



INDEX

SR NO.	MODULE NO.	CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	1	1	TEN PRINCIPLES OF ECONOMICS	2
2		2	MARKET FORCES OF SUPPLY AND DEMAND	21
3		3	ELASTICITY AND ITS APPLICATION	53
4		4	THE COST OF PRODUCTION	78
5	2	1	PERFECT COMPETITION	100
6		2	MONOPOLY COMPETITION	117
7		3	OLIGOPOLY	132
8		4	MONOPOLISTIC COMPETITION	144
9	3	1	MEASURING A NATION'S INCOME	156
10		2	MEASURING THE COST OF LIVING	175
11		3	SAVING AND INVESTMENT	188
12		4	PRODUCTION AND GROWTH, GDP, GNP, PPP	204
13		5	THE MONETARY SYSTEM	235
14		6	MONEY GROWTH AND INFLATION	252
15		7	OPEN-ECONOMY MACROECONOMICS	274
16	4	1	AGGREGATE DEMAND AND AGGREGATE SUPPLY	292
17		2	THE INFLUENCE OF MONETARY AND FISCAL POLICY ON AGGREGATE DEMAND	322
18		3	THE SHORT-RUN TRADE-OFF BETWEEN INFLATION AND UNEMPLOYMENT	341



Subject: ECONOMICS FOR MANAGER (4519202)

MBA SEM 01 Module 01 Chapter 01

🌀 TEN PRINCIPLES OF ECONOMICS 🌀

❖ What Economics Is All About?

- **Scarcity** refers to the limited nature of society's resources.¹
- **Economics** is the study of how society manages its scarce resources, including:²
 - how people decide how much to work, save, and spend, and what to buy³
 - how firms decide how much to produce, how many workers to hire⁴
 - how society decides how to divide its resources between national defense, consumer goods, protecting the environment, and other needs⁵

❖ TEN PRINCIPLES OF ECONOMICS⁶

A. HOW PEOPLE MAKE DECISIONS⁷

1. People Face Tradeoffs⁸
2. The Cost of Something Is What You Give Up to Get It⁹
3. Rational People Think at the Margin¹⁰
4. People Respond to Incentives¹¹



B. HOW PEOPLE INTERACT¹²

5. Trade Can Make Everyone Better Off¹³
6. Markets Are Usually A Good Way to Organize Economic Activity¹⁴
7. Governments Can Sometimes Improve Market Outcomes¹⁵

C. HOW THE ECONOMY AS A WHOLE WORKS¹⁶

8. A Country's Standard of Living Depends on its Ability to Produce Goods & Services¹⁷
9. Prices Rise When the Government Prints Too Much Money¹⁸
10. Society Faces A Short Run Tradeoff Between Inflation & Unemployment¹⁹

A. HOW PEOPLE MAKE DECISIONS

- Decision making is at the heart of economics.²⁰
- The first four principles deal with how people make decisions.²¹

1. People Face Tradeoffs

- All decisions involve tradeoffs.²²
Examples:
 - Going to a party the night before your midterm leaves less time for studying.²³
 - Having more money to buy stuff requires working longer hours, which leaves less time for leisure.²⁴
 - Protecting the environment requires resources that might otherwise be used to produce consumer goods.²⁵



- Society faces an important tradeoff:
Efficiency vs. equity²⁶
- **efficiency:** getting the most out of scarce resources²⁷
- **equity:** distributing prosperity fairly among society's members²⁸
- **Tradeoff:** To increase equity, can redistribute income from the well-off to the poor.²⁹
- But this reduces the incentive to work and produce, and shrinks the size of the economic "pie."³⁰

2. The Cost of Something Is What You Give Up to Get It

- Making decisions requires comparing the costs and benefits of alternative choices.³¹
- The opportunity cost of any item is whatever must be given up to obtain it.³²
- It is the relevant cost for decision making.³³

Examples:

The opportunity cost of...

- ...going to college for a year is not just the tuition, books, and fees, but also the foregone wages.³⁴
- ...seeing a movie is not just the price of the ticket, but the value of the time you spend in the theater.³⁵

3. Rational People Think at the Margin

- A person is rational if he/she systematically and purposefully does the best they can to achieve his/her objectives.³⁶



- Many decisions are not “all or nothing,” but involve marginal changes – incremental adjustments to an existing plan.³⁷
- Evaluating the costs and benefits of marginal changes is an important part of decision making.³⁸

Examples:

- A student considers whether to go to college for an additional year, comparing the fees & foregone wages to the extra income he could earn with an extra year of education.³⁹
- A firm considers whether to increase output, comparing the cost of the needed labor and materials to the extra revenue.⁴⁰

4. People Respond to Incentives

- **Incentive:** something that induces a person to act, i.e. the prospect of a reward or punishment.⁴¹
- Rational people respond to incentives because they make decisions by comparing costs and benefits.⁴²

Examples:

- In response to higher cigarette taxes, teen smoking falls.⁴³

B. HOW PEOPLE INTERACT

- An “economy” is just a group of people interacting with each other.⁴⁴
- The next three principles deal with how people interact.⁴⁵



5. Trade Can Make Everyone Better Off

- Rather than being self-sufficient, people can specialize in producing one good or service and exchange it for other goods.⁴⁶
- Countries also benefit from trade & specialization:⁴⁷
 - get a better price abroad for goods they produce⁴⁸
 - buy other goods more cheaply from abroad than could be produced at home⁴⁹

6. Markets Are Usually A Good Way to Organize Economic Activity

- A market is a group of buyers and sellers. (They need not be in a single location.)⁵⁰
- “Organize economic activity” means determining⁵¹
 - What goods to produce
 - How to produce them
 - how much of each to produce
 - Who gets them?
- In a market economy, these decisions result from the interactions of many households and firms.⁵²
- Famous insight by **Adam Smith** in **The Wealth of Nations (1776)**:⁵³

Each of these households and firms acts as if “led by an invisible hand” to promote general economic well-being.⁵⁴
- **The invisible hand** works through the price system:⁵⁵
- The interaction of buyers and sellers determines prices of goods & services.⁵⁶
- Each price reflects the good’s value to buyers and the cost of producing the good.⁵⁷



- Prices guide self-interested households and firms to make decisions that, in many cases, maximize society's economic well-being.⁵⁸

7. Governments Can Sometimes Improve Market Outcomes

- Important role for govt.: enforces property rights (with police, courts)⁵⁹
- People are less inclined to work, produce, invest, or purchase if large risk of their property being stolen.⁶⁰

C. HOW THE ECONOMY AS A WHOLE WORKS

- The last three principles deal with the economy as a whole.⁶¹

8. A Country's Standard of Living Depends on its Ability to Produce Goods & Services

- Huge variation in living standards across countries and over time:⁶²
- Average income in rich countries is more than ten times average income in poor countries.⁶³
- The U.S. standard of living today is about eight times larger than 100 years ago.⁶⁴
- The most important determinant of living standards: productivity, the amount of goods and services produced per unit of labor.⁶⁵
- Productivity depends on the equipment, skills, and technology available to workers.⁶⁶



- Other factors (e.g., labor unions, competition from abroad) have far less impact on living standards.⁶⁷

9. Prices Rise When the Government Prints Too Much Money

- **Inflation:** increases in the general level of prices.⁶⁸
- In the long run, inflation is almost always caused by excessive growth in the quantity of money, which causes the value of money to fall.⁶⁹
- The faster the govt. creates money, the greater the inflation rate.⁷⁰

10. Society Faces A Short Run Tradeoff Between Inflation & Unemployment

- In the short run (1 – 2 years), many economic policies push inflation and unemployment in opposite directions.⁷¹
- Other factors can make this tradeoff more or less favorable, but the tradeoff is always present.⁷²



EXERCISE

- 1) You are selling your 1996 Mustang. You have already spent \$1000 on repairs. At the last minute, the transmission dies. You can pay \$600 to have it repaired, or sell the car “as is.”

In each of the following scenarios, should you have the transmission repaired?

- A. The book value is \$6500 if transmission works, \$5700 if it doesn't
B. The book value is \$6000 if transmission works, \$5500 if it doesn't

Answers:

Cost of fixing transmission = \$600

- A. The book value is \$6500 if transmission works, \$5700 if it doesn't

Benefit of fixing the transmission = \$800(\$6500 – 5700).

It's worthwhile to have the transmission fixed.

- B. The book value is \$6000 if transmission works, \$5500 if it doesn't

Benefit of fixing the transmission is only \$500.

Paying \$600 to fix transmission is not worthwhile.



ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	The phenomenon of scarcity stems from which fact?	Resources are limited
2		What is scarcity?	Society's limited resources
3		Society's limited resources are called...	Scarcity
4	2	What is studied in Economics?	Managing scarce resources
5		What refers to the study of managing scarce resources?	Economics
6	3	What refers to the people's decision regarding how much to work, save, and spend?	Economics
7		How economics helps to people to make decisions?	How much to work, save and spend
8	4	What refers to the firms' decision regarding how much to produce, how many workers to hire?	Economics
9		How economics helps to firms to make decisions?	How much to produce and how many workers to hire
10	5	What refers to the society's decision regarding how to divide its resources?	Economics
11		How economics helps to society to make decisions?	How to divide its resources
12	6	How many principles of economics?	10 (Ten)
13		How many main headings are there in ten principles of economics?	3 (Three)
14	7	How many principles are there in the first main heading of ten principles?	4 (Four)
15		What is the first main heading of ten principles?	How people make decisions



16	8	Which is the first principle of economic?	People face tradeoffs
17		What is the main heading of this principle: People face tradeoffs	How people make decisions
18	9	Which is the second principle of economic?	The cost of something is what you give up to get it
19		What is the main heading of this principle: The cost of something is what you give up to get it	How people make decisions
20	10	Which is the third principle of economic?	Rational people think at the margin
21		What is the main heading of this principle: Rational people think at the margin	How people make decisions
22	11	Which is the fourth principle of economic?	People respond to incentives
23		What is the main heading of this principle: People respond to incentives	How people make decisions
24	12	What is the second main heading of ten principles?	How people interact
25		How many principles are there in the second heading of ten principles?	3 (Three)
26	13	Which is the fifth principle of economic?	Trade can make everyone better off
27		What is the main heading of this principle: Trade can make everyone better off	How people interact
28	14	Which is the sixth principle of economic?	Markets are usually a good way to organize economic activity
29		What is the main heading of this principle: Markets are usually a good way to organize economic activity	How people interact



30	15	Which is the seventh principle of economic?	Governments can sometimes improve market outcomes
31		What is the main heading of this principle: Governments can sometimes improve market outcomes	How people interact
32	16	What is the third main heading of ten principles?	How the economy as a whole works
33		How many principles are there in the third heading of ten principles?	3 (Three)
34	17	Which is the eighth principle of economic?	A country's standard of living depends on its ability to produce goods & services
35		What is the main heading of this principle: A country's standard of living depends on its ability to produce goods & services	How the economy as a whole works
36	18	Which is the ninth principle of economic?	Prices rise when the government prints too much money
37		What is the main heading of this principle: Prices rise when the government prints too much money?	How the economy as a whole works
38	19	Which is the tenth principle of economic?	Society faces a short run tradeoff between inflation and unemployment
39		What is the main heading of this principle: Society faces a short run tradeoff between inflation and unemployment	How the economy as a whole works
40	20	What is decision making for economics?	Heart of economics
41		What is heart of economics?	Decision making



42	21	How many principles deal with how people make decisions?	4 (Four)
43		How many principles are there in the first main heading of ten principles?	4 (Four)
44	22	What is involved in the all decisions?	Tradeoffs
45		Where do we always find a tradeoff?	in all decision making
46	23	When a student goes to a party night before examinations leaves less time for...	Studying
47		Going to a party the night before your midterm leaves less time for studying is an example of which principle?	People face tradeoffs
48	24	Having more money to buy stuff requires working longer hours, which leaves...	Less time for leisure
49		Having more money to buy stuff requires working longer hours, which leaves less time for leisure, is an example of which principle?	People face tradeoffs
50	25	Protecting the environment requires resources that might otherwise be used to...	Produce consumer goods.
51		Protecting the environment requires resources that might otherwise be used to produce consumer goods is an example of which principle?	People face tradeoffs
52	26	Between which factors the society faces an important tradeoff?	Efficiency and equity
53		Who is facing tradeoff between efficiency and equity?	Society
54	27	What is called to get the most out of scarce resources?	Efficiency
55		What is efficiency?	To get the most from scarce resources



56	28	What refers to fairly distributing prosperity among the society's members?	Equity
57		What is equity?	fairly distributing prosperity to society
58	29	What refers to redistributing income from the well-off to the poor?	Tradeoff
59		What is tradeoff?	Redistributing income
60	30	What reduces the incentive to work and produce?	Tradeoff
61		What is reduced by Tradeoff?	Incentive to work and produce
62	31	What is required to be compared to make decisions of alternative choices?	Costs and Benefits
63		Because of what, making decisions requires comparing the costs and benefits of alternative choices?	Opportunity cost
64	32	The cost of something to get it is?	What you give up
65		The opportunity cost of any item is?	What you give up to get it
66		The cost of any item to get it is?	Opportunity cost
67	33	Which cost is relevant cost for the decision making?	Opportunity cost
68		Opportunity cost is relevant cost for?	Decision making
69	34	Going to college for a year is the opportunity cost of...	Foregone wages
70		The opportunity cost of going to college is...	The best opportunity value a student gives up to attend college
71	35	What is the opportunity cost of Seeing a movie in theater?	Time spent
72		While going to a theater, you spent your time there, what kind of cost is called in economics?	Opportunity Cost



73	36	What refers to a person if he/she systematically and purposefully do the best they can to achieve objectives?	Rational
74		Rational peoples mainly focus on which factor?	Margin
75	37	What refers to the Incremental adjustments to an existing plan?	Marginal changes
76		What refers to the Marginal changes to existing plan?	Incremental adjustments
77	38	What plays an important role in evaluating the costs and benefits of marginal changes?	Decision making
78		Decision Making Plays an important role to evaluate what?	Costs and benefits of marginal changes
79	39	A student considers whether to go to college for an additional year, comparing the fees & foregone wages is an example of which principle?	Rational people think at the margin
80		What is compared by students in rational decision making?	The fees & foregone wages
81	40	A firm considers whether to increase output, comparing the cost of the needed labor and materials is an example of which principle?	Rational people think at the margin
82		What is compared by a firm in while deciding about an output increase?	The cost of the needed labor and materials with the output
83	41	What is called to something that induces a person to act?	Incentives
84		Reward or punishment is an example of what?	Incentives
85		Which are the examples of incentives?	Reward and Punishment



86	42	While decision making by comparing the cost and benefits, the rational people responds to what?	Incentives
87		What is compared by the rational people while decision making?	Costs and Benefits
88	43	What happens when the cigarette taxes increases?	Smoking of teen falls
89		What can be done to reduce the teen smoking?	Increase in the cigarette taxes
90	44	What refers to the group of people interacting with each other?	Economy
91		What is economy?	Group of people interacting with each other
92	45	How many principles are there in the second main heading of ten principles?	3 (Three)
93		What is the second main heading of ten principles?	How people interact
94	46	What refers to the exchange of goods and services?	Barter system
95		What can be done rather than being self-sufficient?	Exchange goods or services
96	47	How Countries also get benefit?	Trade & specialization
97		Trade & specialization benefits to whom?	Countries
98	48	How countries can get benefit from specialization in abroad?	Get better price in abroad
99		How countries can get batter price abroad?	Through trade & specialization
100	49	When firm buys other goods more cheaply from abroad than could be produced at home is an example of...	Trade can make everyone better off



101		What can be shifted from one country to other country through trade?	Demand of particular goods
102	50	Market comprise of what?	Buyers and Sellers
103		What refers to a group of buyers and sellers?	Market
104	51	Organize economic activity means determining...	What, who, how, when, how much to produce
105		What is referred to what goods to produce, how to produce them, how much of each to produce, who gets them?	Organizing economic activity
106	52	In a market economy, decisions regarding economic activity are resulted from the interactions of what?	Households and Firms
107		By interactions of many households and firm, which decisions are taken?	Organizing economic activity
108	53	Who is the author of The Wealth of Nations?	Adam Smith
109		Which book is written by Adam Smith?	The Wealth of Nations
110	54	Households and firms act as if To promote general economic well-being.	led by an invisible hand
111		Why the households and firms act as if led by an invisible hand?	To promote economic well-being
112	55	Which system works through the invisible hands?	Price System
113		By which factor the price system works?	The invisible hand
114	56	What is determined by the interactions of buyers and sellers?	Price
115		By interactions of which factors the price is determined	Buyers and Sellers



116	57	What is reflected to buyers by the price and cost of goods or services?	Value
117		What is reflected in the good's value to the buyers?	Price and Cost
118	58	Which decisions are guided by prices to self-interested households and firms?	Maximize society's economic well-being
119		In a market economy, how economic activity is guided?	By self-interest & prices
120	59	What is the important role for government in improving market outcomes?	Enforcing property rights
121		Who can also improve market outcomes?	Government
122	60	People are inclined to work, produce, invest, or purchase if large risk of their property being stolen.	Less
123		People are less inclined to work, produce, invest, or purchase if...	High risk for property being stolen
124	61	The last three principles deal with what?	Economy as a whole
125		How many principles are there in the third main heading of ten principles?	3 (Three)
126	62	What is depended on the country's ability to produce goods and services?	Standard of Living
127		What makes the better standard of living of a country?	Ability to produce goods & services
128	63	Average income in rich countries is how much more than the average income in poor countries?	10 (Ten) Times
129		Average income in poor countries is how much less than the average income in rich countries?	10 (Ten) Times



