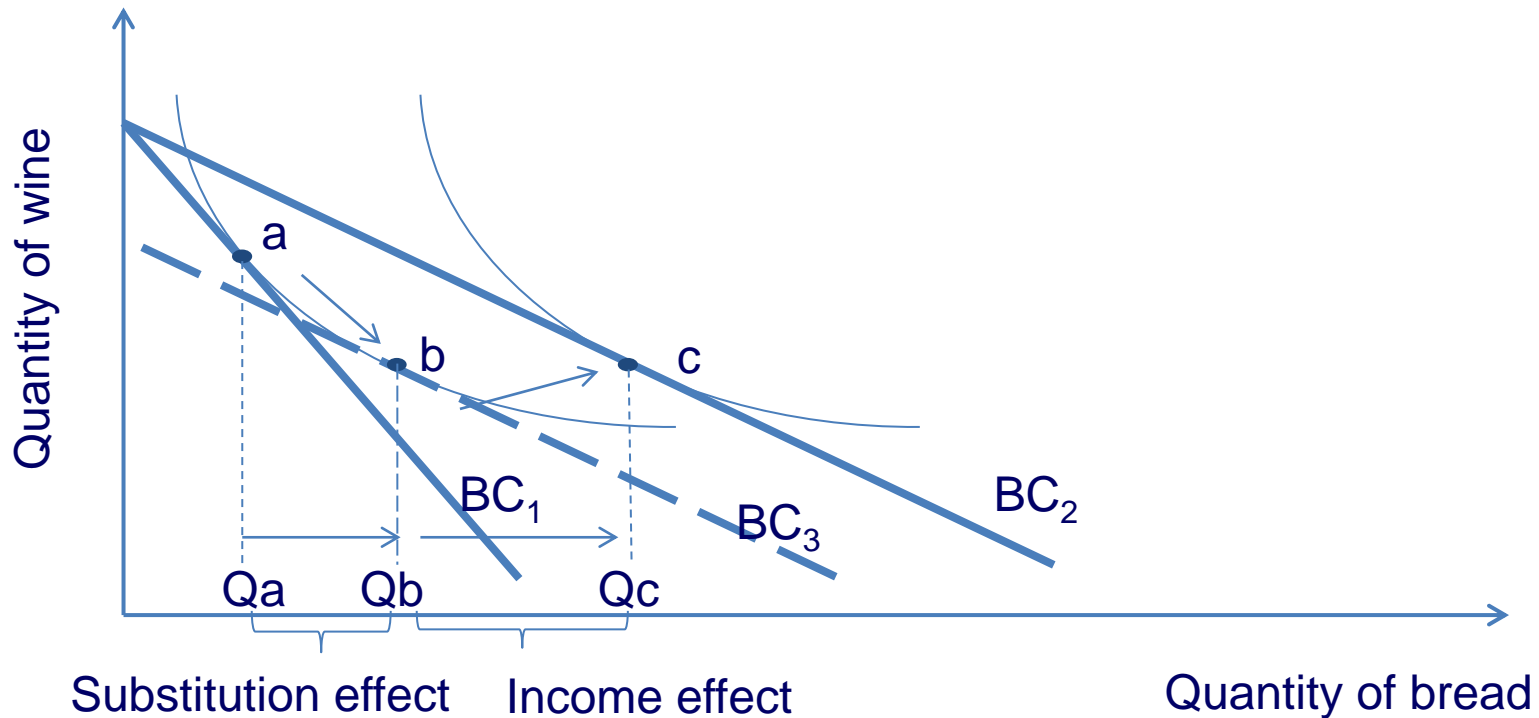
- *Income effect* can be towards more or less consumption of Good X --- either increase or decrease consumption of a good

- When the price of Good X decreases, a **substitution effect** shifts consumption towards more of X --- always acts to increase the consumption of a good when fallen in price
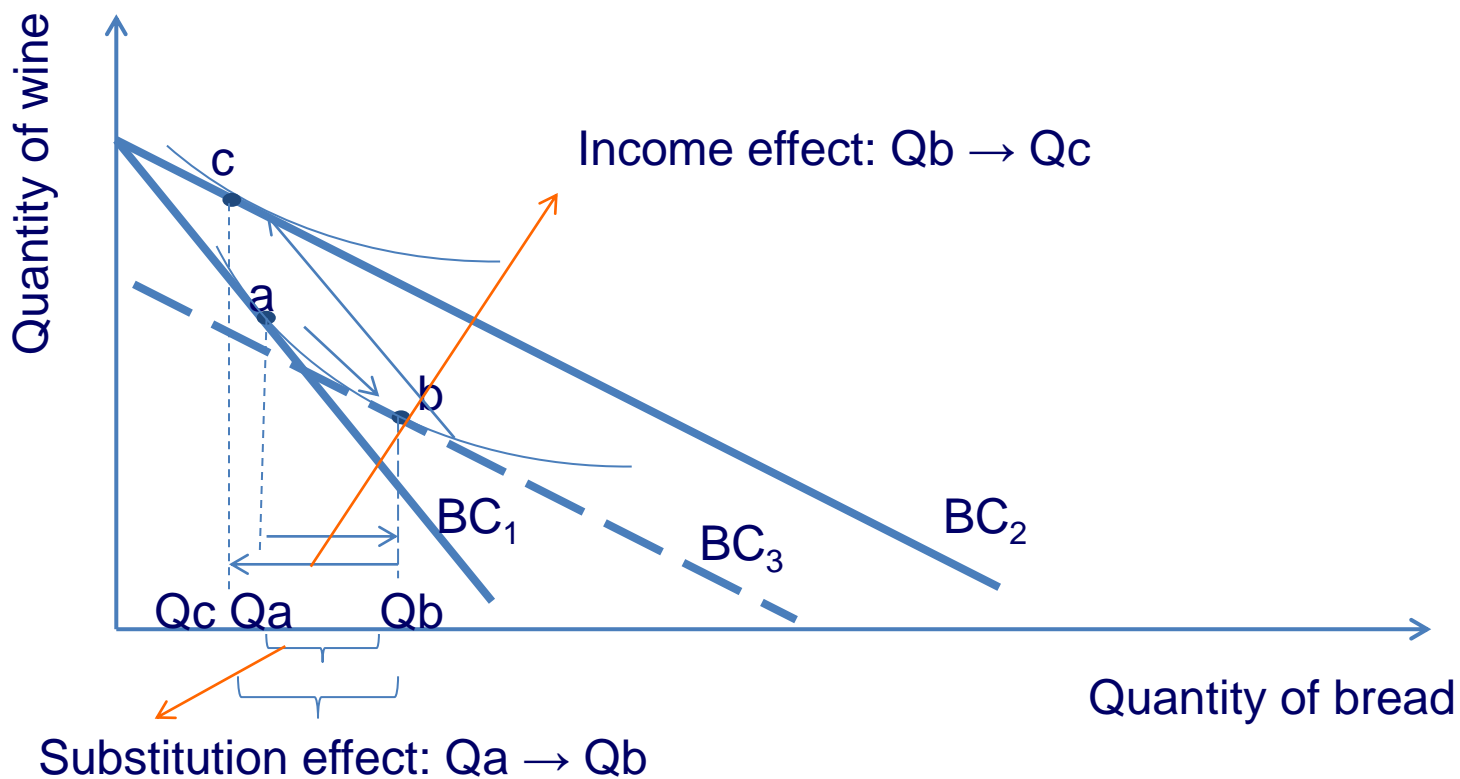
Substitution & Income Effects

Negative Income Effect, Smaller Than
Substitution Effect: **Inferior Goods**
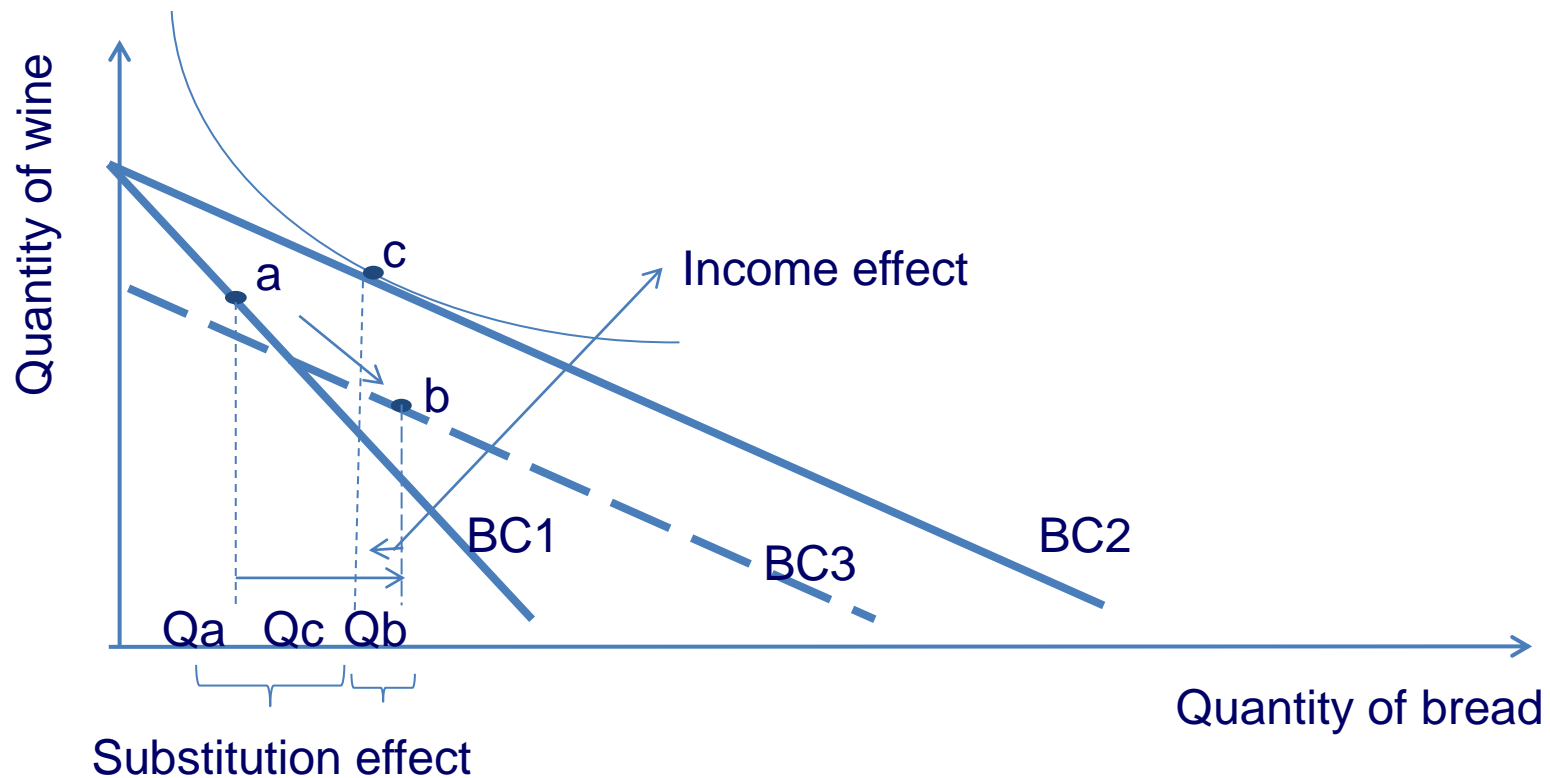
Substitution & Income Effects

Negative Income Effect, Larger Than Substitution Effect: Giffen Goods

Income effect: Qb → Qc

Substitution effect: Qa → Qb

Giffen Goods and Veblen Goods

- **Giffen Goods**
  - *An inferior good for which the negative income effect outweighs the positive substitution effect when price falls.*
  - *Upward-sloping demand curve*
  - *At lower prices, a smaller quantity would be demanded as a result of the dominance of the income effect over the substitution effect.*

- **Veblen Goods**
  - *A higher price makes the good more desirable.*
  - *Have a positively sloped demand curve for some individual over some range of prices*

- *Distinctions:*
  - *Giffen goods are inferior goods, while Veblen goods certainly are not;*
  - *The existence of Giffen goods is theoretically supported by our rules of consumer choice, while the existence of Veblen goods is not.*

EXAMPLE 2

Monica has a monthly entertainment budget that she spends on (a) movies and (b) an assortment of other entertainment items. When the price of each movie is $8, she spends a quarter of her budget on six movies a month and the rest of her budget on other entertainment. Monica was offered an opportunity to join a movie club at her local theater that allows her to purchase movies at half the regular price, and she can choose each month whether to join the movie club or not. There is a membership fee she must pay for each month she belongs to the club. Monica is exactly indifferent between (a) not buying the membership and, therefore, paying $8 for movies and (b) buying the membership and paying $4 per movie. So, she flips a coin each month to determine whether to join the club that month. In months that she does join the club, she sees eight movies. For her birthday, a friend gave her a one-month club membership as a gift, and that month she saw 12 movies.

1. If there were no club and the price of movies were to simply fall from $8 to $4, how many more movies would Monica buy each month?

Determine how much Monica is willing to pay each month for the privilege of buying movies at half price. (What is the value of X that makes her indifferent between joining the club and not joining it?)

3. Of the increased number of movies Monica would purchase if the price were to fall from $8 to $4, determine how much of the increase would be attributable to the substitution effect and how much to the income effect of that price decrease.

4. For Monica, are movies a normal, inferior, or Giffen good?

Solution to 1:

Six movies. When her friend gave her a club membership, she bought 12 movies instead of her usual 6. With the gift of the club membership, Monica could buy movies at a price of $4 without paying for that privilege. This is the same as if the price of each movie fell from $8 to $4.

Solution to 2:

Note that Monica is indifferent between two states of the world: State A, in which she has all of her entertainment budget to spend on movies and other entertainment but must pay full price of $8 per movie, and State B, in which she has to pay some dollar amount X for the privilege of buying movies at half price. So, X is the maximum she would pay for a membership fee. She buys eight movies in months when she joins the club. Without a club membership, those movies would cost her $64 (8 movies × $8). With a club membership, the movies would cost her $32 (8 movies × $4). So the most she is willing to pay for a club membership is $32. (Note that one might be tempted to say she would be willing to pay only $24 for the membership because she was buying six movies at $8, spending $48, whereas if she were able to buy six movies at only $4 per movie, she would have to spend only $24. But because of the substitution effect, she would now be willing to buy more movies than before, so her benefit from the half-price privilege is worth more than $24.)

Solution to 3:

When Monica pays the club membership herself, she buys eight movies, two more than usual. Because Monica is equally well off whether she joins the club for a monthly fee and thereby pays half price or whether she does not join the club and pays full price, we can say that the income effect of the price decrease has been removed by charging her the monthly fee. So the increase from six movies to eight is the result of the substitution effect. When Monica's friend gave her the gift of a club membership, allowing her to pay half price without paying for the privilege, Monica bought 12 movies, 6 more than usual and 4 more than she would have had she paid the membership fee. The increase from 8 movies to 12 is the result of the income effect.

Solution to 4:

When the price fell from $8 to $4, Monica bought more movies, so clearly movies are not a Giffen good for her. Additionally, because the substitution effect and the income effect are in the same direction of buying more movies, they are a normal good for Monica. The substitution effect caused her to buy two more movies, and the income effect caused her to buy an additional four movies.

Production Function

Production Function: consider a given amount of capital, we can examine the increase in production as we increase the amount of labor employed
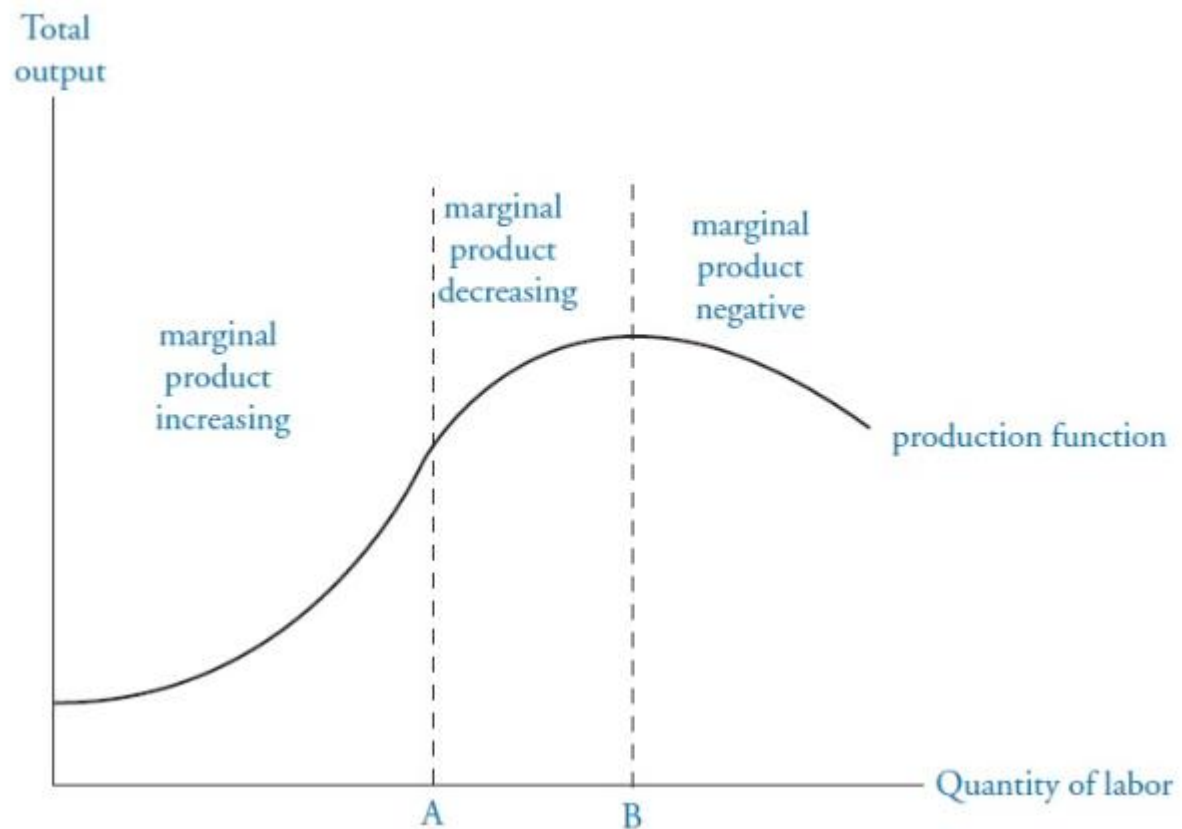- *Q= f (K,L) for a two-factor production model*

output
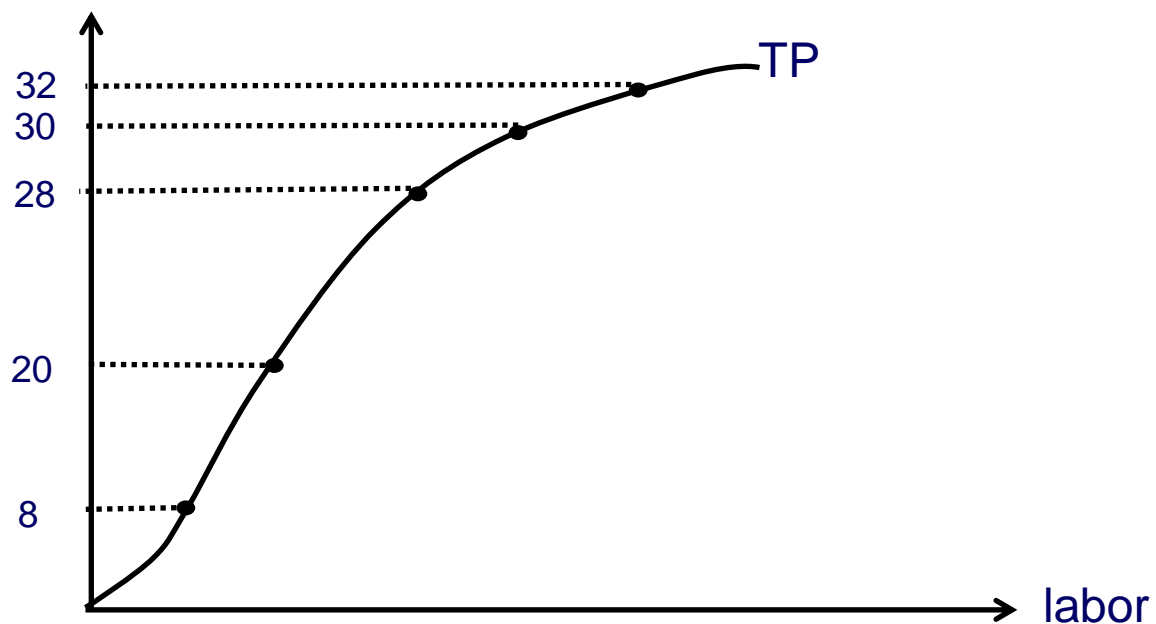
Factors of production are the resources a firm uses to generate output, which includes: land, labor, capital and materials

Figure 4: Production Function—Capital Fixed, Labor Variable

Total, Marginal, and Average Product

Workers	Total Product	Marginal Product	Average Product
1	8	8	8
2	20	12	10
3	26	6	8.7
4	30	4	7.5
5	32	2	6.4
6	33	1	5.5

33 ÷ 6 = 5.5

Marginal Product

Marginal product
(shirts per worker-day)

Marginal Product, holding other inputs constant, first increases and then decreases

MP
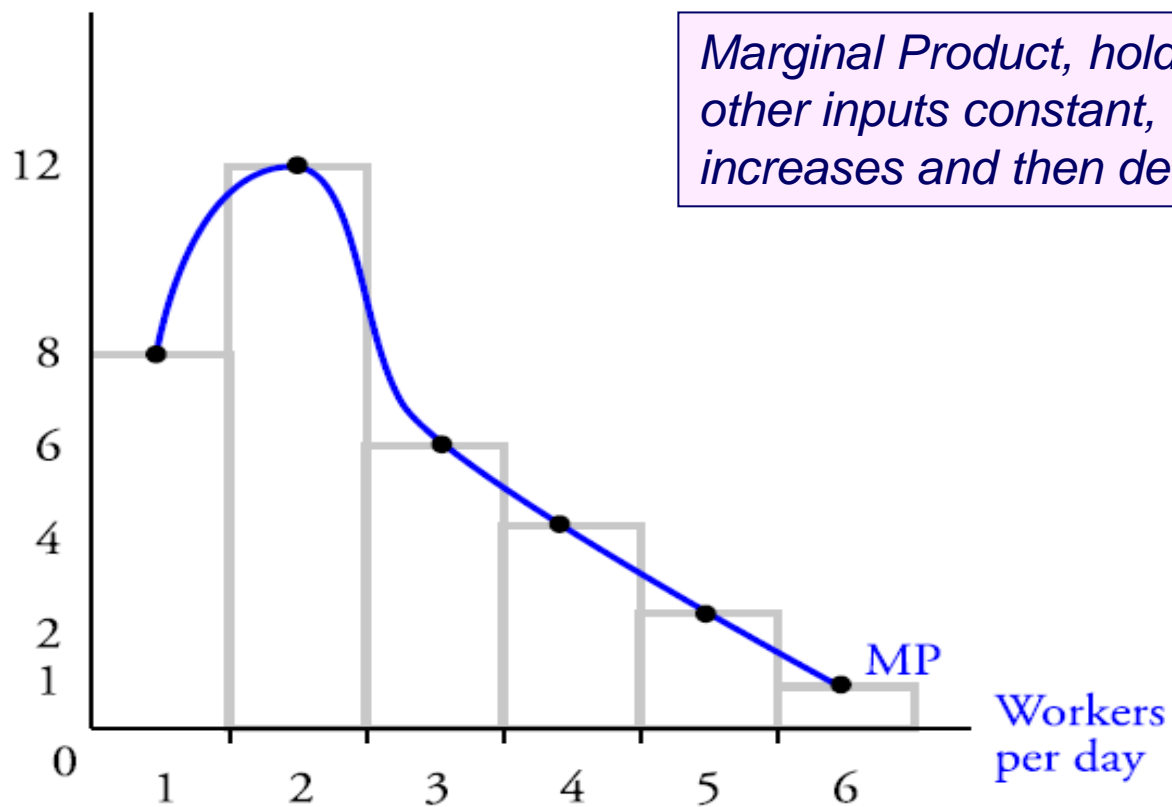
Workers per day

Diminishing marginal returns to labor occur

Marginal and Average Product
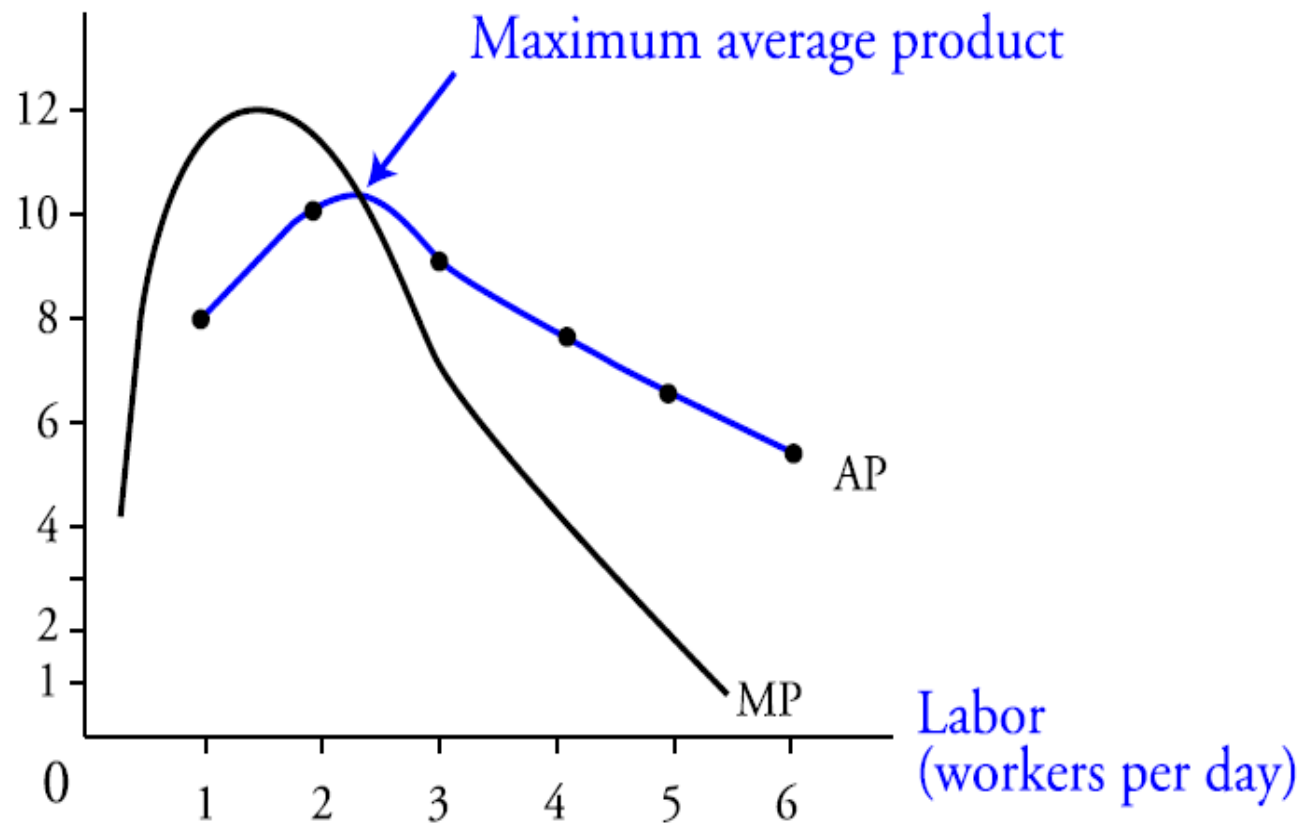
Product Curve and Cost Curve

Output

（a）**Marginal and Average Product Curves**

MP

AP

| MP↑, MC↓ AP↑, AVC↓ | MP↓, MC↑ AP↑, AVC↓ | MP↓, MC↑ AP↓, AVC↑ |

Labor

（b）**Cost Curve**

Cost

MC

AVC

| MP max MC min | AP max AVC min |
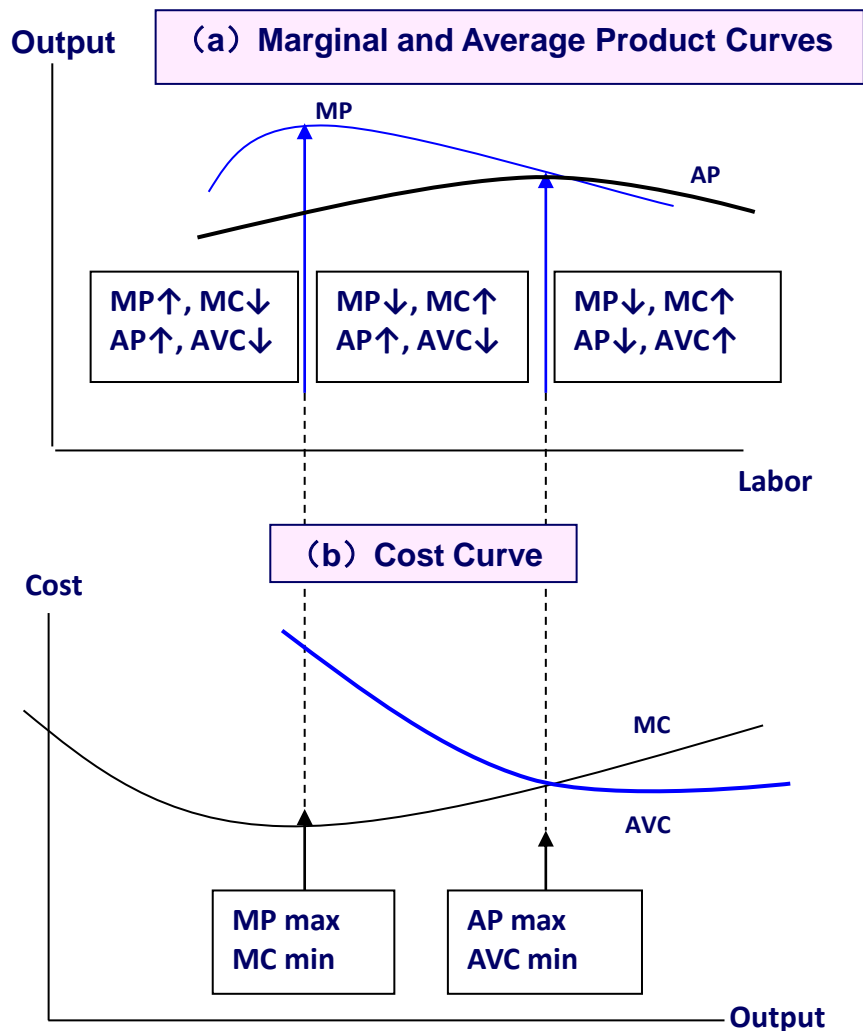
Output