130		The standard of living of U.S. is how much larger than 100 years ago?	8 (Eight) Times
131	64	The use standard of leaving is increased by 8 times in how many years?	100 Years
132	65	What is the most important determinant of standard of living?	Productivity
133		What is determined by the productivity?	Standard of living
134	66	What depends on the equipment, skills, and technology available to workers?	Productivity
135		Productivity depends on which factors?	Skills, equipment and technology
136	67	Which factors have less impact on the living standards?	Labor unions, competition from abroad
137		Labor unions & Competitions from abroad are having less impact on what?	Living Standards
138	68	What refers to the increases in the general level of prices?	Inflation
139		Give exact word for the increase in the general level of prices.	Inflation
140	69	In the long run, due to the excessive growth in the quantity of money what happens to the value of money?	Falls
141		In the long run, what is caused by excessive growth in the quantity of money?	Inflation
142	70	The faster the government creates money, the greater the....	Inflation rate
143		What happens when government prints too much money?	Price rises



144	71	In the short run, economic policies push inflation and unemployment in which direction?	Opposite
145		In the short run, the society faces an important tradeoff between what?	Inflation and Unemployment
146	72	Up to which level other factors influence the trade-off?	Partially
147		Do the other factors nullify the tradeoff?	No

MBA SEM 01
Module 01 Chapter 02

❁ THE MARKET FORCES OF SUPPLY
AND DEMAND ❁

❖ MARKETS AND COMPETITION

- A **market** is a group of buyers and sellers of a particular product.¹
- A **competitive market** is one with many buyers and sellers, each has a negligible effect on price.²
- A **perfectly competitive** market:³
 - all goods exactly the same
 - buyers & sellers so numerous that no one can affect market price – each is a “**price taker**”

❖ DEMAND

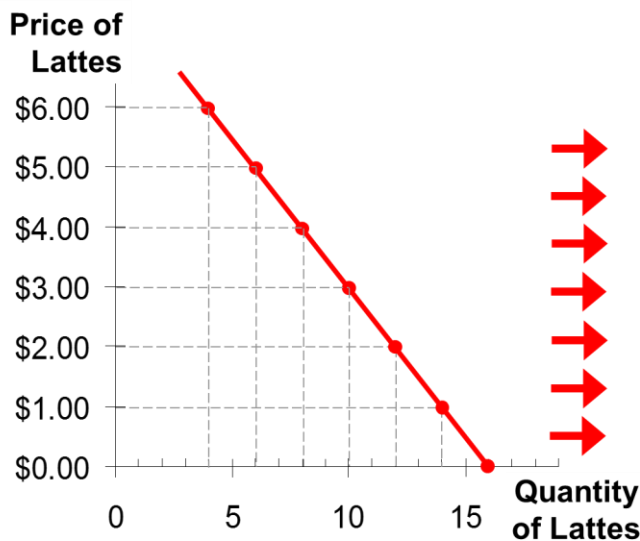
- Demand comes from the behavior of buyers.⁴
- The **quantity demanded** of any good is the amount of the good that buyers are willing and able to purchase.⁵
- **Law of demand**: the claim that the quantity demanded of a good fall when the price of the good rises, other things equal.⁶

❖ THE DEMAND SCHEDULE

- **Demand Schedule:** A table that shows the relationship between the price of a good and the quantity demanded.⁷
- Example: Helen’s demand for lattes.⁸
- Notice that Helen’s preferences obey the Law of Demand.⁹

Price of lattes	Quantity of lattes demanded
\$0.00	16
1.00	14
2.00	12
3.00	10
4.00	8
5.00	6
6.00	4

➤ Helen’s Demand Schedule & Curve



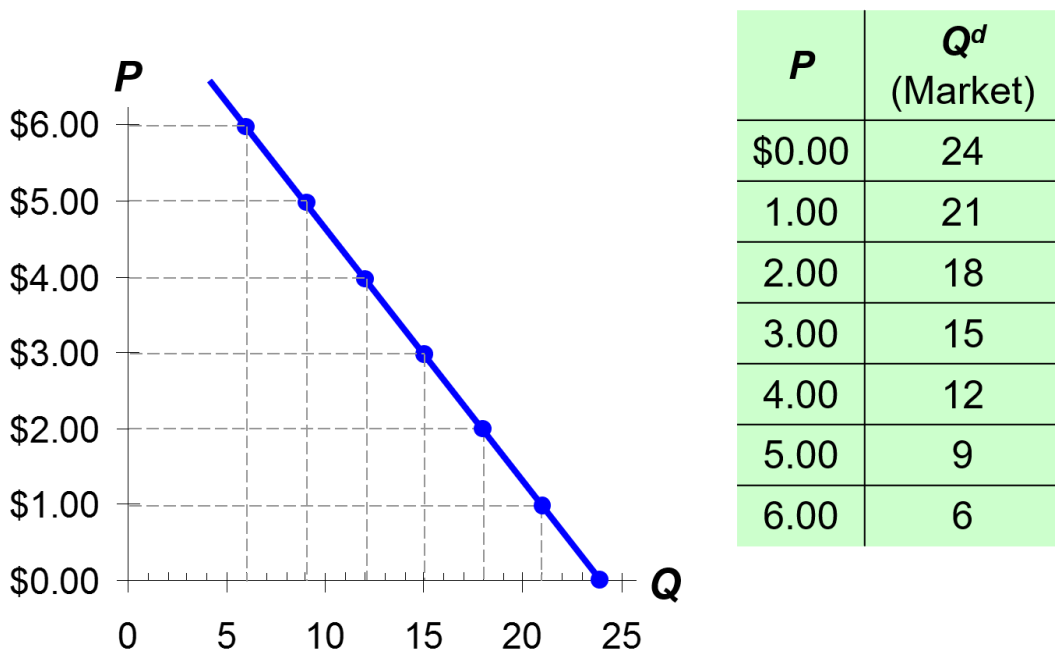
Price of lattes	Quantity of lattes demanded
\$0.00	16
1.00	14
2.00	12
3.00	10
4.00	8
5.00	6
6.00	4

➤ **Market Demand versus Individual Demand**

- The quantity demanded in the market is the sum of the quantities demanded by all buyers at each price.¹⁰
- Suppose Helen and Ken are the only two buyers in the Latte market.
(Q^d = quantity demanded)¹¹

Price	Helen's Q^d		Ken's Q^d		Market Q^d
\$0.00	16	+	8	=	24
1.00	14	+	7	=	21
2.00	12	+	6	=	18
3.00	10	+	5	=	15
4.00	8	+	4	=	12
5.00	6	+	3	=	9
6.00	4	+	2	=	6

➤ **The Market Demand Curve for Lattes**

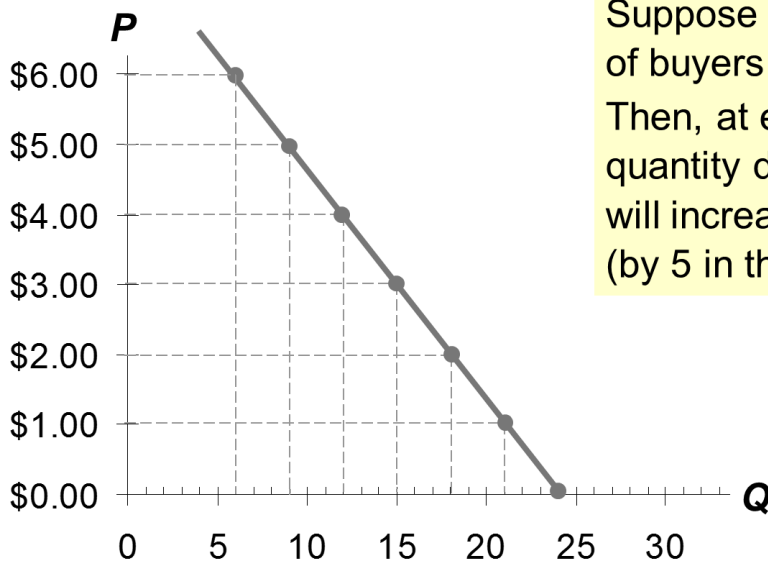


❖ DEMAND CURVE SHIFTERS

- The demand curve shows how price affects quantity demanded, *other things being equal*.¹²
- These “other things” are non-price determinants of demand (*i.e.*, things that determine buyers’ demand for a good, other than the good’s price). Changes in them shift the **D** curve...¹³

1. No. of Buyers

- An increase in the number of buyers causes an increase in quantity demanded at each price, which shifts the demand curve to the right.¹⁴



Suppose the number of buyers increases. Then, at each price, quantity demanded will increase (by 5 in this example).