- *As labor and output increase, AP reaches a maximum at the same output for which AVC is at a minimum.*

- *As labor and output increase, the MP curve reaches a maximum at the output where the MC curve is at its minimum.*

Revenue & Cost

- **Total revenue:** price multiplied by quantity sold

- **Average revenue:** total revenue divided by the quantity sold

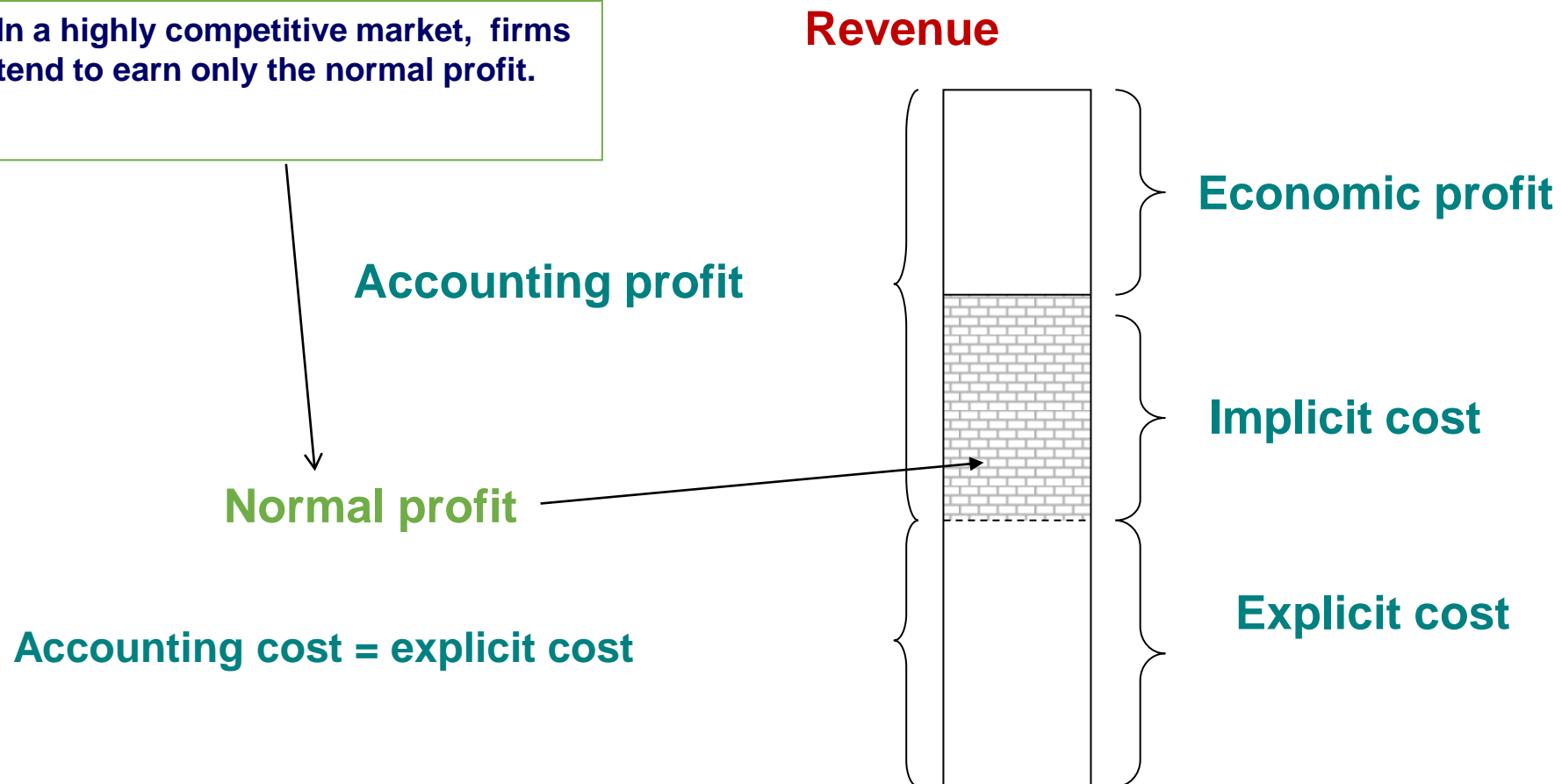- **Marginal revenue:** the increase in total revenue from selling one more unit of a good or service

- **Total fixed cost (TFC)** is the cost of fixed inputs, inputs that do not vary with output

- **Total variable cost (TVC)** is the cost of all inputs that vary with output

- **Total costs =** Total fixed costs + Total variable costs

- **Marginal cost =** change in total cost / change in output

- **Average fixed cost (AFC) =** total fixed cost / output

- **Average variable cost (AVC) =** total variable cost / output

- **Average cost =** total cost / output = AFC+AVC

Summary: Types of Profit Measures

In a highly competitive market, firms tend to earn only the normal profit.

Revenue

Accounting profit

Normal profit

Accounting cost = explicit cost

Economic profit

Implicit cost

Explicit cost

Accounting profit = economic profit + normal profit

Short Run and Long Run

- *The **short term/run** is defined as a time period <u>for which quantities of some resources are fixed</u>, 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</u> **long run**.*

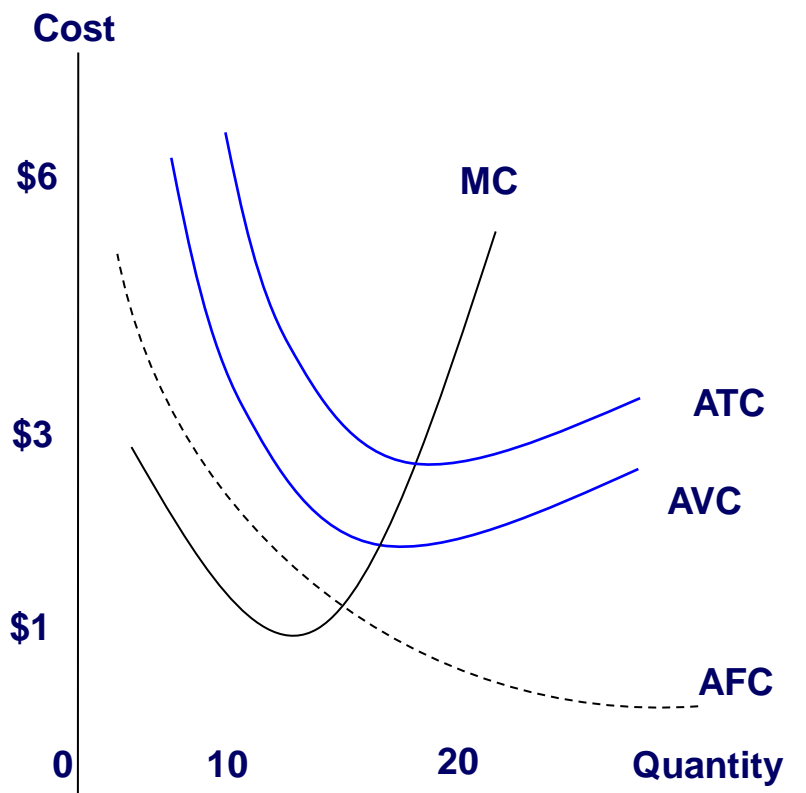# Total, Variable, and Fixed Costs
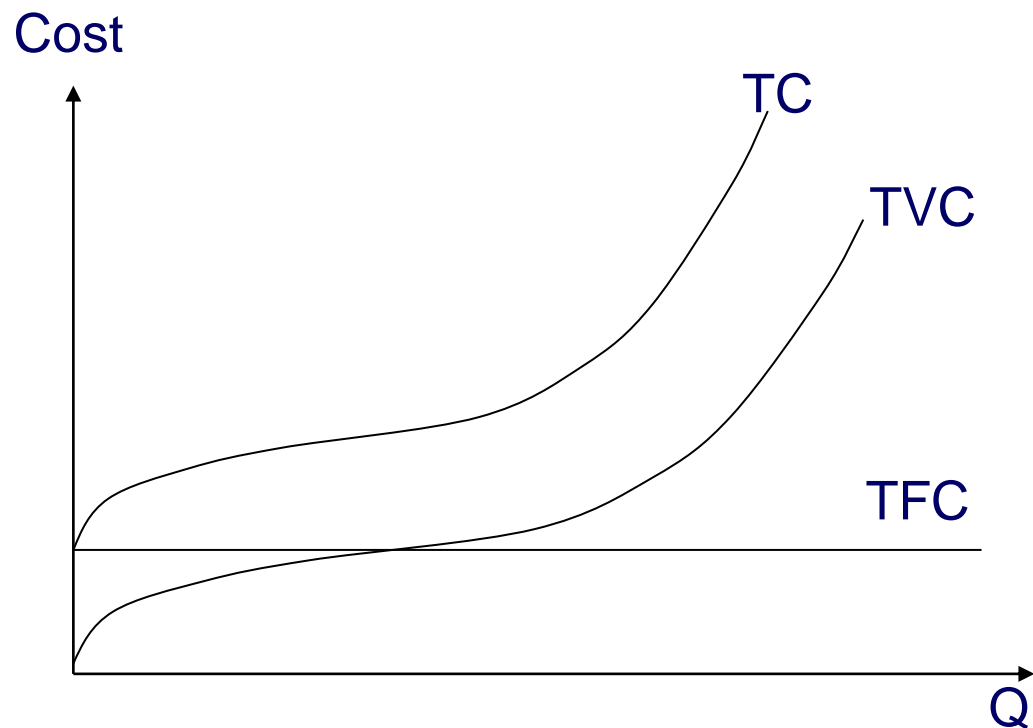
TC (total cost) = total variable cost (TVC) + total fixed cost (TFC)

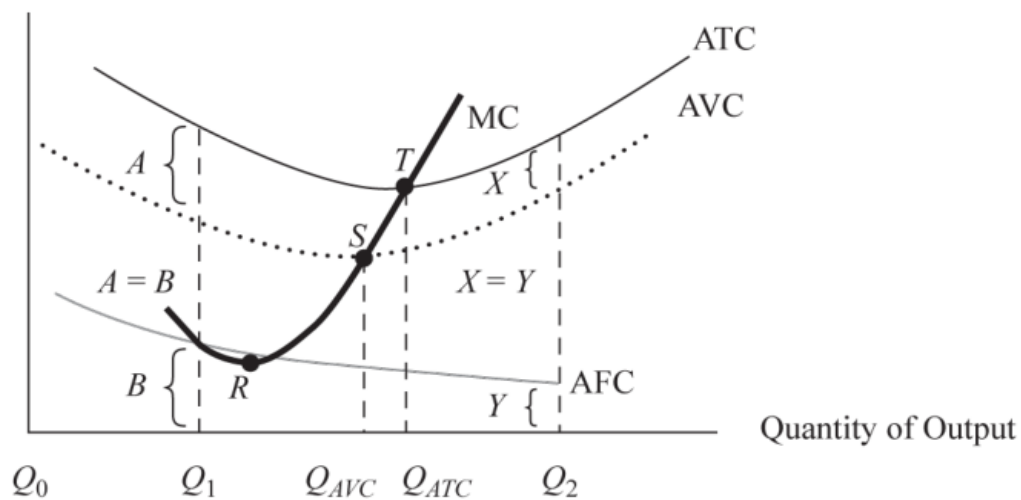# Total, Average, Fixed, and Marginal Costs

- *AFC slopes downward .*

- *The vertical distance between the ATC and AVC curve is equal to AFC.*

- *MC declines initially, then increase.*

- *MC intersects AVC and ATC at their minimum points.*

- *ATC and AVC are U-shaped.*

ATC = AFC + AVC

Exhibit 12.   Average Total Cost, Average Variable Cost, Average Fixed Cost, and Marginal Cost

S, the lowest point on the AVC curve, is where MC equals AVC. Beyond quantity Q_{AVC}, MC is greater than AVC; thus, the AVC curve begins to rise. Note that it occurs at a quantity lower than the minimum point on the ATC curve.

T, the lowest point on the ATC curve, is where MC equals ATC. Beyond quantity Q_{ATC}, MC is greater than ATC; thus, the ATC curve is rising.

A, the difference between ATC and AVC at output quantity Q_1, is the amount of AFC.

R indicates the lowest point on the MC curve. Beyond this point of production, fixed input constraints reduce the productivity of labor.

X indicates the difference between ATC and AVC at quantity Q_2. It is less than A because AFC (Y) falls with output.

Exhibit 16. Demand and Total Revenue Functions for Firms under Conditions of Perfect and Imperfect Competition
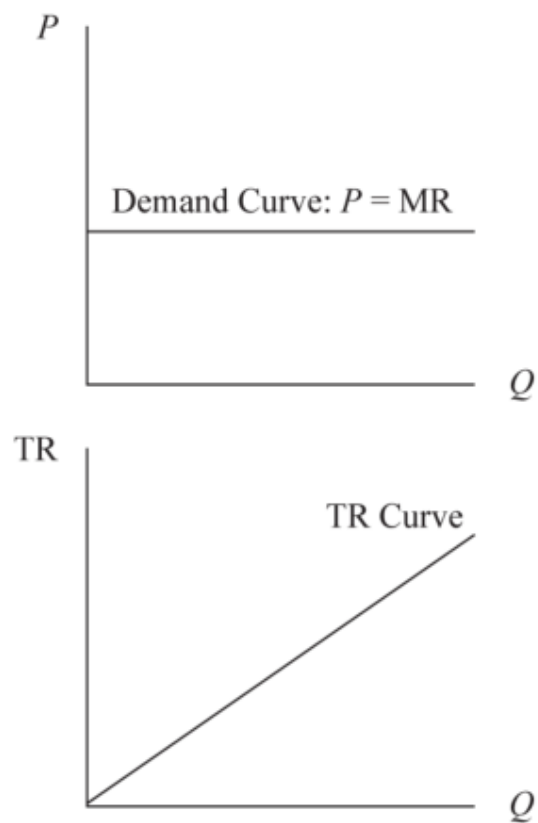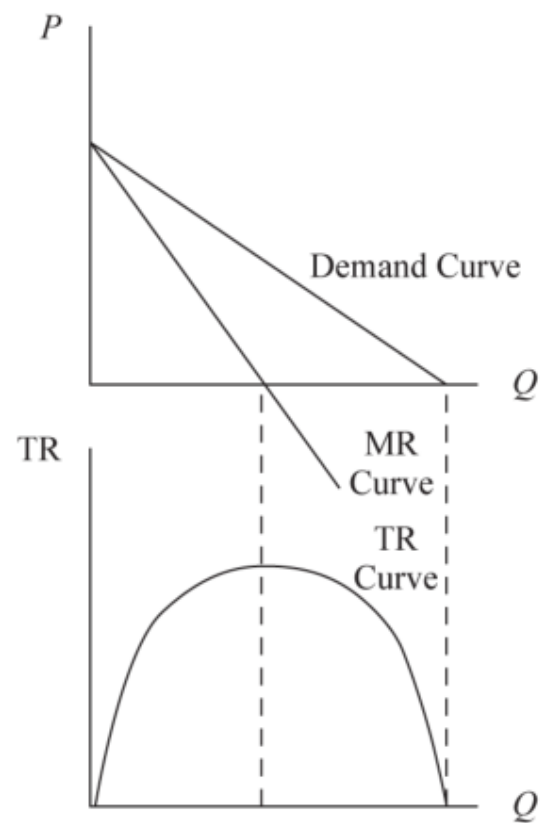
Profit-Maximizing Level of Output
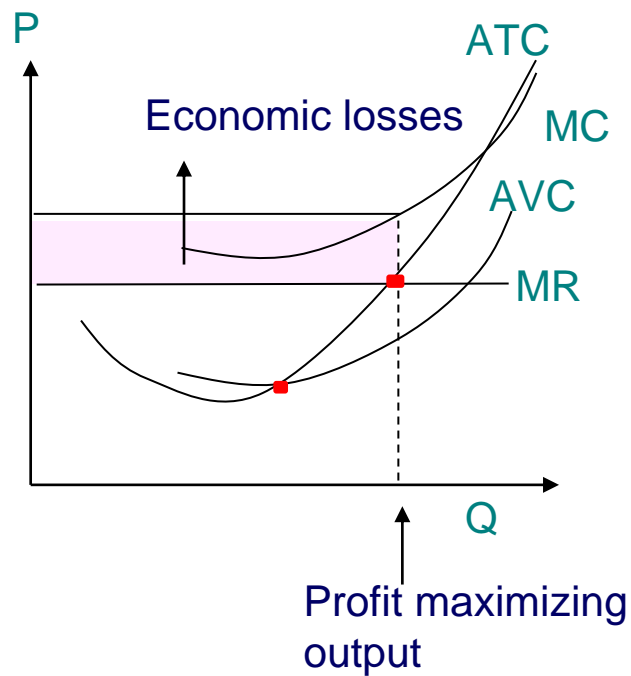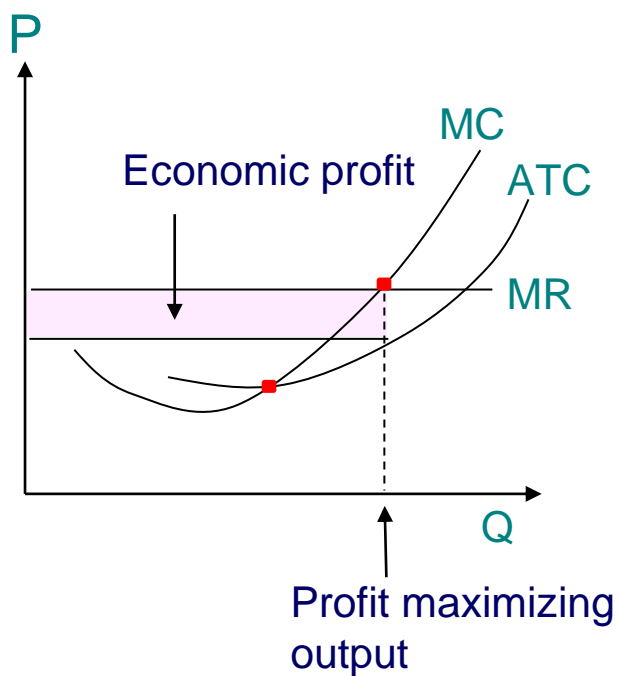
- *Just as under perfect competition, a firm in imperfect competition maximizes profits by producing the quantity of output for which*

- *MR = MC, the same quantity for which TR – TC is at its maximum.*

Shutdown and Breakeven Under Prefect Competition

P & C

MC

ATC

Operate in SR

Shutdown in LR

Breakeven Point

AVC

Shut down Point

Q
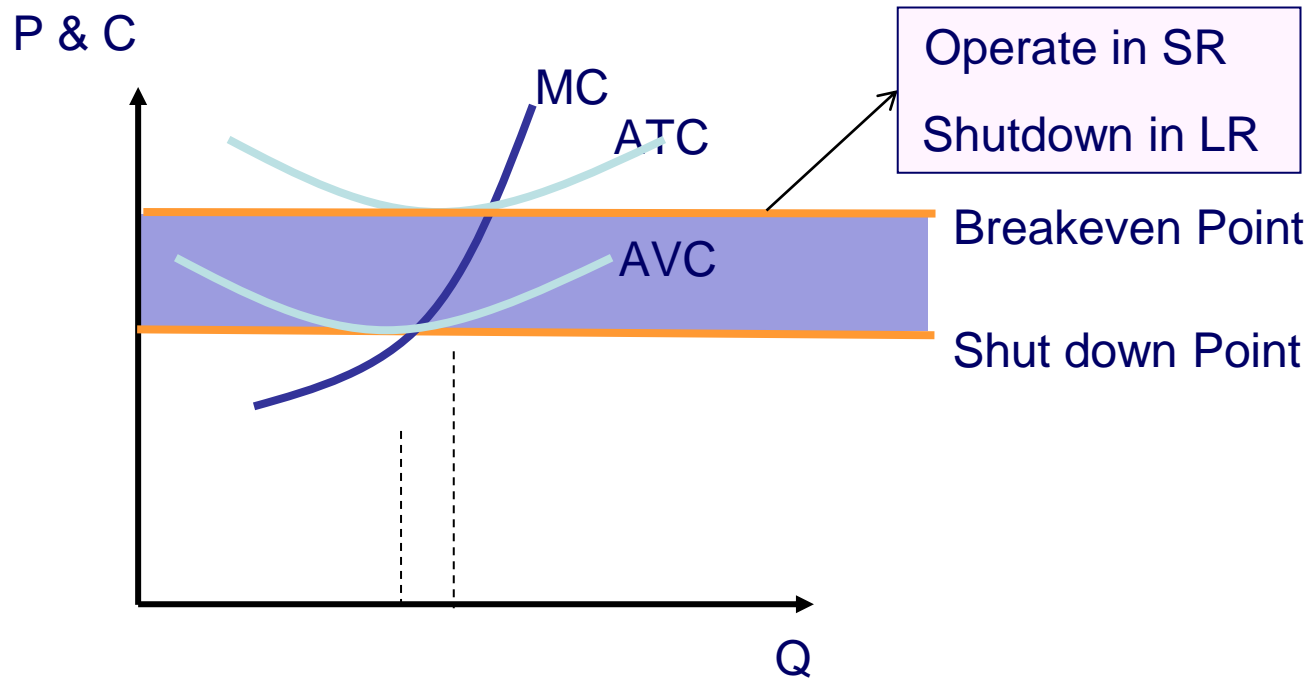
- *If AR >= ATC, firm should stay in the market in both the short and long run.*

- *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 shun down in the short run and exit the market in the long run.*

Exhibit 22.   Short Run and Long Run Decisions to Operate or Not

Revenue–Cost Relationship	Short-Run Decision	Long-Term Decision
TR = TC	Stay in market	Stay in market
TR = TVC but < TC	Stay in market	Exit market
TR < TVC	Shut down production	Exit market

Profit-maximization and Breakeven

Total Approach
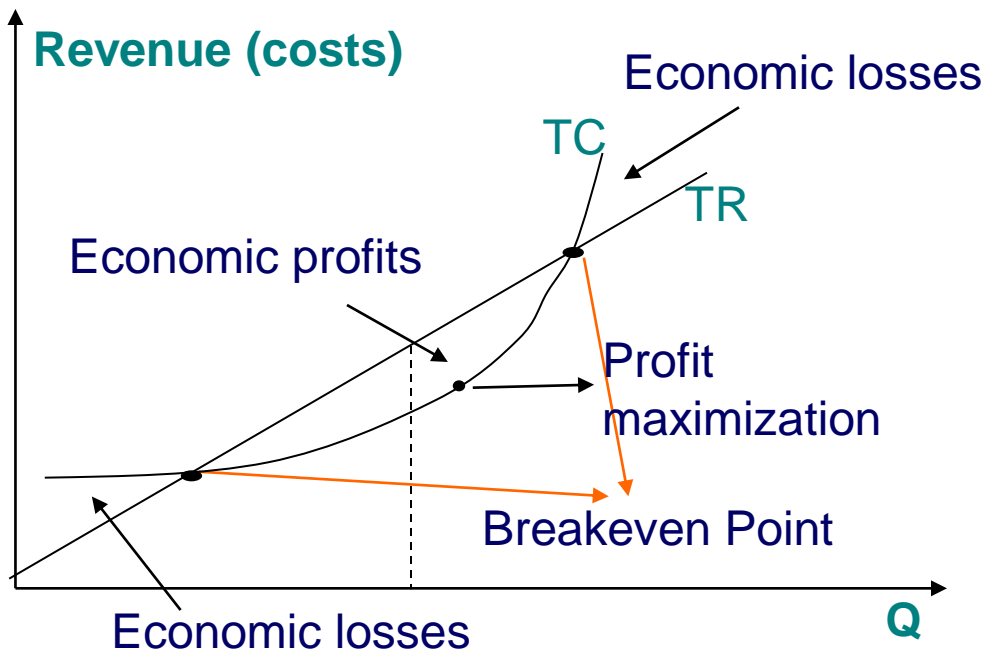
- **profit-maximization output level:**
  The difference between TR and TC is maximized
- *MR=MC （refers to the output)*

- *TR = TC: breakeven*

- *TC > TR > TVC: firm should continue to operate in the short run but shunt down in the long run.*

- *TR < TVC: firm should shunt down in the short run and the long run.*

Exhibit 21

Quantity (Q)	Price (P)	Total Revenue (TR)	Total Cost (TC)[a]	Profit
0	10,000	0	100,000	−100,000
10	9,750	97,500	170,000	−72,500
20	9,500	190,000	240,000	−50,000
30	9,250	277,500	300,000	−22,500
40	9,000	360,000	360,000	0
50	8,750	437,500	420,000	17,500
60	8,500	510,000	480,000	30,000
70	8,250	577,500	550,000	27,500
80	8,000	640,000	640,000	0
90	7,750	697,500	710,000	−12,500
100	7,500	750,000	800,000	−50,000

[a] Includes all opportunity costs

EXAMPLE 6

For the most recent financial reporting period, a business domiciled in Ecuador (which recognizes the US dollar as an official currency) has revenue of $2 million and TC of $2.5 million, which are or can be broken down into TFC of $1 million and TVC of $1.5 million. The net loss on the firm's income statement is reported as $500,000 (ignoring tax implications). In prior periods, the firm had reported profits on its operations.

1. What decision should the firm make regarding operations over the short term?

2. What decision should the firm make regarding operations over the long term?

3. Assume the same business scenario except that revenue is now $1.3 million, which creates a net loss of $1.2 million. What decision should the firm make regarding operations in this case?

Solution to 1:

In the short run, the firm is able to cover all of its TVC but only half of its $1 million in TFC. If the business ceases to operate, its loss would be $1 million, the amount of TFC, whereas the net loss by operating would be minimized at $500,000. The firm should attempt to operate by negotiating special arrangements with creditors to buy time to return operations back to profitability.

Solution to 2:

If the revenue shortfall is expected to persist over time, the firm should cease operations, liquidate assets, and pay debts to the extent possible. Any residual for shareholders would decrease the longer the firm is allowed to operate unprofitably.

Solution to 3:

The firm would minimize loss at $1 million of TFC by shutting down. If the firm decided to continue to do business, the loss would increase to $1.2 million. Shareholders would save $200,000 in equity value by pursuing this option. Unquestionably, the business would have a rather short life expectancy if this loss situation were to continue.

Short-Run and Long-Run Cost Curve

- *Short-run: MR = MC (price at that output quantity is greater than AVC)*

- *Long-run: firm will choose to operate at the minimum average cost, considering all possible plant sizes*
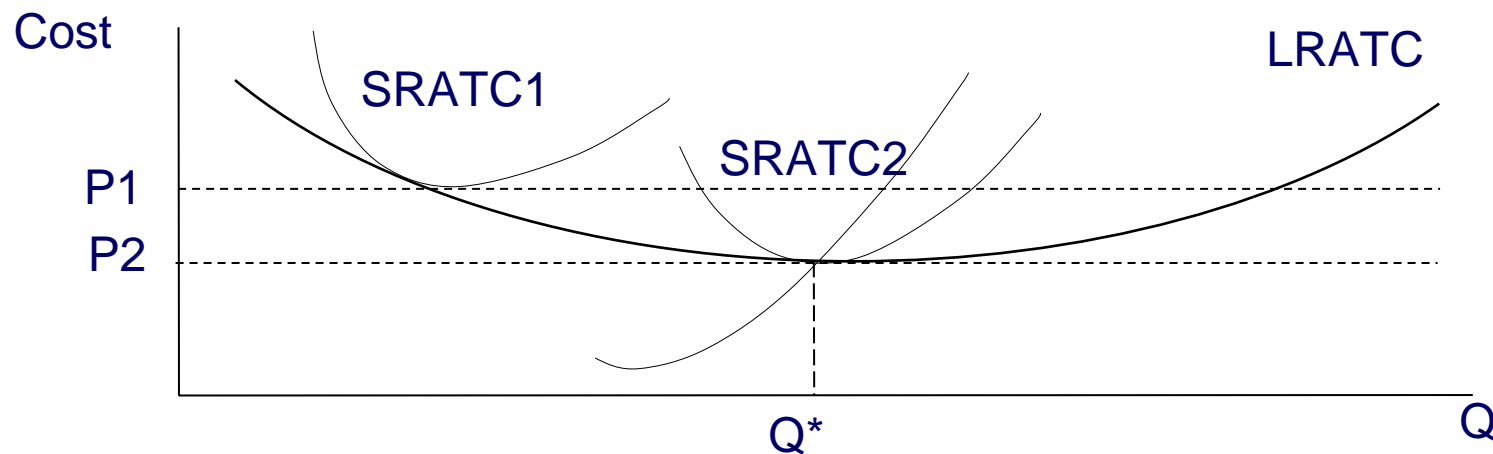
Exhibit 23. Short-Run Total Cost Curves for Various Plant Sizes
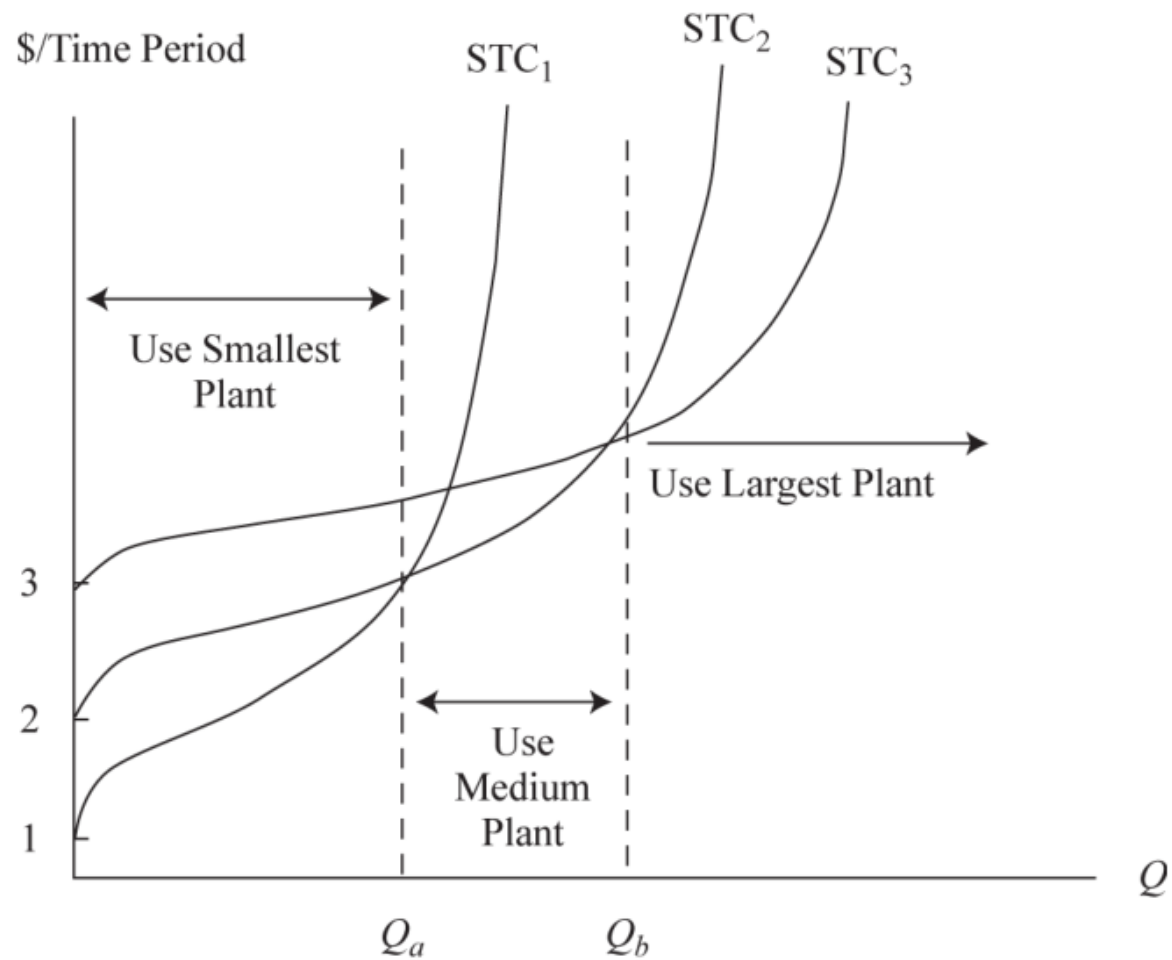
Economies of Scale

- *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 the **diseconomies of scale** when average unit costs rise as the scale of the business increases.*

- *Minimum efficient scale（MES）: the minimum point on the LRATC（Q*）*
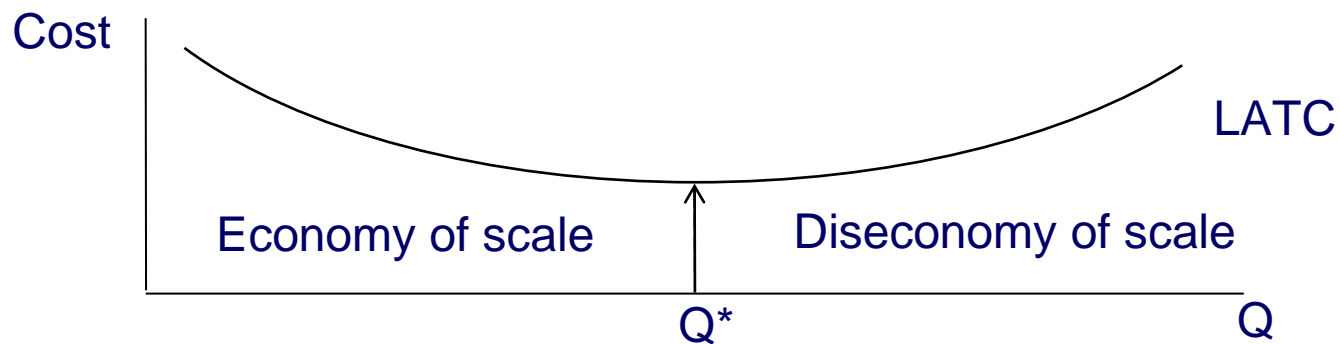
The Firm and Market Structures

Factors that Determine Market Structure

- *The number and relative size of firms supply the product*

- *The degree of product differentiation*

- *The power of the seller over pricing decision*

- *The relative strength of the barriers to entry and exit*

- *The degree of non-price competition*

Exhibit 1. Characteristics of Market Structure

Market Structure	Number of Sellers	Degree of Product Differentiation	Barriers to Entry	Pricing Power of Firm	Non-price Competition
Perfect competition	Many	Homogeneous/Standardized	Very Low	None	None
Monopolistic competition	Many	Differentiated	Low	Some	Advertising and Product Differentiation
Oligopoly	Few	Homogeneous/Standardized	High	Some or Considerable	Advertising and Product Differentiation
Monopoly	One	Unique Product	Very High	Considerable	Advertising

Perfect Competition

- *There are a large number of potential buyers and sellers.*

- *The products offered by the sellers are virtually identical.*

- *There are few or easily surmountable barriers to entry and exit.*

- *Sellers have no market-pricing power.*

- *Non-price competition is absent.*

Short-run Profit Maximization

Marginal Approach
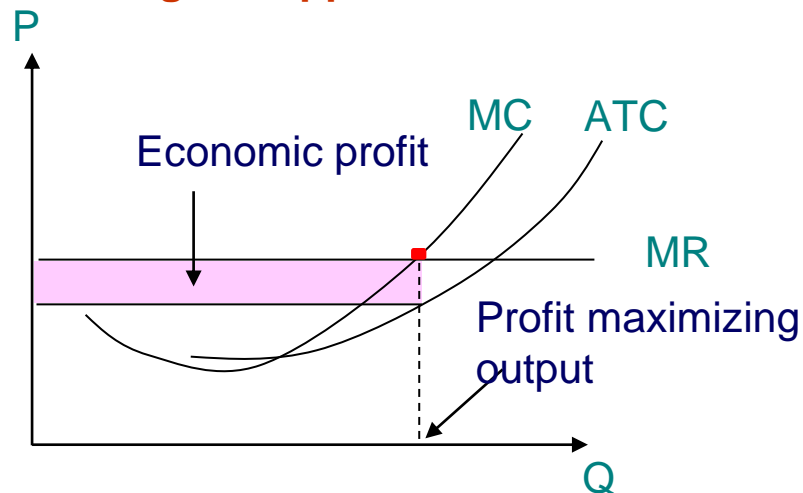
Total Approach
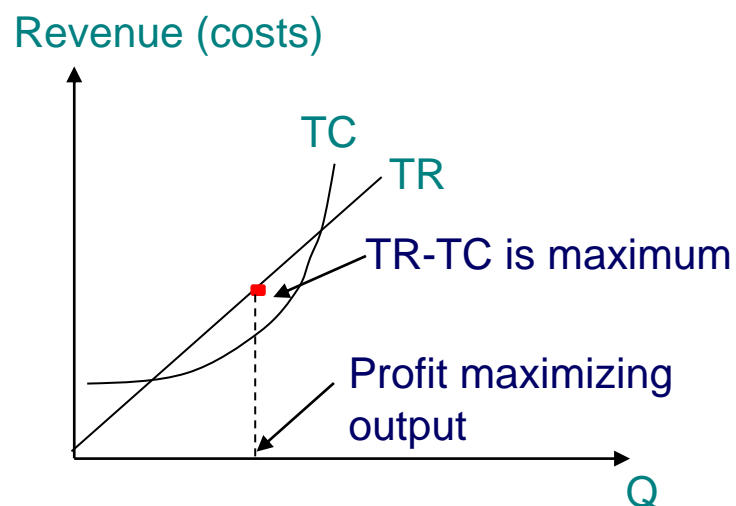
Determine the profit maximizing output：
* *price=average revenue=marginal revenue*
* *Maximize profit: P=MR=MC*
* *Economic profit equals total revenue less the opportunity cost of production, which includes the cost of a normal return to all factors of production, including invested capital.*

Long-run Profit Maximization

- *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.*
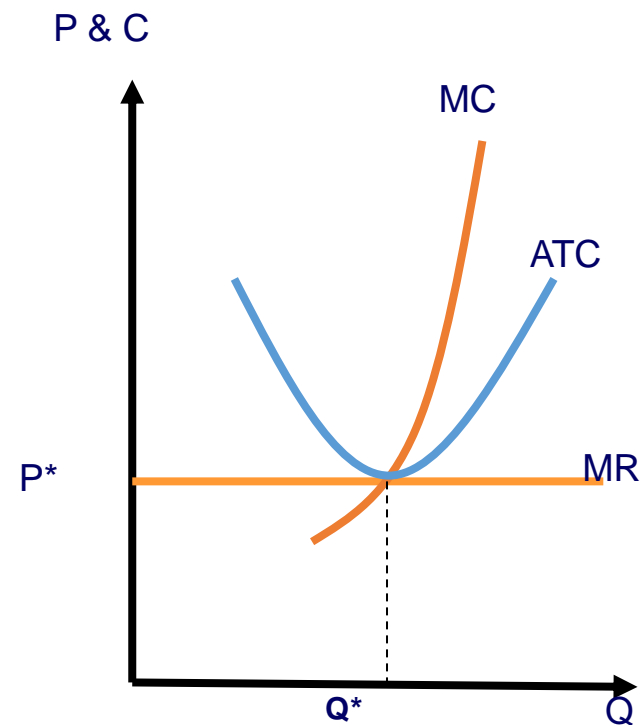
Attention: Contrast with the short-run!

Demand Curve

（a）Industry

Price

P₁
P₀

S₀
S₁
D₁
D₀

Q₀ Q₁ Q₂

Quantity

（b）Firm

Price and Cost

MC
ATC

P₁
P₀

MR₁
MR₀

q₀ q₁

Quantity

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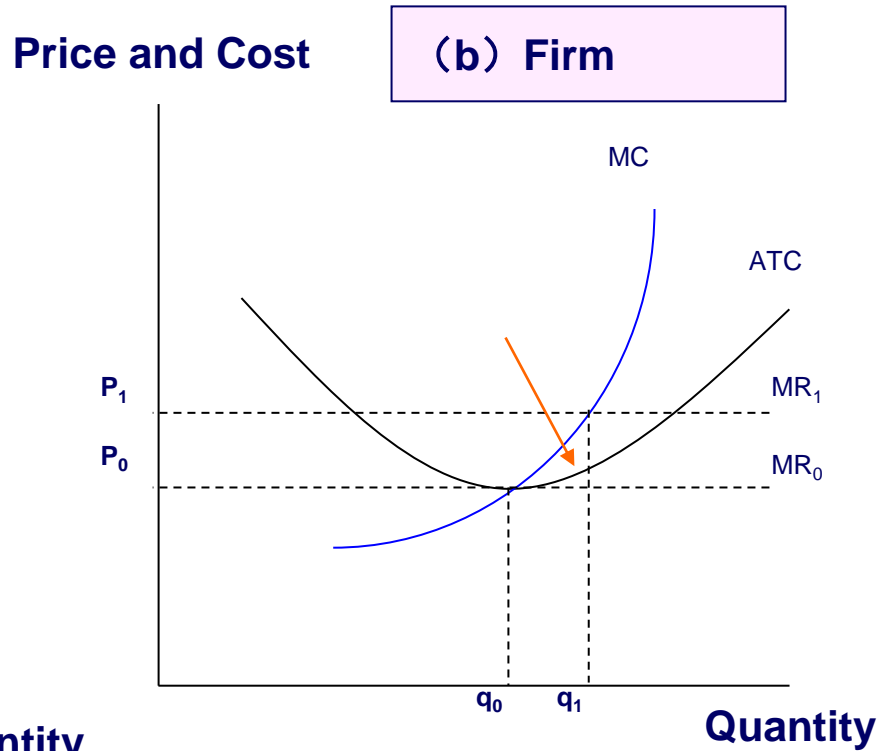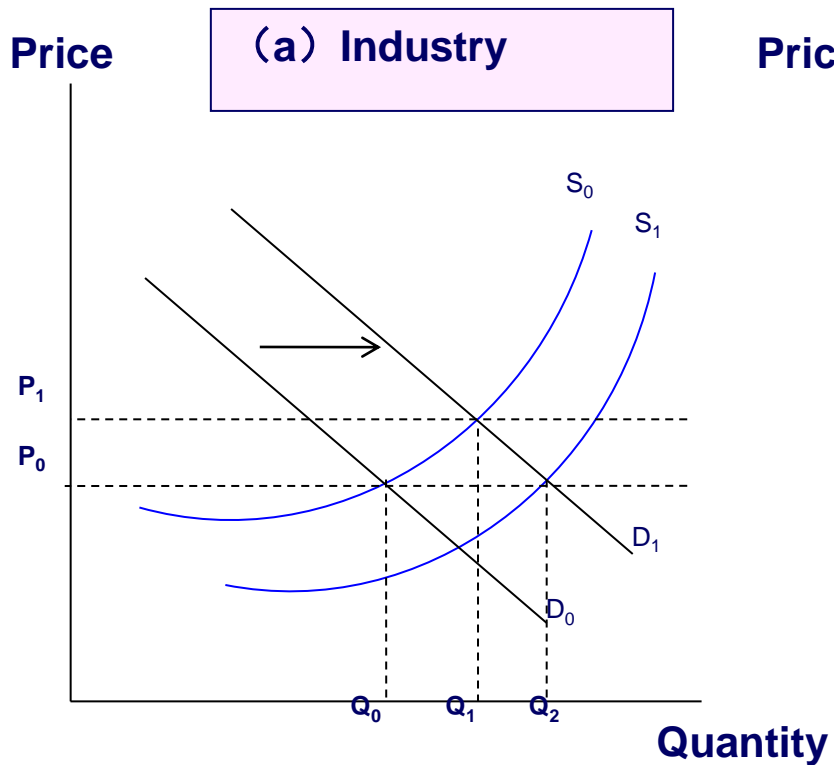
Monopolistic Competition

- *There are a large number of potential buyers and sellers.*

- *The products offered by the sellers are close substitutes for the products offered by other firms, and each firm tries to make its product look different.*

- *Entry into and exit form the market are possible with fairly low costs.*

- *Firms have some pricing power.*

- *Suppliers differentiate their products through advertising and other non-price strategies.*
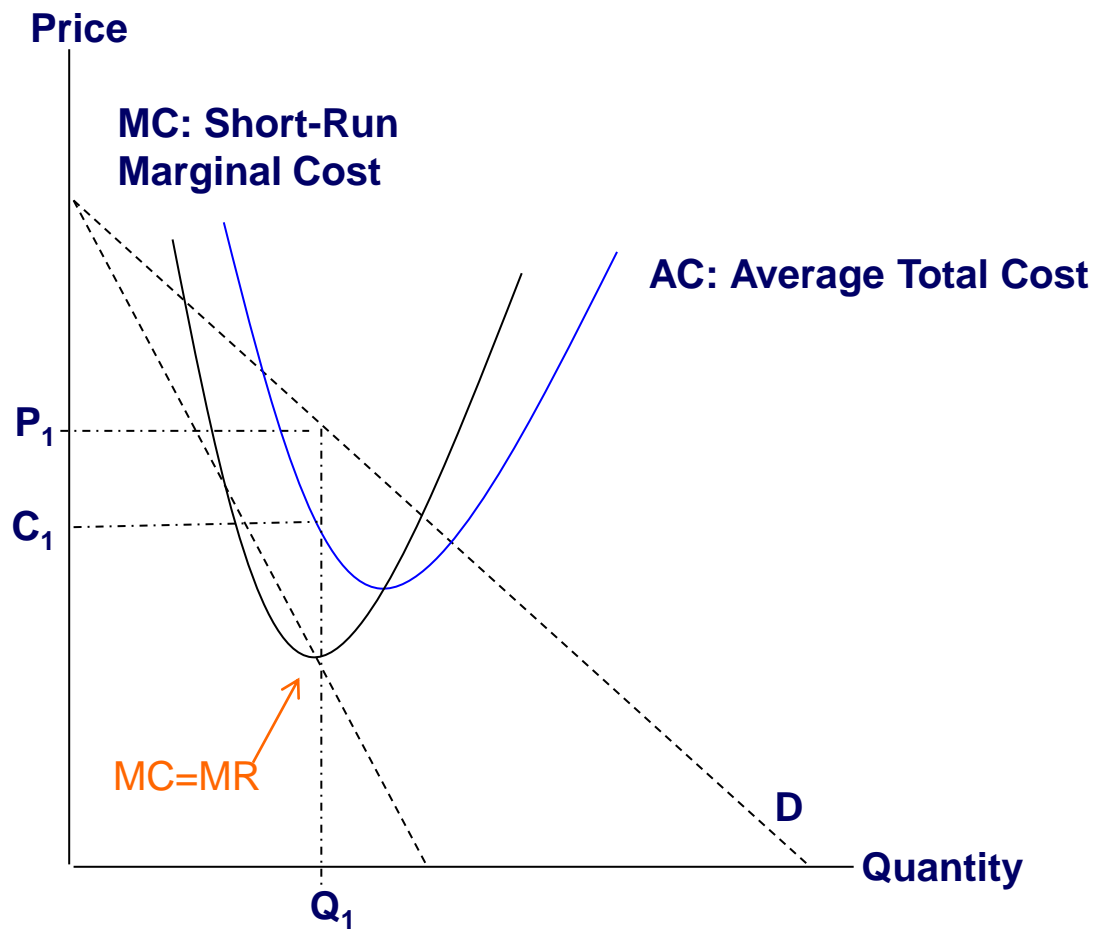
Monopolistic Competition

Short-run output decision for a firm
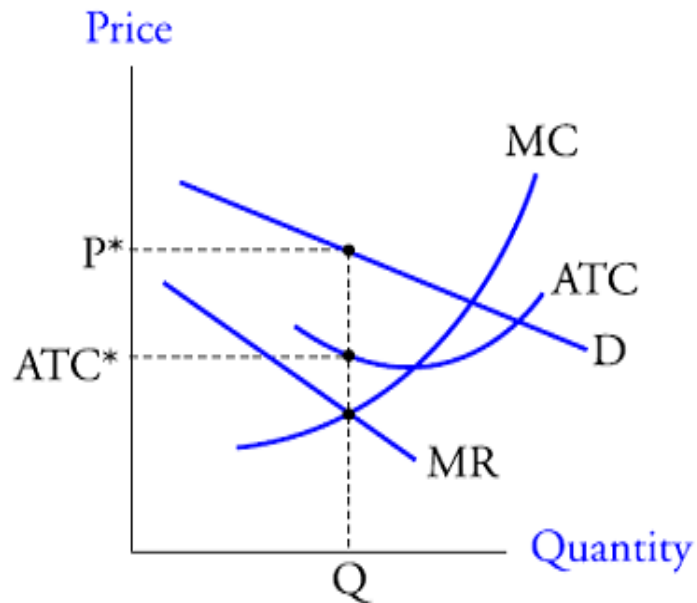
Long-run output decision for a firm
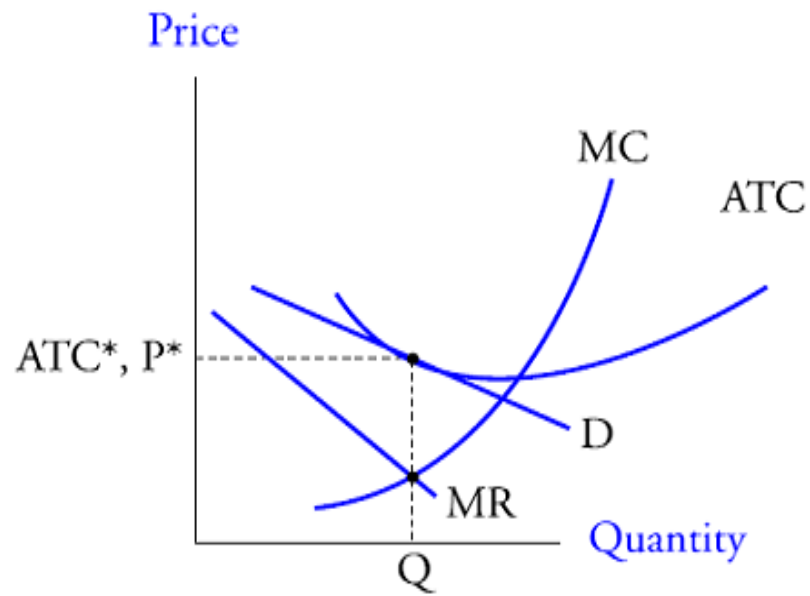
Economic profit
- The entry of new firm shifts the demand curve faced by each individual firm down to the point where P=ATC
- No economic profit

Long-run Output Decision for a Firm
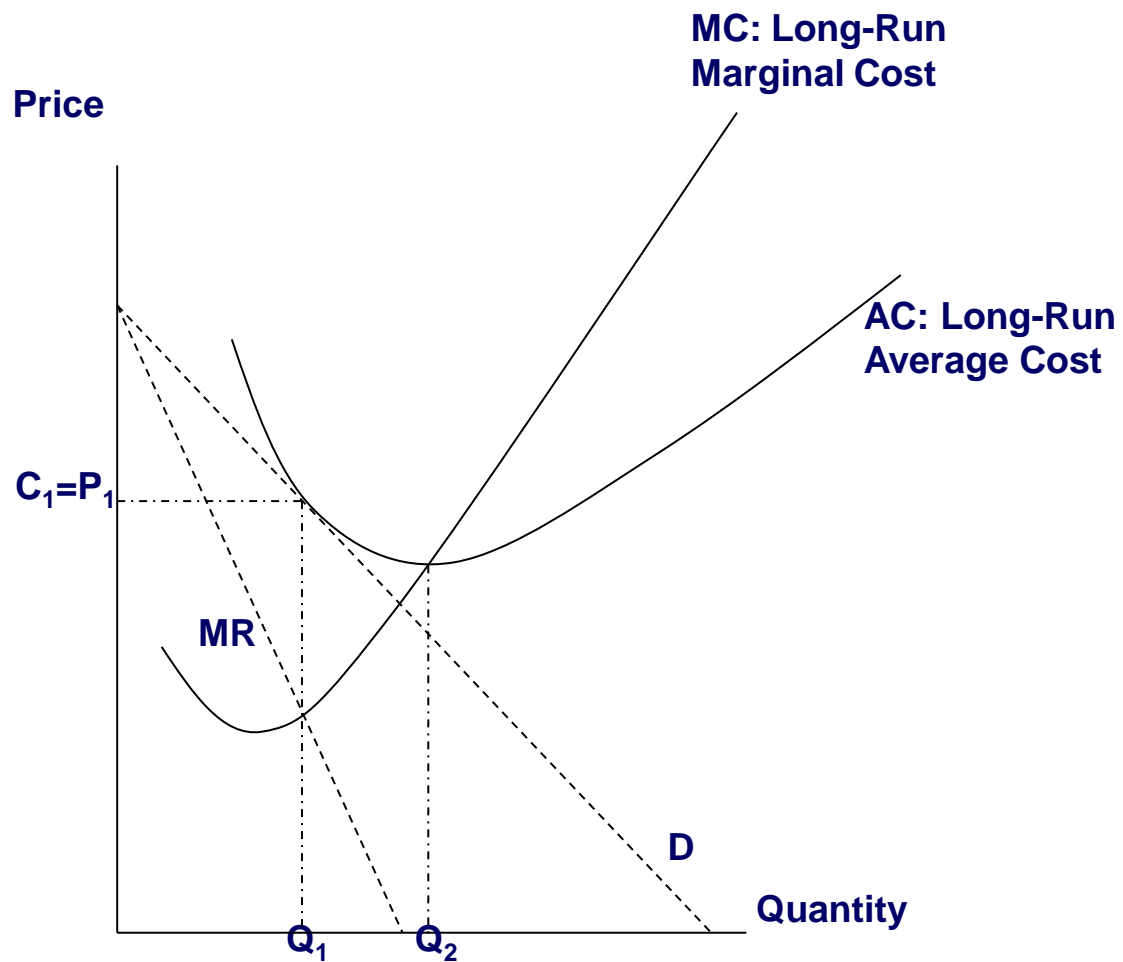
Monopolistic Vs. Perfect Competition
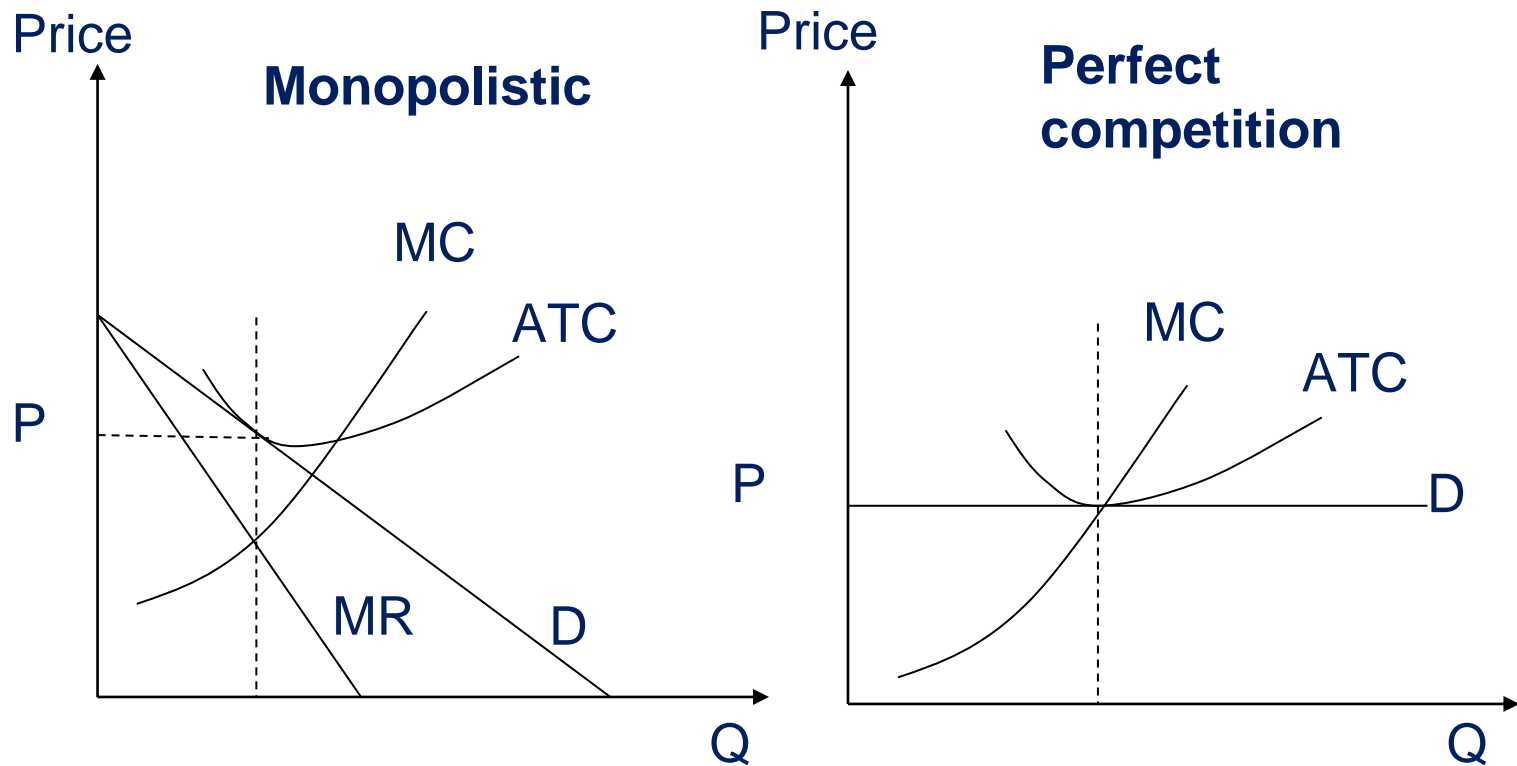
- *P>MC, suggesting inefficient allocation of resources.*
- *Price is slightly higher than under perfect competition.*

Oligopoly

- *There are a small number of potential sellers.*

- *The products offered by each seller are close substitutes for the products offered by other firms and may be differentiated by brand or homogeneous and unbranded.*

- *Entry into the market is difficult, with fairly high costs and significant barriers to competition.*

- *Firms typically have substantial pricing power.*

- *Products are often highly differentiated through marketing, features, and other non-price strategies.*

Pricing Strategies of Oligopoly

- ***Pricing interdependence***
  - ✓ *Assume pricing interdependence among firms in the oligopoly*

- ***The Cournot assumption***
  - ✓ *Each firm determine its profit-maximizing production level by assuming that the other firm's output is constant.*

- ***The Nash equilibrium***
  - ✓ *Participants make their own decisions based on the anticipations of their opponents' rational choices or strategies.*

Pricing Interdependence

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.
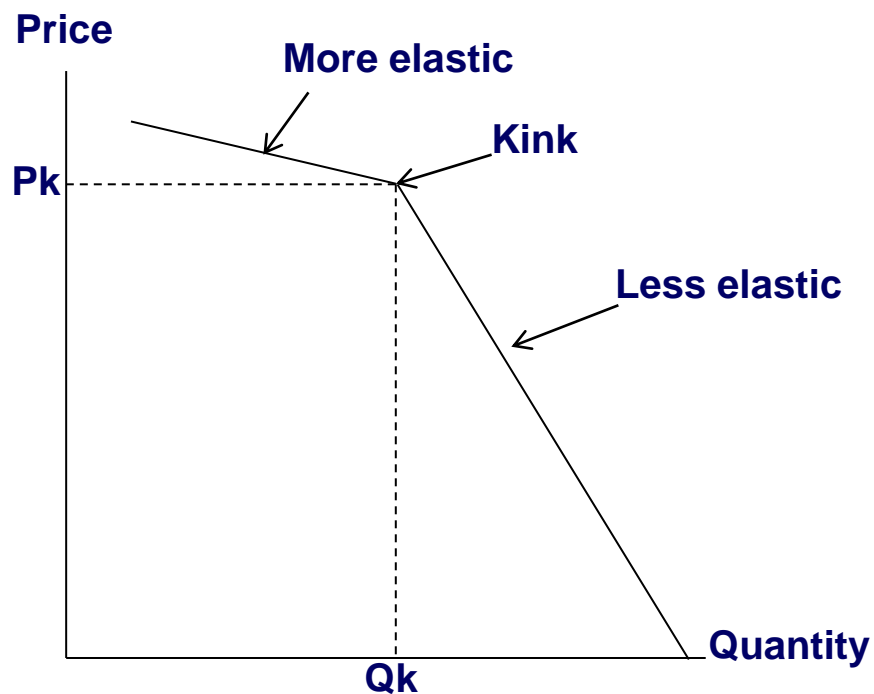
A small price increase will result in a large decrease in demand.