2. Income

- Demand for a **normal good** is positively related to income.¹⁵
- An increase in income causes increase in quantity demanded at each price, shifting the D curve to the right.¹⁶

(Demand for an **inferior good** is negatively related to income. An increase in income shifts D curves for inferior goods to the left.)¹⁷

3. Prices of Related Goods

- Two goods are **substitutes** if
 - an increase in the price of one good causes an increase in demand for the other goods.¹⁸
- Example: pizza and hamburgers.¹⁹
- An increase in the price of pizza increases demand for hamburgers, shifting hamburger demand curve to the right.²⁰
- Other examples: Coke and Pepsi, laptops and desktop computers, compact discs and music downloads.²¹
- Two goods are **complements** if
 - an increase in the price of one causes a fall in demand for the other.²²
- Example: computers and software.²³
- If price of computers rises, people buy fewer computers, and therefore less software shifting software demand curve to the left.²⁴
- Other examples: college tuition and textbooks, bagels and cream cheese, eggs and bacon.²⁵



4. Tastes

- Anything that causes a shift in tastes toward a good will increase demand for that good and shift its D curve to the right.²⁶
- Example:
The Atkins diet became popular in the '90s, caused an increase in demand for eggs, shifted the egg demand curve to the right.²⁷

5. Expectations

- Expectations affect consumers' buying decisions.²⁸
- Examples:
 - If people expect their incomes to rise, their demand for meals at expensive restaurants may increase now.²⁹

Summary: Variables That Affect Demand

Variable	A change in this variable...
Price	...causes a movement along the D curve
No. of buyers	...shifts the D curve
Income	...shifts the D curve
Price of related goods	...shifts the D curve
Tastes	...shifts the D curve
Expectations	...shifts the D curve

❖ SUPPLY

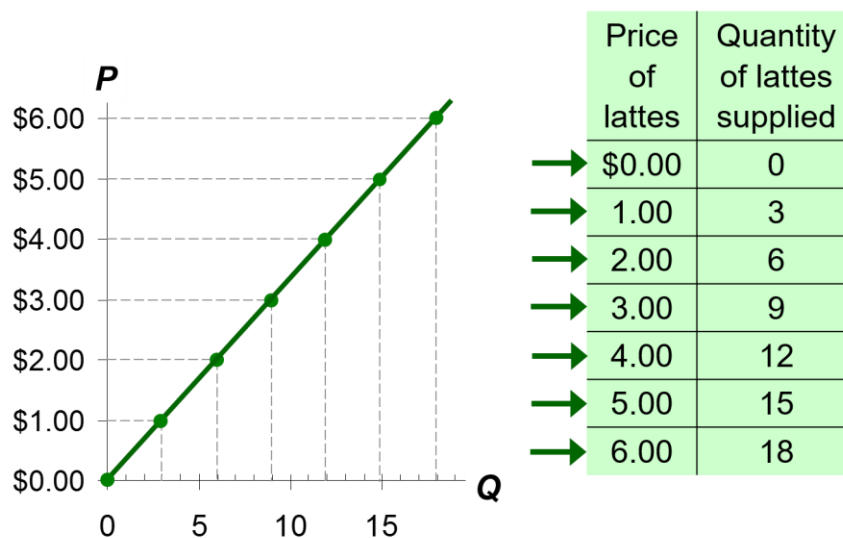
- Supply comes from the behavior of sellers.³⁰
- The **quantity supplied** of any good is the amount that sellers are willing and able to sell.³¹
- **Law of supply:** the claim that the quantity supplied of a good rise when the price of the good rises, other things equal³²

❖ The Supply Schedule

- **Supply schedule:** A table that shows the relationship between the price of a good and the quantity supplied.³³
- Example: Starbucks' supply of lattes.³⁴

Price of lattes	Quantity of lattes supplied
\$0.00	0
1.00	3
2.00	6
3.00	9
4.00	12
5.00	15
6.00	18

➤ Starbucks' Supply Schedule & Curve

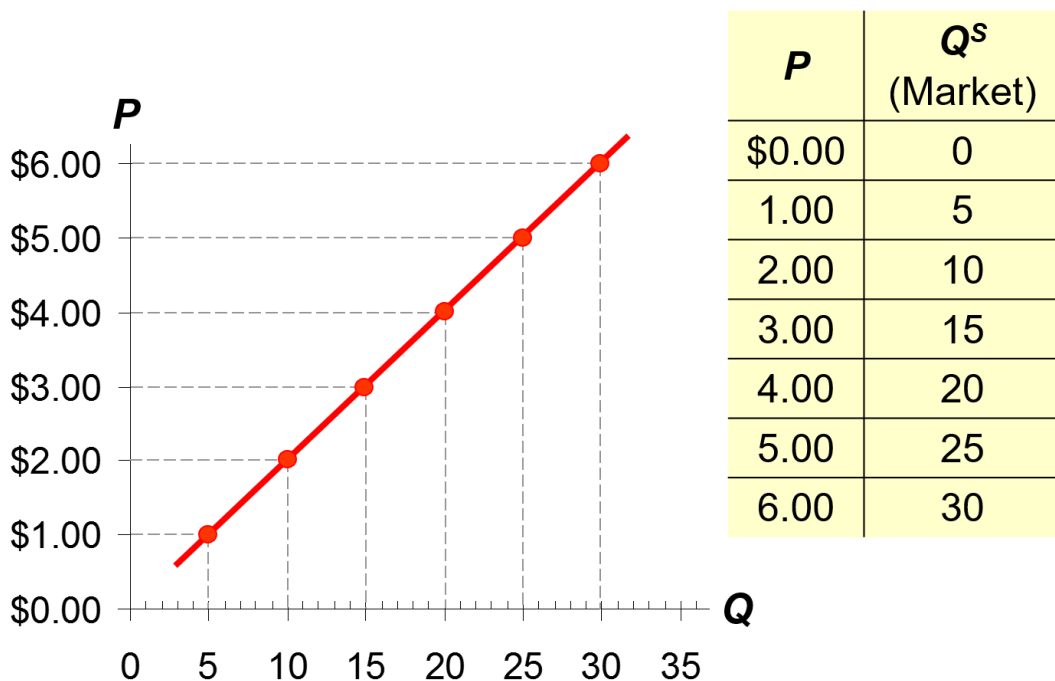


➤ **Market Supply versus Individual Supply**

- The quantity supplied in the market is the sum of the quantities supplied by all sellers at each price.³⁵
- Suppose Starbucks and Jitters are the only two sellers in this market.
(Q^s = quantity supplied)³⁶

Price	Starbucks	+	Jitters	=	Market Q^s
\$0.00	0	+	0	=	0
1.00	3	+	2	=	5
2.00	6	+	4	=	10
3.00	9	+	6	=	15
4.00	12	+	8	=	20
5.00	15	+	10	=	25
6.00	18	+	12	=	30

➤ **The Market Supply Curve**

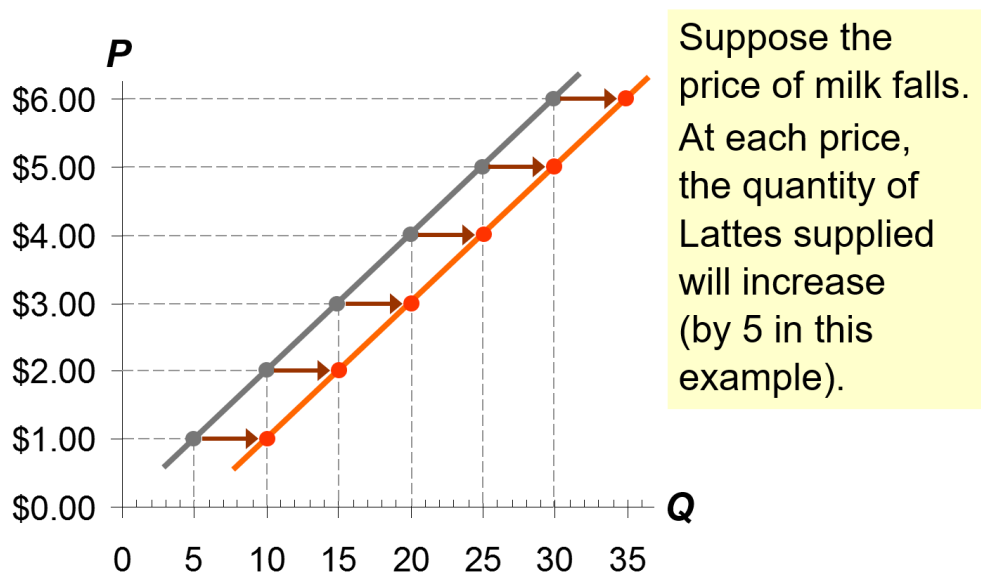


➤ Supply Curve Shifters

- The supply curve shows how price affects quantity supplied, *other things being equal*.³⁷
- These “other things” are non-price determinants of supply. Changes in them shift the **S** curve...³⁸

1. Input Prices

- Examples of input prices: wages, prices of raw materials.³⁹
- A fall in input prices makes production more profitable at each output price, so firms supply a larger quantity at each price, and the **S** curve shifts to the right.⁴⁰



2. Technology

- Technology determines how much inputs are required to produce a unit of output.⁴¹
- A cost-saving technological improvement has same effect as a fall in input prices, shifts the **S** curve to the right.⁴²

3. No. of Sellers

- An increase in the number of sellers increases the quantity supplied at each price, shifts the **S** curve to the right.⁴³

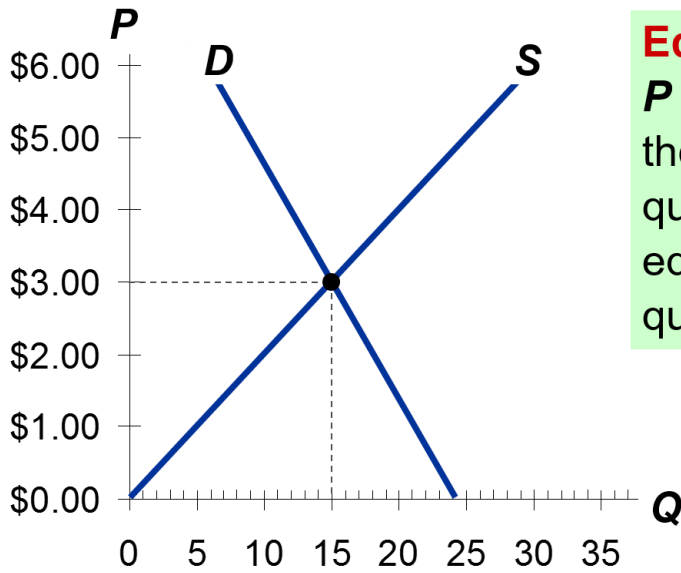
4. Expectations

- Suppose a firm expects the price of the good it sells to rise in the future. The firm may reduce supply now, to save some of its inventory to sell later at the higher price. This would shift the **S** curve leftward.⁴⁴

Summary: Variables That Affect Supply

Variable	A change in this variable...
Price	...causes a movement along the S curve
Input prices	...shifts the S curve
Technology	...shifts the S curve
No. of sellers	...shifts the S curve
Expectations	...shifts the S curve

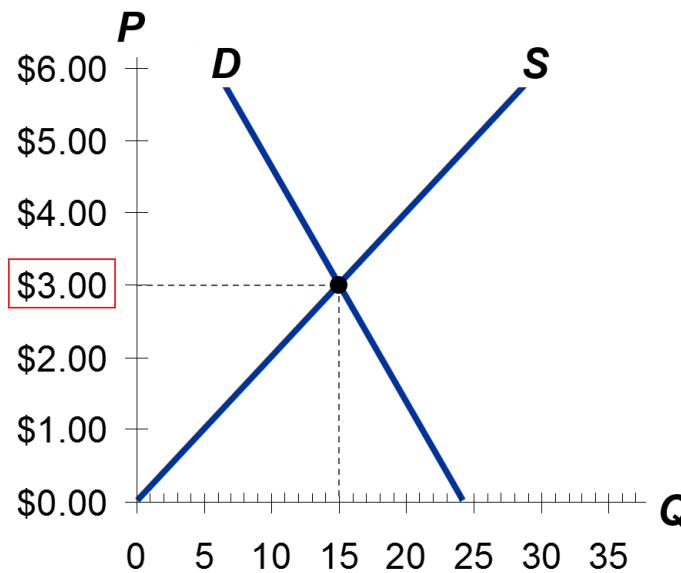
❖ **SUPPLY AND DEMAND TOGETHER**



Equilibrium:
P has reached the level where quantity supplied equals quantity demanded

➤ **Equilibrium price:**

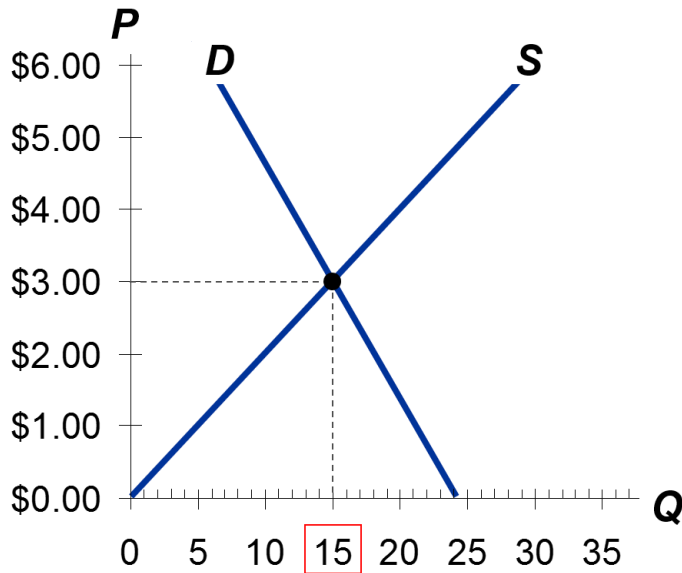
The price that equates quantity supplied with quantity demanded.⁴⁵



<i>P</i>	Q^D	Q^S
\$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

➤ **Equilibrium quantity:**

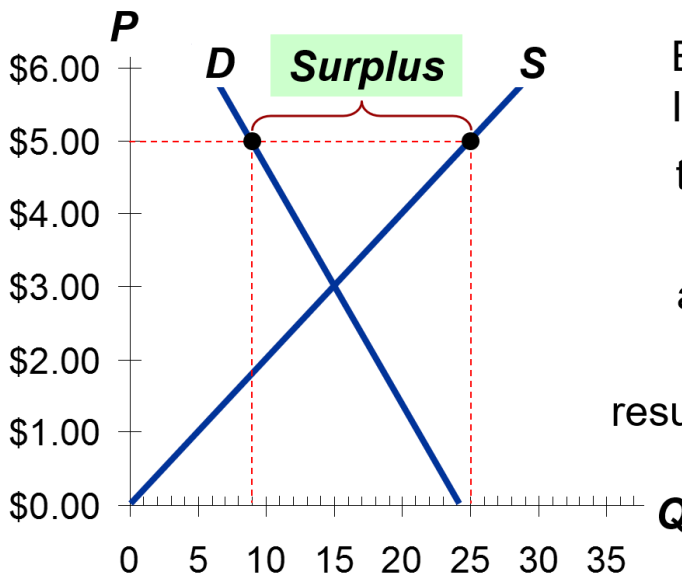
The quantity supplied and quantity demanded at the equilibrium price.⁴⁶



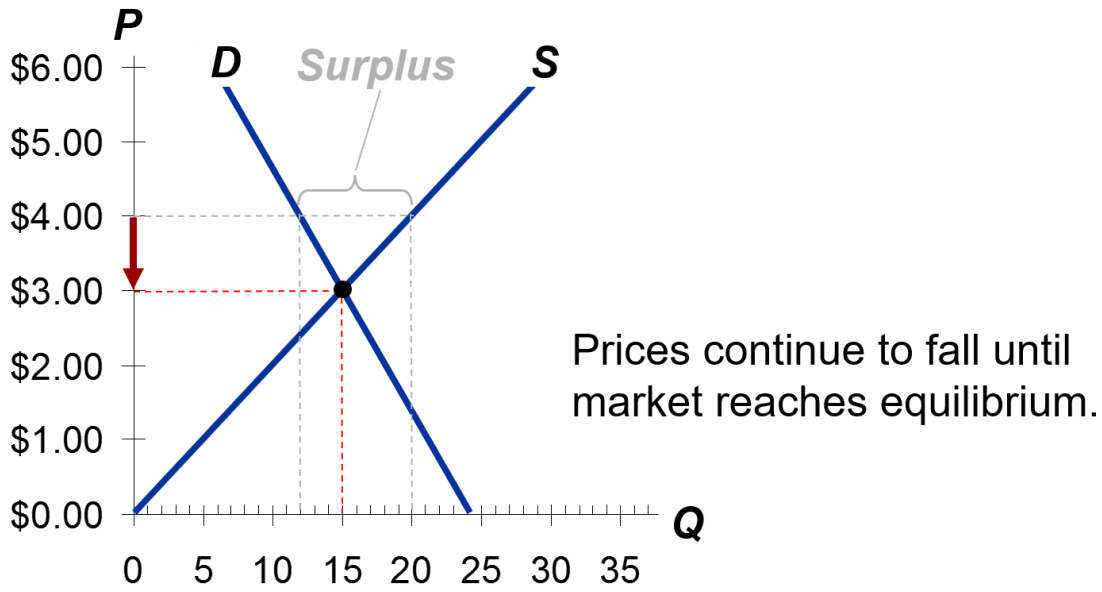
<i>P</i>	<i>Q^D</i>	<i>Q^S</i>
\$0	24	0
1	21	5
2	18	10
3	15	15
4	12	20
5	9	25
6	6	30

➤ **Surplus:**

when quantity supplied is greater than quantity demanded.⁴⁷

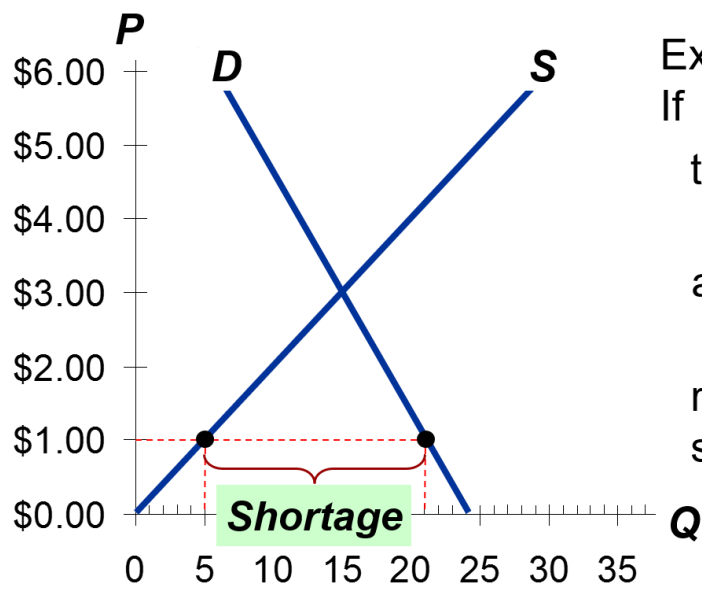


Example:
 If $P = \$5$,
 then
 $Q^D = 9$ lattes
 and
 $Q^S = 25$ lattes
 resulting in a surplus
 of 16 lattes