Exhibit 13(A). Kinked Demand Curve in Oligopoly Market
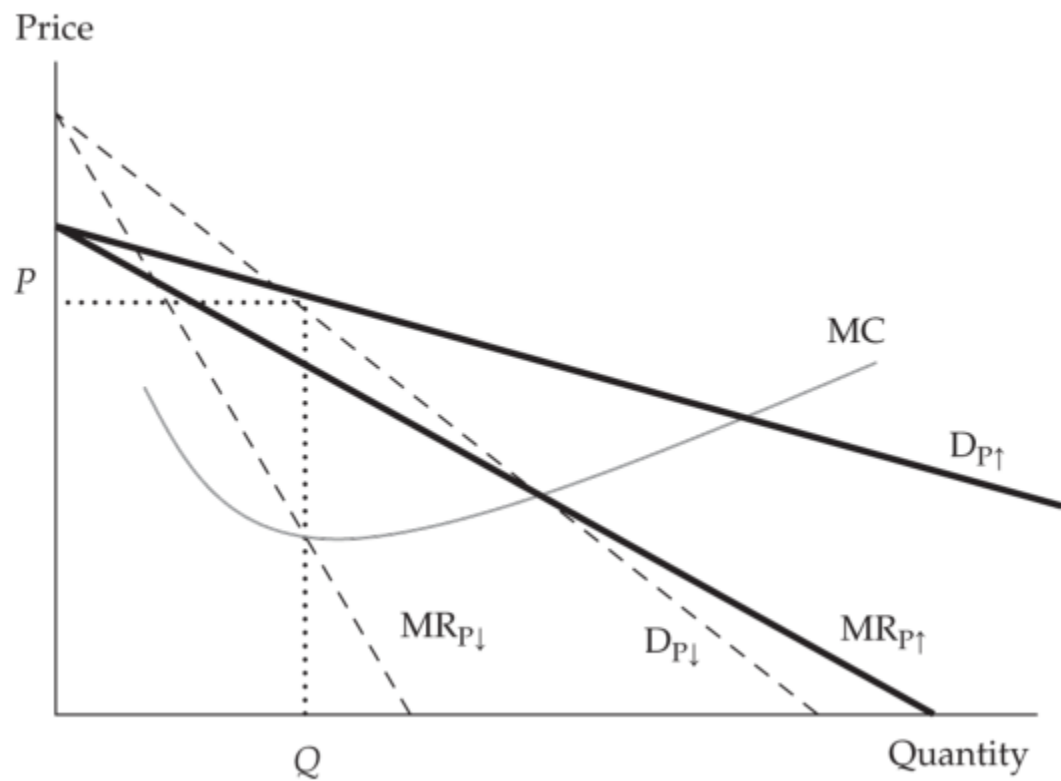
Exhibit 13(B). Kinked Demand Curve in Oligopoly Market
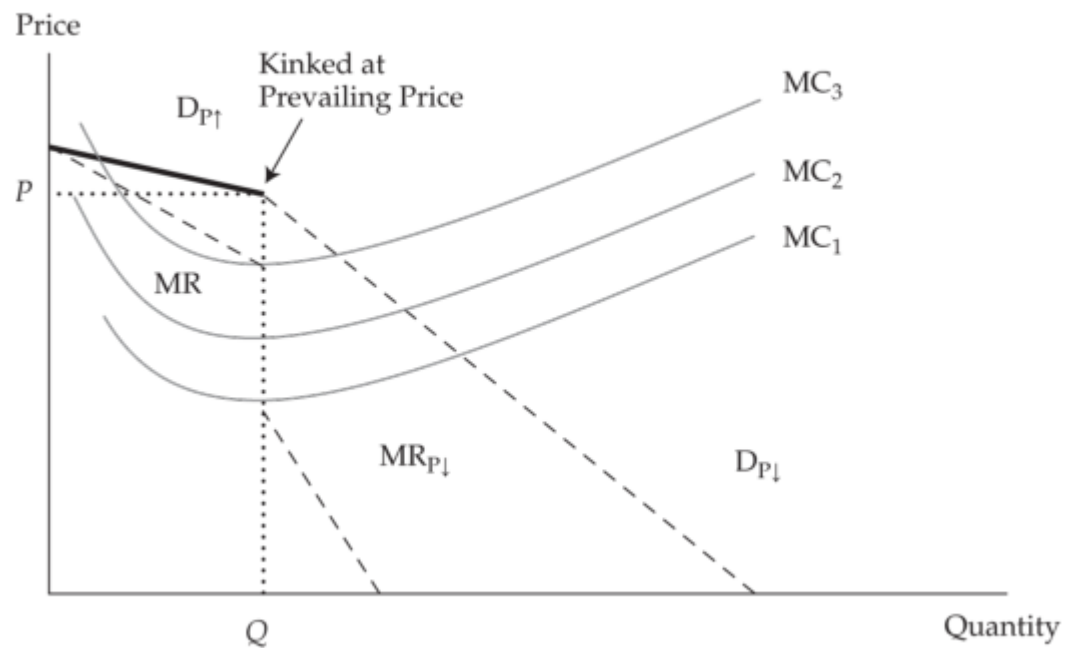
Exhibit 14.   Cournot Equilibrium in Duopoly Market
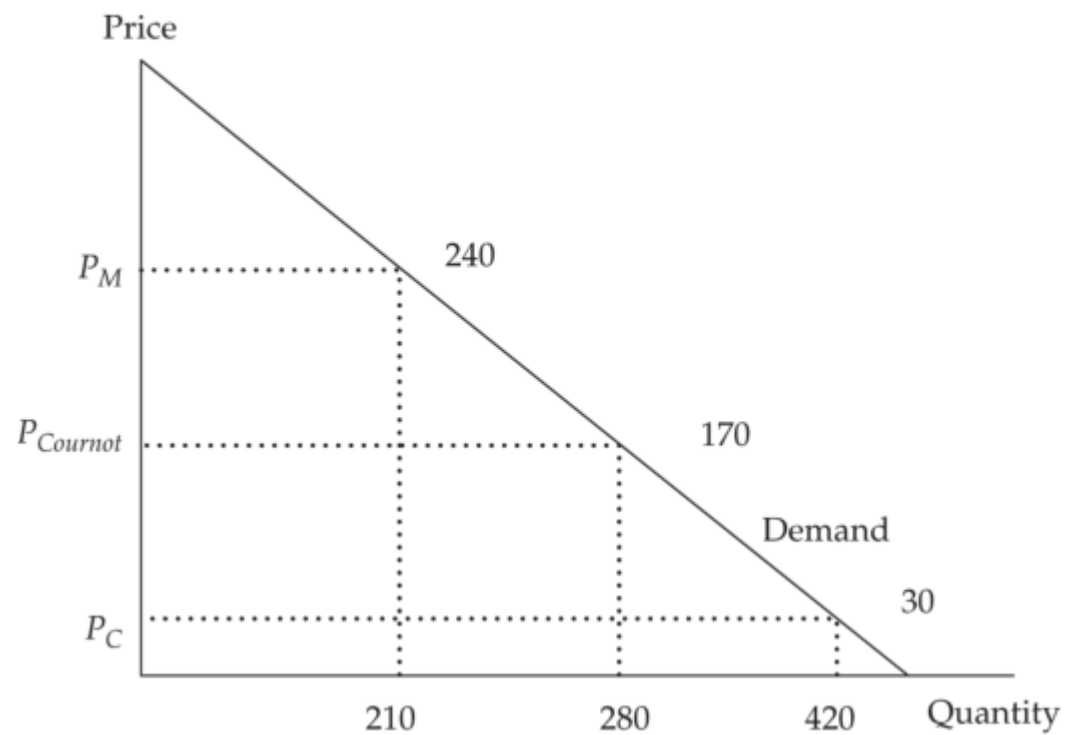
Nash Equilibrium

- ***Nash Equilibrium*** *is a status when none of the oligopolists can increase its profits by unilaterally changing its price strategy.*
- *The solution of Nash Equilibrium is not the firm's best interests and it does not maximize the joint profits (it is the lower equilibrium).*
- ***Prisoners' Dilemma***

	Prisoner B is silent	Prisoner B confesses
Prisoner A is silent	(2,2)	(10,0)
Prisoner A confesses	(0,10)	(6,6)

- *Firms could be better-off by collusion.*
  - *If the collusion is open and formal, the firms involved are called **cartel**.*

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Exhibit 15. Nash Equilibrium in Duopoly Market

	BatCo – Low Price	BatCo – High Price
ArcCo – Low Price	ArcCo 50 / BatCo 70	ArcCo 80 / BatCo 0
ArcCo – High Price	ArcCo 300 / BatCo 350	ArcCo 500 / BatCo 300

Factors Affect the Success of Collusion

- *The number and size distribution of sellers*
- *The similarity of the products.*
- *Cost structure*
- *Order size and frequency*
- *The strength and severity of retaliation*
- *The degree of external competition*

Supply，Optimal Price and Output Analysis in Oligopoly Markets
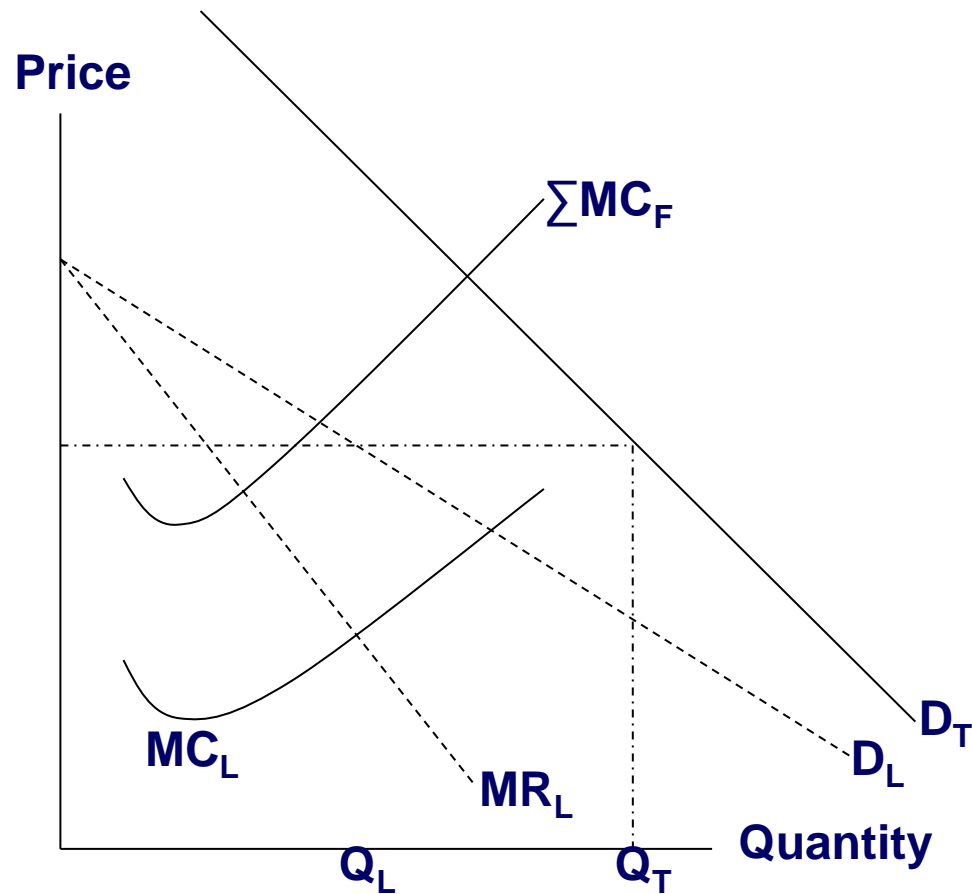
Supply，Optimal Price and Output Analysis in Oligopoly Markets

- *Oligopolist's optimal levels of output and price are dependent on the demand conditions and strategies.*
- *No single optimal price and output that fits all oligopoly market situations.*
- *The level of output (Q*)that maximizes profit is where MR=MC.*
- *The equilibrium price is determined by Q* and the demand curve the firms faces.*
- *If there is no collusion, the dominant firm is the price maker, the other firms are the followers of the pricing pattern.*

Long-run Equilibrium in Oligopoly Markets

- *Long-run economic profits are possible for firms in oligopoly markets.*
- *Over time, the market share and profitability of the dominant firm declines.*
- *Profit attracts new entrants with lower marginal cost (by adopting new techniques).*
- *Pricing wars should be avoided*
- *Innovation may be a way to maintain market leadership.*

Monopoly

- *There are a single seller of a highly differentiated product.*

- *The product offered by the seller has no close substitutes.*

- *Entry into the market is very difficult, with high costs and significant barriers to competition.*

- *The firm has considerable pricing power.*

- *The product is differentiated through non-price strategies such as advertising.*

Supply, Optimal Price and Output Analysis in Oligopoly Markets

A monopolist faces a **downward sloping demand curve**.

- profit maximization occurs in the elastic portion of the demand curve.
- $P^*(1-1/E_p)=MR=MC$

Price

MR   D

Quantity

a/2

a

Price

Monopoly
Profit

MC

P*

ATC

AC*

D

Q*   Quantity
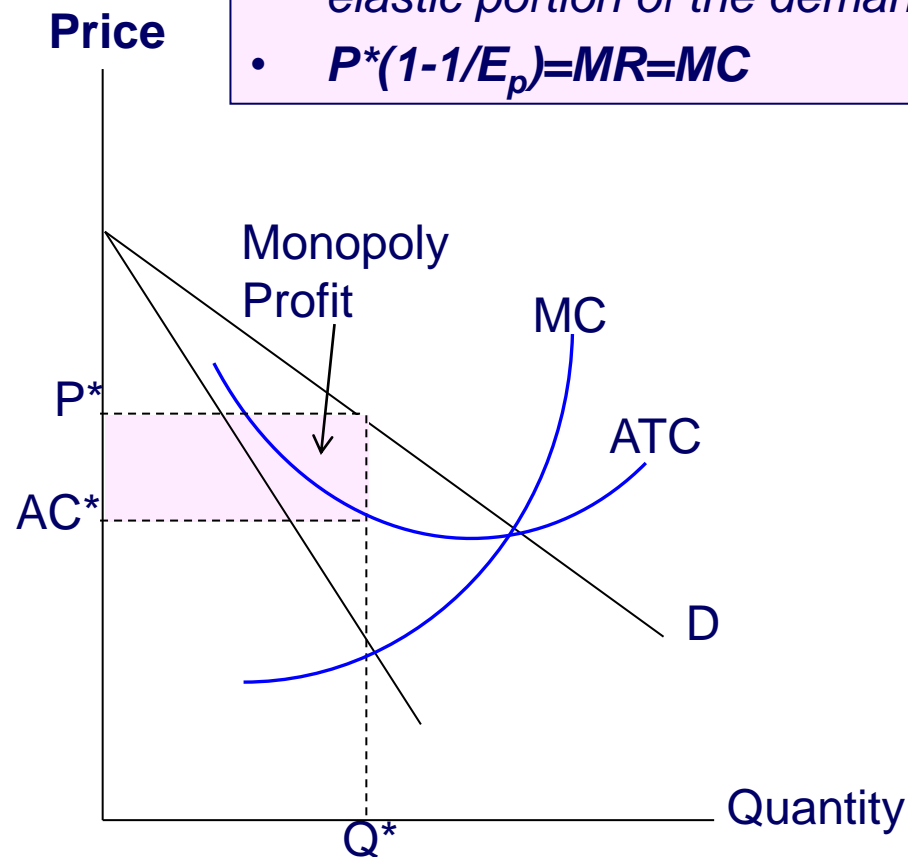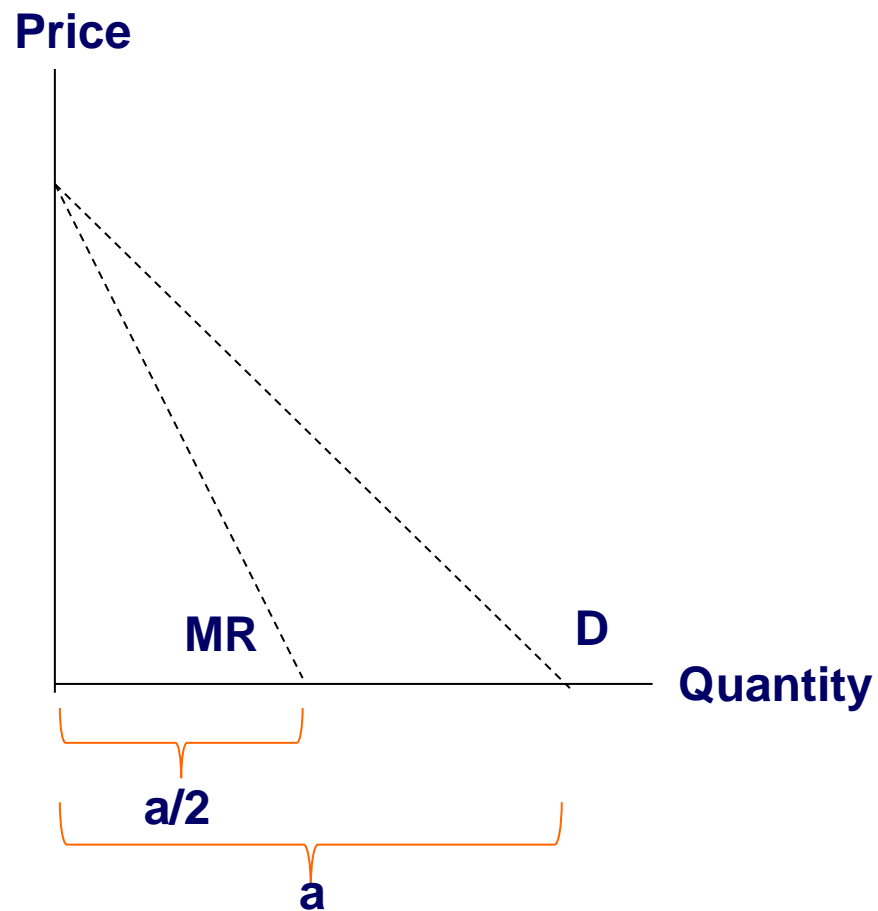
Supply, Optimal Price and Output Analysis in Oligopoly Markets

- *The monopolists want to **maximize profits, not price**, So they will **not** charge the highest possible price.*
- *Monopolists will **maximize profit** when MR=MC.*
- *Positive economic profits can exist in the long run due to the high entry barriers.*
- *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>.*

Regulation over Natural Monopoly

Regulation of a natural monopoly can take the form of average cost pricing or marginal cost pricing.

Price and Cost

*A **natural monopoly** exists when economies of scale are so pronounced that average total cost is falling (MC < ATC) over the entire relevant output range so that the cost of total industry production is minimized when there is only one firm in the industry.*
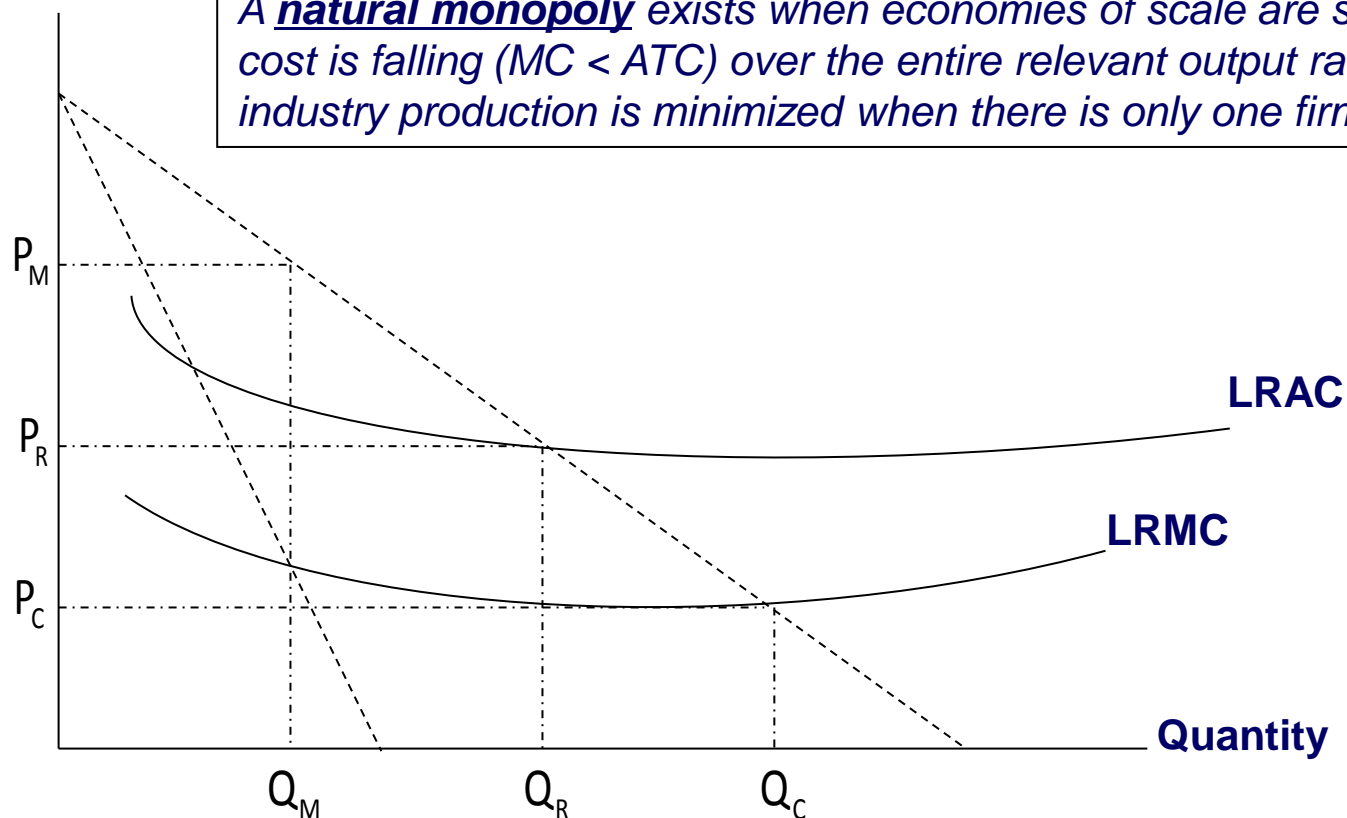
Government Regulation

- *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* 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.

Price Discrimination

- ***Price Discrimination** is the practice of charging different consumers different prices for the same product or service.*
  - ✓ *In first degree price discrimination, price varies by <u>customer</u>.*
  - ✓ *In second degree price discrimination, price varies according to <u>quantity</u> sold.*
  - ✓ *In third degree price discrimination, price varies by location or by customer <u>segment</u>, or in the most extreme case, by individual customer.*
  - ✓ *<u>Price discrimination</u> could be used by the seller to capture all consumer's surplus from clients.*

Price Discrimination

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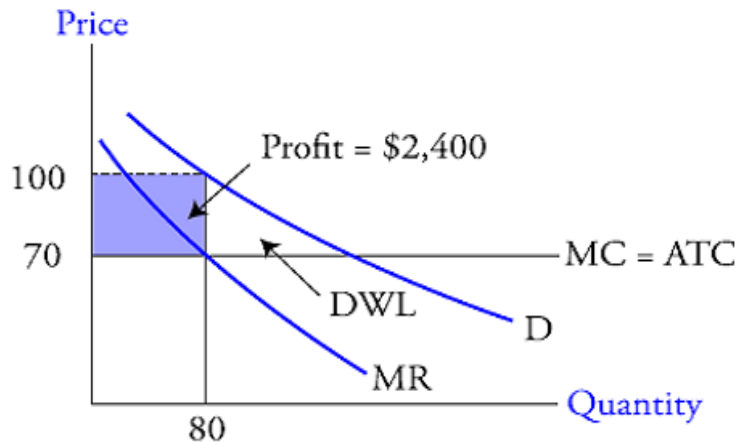
(b) With price discrimination
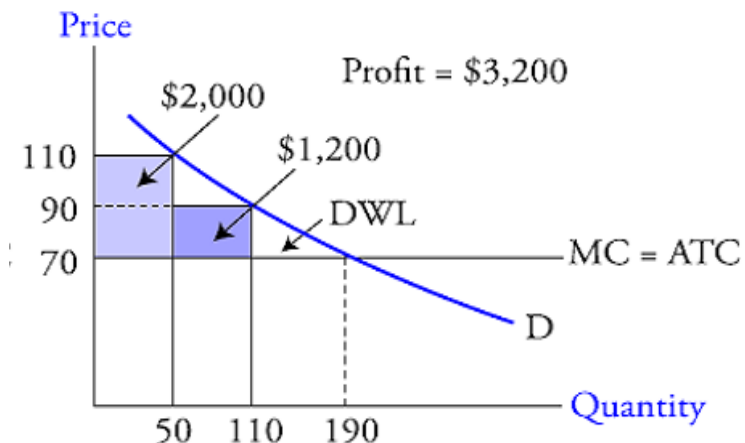
- *Company gains from price discrimination: As long as a firm has groups of customers with downward facing demand curves, profits can be increased through price discrimination.*

- *Winners and losers:*
  - *Price discrimination reduces the allocative inefficiencies that result from pricing above marginal cost.*
  - *The major benefit is more output. The firm gains from those customers with inelastic demand curves while still providing goods to customers with more elastic demand curves.*

EXAMPLE 3

Nicole's monthly demand for visits to her health club is given by the following equation: $Q_D = 20 - 4P$, where Q_D is visits per month and P is euros per visit. The health club's marginal cost is fixed at €2 per visit.

1. Draw Nicole's demand curve for health club visits per month.

2. If the club charged a price per visit equal to its marginal cost, how many visits would Nicole make per month?

3. How much consumer surplus would Nicole enjoy at that price?

4. How much could the club charge Nicole each month for a membership fee?

EXAMPLE 3

Price Discrimination

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3. How much consumer surplus would Nicole enjoy at that price?

4. How much could the club charge Nicole each month for a membership fee?

Solution to 1:

$Q_D = 20 - 4P$, so when $P = 0$, $Q_D = 20$. Inverting, $P = 5 - 0.25Q_D$, so when $Q = 0$, $P = 5$.

Solution to 2:

$Q_D = 20 - 4(2) = 12$. Nicole would make 12 visits per month at a price of €2 per visit.

Solution to 3:

Nicole's consumer surplus can be measured as the area under her demand curve and above the price she pays for a total of 12 visits, or (0.5)(12)(3) = 18. Nicole would enjoy a consumer surplus of €18 per month.

Solution to 4:

The club could extract all of Nicole's consumer surplus by charging her a monthly membership fee of €18 plus a per-visit price of €2. This pricing method is called a two-part tariff because it assesses one price per unit of the item purchased plus a per-month fee (sometimes called an "entry fee") equal to the buyer's consumer surplus evaluated at the per-unit price.