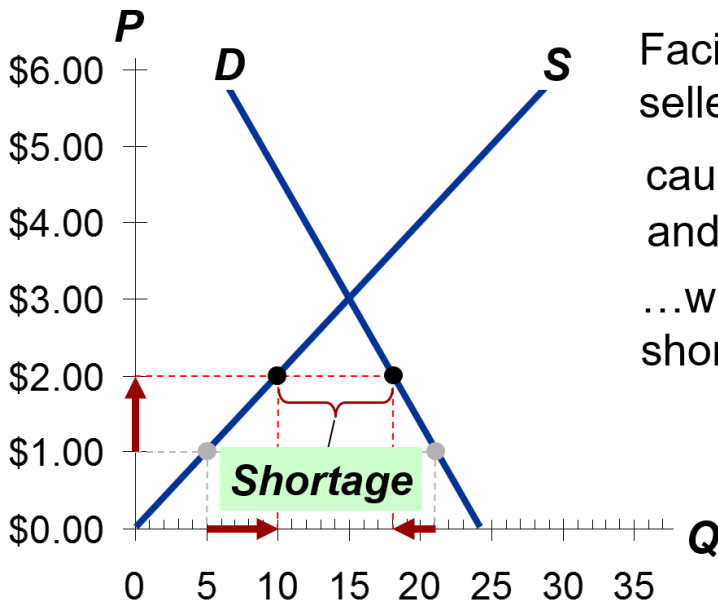


➤ **Shortage:**

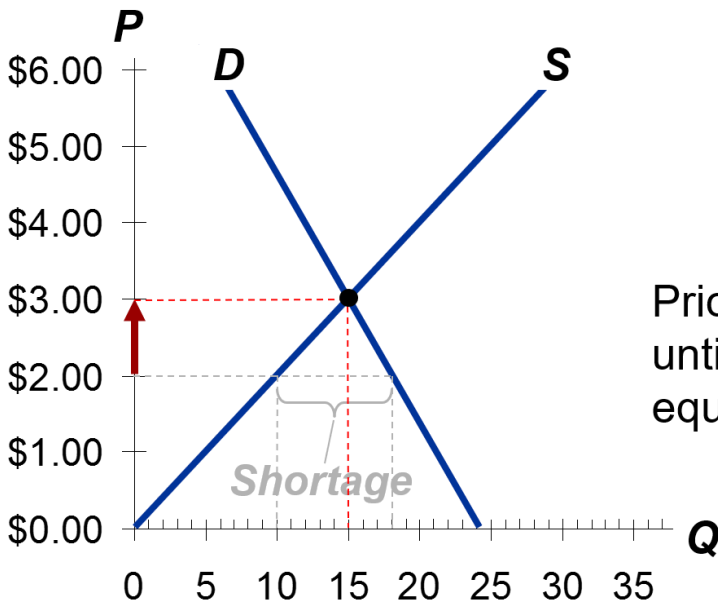
when quantity demanded is greater than quantity supplied.⁴⁸



Example:
 If $P = \$1$,
 then
 $Q^D = 21$ lattes
 and
 $Q^S = 5$ lattes
 resulting in a
 shortage of 16 lattes



Facing a shortage, sellers raise the price, causing Q^D to fall and Q^S to rise, ...which reduces the shortage.

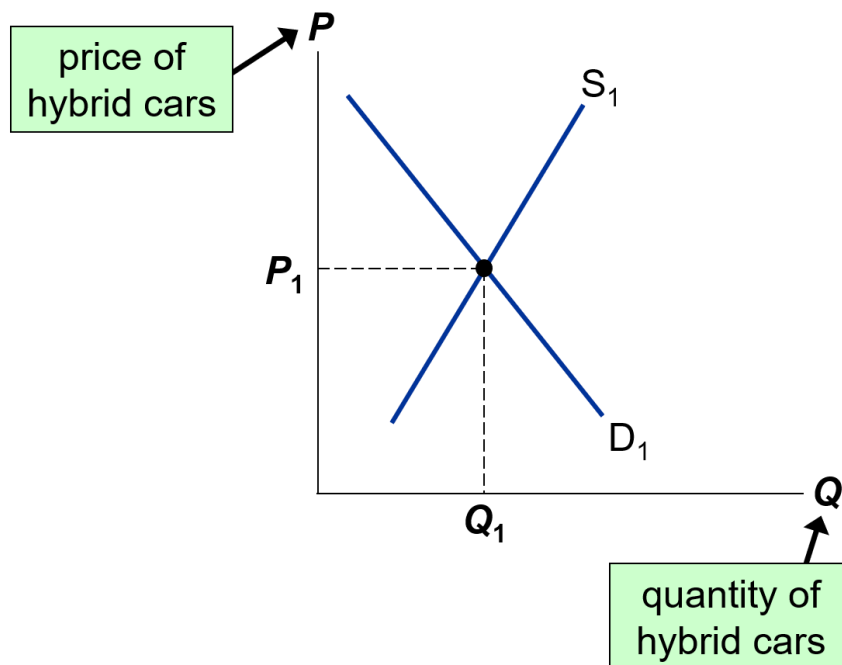


Prices continue to rise until market reaches equilibrium.

➤ **Three Steps to Analyzing Changes in Equilibrium**

- To determine the effects of any event,⁴⁹
 - 1) Decide whether event shifts **S** curve, **D** curve, or both.⁵⁰
 - 2) Decide in which direction curve shifts.⁵¹
 - 3) Use supply-demand diagram to see how the shift changes equilibrium **P** and **Q**.⁵²

➤ **EXAMPLE: The Market for Hybrid Cars**



➤ **EXAMPLE 1: A Change in Demand**

EVENT TO BE ANALYZED: Increase in price of gas.

STEP 1:

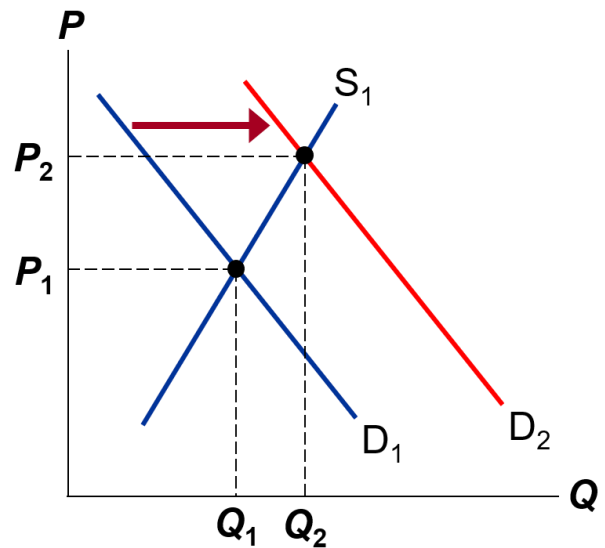
D curve shifts because price of gas affects demand for hybrids. **S** curve does not shift, because price of gas does not affect cost of producing hybrids.⁵³

STEP 2:

D shifts right because high gas price makes hybrids more attractive relative to other cars⁵⁴

STEP 3:

The shift causes an increase in price and quantity of hybrid cars.⁵⁵



Notice:

When **P** rises, producers supply a larger quantity of hybrids, even though the **S** curve has not shifted.

*Always be careful to distinguish b/w a shift in a curve and a movement along the curve.*⁵⁶

➤ **Terms for Shift vs. Movement Along Curve**

- **Change in supply:** a shift in the **S** curve occurs when a non-price determinant of supply changes (like technology or costs)⁵⁷
- **Change in the quantity supplied:** a movement along a fixed **S** curve occurs when **P** changes⁵⁸

- **Change in demand:** a shift in the **D** curve occurs when a non-price determinant of demand changes (like income or # of buyers)⁵⁹
- **Change in the quantity demanded:** a movement along a fixed **D** curve occurs when **P** changes

➤ **EXAMPLE 2: A Change in Supply**

EVENT: New technology reduces cost of producing hybrid cars.

STEP 1: S curve shifts

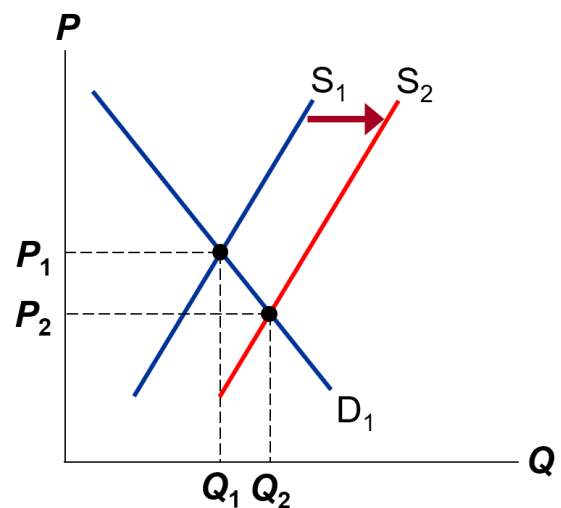
because event affects cost of production.
D curve does not shift, because production technology is not one of the factors that affect demand.⁶¹

STEP 2: S shifts right

because event reduces cost, makes production more profitable at any given price.⁶²

STEP 3:

The shift causes price to fall and quantity to rise.⁶³



➤ **EXAMPLE 3: A Change in Both Supply and Demand**

EVENTS: price of gas rises AND new technology reduces production costs

STEP 1:

Both curves shift.⁶⁴

STEP 2:

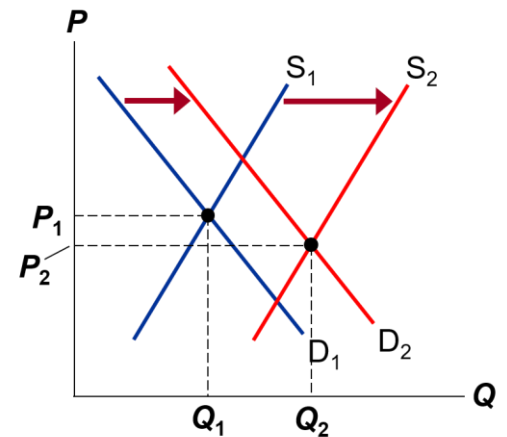
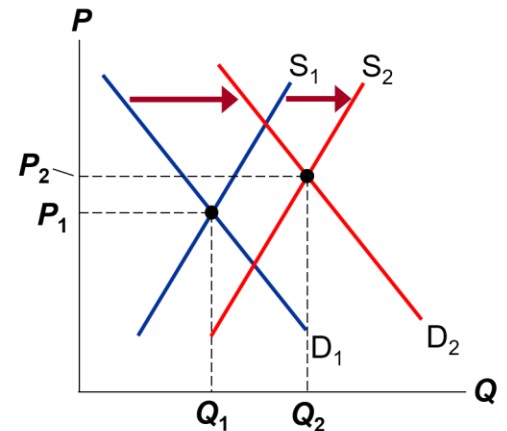
Both shift to the right.⁶⁵

STEP 3:

Q rises, but effect on P is ambiguous:

If demand increases more than supply, P rises.

But if supply increases more than demand, P falls.⁶⁶

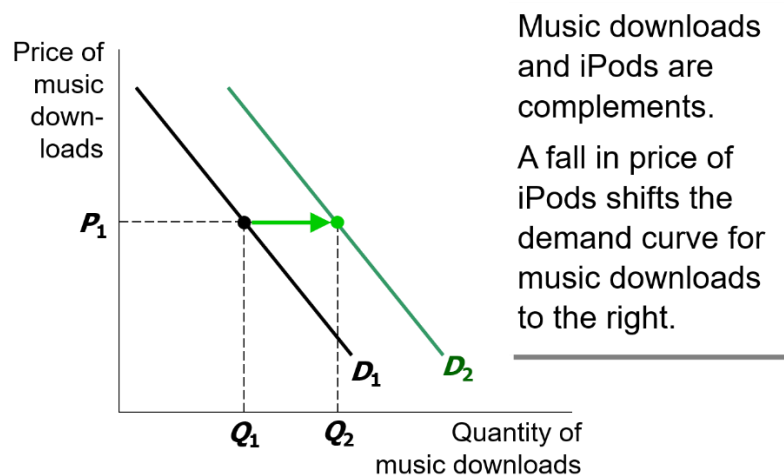


EXERCISE

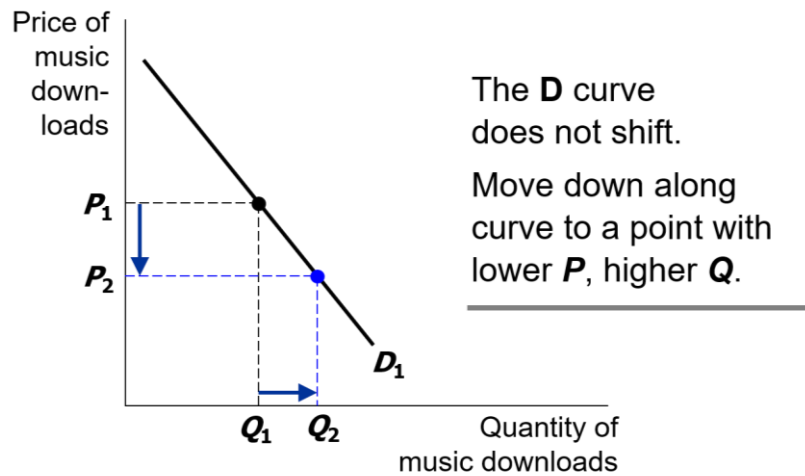
1. Draw a demand curve for music downloads. What happens to it in each of the following scenarios? Why?

- A. The price of iPods falls
- B. The price of music downloads falls
- C. The price of compact discs falls

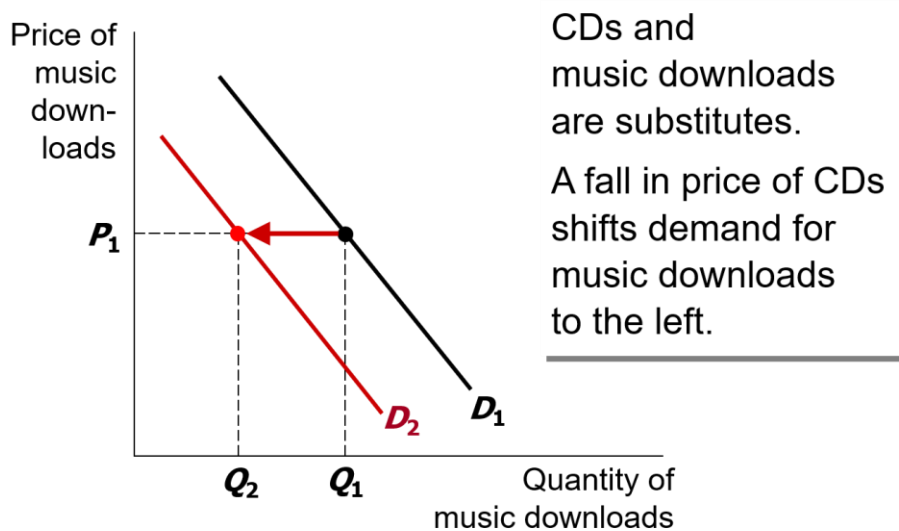
A. The price of iPods falls



B. price of music downloads falls

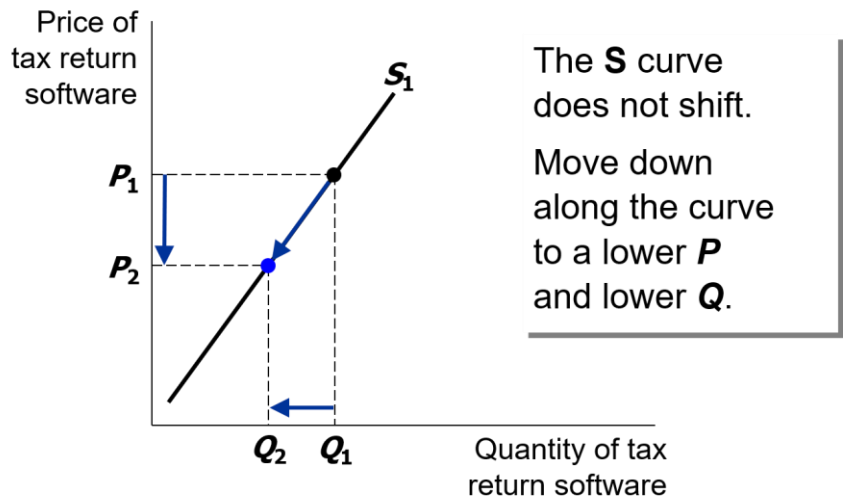


C. price of CDs falls

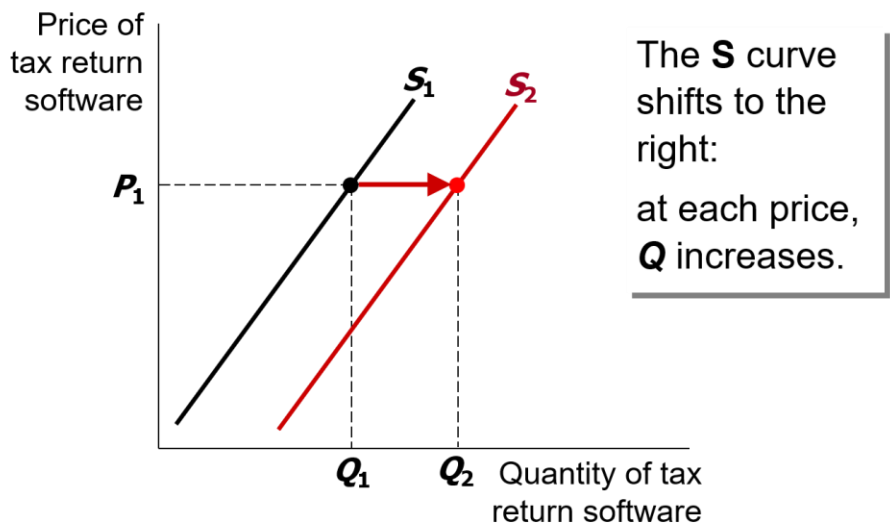


2. Draw a supply curve for tax return preparation software. What happens to it in each of the following scenarios?
 - A. Retailers cut the price of the software.
 - B. A technological advance allows the software to be produced at lower cost.
 - C. Professional tax return preparers raise the price of the services they provide.