Monopoly vs. Perfect Competition

- *Compared with a perfectly competitive industry, the monopoly firm will produce <u>less total output and charge a higher price</u>.*

Perfect competition vs. monopoly
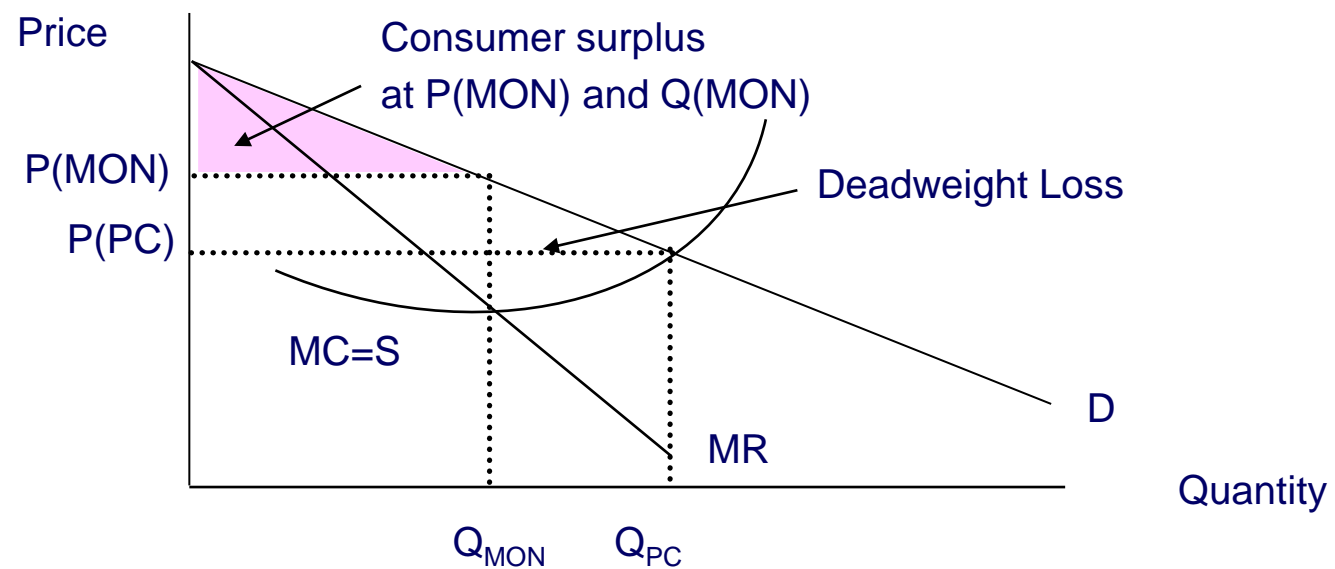
Concentration Measures

- **The N-Firm Concentration Ratio** is the percentage of the value of sales accounted for by the N largest firms in an industry.

  - **Advantage:** It's simple to compute.

  - **Disadvantage:** It does not directly quantify market power or elasticity of demand.

- **Herfindahl-Hirschman Index (HHI)** is sum of the <u>squared</u> market shares of the largest firms in a market.

- **Limitations**
  - ✓ One limitation of the N-firm concentration ratio is that it may be relatively insensitive to mergers of two firms with large market shares.
  - ✓ A second limitation of both of measures is that **barriers to entry** are not considered in either case.

Example: 4-firm concentration ratios

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

Firm	Sales/Total Market Sales
Acme	25%
Blake	15%
Curtis	15%
Dent	10%
Erie	5%
Federal	5%

Answer:

Prior to the merger, the 4-firm concentration ratio for the market is 25 + 15 + 15 + 10 = 65%. After the merger, the Acme + Blake firm has 40% of the market, and the 4-firm concentration ratio is 40 + 15 + 10 + 5 = 70%. Although the 4-firm concentration ratio has only increased slightly, the market power of the largest firm in the industry has increased significantly from 25% to 40%.

Prior to the merger, the 4-firm HHI is $0.25^2 + 0.15^2 + 0.15^2 + 0.10^2 = 0.1175$.

After the merger, the 4-firm HHI is $0.40^2 + 0.15^2 + 0.10^2 + 0.05^2 = 0.1950$, a significant increase.

Aggregate Output, Prices, and Economic Growth

GDP

- *GDP is the total market value of final goods and services produced in a country within a certain time period.*

  ✓ *The value used in calculating GDP are market values of __final__ goods and services.*

- *Expenditure approach: summing the amounts spent on goods and services produced during the period.*

  - *Value-of-final-output method (expenditure method)*
  - *Sum-of-value-added method: summing the additions to value created at each stage of production and distribution.*

- *Income approach: summing the amounts earned by households and companies during the period, including wage income, interest income, and business profits.*

Exhibit 1.   Output, Income, and Expenditure in a Simple Economy: The Circular Flow
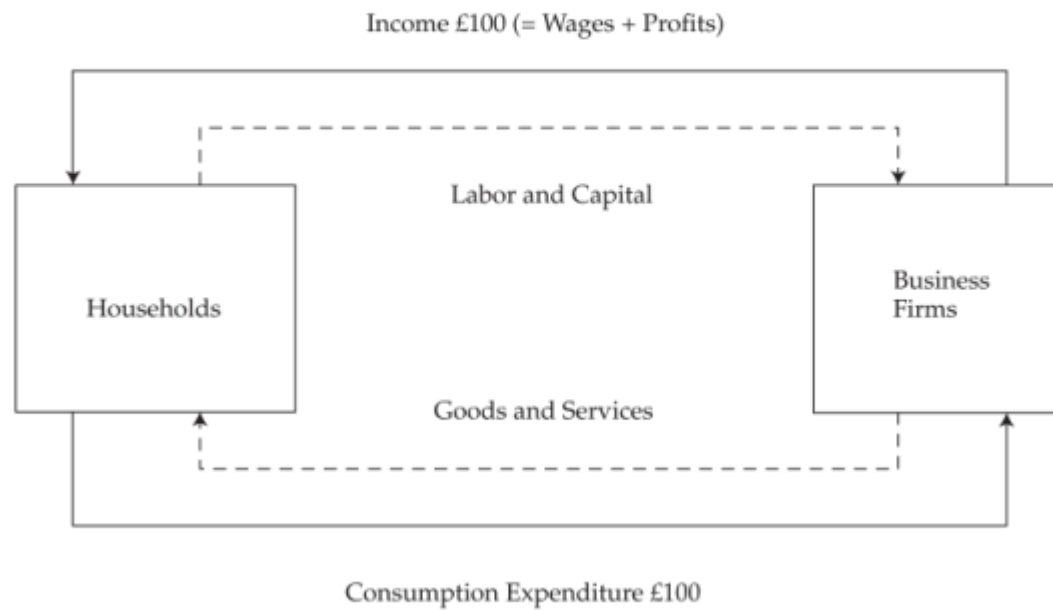
Exhibit 2. Value of Final Product Equals Income Created

	Receipts at Each Stage (€)	Value Added (= Income Created) at Each Stage (€)	
Receipts of farmer from miller	0.15	0.15	Value added by farmer
Receipts of miller from baker	0.46	0.31	Value added by miller
Receipts of baker from retailer	0.78	0.32	Value added by baker
Receipts of retailer from final customer	1.00	0.22	Value added by retailer
	1.00	1.00	
	Value of final output	Total value added = Total income created	

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Stage of Production	Sales Value ($)	Value Added ($)	
1. Production of basic materials			
Steel	1,000	1,000	
Plastics	3,000	3,000	
Semiconductors	1,000	1,000	
Total Inputs		5,000	(sum of 3 inputs)
2. Assembly of car (manufacturer price)	15,000	10,000	= (15,000 − 5,000)
3. Wholesale price for car dealer	16,000	1,000	= (16,000 − 15,000)
4. Retail price	18,000	2,000	= (18,000 − 16,000)
Total expenditures	18,000		
Total value added		18,000	

Thus, the sum of the value added by each stage of production is equal to $18,000, which is equal to the final selling price of the automobile. If some of the inputs (steel, plastics, or semiconductors) are imported, the value added would be reduced by the amount paid for the imports.

Exhibit 3 provides simplified information on the cost of producing an automobile in the United States at various stages of the production process. The example assumes the automobile is produced and sold domestically and assumes no imported material is used. Calculate the contribution of automobile production to GDP using the value-added method, and show that it is equivalent to the expenditure method. What impact would the use of imported steel or plastics have on GDP?

Nominal GDP & Real GDP

- **Nominal GDP** *measures the value of goods and services at current price level.*

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

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

- **Real GDP** *removes the effect of price change, and is a better measure of output level.*

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

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

GDP Deflator

- *GDP deflator: a price index that can be used to convert nominal GDP into real GDP, taking out the effects of changes in the overall price level.*

$$\text{GDP deflator for year t} = \frac{\sum_{i=1}^{N} P_{i,t} Q_{i,t}}{\sum_{i=1}^{N} P_{i,B} Q_{i,t}} \times 100$$

$$= \frac{\text{nominal GDP in year t}}{\text{value of year t output at base year price}} \times 100$$

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

Example: Calculating and using the GDP deflator

1. GDP in 20X2 is $1.80 billion at 20X2 prices and $1.65 billion when calculated using 20X1 prices. Calculate the GDP deflator using 20X1 as the base period.

2. Nominal GDP was $213 billion in 20X6 and $150 billion in 20X1. The 20X6 GDP deflator relative to the base year 20X1 is 122.3. Calculate real GDP for 20X6 and the compound annual real growth rate of economic output from 20X1 to 20X6.

Answer:

1. GDP deflator = 1.80 / 1.65 × 100 = 109.1, reflecting a 9.1% increase in the price level.

2. Real GDP 20X6 = $213 / 1.223 = $174.16.

   Noting that real and nominal GDP are the same for the base year, the compound real annual growth rate of economic output over the 5-year period is:

   $$\left(\frac{174.16}{150}\right)^{\frac{1}{5}} - 1 = 3.03\%$$

Components of GDP

- *Under the expenditure approach: GDP = C + I + G + (X – M)*

- *Under the income approach: GDP = national income + capital consumption allowance + statistical discrepancy*

  - *Capital consumption allowance (CCA) measures the depreciation of physical capital from the production of goods and services over a period.*

- *National income = compensation of employees (wages and benefits)*

  - *+corporate and government enterprise profits before taxes*

  - *+interest income*

  - *+unincorporated business net income(including rent)*

  - *+indirect business taxes – subsidies*

Having defined GDP and discussed how it is measured, we can now consider the major components of GDP, the flows among the four major sectors of the economy—the household sector, the business sector, the government sector, and the foreign or external sector (comprising transactions with the "rest of the world")—and the markets through which they interact. An expression for GDP, based on the expenditure approach, is

Equation (1)

GDP = C + I + G + (X − M)

where

C = Consumer spending on final goods and services

I = Gross private domestic investment, which includes business investment in capital goods (e.g., plant and equipment) and changes in inventory (inventory investment)

G = Government spending on final goods and services

X = Exports

M = Imports

Exhibit 6. Output, Income, and Expenditure Flows
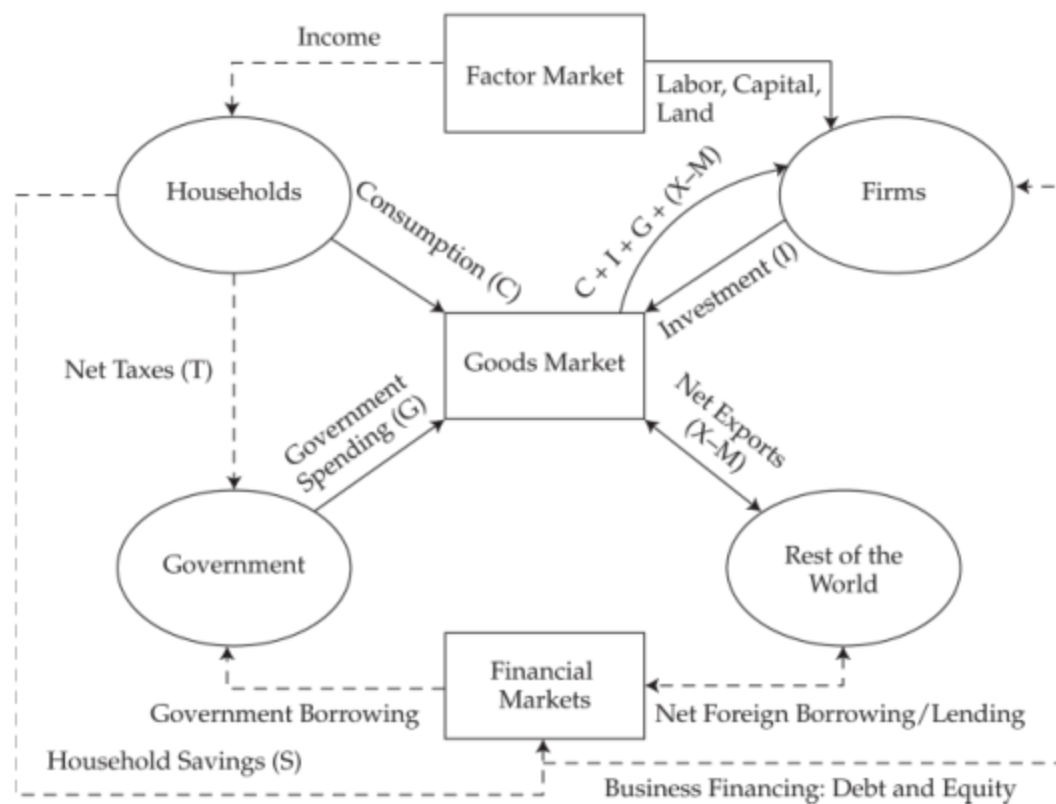
Income based:					
Wages, salaries, and supplementary labor income	695,093	743,392	784,885	818,613	819,066
Corporate profits before tax**	185,855	194,024	203,392	210,756	149,438
Government business enterprise profits before taxes	15,293	14,805	15,493	16,355	12,975
Interest income	61,421	66,404	71,589	83,998	63,947
Unincorporated business net income, including rent	85,234	86,750	90,411	94,559	99,879
Taxes less subsidies on factors of production	61,982	64,536	67,900	71,094	70,604
Taxes less subsidies on products	93,302	96,052	98,816	94,840	93,030
National Income	**1,198,180**	**1,265,963**	**1,332,486**	**1,390,215**	***TBD***
Statistical discrepancy	−581	−759	757	10	−466
Capital consumption allowance	176,246	185,201	196,346	209,383	218,785
GDP at Market Prices	**1,373,845**	**1,450,405**	**1,529,589**	**1,599,608**	***TBD***
Undistributed corporate profits	**91,926**	**96,793**	**90,829**	**110,431**	**56,969**

Corporate income taxes	51,631	47,504	54,867	53,176	34,319
Transfer payments: government to consumer	136,247	145,754	154,609	163,979	174,390
Personal Income	1,035,586	1,106,832	1,174,683	1,224,653	***TBD***
Personal Disposable Income	794,269	853,190	901,634	949,484	965,628
Interest paid to business	14,029	16,978	19,063	19,558	18,115
Consumer transfers to foreigners	4,395	4,483	5,533	5,117	4,737
Personal saving	16,878	29,987	25,435	34,458	***TBD***

* Includes change in government inventory.

** Includes inventory valuation adjustment.

Source: Statistics Canada.

Exhibit 9. GDP Release for the Canadian Economy
(millions of C$ at market prices, seasonally adjusted at annual rates)

	2005	2006	2007	2008	2009
Expenditure based:					
Consumer spending	758,966	801,742	851,603	890,351	898,728
Government spending	259,857	277,608	293,608	314,329	333,942
Government gross fixed investment	37,067	41,151	45,321	50,955	59,078
Business gross fixed investment	255,596	283,382	301,885	313,574	269,394
Exports	519,435	524,075	534,718	563,948	438,553
Deduct: Imports	468,270	487,674	505,055	539,012	464,722
Change in inventories*	10,614	9,362	8,266	5,472	−8,180
Statistical discrepancy	580	759	−757	−9	465
GDP at Market Prices	**1,373,845**	**1,450,405**	**1,529,589**	**1,599,608**	*TBD*

GDP = National income + Capital consumption allowance + Statistical discrepancy

where **national income** is the income received by all factors of production used in the generation of final output:

National income = Compensation of employees
+ Corporate and government enterprise profits before taxes
+ Interest income
+ Unincorporated business net income (proprietor's income)
+ Rent
+ Indirect business taxes less subsidies

Personal Income & Personal Disposable Income

- ***Personal income**: a measure of the pretax income received by households and is one determinant of consumer purchasing power and consumption.*
  - ✓ *Personal income = national income + transfer payments to households – indirect business taxes – corporate income taxes – undistributed corporate profits*

- ***Personal disposable income** = personal income – personal taxes*
  - ✓ *Measure the amount that households have available to either save or spend on goods and services*

Saving and Investment

- *How private savings are related to investment, the government sector, and foreign trade.*

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

- *$GDP = C + S + T$*
  - ✓ *consumption + household saving + net taxes*

- *$S = I + (G - T) + (X - M)$*

- *$(G - T) = (S - I) - (X - M)$*

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

IS Curve

- *Investment (I) and savings (S) are the primary variables that adjust to maintain the balance between expenditure and income*

- *(G-T)+(X-M) decreasing function of aggregate income*

- *(S – I)= (G – T)+(X – M), high aggregate income causes the fiscal deficit to decrease, because taxes increase with income. Higher aggregate income in the domestic market causes the trade surplus (X-M) to decrease, because imports increase with income.*

- *At given real interest rate, the excess of private saving over private investment (S-I): increasing function of aggregate income, the intersection of the two function is the level of aggregate income that satisfies the equation, given a particular real interest rate.*

(a) Functions of aggregate Income

S-I: (G-T)+(X-M)
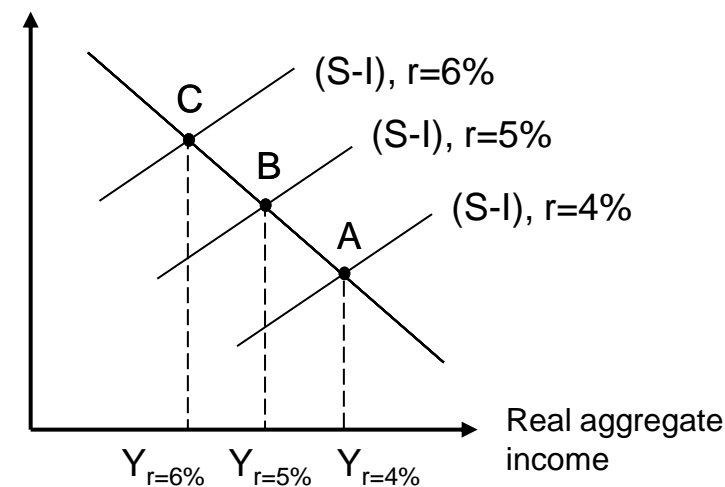
Exhibit 11. Balancing Aggregate Income and Expenditure

Real Interest Rate, r

$S–I (r = r_0)$

$S–I (r = r_1 < r_0)$

$(G–T) + (X–M)$
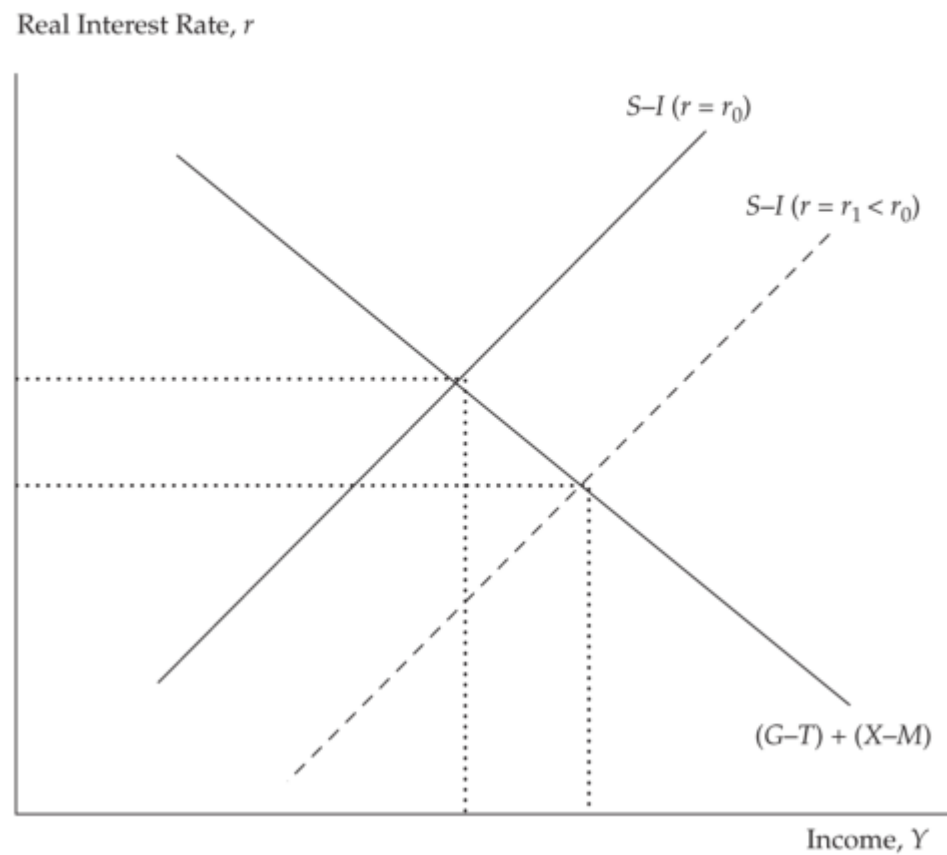
Income, Y

IS Curve

- *The **IS curve** plots the combinations of income and the real interest rates for which aggregate output (and income) equal planned expenditure*

- *If income and expenditure are to remain in equilibrium, there must be an **inverse relationship between the real interest rate and income.***

(b) The IS Curve
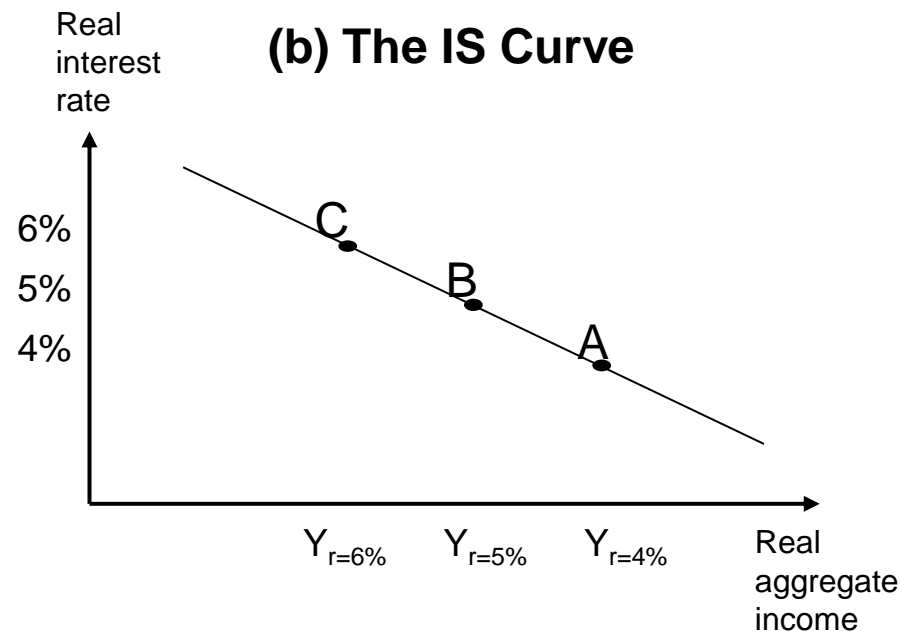
LM Curve

- *Examining the relationship between supply and demand in the financial markets --- **LM curve**.*

- *LM curve: 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.*

- *Quantity theory of money: $MV = PY$*

  $M/P = (M/P)_D = kY$ (k=1/v)

- *Demand for money is inversely related to the real interest rate, the higher the real interest rate, the less willing people are to hold cash balances.*

- *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 increase in real income must be offset by a decrease in demand for money from an increase in the real interest rate to keep the equation in balance.*

LM Curve

- *This means 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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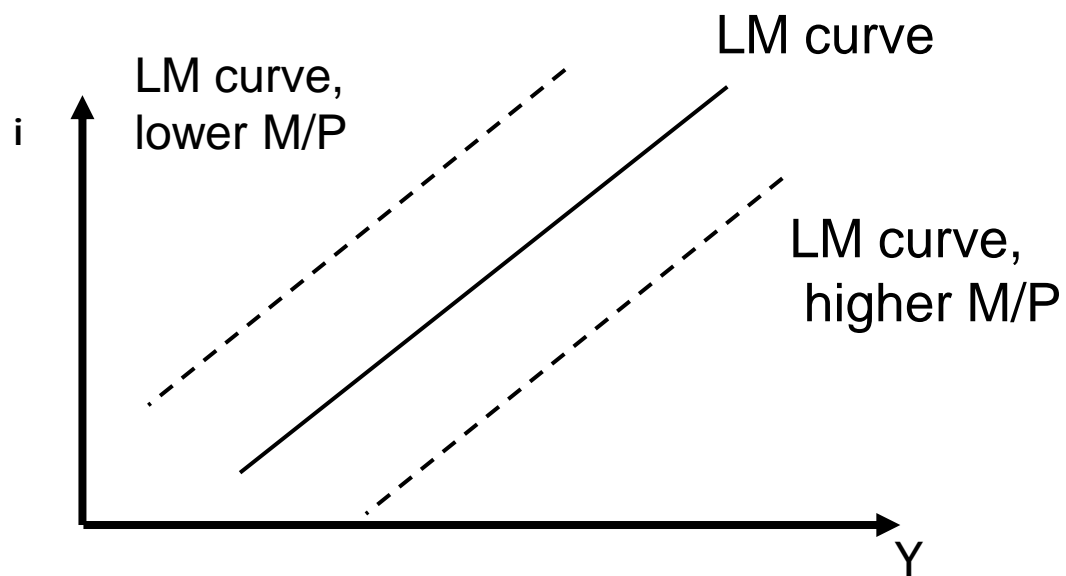
The Aggregate Demand Curve
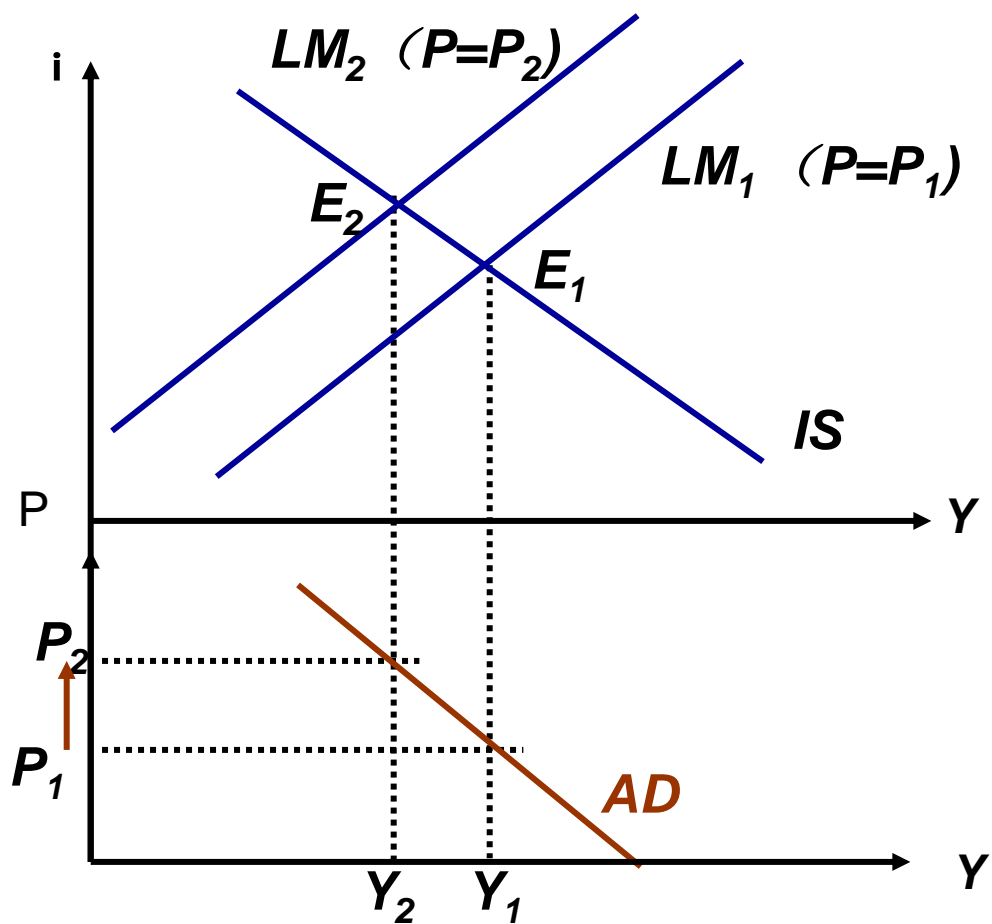
The Aggregate Demand Curve

- *When the IS and LM curves are combined, the point at which they intersect represents the levels of the real interest rate and income 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 equilibrium levels of prices and real income (real GDP) for a given level of the real money supply.*

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

- *The AD curve is downward sloping, higher price levels reduce real wealth, increase real interest rates, and make domestically produced goods more expensive– reduce the quantity of domestic output demanded.*

The Aggregate Supply

- *AS curve describes the relationship between the price level and the quantity of real GDP supplied*

- *VSRAS: assume that wages, input costs, and prices are fixed, producers can increase or decrease output without affecting price --- perfectly elastic*

- *SRAS: output prices change proportionally to price level, input prices are sticky. – an increasing function of the price level, upward sloping SRAS curve*

- *LRAS: all price can vary in the long run. vertical at potential (full-employment)--- perfectly inelastic (potential GDP)*

The Aggregate Supply

LRAS

P

SRAS

VSRAS

Y

Potential GDP

(full employment)
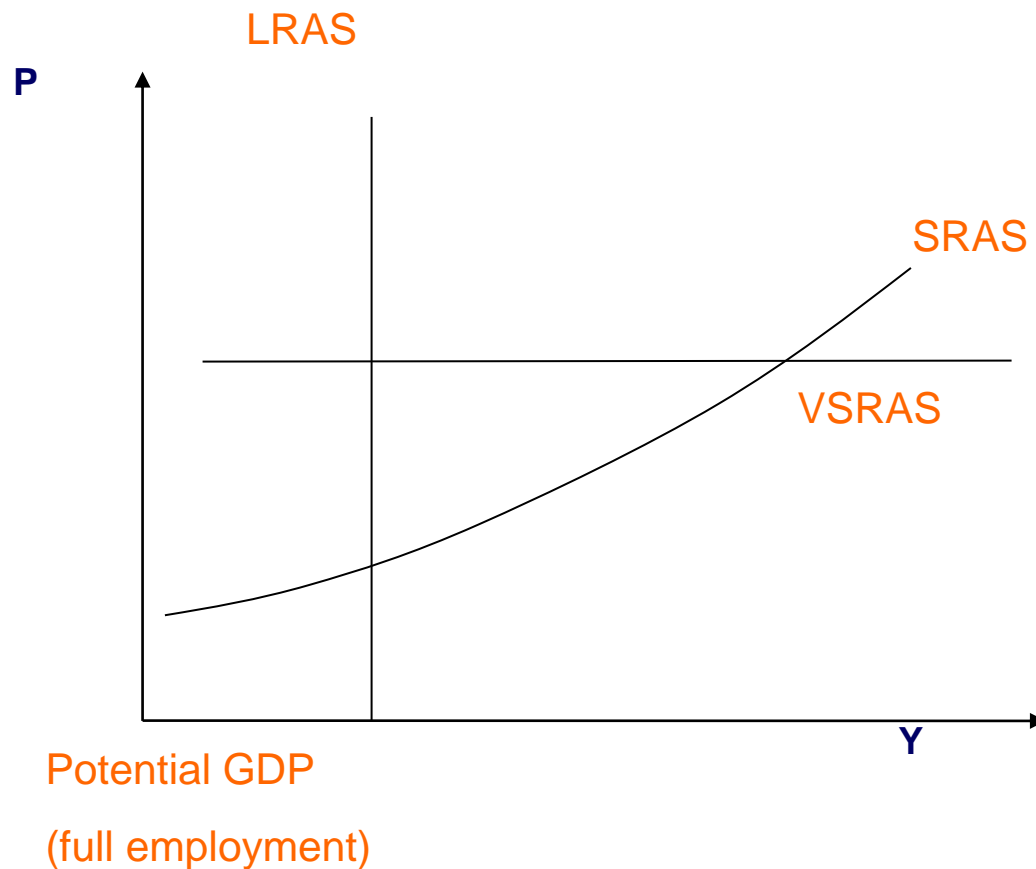
Macroeconomic Equilibrium

• Equilibrium occurs when AD and AS curve intersect.
• **Short-run macroeconomic equilibrium** occurs at the point of intersection of the <u>AD curves and the SRAS curve</u>.
• **Long-run macroeconomic equilibrium** occurs at the intersection of the <u>AD curve and the LRAS curve</u>

Shifts in AD Curve

- *Increase in consumer's wealth*

- *Business expectations*

- *Consumer expectations of future income*

- *High capacity utilization*

- *Expansionary monetary policy*

- *Expansionary fiscal policy*

- *Exchange rates*

- *Global economic growth*

- *Movement along AS and AD curves reflect the impact of a change in the price level or the quantity demanded and the quantity supplied.*

Exhibit 18.   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

Shifts in Supply Curve

- *Shifts in SRAS Curve*

  - *Nominal wages*

  - *Input prices*

  - *Expectations of future output prices*

  - *Taxes and government subsidies*

  - *Exchange rates*

- *Shifts in LRAS Curve（LRAS curve is vertical at the potential (full-employment) level of real GDP）*
  - *supply of labor and quality of labor forces(human capital)*
  - *supply of natural resources*
  - *supply of physical capital*
  - *productivity and technology*

Recessionary Gap

Price Level

LAS

SAS₁

P₁

AD₁

Real GDP

GDP₁
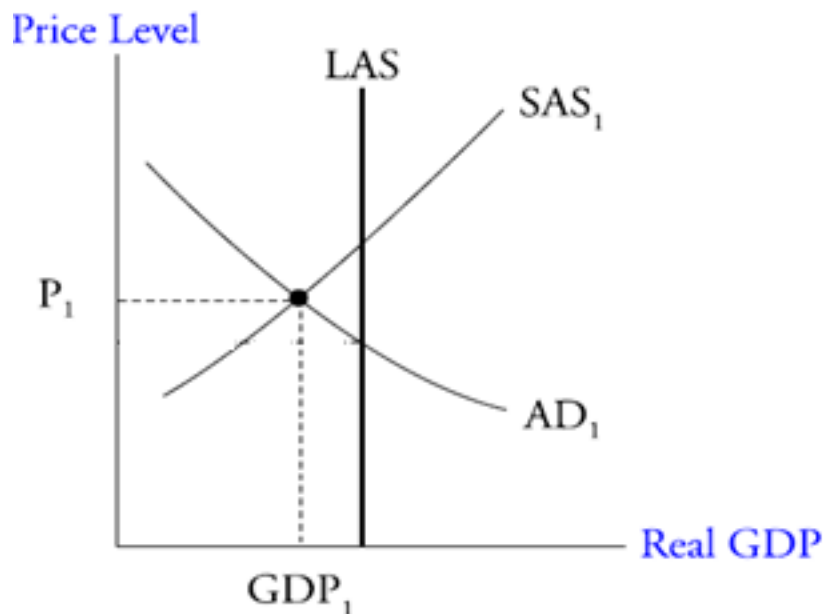
- *Recessionary gap is the result of a leftward shift of AD curve.*
- *The economy is in a recession.*
- *Companies reduces their workforce and unemployment rate rises.*

- *Corporate profits, commodity prices, interest rates, demand for credit will decline*
- ***Investment strategy***:
  - ***Reduce investments in***: *cyclical companies, commodities/commodity-oriented companies, speculative equity securities, fixed-income securities with low credit ratings.*
  - ***Increase investments in***: *defensive companies, investment-grade or government-issued fixed-income securities, long-maturity fixed-income securities*

Exhibit 21. Long-Run Macroeconomic Equilibrium
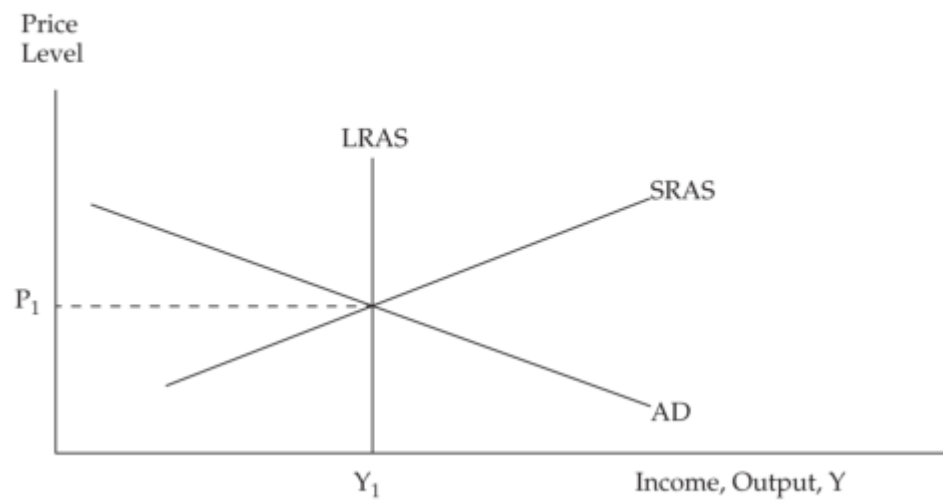
Inflationary Gap
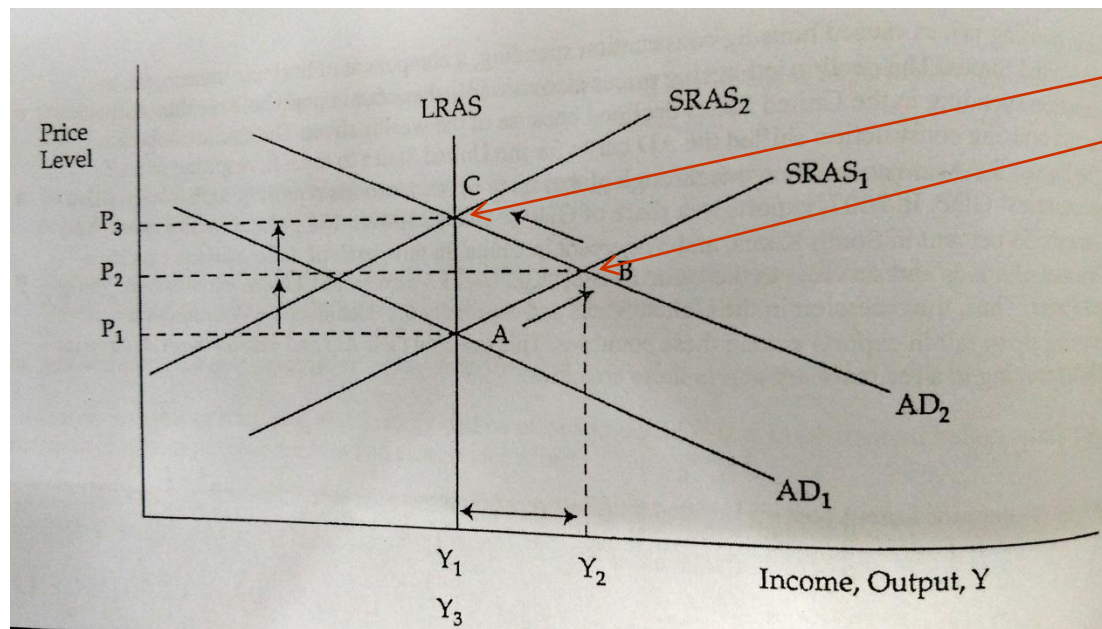
Long-run equilibrium

Short-run equilibrium

- *Inflationary gap is the result of a rightward shift of AD curve.*
- *The economy will face inflation.*
- *Companies increases their production and workforce, and unemployment rate declines.*

- *Corporate profits, commodity prices, interest rates, inflationary pressure will rise*
- ***Investment strategy:***
  - ***Reduce investments in**: defensive companies, fixed-income securities, especially longer-maturity securities.*
  - ***Increase investments in**: cyclical companies, commodities/commodity-oriented companies*

Stagflation

- *Stagflation*: *high unemployment and increasing inflation*

- *Stagflation is generally associated with a sharp decrease in AS.*
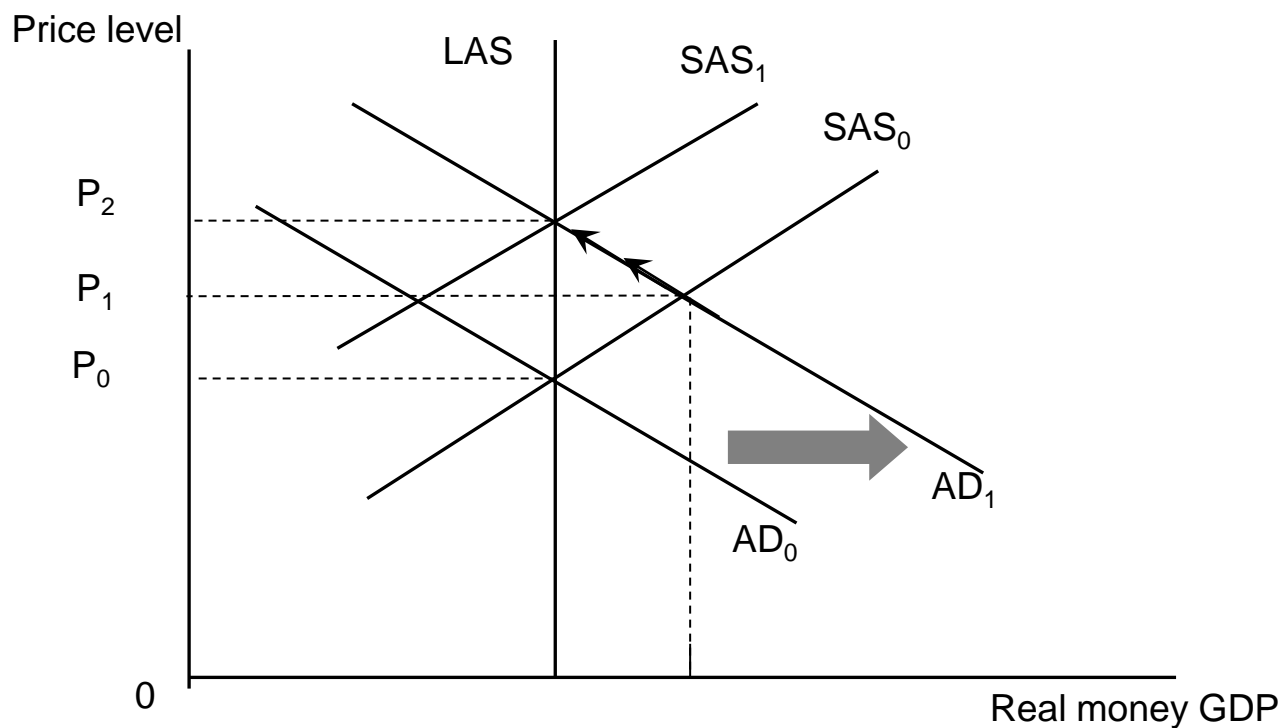
Stagflation

- *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 mark 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*
- *May be a slow process that make it politically risky for the government to take no immediate action*

- ***Investment strategy***:
  - *Reduce investments in:*
    - ***Fixed income*** *as nominal interest rate may rise due to increasing inflationary pressure*
    - ***Equity securities*** *as profit margins are squeezed and output declines*
  - *Increase investments in:*
    - ***commodities/commodity-oriented companies*** *as prices and profit is likely to rise*

Figure 15: Short-Run Macroeconomic Effects

Type of Change	Real GDP	Unemployment	Price Level
Increase in AD	Increase	Decrease	Increase
Decrease in AD	Decrease	Increase	Decrease
Increase in AS	Increase	Decrease	Decrease
Decrease in AS	Decrease	Increase	Increase

Figure 16: Changes in Aggregate Supply and Aggregate Demand

(a) AD and SRAS increase

(b) AD and SRAS decrease

(c) AD increases, SRAS decreases

(d) AD decreases, SRAS increases
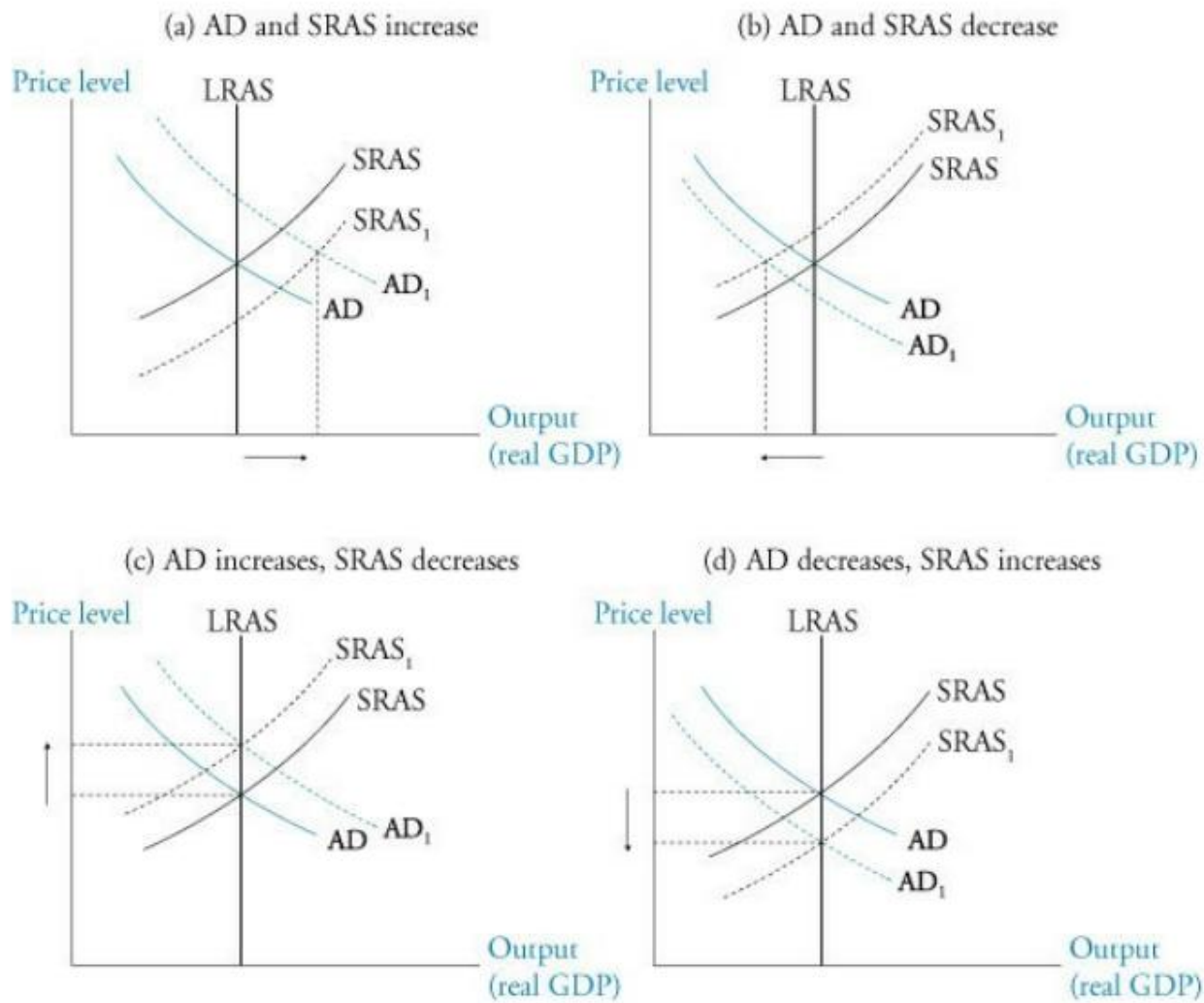
Production Function

- *Production function* relates economic output to the supply of labor, the supply of capital and total factor productivity

- Production Function: $Y = A \times f(L, K)$

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

- $Y/L = A \times f(K/L)$
  - labor productivity can be increased by either improving technology or increasing physical capital per worker (capital-to-labor ratio)

- *Assumptions of Production Function*
  - *Constant returns to scale*: output will increase by the same percentage if all the inputs increase proportionally
  - *Diminishing marginal productivity of any input*:
    - Long-term sustainable growth cannot be achieved solely by capital deepening investment.
    - There will be a convergence of income between developing countries and developed ones.
    - The only way to sustain growth in potential GDP per capita is to improve technology or growth in total factor productivity.

Sources of Economic Growth

- *Labor supply*
  - *Total hours worked= labor force $\times$ average hours worked per worker*
- *Human capital*
  - *accumulated knowledge and skill that workers acquire from education, training, and life experience.*
- Physical capital stock
- Technology
  - *TFP growth= growth in potential GDP- W_L (growth in labor) -W_C (growth in capital)*
- Natural resources (renewable and non-renewable)

Measures of Sustainable Economic Growth

By growth accounting equation

- *Sustainable rate of economic growth: the rate of increase in the economy's productive capacity*

- *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 respectively*

By labor productivity

- *Labor productivity is the quantity of outputs a worker can produce in a working hour.*

- *Labor productivity = real GDP/ Aggregate working hours*

- *Growth in labor productivity = growth in technology + W_C (growth in the capital-to-labor ratio)*
- *In developed countries, technological advances that increase total factor productivity are the main source of sustainable economic growth*

- *potential GDP = aggregate hours worked x labor productivity*

- *Potential growth rate = long-term growth rate of labor force + long-term labor productivity growth rate*

Understanding Business Cycles

Phases of Business Cycle

- *The business cycle is characterized by fluctuations in economic activity.*
- *Real GDP and the rate of unemployment are key variables used when determining the current phase of the cycle.*
- *The four phases of the business cycle are:*
  - *Expansion: A speedup in the pace of economic activity*
  - *Peak: The upper turning of a business cycle*
  - *Contraction/recession: A slowdown in the pace of economic activity*
  - *Trough: The lower turning point of a business cycle, where a contraction turns into an expansion*

EXAMPLE 1

When Do Recessions Begin and End?

A simple and commonly referred to rule is: A recession has started when a country or region experiences two consecutive quarters of negative real GDP growth. Real GDP growth is a measure of the "real" or "inflation-adjusted" growth of the overall economy. This rule can be misleading because it does not indicate a recession if real GDP growth is negative in one quarter, slightly positive the next quarter, and again negative in the next quarter. Many analysts question this result. This issue is why, in some countries, there are statistical and economic committees that apply the principles stated by Burns and Mitchell to several macroeconomic variables (and not just real GDP growth) as a basis to identify business cycle peaks and troughs. The National Bureau of Economic Research (NBER) is the well-known organization that dates business cycles in the United States. Interestingly, the economists and statisticians on NBER's Business Cycle Dating Committee analyze numerous time series of data focusing on employment, industrial production, and sales. Because the data are available with a delay (preliminary data releases can be revised even one year after the period they refer to), it also means that the Committee's determinations may take place well after the business cycle turning points have occurred. As we will see later in the reading, there are practical indicators that may help economists understand in advance if a cyclical turning point is about to happen.

1. Which of the following rules is *most likely* to be used to determine whether the economy is in a recession?

    A. The central bank has run out of foreign reserves.

    B. Real GDP has two consecutive quarters of negative growth.

    C. Economic activity experiences a significant decline in two business sectors.

2. Suppose you are interested in forecasting earnings growth for a company active in a country where no official business cycle dating committee (such as the NBER) exists. The variables you are *most likely* to consider to identify peaks and troughs of a country's business cycle are:

    A. inflation, interest rates, and unemployment.

    B. stock market values and money supply.

    C. unemployment, GDP growth, industrial production, and inflation.

Solution to 1:

B is correct. GDP is a measure of economic activity for the whole economy. Changes in foreign reserves or a limited number of sectors may not have a material impact on the whole economy.

Solution to 2:

C is correct. Unemployment, GDP growth, industrial production, and inflation are measures of economic activity. The discount rate, the monetary base, and stock market indexes are not direct measures of economic activities. The first two are determined by monetary policy, which react to economic activities, whereas the stock market indexes tend to be forward looking or leading indicators of the economy.

Business Cycle Phases
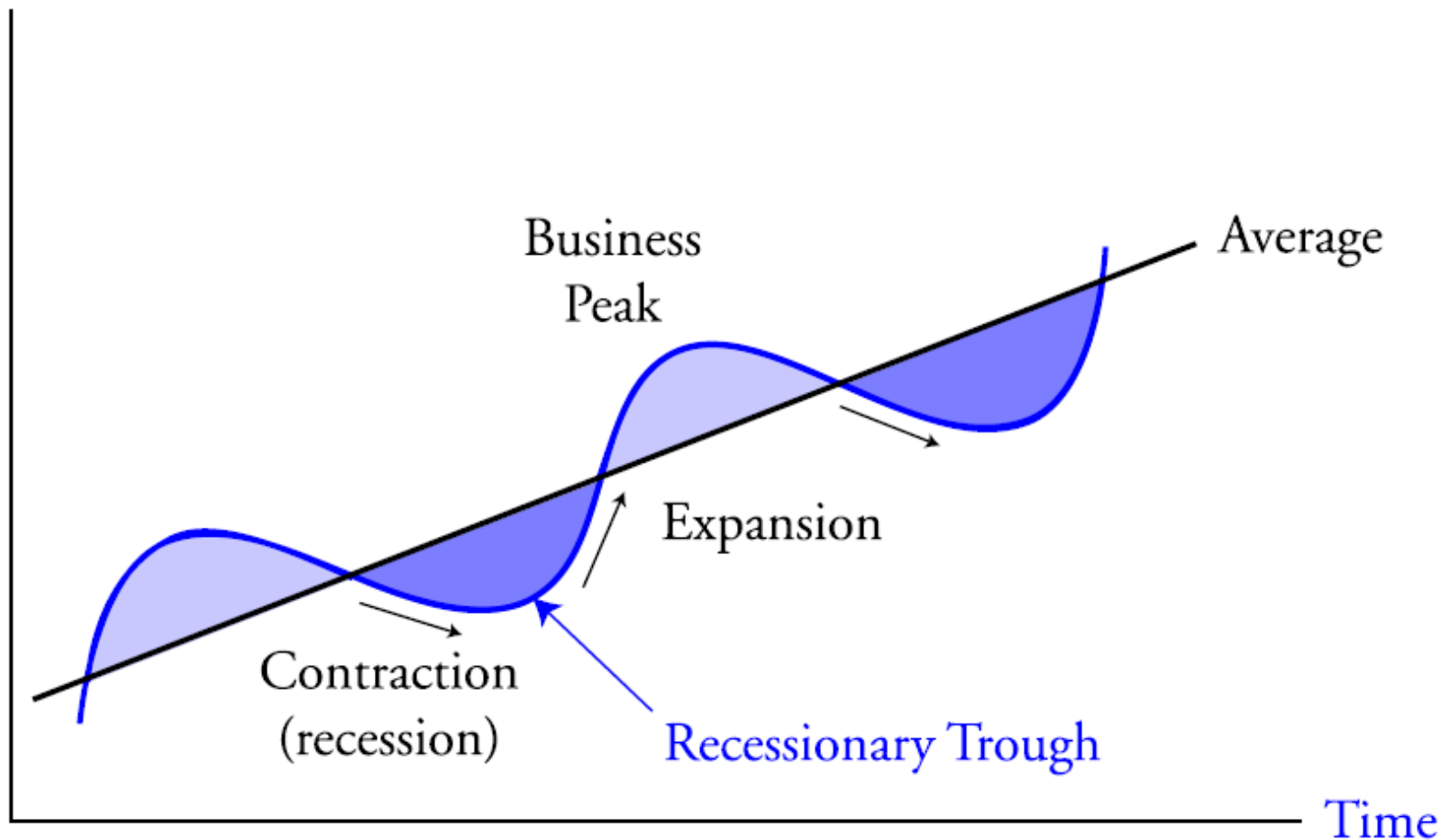
Panel A: Representation of a Business Cycle
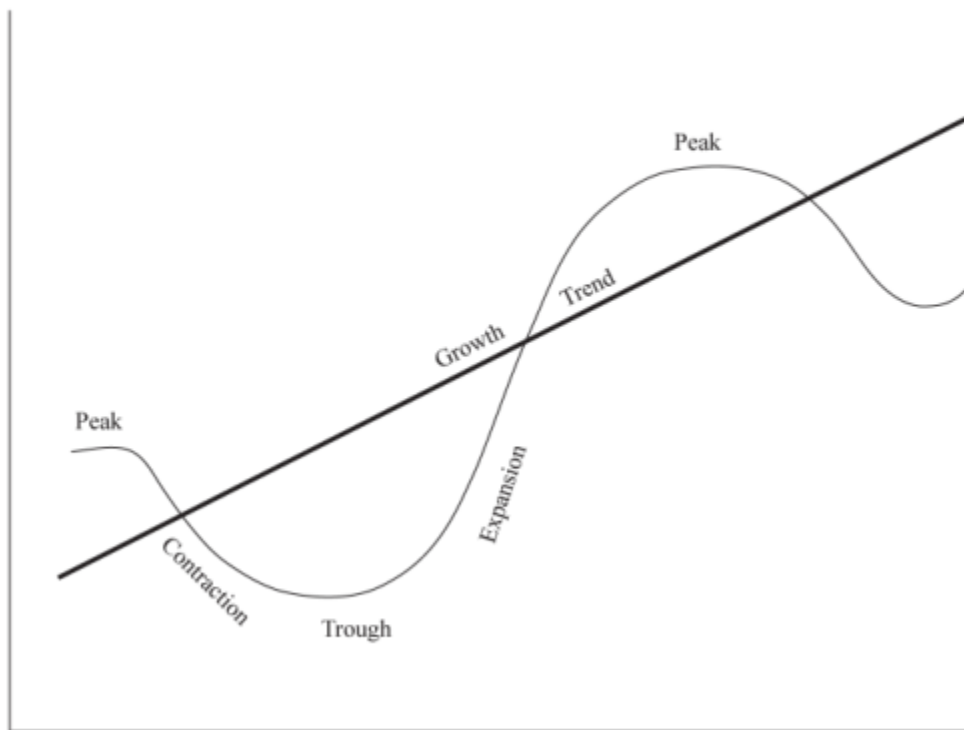
Panel B: Characteristics

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

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

Phases of Business Cycle

- *Resource use through the business cycle*

    - ✓ *Fluctuation in Capital spending*
    - ✓ *Fluctuation in Inventory levels*
    - ✓ *Consumer Behavior*

- *Housing sector behavior*
- *External trade sector behavior*

Theories of the Business Cycle

Neoclassical economists believe:

- *Equilibrium could be achieved by "invisible hand, or free market".*
- *Interest rates, money wages change rapidly to restore LR equilibrium at full employment.*
- *Supply creates its own demand.*

Austrian school believe:

- *Business cycle starts with government trying to boost economy with expansionary monetary policy.*
- *Government intervention should be limited.*

Theories of the Business Cycle

- **Keynesian economists** *believe:*
    - *Business cycles are caused by shifts in demand side.*
    - *Wages are "downward sticky," the force necessary to bring SRAS up is hard to attain, therefore recessions can be prolonged.*
    - *To restore full employment, government should intervene the crisis, increasing AD directly through monetary or fiscal policy.*

- **Monetarists** *believe:*
    - *Both exogenous shocks and government intervention could lead to business cycles .*
    - *The central bank should follow a policy of steady and predictable money supply growth.*
    - *The timing and magnitude of economic policies should be predictable so that uncertainty of economic fluctuation could be avoided.*

Theories of the Business Cycle

- *New Classical School --Real Business Cycle Theory (RBC)*

  - *Fluctuations in supply side (such as change in technology and external shocks) are the main source of economic fluctuations*

  - *Government's anti-cyclical policy could cause a recession.*
  - *The policymakers should not try to counteract business cycles because expansions and contractions are efficient market responses to real external shocks*

- *New Keynesian economists*

  - *Prices and wages adjust slowly*

  - *Small imperfections could cause disequilibrium for a long time.*
    - *Sticky prices*

    - *menu costs*

Unemployment

- *Unemployed: people who are actively looking for a job but are currently not employed.*
    - ***Long-term unemployed***: *people who have been out of job for a long time but are still seeking employment.*
    - ***Frictionally unemployed***: *people who are not working currently but are about to start a new job.*
- *Underemployed: people taking a under-paying job.*
- *Discouraged worker: people who have stopped seeking employments.*
- *Voluntarily unemployed: people voluntarily outside the labor force.*
- *Labor force= have a job + actively looking for a job (exclude…)*
- *Activity ratio(participation ratio) = labor force/population of working age*
- *Unemployment ratio = number of Unemployed / Labor force*
- *Lagging indicator of business cycles*
- *productivity*

Concepts of Inflation

- **Inflation**

  - *Inflation is a persistent increase in the price level*

- **Inflation rate:**

  - *Percentage increase in the price level, compared to the prior year*

- **Hyperinflation:**

  - *Extreme high inflation, that accelerates out of control*

- **Disinflation:**

  - *an inflation rate that is decreasing over time but remains greater than zero*

- **Deflation:**

  - *a persistently decreasing price level, indicating a negative inflation rate.*

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The Measure of Inflation

- **The consumer price index (CPI)**
  - *The CPI measures the average price for a defined "basket" of goods and services. The CPI is one of the primary indicators used to measure the inflation rate.*

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

  - $\text{Inflation rate}= \dfrac{\text{Current CPI — year-ago CPI}}{\text{year-ago CPI}} \times 100$

Laspeyres index: use constant basket of goods and services
Factors cause a Laspeyres CPI to be biased upward as a measure of the cost of living
  - *Substitution bias*
  - *Quality changes*
  - *New goods*
All three biases above leads to upward bias if measure inflation based on Laspeyres index

The Measure of Inflation

- *To address the bias from substitution, reporting agencies use a chained or chain-weighted price index such as a Fisher index*
  - ***A Paasche index*** *uses the current consumption weights, price from the base period, and prices in the current period*
  - ***Fisher index****: geometric mean of a Laspeyres index and a Paasche index*

- *Alternative measure of consumer price inflation is the **price index for personal consumption expenditure (PCE)***
  - *Covers all personal consumption using business surveys.*
- ***Producer price index (PPI)** or **wholesale price index (WPI)***
  - *Reflects price changes faced by domestic producers*
  - *Could influence CPI*

$$\text{Paasche Index}_{02/2010} = I_P = \frac{(70 \times 4) + (60 \times 4.5)}{(70 \times 3) + (60 \times 4.4)} \times 100$$

$$= \frac{550}{474} \times 100 = 116.03$$

The value of the Fisher index is

$$\text{Fisher Index}_{02/2010} = \sqrt{I_P \times I_L} = \sqrt{116.03 \times 112.45} = 114.23$$

where I_L is the Laspeyres index.

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*

- <u>*When cyclical unemployment is zero, the economy is said to be operating at full employment*</u>*. However,* *at full employment, both structural and frictional unemployment still exist.*

- *The* **natural rate of unemployment** *is the rate of unemployment at which the inflation rate will not rise due to the shortage of labor.*

Demand-Pull Inflation

- *An inflation that results from an initial increase in aggregate demand is called*

  demand-pull inflation*,*

- *Commodity price could be a sign of excess demand.*

- *A surplus of money could create inflation.*

  - *Money growth compared to past trends*

  - *Money growth compared to growth of nominal economy*

- *Inflation Expectations*

Cost-Push Inflation (SRAS down)
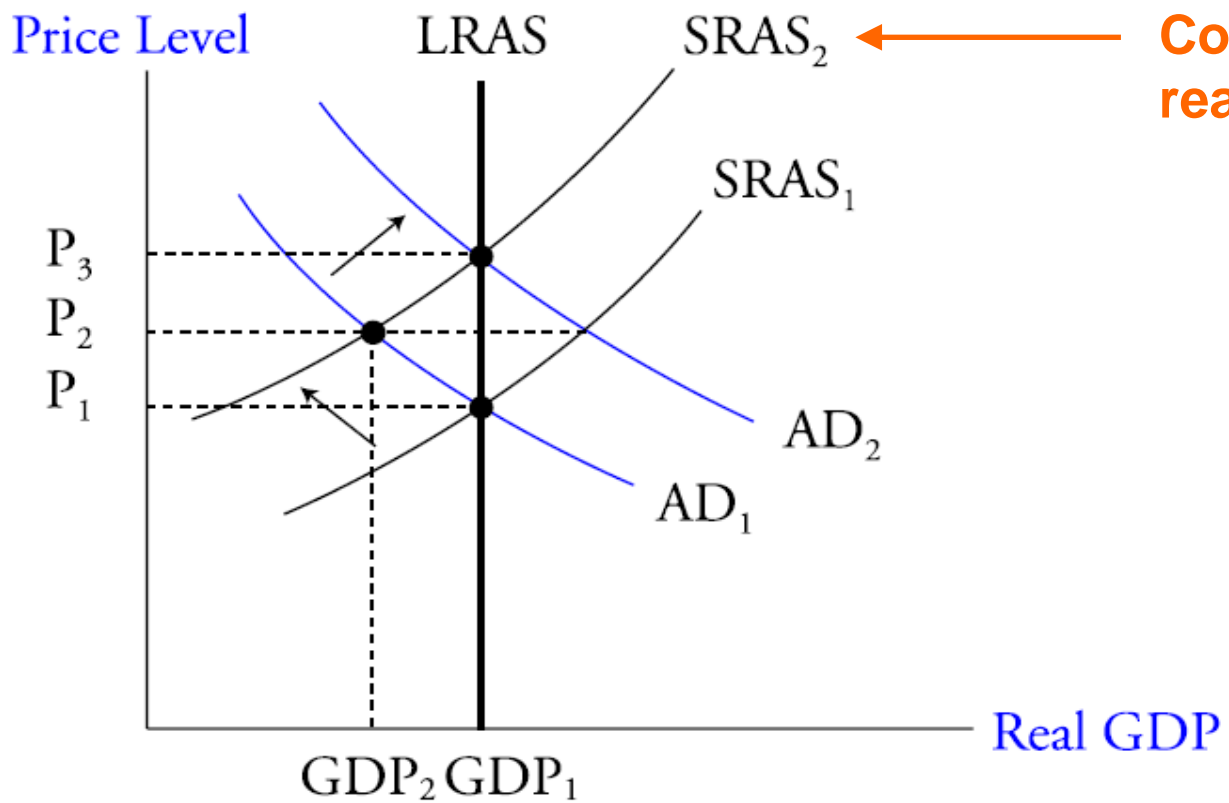
Could result from an increase in real resource price

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Economic Indicator

- *An economic indicator reflects the state of overall economy.*
  - ***Leading indicators****: have turning points precede those of the overall economy*
  - ***Coincident economic indicators****: have turning points close to those of the overall economy*
  - ***lagging economic indicators****: have turning points later than those of the overall economy*

Economic Indicator

- ***Leading Index***
  - *Average weekly hours, manufacturing*
  - *Average weekly initial claims for unemployment insurance*
  - *Manufacturers' new orders, consumer goods and materials*
  - *ISM new order index*
  - *Manufacturers' new orders for non-defense capital goods*
  - *Building permits, new private housing units*
  - *S&P 500 Index*
  - *Leading Credit Index*
  - *Interest rate spread, 10-year Treasury bonds less federal funds rate*
  - *Index of consumer expectations*

Exhibit 5. Leading, Coincident, and Lagging Indicators—United States

Indicator and Description	Reason
Leading	
1. Average weekly hours, manufacturing	Because businesses will cut overtime before laying off workers in a downturn and increase it before rehiring in a cyclical upturn, these measures move up and down before the general economy.
2. Average weekly initial claims for unemployment insurance	This measure offers a very sensitive test of initial layoffs and rehiring.
3. Manufacturers' new orders for consumer goods and materials	Because businesses cannot wait too long to meet demands for consumer goods or materials without ordering, these gauges tend to lead at upturns and downturns. Indirectly, they capture changes in business sentiment as well, which also often leads the cycle.
4. ISM new order index[a]	This index is a diffusion index that reflects the month-to-month change in new orders for final sales. The weakening of demand, which can lead to a recession, is usually first reflected in the decline of new orders.
5. Manufacturers' new orders for non-defense capital goods excluding aircraft	In addition to offering a first signal of movement, up or down, in an important economic sector, movement in this area also indirectly captures business expectations.
6. Building permits for new private housing units	Because most localities require permits before new building can begin, this gauge foretells new construction activity.

7. S&P 500 Index

Because stock prices anticipate economic turning points, both up and down, their movements offer a useful early signal on economic cycles.

8. Leading Credit Index

This index aggregates the information from six leading financial indicators, which reflect the strength of the financial system to endure stress. A vulnerable financial system can amplify and propagate the effects of negative shocks, resulting in a widespread recession for the whole economy.

9. 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.

Leading

10.	Average Consumer Expectations for Business and Economic Conditions	If consumers are optimistic about future business and economic conditions, they tend to increase spending. Because consumption is about two-thirds of the US economy, its future movements offers early insight into the direction ahead for the whole economy.

Coincident

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

Lagging

1.	Average Duration of Unemployment	Because businesses wait until downturns look genuine to lay off, and wait until recoveries look secure to rehire, this measure is important because it lags the cycle on both the way down and the way up.
2.	Inventory–sales ratio	Because inventories accumulate as sales initially decline and then, once a business adjusts its ordering, become depleted as sales pick up, this ratio tends to lag the cycle.
3.	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 labor force 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.
4.	Average bank prime lending rate	Because this is a bank administered rate, it tends to lag other rates that move either before cyclical turns or with them.
5.	Commercial and industrial loans outstanding	Because these loans frequently support inventory building, they lag the cycle for much the same reason that the inventory–sales ratio does.
6.	Ratio of consumer installment debt to income	Because consumers only borrow heavily when confident, this measure lags the cyclical upturn, but debt also overstays cyclical downturns because households have trouble adjusting to income losses, causing it to lag in the downturn.
7.	Change in consumer price index for services	Inflation generally adjusts to the cycle late, especially the more stable services area.

[a] A diffusion index usually measures the percentage of components in a series that are rising in the same period. It indicates how widespread a particular movement in the trend is among the individual components.

Economic Indicator

- **Coincident Index**

  - *Employees on non-agricultural payrolls*

  - *Aggregate real personal income*

  - *Industrial Production Index*

  - *Manufacturing and trade sales*

- **Lagging Index**

  - *Average duration of unemployment*

  - *Inventories to sales ratio*

  - *Change in unit Labor cost*

  - *Average bank prime lending rate*

  - *Commercial and industrial loans*

  - *ratio of Consumer installment debt to income*

  - *Change in consumer price index for services*

Monetary and Fiscal Policy

Monetary and Fiscal Policy

- *Monetary policy: operation by central bank to influence the quantity of money and credit in an economy.*

- *Fiscal policy: government's decision about spending and taxation.*

- *The primary goal of both monetary and fiscal policy is to achieve an economic environment where:*

  - *Growth is stable and positive*

  - *Inflation is stable and low*

Money Supply

- **Narrow money**: the amount of notes (currency) and coins in circulation in an economy plus highly liquid deposits.

- **Broad money**: includes narrow money plus any amount available in liquid assets, which can be used to make purchase.

- M1 (narrow money) includes all currency in circulation, travelers' checks, and demand deposits, checking account.

- M2 (broad money) includes all the components of M1, plus time deposits, savings deposits, and money market mutual fund balances

How Banks Create Money

Deposit $1,000 → BANK1 —— Maintain $200 with FED

BANK1 Lend $800 ↓

BANK2 —— Maintain $160 with FED

BANK2 Lend $640 ↓

BANK3 —— Maintain $128 with FED

BANK3 ↓

etc

→ FED
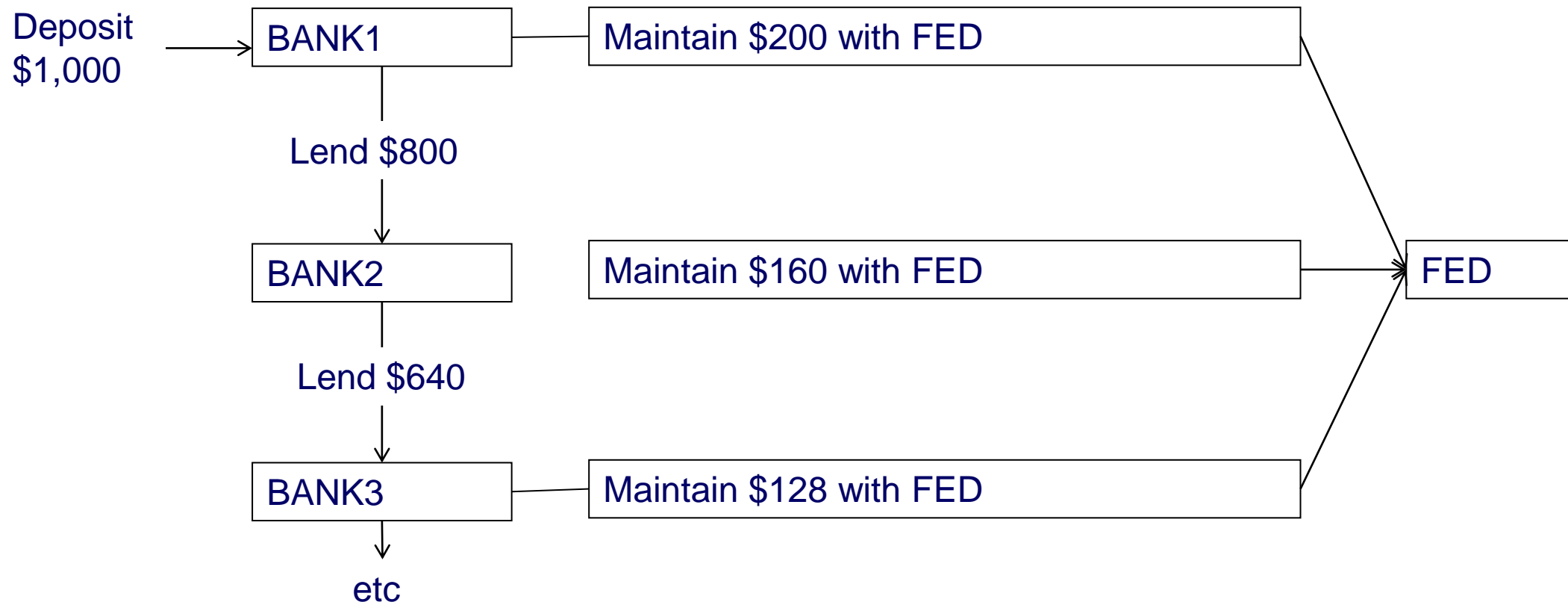
Potential deposit expansion multiplier
= 1/required reserve ratio

Quantity Theory of Money

Quantity equation of exchange: $MV = PY$

money supply $\times$ velocity = price $\times$ real output

• *Money neutrality*: Since **velocity** and **real output** are relatively constant, increases in the money supply lead to **proportional increases in the price level**

• *Monetarists believe that inflation could be controlled by manipulating the rate of growth of the money supply.*

Demand for Money

- **Demand for money** *(opposed to bonds or equities)*
  - *Transaction-related*：*positively related to GDP*
  - *Precautionary: positively related to transaction values and GDP*
  - *Speculative: negatively related to the expected return on other financial assets and positively related to the perceived risk of other financial assets*
  - *The demand schedule is downward sloping because at higher interest rates, the opportunity cost of holding money increases and people will desire to hold less money and more interest-earning assets.*

Demand and Supply of Money

Interest rate (percent per year)

MS$_1$ MS$_0$ MS$_2$

An increase in the money supply lowers the interest rate

A decrease in the money supply raises the interest rate

MD

Real money
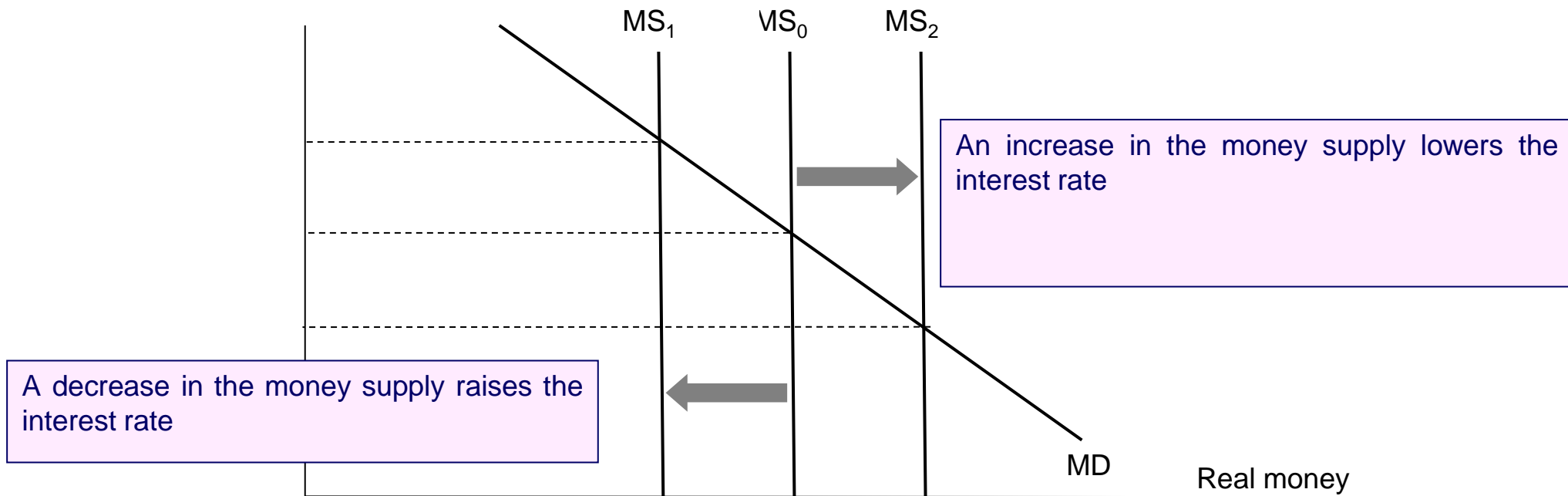
Supply of money
Is determined by the central bank and is not affected by changes in interest rates. Thus the supply of money curve is vertical

Demand and Supply of Money

Interest rate (percent per year)

MS$_0$ MS$_1$

SR

5%

4%

MD

LR

0

Real money (trillions of dollars)

Price level

LAS

SAS$_1$

SAS$_0$

P$_2$

P$_1$

P$_0$

AD$_0$ AD$_1$

0

Real money GDP
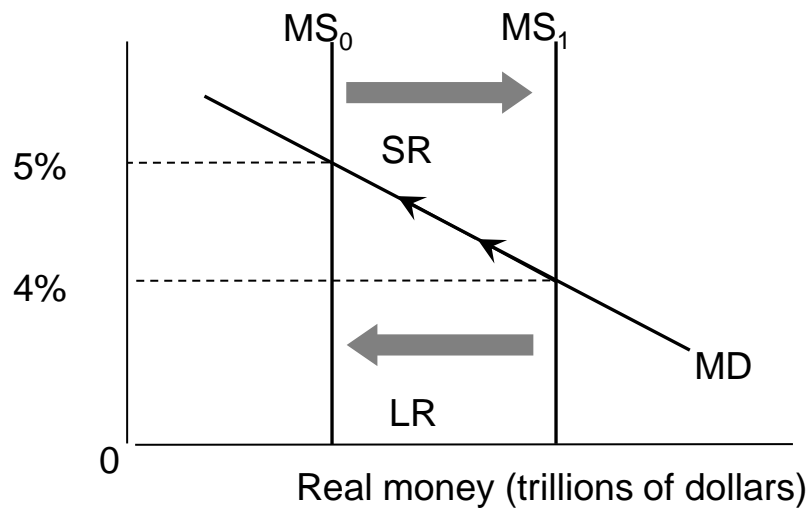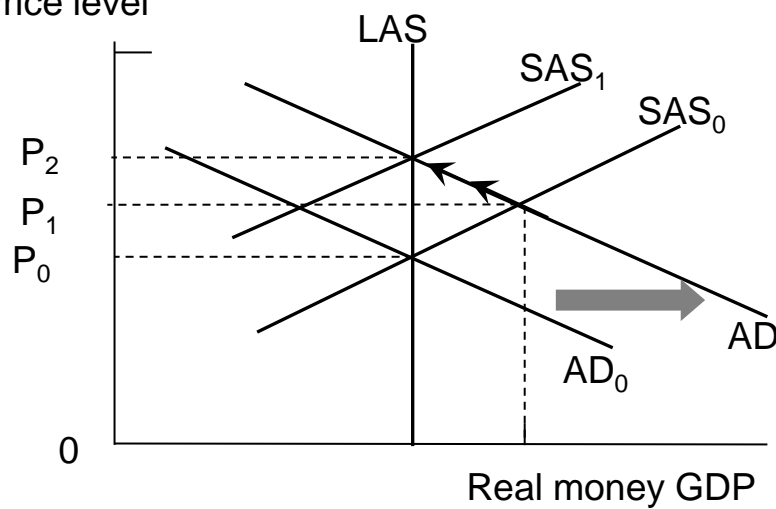
In short-run MS↑ — Interest Rate ↓ — real GDP ↑ — P↑

In long-run MS↑ — Interest Rate → — real GDP → — P↑

Fisher Effect

Nominal interest rate=Real interest rate + expected inflation

• *Related to the concept of money neutrality: over the long run, the growth of money supply will only affect inflation and inflation expectations, but not real interest rate.*

• *Real rates are relatively stable, and changes in interest rates are driven by changes in expected inflation*

• *Investors require an additional return (a risk premium) for bearing inflation uncertainties:*

  • *Nominal interest rate=Real interest rate + expected inflation+ RP*

Central Bank Policy Tools

- *Open market operations*: most often used
  - *Fed buys government securities for cash, reserves increase, money supply increases*
  - *Selling securities decreases the money supply*

- *Required reserve ratio*: seldom changed
  - *Reducing required reserve percentage increases excess reserves and increases the money supply*
  - *Increasing required reserve ratio decreases the money supply*

- **The central bank's policy rate**: *Interest rate member banks pay the Central bank for borrowing.*
  - *Federal funds rate in the U.S.*
  - *By raising the policy rate, Fed discourages banks from borrowing reserves, thus encouraging them to reduce their lending (reduces money supply)*
  - *Decreasing the policy rate tends to increase the money supply*

Roles and Objectives of Central Banks

- *Roles:*

  - *monopoly supplier of the currency*

  - *Banker to the government and the bankers' bank*

  - *The lender of last resort*

  - *Regulator and supervisor of the payments system*

  - *Conductor of monetary policy*

  - *Supervisor of banking system*

- *Objectives*

  - *Primary objective is to control inflation so as to promote price stability.*
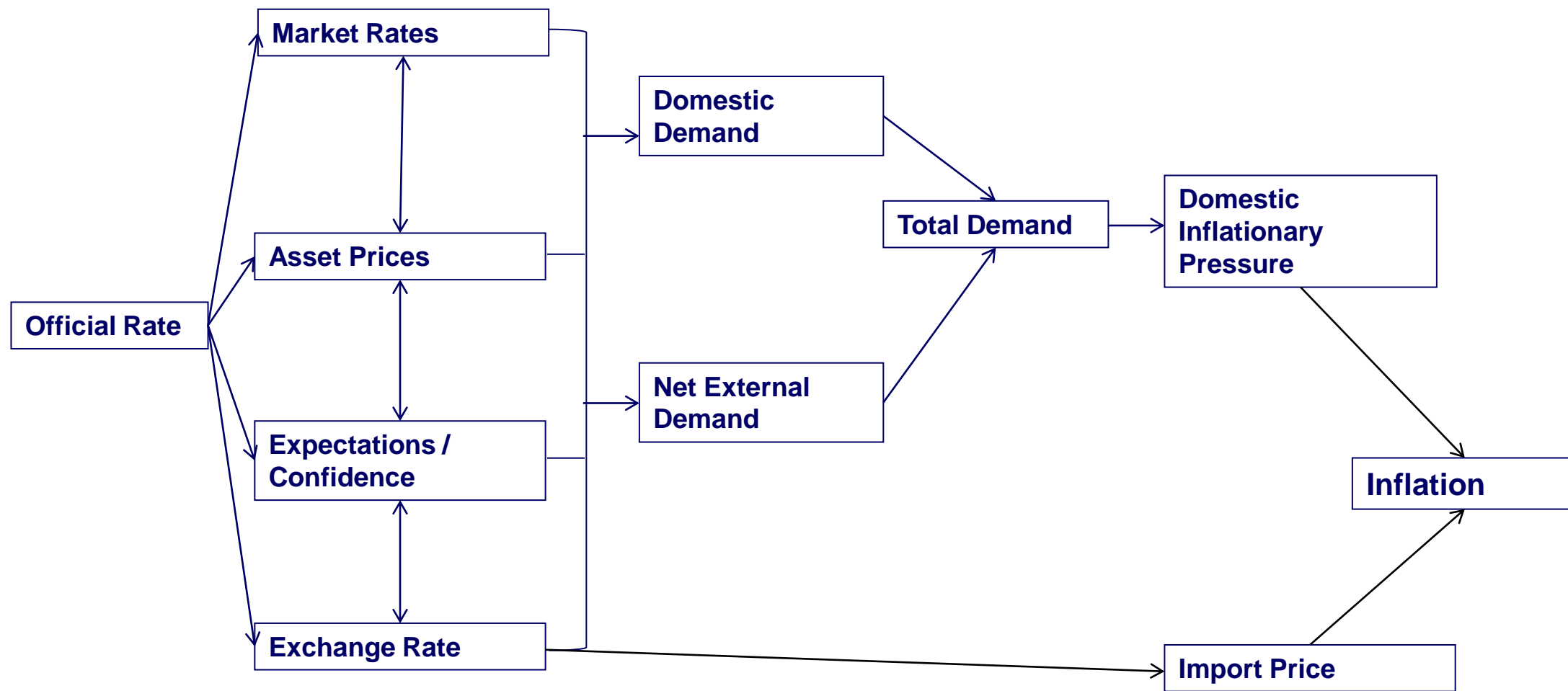
The Costs of Inflation

- ***Expected inflation*** *leads to*
  - *Menu costs*
  - *Shoe leather costs*

- ***Unexpected inflation*** *can in addition lead to:*
  - *Lead to inequitable transfers of wealth between borrowers and lenders.*
  - *Give rise to risk premium in borrowing rates and the prices of other assets.*
  - *Distorted information from market price.*

Inflation Targeting

- *Inflation targeting is to set a target level of inflation and to ensure this target is met by monitoring a wide range of variables.*

- *Three essential factors for inflation targeting to work:*
  - *Central bank independence: monetary policy should be independent of political pressure.*
    - *Operationally and target independent*
  - *Credibility*
  - *Transparency of the central bank's decision- making*

- *Inflation target should not be 0 to avoid the danger of deflation.*

Expansionary / Contractionary

- ***Neutral interest rate*** *is the LT growth rate of money supply*

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

- *Expansionary: policy rate < neutral rate*

- *Contractionary: policy rate > neutral rate*

- **The source of the shock to the inflation rate:**
  - *Demand shock*
  - *Supply shock*

Limitation of Monetary Policy

- *In all, central bank cannot control decisions of individuals and banks that are parts of money creations, and therefore may lose control of money supply.*

- *Monetary policy changes may affect **inflation expectations** to such an extent that long-term interest rates move opposite to short-term interest rates.*

- ***Deflation** is challenging for conventional monetary policy.*

  - ***Liquidity trap**: People may wish to hold greater cash balance without a change in short-term rate*

  - *Banks unwilling to lend greater amounts even with increased excess reserves*

  - *Short term rate cannot be below 0*

Fiscal Policy

- ***Expansionary fiscal policy***: *cut taxes and increase government spending*

- ***Keynesians:*** *fiscal policy can have powerful effects on aggregate demand, output and employment when there is substantial spare capacity in the economy.*

- ***Monetarists:*** *it only has temporary effect on aggregate demand.*

- ***Objective of fiscal policy***:
  - *Influencing economic activity and aggregate demand*
  - *Redistributing wealth and income*
  - *Allocating resources among economic agents*

Automatic Stabilizers

- ***Automatic stabilizers*** *are built-in fiscal devices*

- *Budget surplus/deficit=government revenue-expenditure*
  - *Increase of budget surplus → contractionary fiscal policy*
  - *Increase of deficit → expansionary fiscal policy*

- ***taxes:*** *Taxes rise during expansion and fall during recession*

- ***spending:*** *Government payments based on need, such as unemployment compensation, increase during a recession and decrease during an expansion*

Fiscal Policy Tools

- *Spending tools*
  - *Transfer payments*
  - *Current spending*
  - *Capital spending*

- *Revenue tools*
  - **Direct taxes**: *on income or wealth, which includes income taxes, taxes on income for national insurance, wealth taxes, estate taxes, corporate taxes, capital gains taxes.*
  - **Indirect taxes**: *on goods and services, which includes sales taxes, VATs and excise taxes*

Advantage and Disadvantage of Fiscal Policy Tools

- Advantages of fiscal policy tools
  - Indirect taxes can be adjusted almost immediately.
  - Social policies can be adjusted almost instantly.

- Disadvantages of fiscal policy tools
  - Direct taxes take time to implement
  - Capital spending takes long time to implement

Fiscal Policy Multipliers

- *Fiscal Policy decisions produce **multiplier** or magnified effects*
  - *Government purchases multiplier*
  - *Tax multiplier*
  - *Balanced budget multiplier*

MPC: marginal propensity to consume
MPC=1-MPS

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

- ***Government purchases multiplier:*** *An increase in government spending causes even greater increase in AD*
- ***Tax multiplier:*** *An increase in taxes causes a decrease in AD of more than the amount of the tax increase*
- ***Balanced budget multiplier:*** *Government purchases multiplier is stronger than the tax multiplier, equal increases in taxes and spending have positive effect on AD*

Discretionary fiscal policy

- *Discretionary fiscal policy refers to government spending and taxing decisions designed to stabilize the economy.*

- *Limitations of discretionary fiscal policy*
  - *Recognition lag: the policymaker needs time to realize the stage of the economy.*
  - *Action lag: it takes t time to pass new tax law.*
  - *Impact lag: it takes time for the effects of the fiscal policy change to be felt.*

effect   finding   decision   Effect of policy

Difficulties in Implementation of Fiscal Policy

- *Misreading economic statistics*
  - *full employment level not precisely measurable*

- *Crowding-out effect*
  - *crowd out private investment*

- *Supply shortages*
  - *Inflationary pressure due to resource constraints*

- *Limits to deficits*
  - *high deficit lead to higher interest rate*

- *Multiple targets*
  - *high unemployment vs. high inflation*

Determine Fiscal Policy

- *Changes in the surplus or deficit to determine if the fiscal policy is expansionary or contractionary*
  - *Increase (decrease) in surplus is indicative of a contractionary (expansionary) fiscal policy.*
  - *Increase (decrease) in deficit is indicative of an expansionary (contractionary) fiscal policy*

- *Issue: in recession, transfer payments increased and tax revenue decreased---deficit*

Interaction of Monetary and Fiscal Policy

- *Expansionary fiscal and monetary policy*
  - *Int rate lower, private & public sectors expand*

- *Contractionary fiscal and monetary policy*
  - *Int rate higher, private & public sectors contract*

- *Expansionary fiscal + contractionary monetary policy*
  - *Int rate higher, Gov spending as proportion of GDP increases*

- *Contractionary fiscal + expansionary monetary policy*
  - *Int rate fall, Gov spending as proportion of GDP decreases*
  - *Private sector grow as result of lower int rate.*

International Trade and Capital Flows

Basic Definitions

- **GDP:** *measures the market value of all final goods and services produced by factors of production* located within a country *for a given period of time.*

- **GNP:** *measures the market value of all final goods and services produced by factors of production* provided by residents *of a country.*

- **Imports**：*Goods and services purchased from producers in other countries.*

- **Exports**：*Goods and services purchased from domestic producers.*

- **Net exports**：*Value of exports minus the value of imports over some period.*

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

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

Basic Definitions

- **Autarky/Closed economy**：*A country does not trade with other countries*

- **Free trade**：*No restrictions or charges on imports and export activities*

- **Trade protection**：*Government places restrictions, limits or charges on exports or imports*

- **World price**：*Price of a good or service in world markets for those to whom trade is not restricted*

- **Domestic price**：*Price of a good or service in the domestic country。*

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

- **Foreign direct investment（FDI）**：*Ownership of productive 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*

Benefits and Costs of International Trade

- *Benefits:*

  - *gains from exchange and specialization*

  - *Economies of scales for industries*

  - *Product variety for customers and producers*

  - *Increased competition*

  - *Resources are allocated more efficiently*

- *Cost:*

  - *greater income inequality*

  - *Loss of jobs in developed countries as a result of import competition*

- *Gains from trade means the overall benefit of trade overweigh the loss from trade.*

Comparative Advantage

- **Absolute advantage**：production of a good if it can produce the good at lower cost in terms of resources than of another country

- **Comparative advantage**：refers to the lowest opportunity cost to produce a product

- **Law of comparative advantage**：Trading partners can be made better off if they specialize in producing goods for which they are the low-opportunity-cost producer and trade for the goods for which they are the high-opportunity-cost producer.

Comparative Advantage Models

Ricardian Model of trade

- *Labor is the only factor of production.*
- *comparative advantage and pattern of trade are determined by differences in labor productivity. due to difference in technology between countries.*
- *Comparative advantage could be shifted by technology development of the country with comparative disadvantage.*

Heckscher-Ohlin model

- *Labor and capital are factors of production.*
- *comparative advantage and pattern of trade are determined by differences in the relative amounts of factor (capital & labor) endowments between countries.*
- *Technology is the same among countries for the same industry.*
- *If a country has more endowment of one factor, the comparative advantage goes to the country for the goods whose production is more intensive in the specific factor.*

Arguments 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.*

- *National security*：*Protect producers of goods crucial to the country's national defense.*

- *Anti-dumping argument*：*Exporters should be prohibited from selling goods abroad at less than production cost.*

- *Other arguments have **very little support**:*
  - *Trade barriers protect jobs*
  - *Protecting domestic industries*

Types of Trade Restrictions

- *Tariffs :* *A tariff is a tax imposed on imported goods collected by the government*
  - *Benefits: Domestic producers & domestic government*
  - *Foreign exporters lose*

- *Quotas:* *A quota is a quantitative restriction on the import of a particular good, which specifies the maximum amount of the good that may be imported in a given period of time.*
  - *Benefits: Domestic producers*
  - *Domestic consumers lose*
  - *Domestic government does not charge for the import licenses– gain to foreign exporters – quota rents*

Exhibit 12. Welfare Effects of Tariff and Import Quota

Figure 3: Effects of Tariffs and Quotas
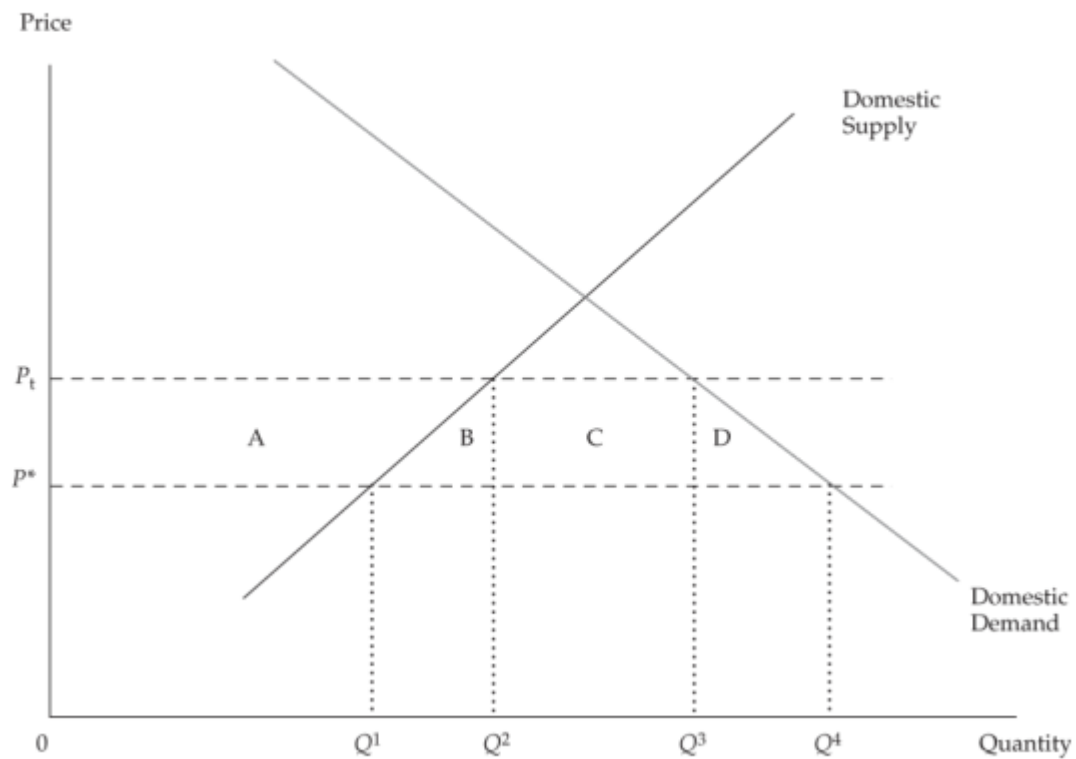
Welfare Effects of an Import Tariff or Quota	
	Importing Country
Consumer surplus	$-(A + B + C + D)$
Producer surplus	$+A$
Tariff revenue or Quota rents	$+C$
National welfare	$-B - D$
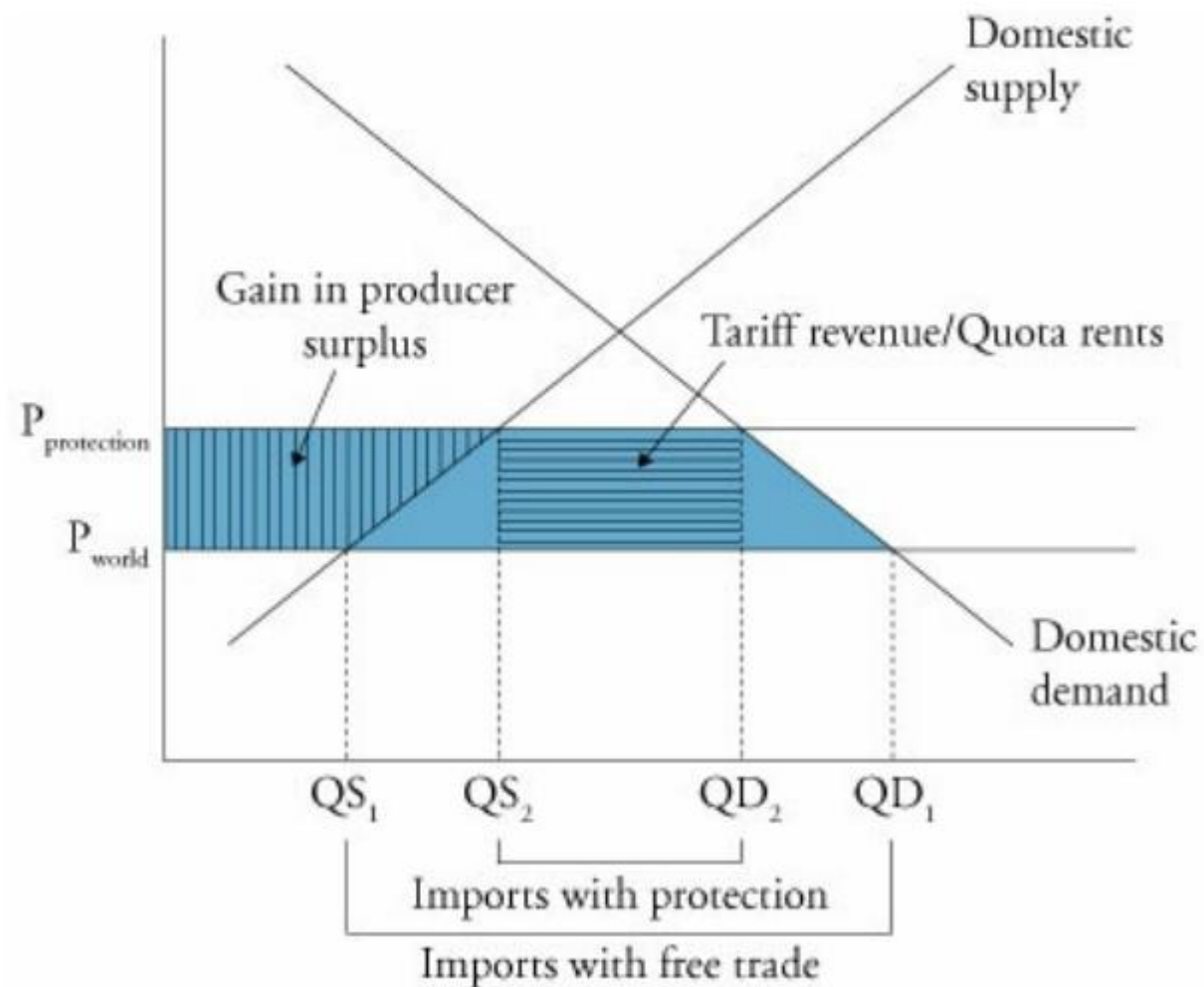
Types of Trade Restrictions

- ***Export subsidies****: Government payment to firms that export goods*
  - *Payments by a government to its country's exports*
  - *Benefit producers (exports)*
  - *But increase prices and reduce consumer surplus in the exporting countries*

- ***Voluntary export restraints (VER)****: A voluntary export restraint are agreements by exporting countries to voluntarily limit the quantity of goods they will export to an importing country.*
  - *Benefits: The entities that hold export permit under a VER system*

Exhibit 13

Panel A. Effects of Alternative Trade Policies				
	Tariff	**Import Quota**	**Export Subsidy**	**VER**
Impact on	Importing country	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

Panel B. Effects of Alternative Trade Policies on Price, Production, Consumption, and Trade				
	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

Effects of Trade Restrictions

- *With respect to the domestic country, import quotas, tariffs and VERs all*
    - *Reduce imports*
    - *Increase price*
    - *Decrease consumer surplus*
    - *Increase domestic quantity supplies*
    - *Increase producer surplus*

- *Exception: Not all trade restrictions decrease national welfare effect:*
    - *Quotas and tariffs in a large country could increase national welfare.*
    - *Reasons: country imports a large amount of goods, setting a quota or tariff could reduce the world price for the goods.*

Capital Restrictions and Objectives

- *Capital restrictions*: restrict on the flow of financial capital across borders

- Restriction includes:
  - Outright prohibition of investment
  - Prohibition of foreign investment in certain industries
  - taxes on the income earned on foreign investments by domestic citizens
  - Restrictions on repatriation of earnings of foreign entities operating in a country.

- *Objectives of Capital restrictions*:
  - Reduce the volatility of domestic asset prices.
  - Maintain fixed exchange rates.
  - Protect strategic industries.

Regional Trading Agreements (Trading Blocs)

- *Free trade areas*
  - All barriers to import/export of goods and services among member countries are removed.
  - Each country has its own polices against non-members.

- *Customs union*
  - All barriers to import/export of goods and services among member countries are removed.
  - All countries adopt a common set of trade restrictions with non-members.

- *Common market*
  - All barriers to import/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 factors of production (labor and capital) among member countries are removed.

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Regional Trading Agreements (Trading Blocs)

- *Economic union*
    - *All barriers to import/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.*
    - *common institutions and economic policy for the union.*

- *Monetary union*
    - *All barriers to import/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.*
    - *common institutions and economic policy for the union.*
    - *adopt a common currency.*

Balance of Payments

- *Balance of payments (BOP)* *accounting*
  - *a method used to keep track of transactions between a country and its international trading partners.*
  - *The BOP accounts reflect all payments and liabilities to foreigners and all payments and obligations received from foreigners.*

- *International Transactions*

Balance of Payments

- ***Current account***
  - *Merchandise and services*
  - *Income receipts*
  - *Unilateral transfers*

- ***Capital account***
  - *Capital transfers*
  - *Sales and purchase of non-produced, non-financial assets*

- ***Financial account***
  - *Government-owned assets abroad*
  - *Foreign-owned assets in the country*

Balance of Payments Components

- Surplus in the current account must be offset by an opposite balance in the sum of capital and financial accounts.

- Relationship between the trade deficit, saving, and domestic investment are:

- CA = Export (X) – Import (M)

    = private savings + government savings - investment

- **CA (*Current account*) > 0 implies**
    - export > import
    - demand for home currency

- **KA (*Capital account*) > 0 implies**
    - capital inflow > capital outflow
    - demand for home currency

International Monetary Fund

- *Promoting international monetary cooperation*

- *Facilitating the expansion and balanced growth of international trade*

- *Promoting exchange stability*

- *Assisting in the establishment of a multilateral system of payments*

- *Making resources available to members experiencing balance of payments difficulties*

World Bank

- *Vital source of financial and technical assistance to developing countries*

- *Mission*
  - *fight poverty with passion and professionalism for lasting results.*
  - *Help people help themselves and their environment by providing resources, share knowledge, building capacity and forging partnerships.*

WTO

- *International organization dealing with the global rules of trade between nations.*

- *Main function:*
  - *to ensure that trade flows as smoothly, predictably and freely as possible.*
  - *Guaranteeing member countries important trade rights*
  - *Bind government to keep their trade policies within agreed limits to everybody's benefit.*

Currency Exchange Rates

Foreign Exchange Rates

- *Exchange rates Quotation*
  - *Direct exchange rate*
  - *Indirect exchange rate*

- *Real exchange rate and nominal exchange rate*

- *Spot rates and Forward rates*
  - *Spot rate: currency exchange rate for immediate delivery of the currency.*
  - *Forward rate: Exchange rates for currency exchange on a specified future date.*

- *Foreign exchange market*
  - *Sell side*
  - *Buy side*

Cross Rates

- **Definition:** *The exchange rate between two currencies implied by their exchange rates with a common third currency.*
  - *Cross rates are typically calculated when there is no active FX market between the two currencies.*
  - *The third currency is usually the USD or the EUR.*

Example 1: Suppose that S($/€) = 1.4

- *and that S(JP¥/$) = 130*
- *What must the JP¥/€ cross rate be?*

Solution: JP¥/€=1.4*130=182

Example 2: Suppose that S(RMB¥/$) = 7.5

- *and that S(JP¥/$) = 130*
- *What must the RMB ¥/JP¥ cross rate be?*

Solution: RMB ¥/JP¥ =7.5/130=0.058

Cross Rates Arbitrage

Example:Suppose we observe these banks posting these exchange rates

How can we make money?

$S(¥/\$)=120$

$S(£/\$)=1.50$

$S(¥/£)=85$

$ \$ $

$ ¥ $

$ £ $
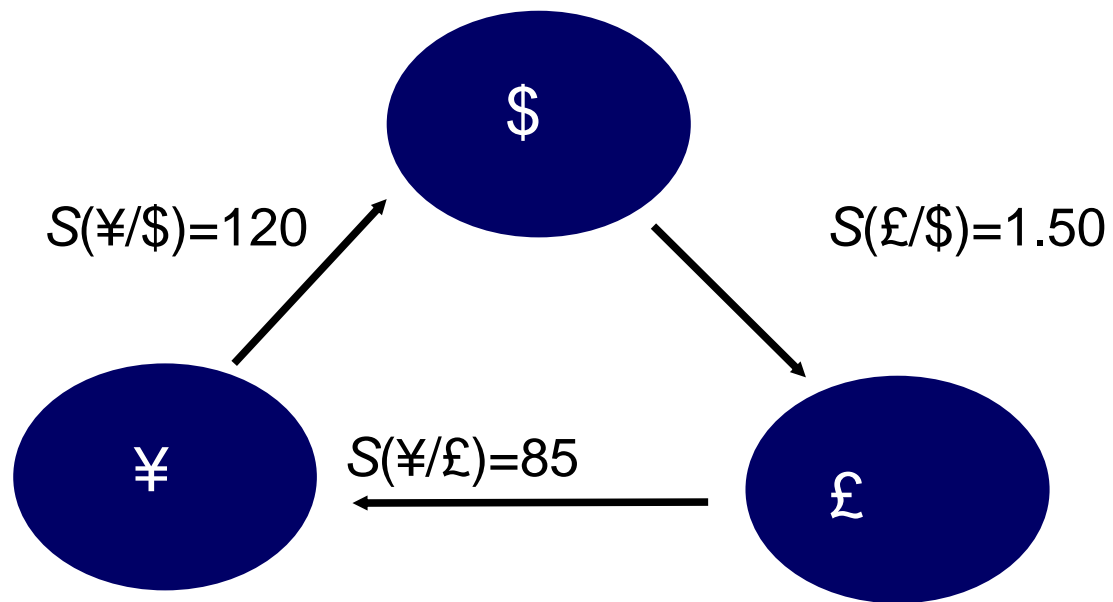
Cross Rates Arbitrage

- *First calculate the implied cross rates to see if an arbitrage exists*

- *The implied S(¥/£) cross rate is S(¥/£) = 120/1.5=80*

- *Posted a quote of S(¥/£)=85*

- *so there is an arbitrage opportunity*

How can we make money if got $100,000
Sell $100,000 for £ at S(£/$) = 1.50   *receive £150,000*
Sell £ 150,000 for ¥ at S(¥/£) = 85   *receive ¥12,750,000*
Sell ¥ 12,750,000 for $ at S(¥/$) = 120 *receive $106,250*

profit = $ 106,250- $100,000 = $6,250

Forward Discount or Premium

*Stated as an **annualized** percent of spot rate:*

$$\left(\begin{array}{c} \text{forward premium} \\ \text{or discount} \end{array} \right) = \left(\frac{\text{forward rate} - \text{spot rate}}{\text{spot rate}} \right) \left(\frac{360}{\begin{array}{c} \text{no. of forward} \\ \text{contract days} \end{array}} \right)$$

Example: *Find the annualized forward GBP discount or premium for the following USD/GBP quote:*

spot rate = 1.8328; 30-day forward rate = 1.8432

Solution:

$$\left(\frac{1.8432 - 1.8328}{1.8328} \right) \left(\frac{360}{30} \right) = 6.81\% \text{ Premium}$$

Interest Rate Parity (IRP)

- *The idea of IRP is that changes in exchange rates will just offset differences in interest rates.*

- *The currency with the higher nominal interest rate will depreciate.*

- *When IRP holds, an investor will make the same return holding either currency.*

- *If the $US rate is 8% and the euro rate is 6%, the dollar will depreciate by approximately 2% relative to the euro, if IRP holds.*

The formal IRP relationship:

$$\text{spot} \times \frac{\left[1 + r_{\text{counter currency}}\left(\dfrac{n}{360}\right)\right]}{\left[1 + r_{\text{base currency}}\left(\dfrac{n}{360}\right)\right]} = \text{Forward}$$

- *If the quoted forward rate does not equal the rate under interest rate parity, covered interest arbitrage will be possible.*

Exchange Rate Regimes

- *IMF categorizes exchange rate regimes:*
    - *2 for countries do not issue own currencies*
    - *7 for countries issue their own currencies*

- Countries that do not have their currency
    - **No separate legal :** *country use the currency of another country*
    - **Monetary union:** *several countries use a common currency*

- Countries that have their own currency
    - **Currency board system (CBS):** *specified foreign currency at a fixed exchange rate*
    - **Conventional fixed peg arrangement:** *within margins of* ± 1 *percent versus another currency or a basket*
    - **Target zone：** *permitted fluctuations in currency value relative to another currency or basket of currencies are wider (e.g., +/-2 %)*

Exchange Rate Regimes

- *Crawling peg：* *exchange rate is adjusted periodically, typically to adjust for higher inflation.*
    - *passive crawling peg : exchange rates are adjusted frequently to keep pace with inflation rate.*
    - *active crawling peg: the small change in exchange rate is* <u>pre-announced</u> *for the coming week. It can influence inflation expectations, adding some predictability to domestic inflation.*
- *Fixed parity within crawling bands*
- *Managed floating exchange rates：* *influence the exchange rate in response to specific indicators (e.g. trade balance, price, unemployment)*
- *Independently floating: the exchange rate is market-determined.*

Exchange Rate Regimes

- *Currency Union*

- *Currency Board*

- *Truly Fixed Exchange Rate*

- *Target Zone or board*

- *Crawling peg*

- *Fixed parity within crawling bands*

- *Managed Float*

- *Free Float*

Increasing Flexibility

Impact of Exchange Rate on Trade

- *Examine how changes in exchange rates affect the balance of trade*

- ***Elasticity approach****: focus on impact of exchange rate on total expenditures on imports and exports*

- *Depreciation of domestic currency ➔ increase export, decrease import*

- *However depreciation of domestic currency does not necessarily say reduce trade deficit.*

- *Elasticity of demand for export goods and import goods is crucial.*

Elasticity approach

- *Elasticity approach: **Marshall-Lerner condition** for a depreciation of the domestic currency to reduce an existing trade deficit If*

$$W_X \varepsilon_X + W_I(\varepsilon_I - 1) > 0$$

- *W_I=Imports / (Imports + Exports)*
- *W_X=Exports / (Imports + Exports)*

- *Elasticity approach: currency depreciation will result in a greater improvement in the trade deficit when either import or export demand is elastic.*

$$\omega_X \varepsilon_X + \omega_M(\varepsilon_M - 1) = 0.4 \times 0.75 + 0.6(0.65 - 1) = 0.09$$
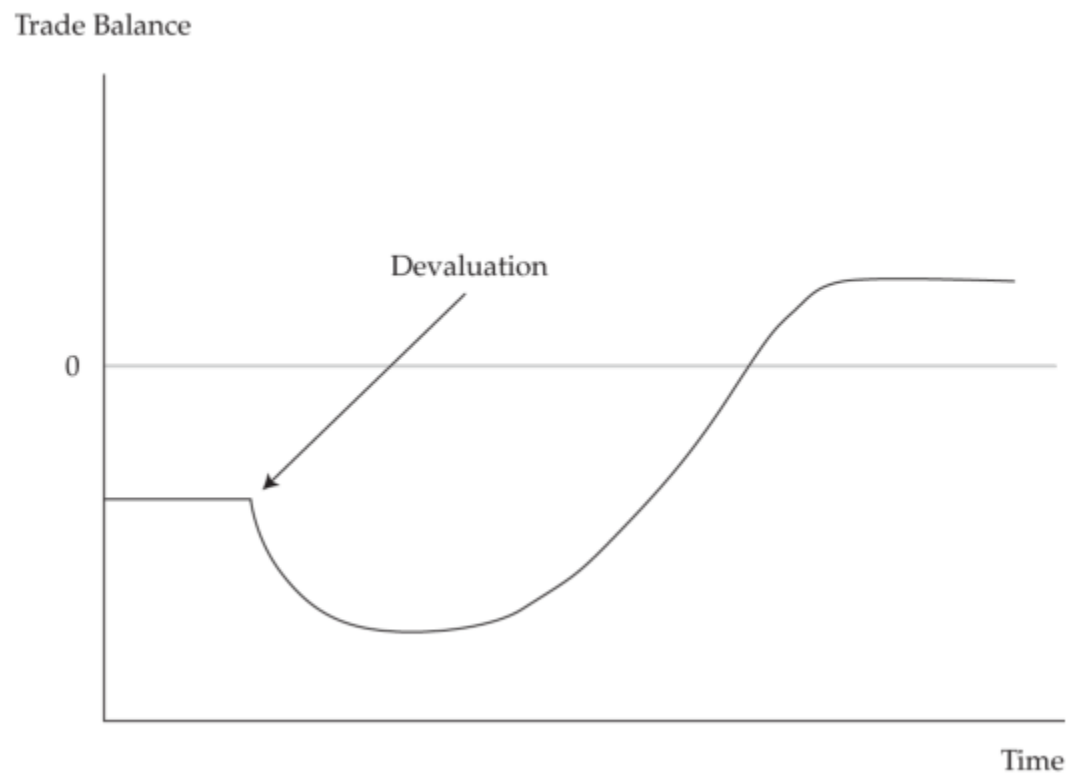
Absorption Approach

- **Absorption approach** *focus on capital account*

- *BT=X-M=Y-A*
  - *Y: domestic production of goods and services*
  - *A: domestic absorption of goods and services*
  - *BT: balance of trade*

- **Absorption approach**
  - *Under the absorption approach, national income must increase relative to national expenditure in order to decrease a trade deficit.*
  - *Domestic saving must increase relative to domestic investment in physical capital in order to decrease a trade deficit.*

Absorption Approach

- **Absorption approach**
    - *Whether a currency depreciation has these effects depends on the current level of capacity utilization in the economy*
    - *Economy at less than full employment, currency depreciation ➜ domestic goods more attractive ➜shift demand from foreign goods ➜increase both expenditures and income ➜ part of income increase will be saved ➜ savings relative to domestic investment increase ➜increase in production more than the increase in domestic absorption ➜improve trade balance*
    - *Economy at full employment, increase in domestic spending ➜ high domestic price ➜reverse the stimulative effect of currency depreciation➜ return to the previous deficit in the trade balance*

Exhibit 11. Trade Balance Dynamics: The *J*-Curve

THANKS