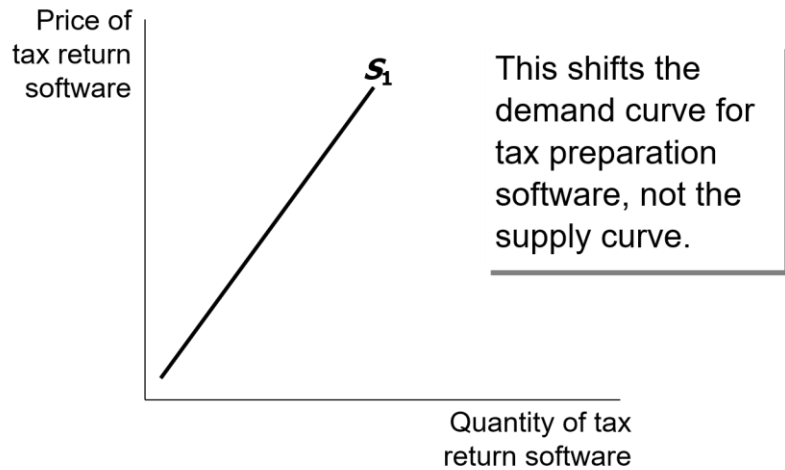
A. fall in price of tax return software



B. fall in cost of producing the software



C. professional preparers raise their price



3. Use the three-step method to analyze the effects of each event on the equilibrium price and quantity of music downloads.

Event A: A fall in the price of compact discs

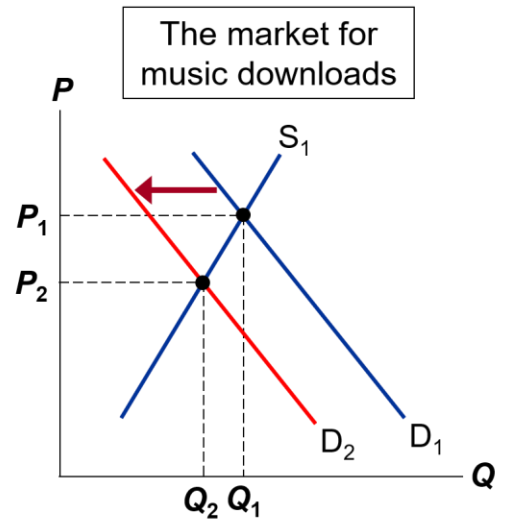
Event B: Sellers of music downloads negotiate a reduction in the royalties they must pay for each song they sell.

Event C: Events A and B both occur.

A. fall in price of CDs

STEPS

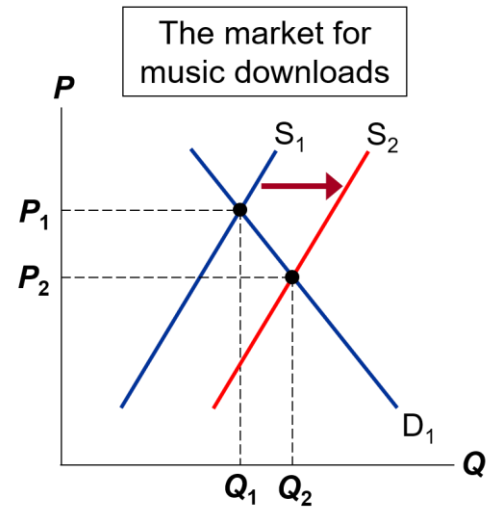
1. D curve shifts
2. D shifts left
3. *P* and *Q* both falls.



B. Fall in cost of royalties

STEPS

1. S curve shifts
(royalties are part of sellers' costs)
2. S shifts right
3. P falls, Q rises.



C. fall in price of CDs AND fall in cost of royalties

STEPS

4. Both curves shift (see parts A & B).
5. D shifts left, S shifts right.
6. P unambiguously falls.
Effect on Q is ambiguous: The fall in demand reduces Q , the increase in supply increases Q .



ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What is a group of buyers and sellers of a particular product?	Market
2		What is market?	Group of buyers and sellers
3	2	A competitive market has a negligible effect on what?	Price
4		In which market the price has its negligible effect?	Competitive market
5	3	In which market all goods are exactly the same?	Perfectly competitive market:
6		In a perfectly competitive market, each is a	Price taker
7	4	What comes from the behavior of buyers?	Demand
8		Demand comes from?	behavior of buyers
9	5	What is called to the amount of the good that buyers are willing and able to purchase?	Quantity demanded
10		What is the quantity demanded of any good?	Willingness and ability to purchase
11	6	What happens when the quantity demanded of a good fall?	Price rises
12		What happens when the price of a good rise?	Demand falls
13	7	What is known as relationship between the price of a good and the quantity demanded?	Demand schedule
14		Between which factors the demand schedule shows relationship?	Price and demand of goods



15	8	What is the example of demand schedule?	Helen's demand for lattes.
16		Helen's demand for lattes: it is an example of?	Demand schedule
17	9	What is obeyed by the persons preferences?	Law of demand
18		What is shown by the law of demand?	Person's preferences
19	10	What is the quantity demanded in the market?	Sum of quantity demanded by all buyers
20		What is the sum of the quantities demanded by all buyers at each price?	Quantity demanded in the market
21	11	What is the full form of Qd?	Quantity Demanded
22		What is the short form of quantity demanded?	Qd
23	12	What is shown by the demand curve?	Effect of demand on price
24		What shows the effects of quantity demanded on price?	Demand curve
25	13	What are the other things in demand curve?	non-price determinants of demand
26		What is called to the things that determines buyers' demand for a good, other than the good's price?	non-price determinants of demand
27	14	What is caused by an increase in the number of buyers?	increase in quantity demanded
28		By which demand shifter the demand curve shifts to the right?	No. of buyers
29	15	Demand for a normal good is positively related to what?	Income
30		What is positively related to income?	Demand for normal goods
31	16	What is caused by an increase in the income?	increase in quantity demanded
32		By which demand shifter the demand curve shifts to the right?	Income



33	17	What is negatively related to income?	Demand for inferior goods
34		Demand for an inferior good is negatively related to what?	Income
35	18	What is called an increase in the price of one good cause an increase in demand for the other goods?	Substitutes goods
36		What is caused to the other goods by the increase in the price of substitute good?	Increase in demand
37	19	Pizza and Hamburgers are the examples of?	Substitutes goods
38		What are the examples of substitutes?	Pizza and Hamburgers
39	20	What is caused by an increase in the price of pizza?	increases demand for hamburgers
40		What is caused to demand curve of hamburgers by an increase in the price of pizza?	Shifts right
41	21	Coke and Pepsi are the examples of?	Substitutes goods
42		Laptops and desktop computers	Substitutes goods
43	22	What is called an increase in the price of one causes a fall in demand for the other?	Complement goods
44		What is caused to the other goods by the increase in the price of complement good?	Fall in demand
45	23	Computers and software are the examples of?	Complement goods
46		What are the examples of complement goods?	Computers and software
47	24	What happens when people buy fewer computers?	price of computers rises
48		What happens when price of computers rises?	people buy fewer computers



49	25	What are the examples of complements goods?	College tuition and textbooks
50		college tuition and textbooks are examples of?	Complement goods
51	26	What causes a shift in tastes?	Demand increases
52		What happens to the demand curve when shift in tastes comes?	Shifts right
53	27	When was the Atkins diet became popular?	In 90s
54		What caused to demand curve by an increase in demand for eggs?	Shifts right
55	28	What affects consumers' buying decisions?	Expectations
56		What is affected by Expectations of consumers?	Buying decisions
57	29	What happens when people expect their incomes to rise?	demand for meals at expensive restaurants may increase
58		Due to what reason demand for meals at expensive restaurants may increases?	When people expect income to rise
59	30	From where the supply comes?	Behavior of sellers
60		What comes from the behavior of sellers?	Supply
61	31	What is called to the amount of goods that sellers are willing and able to sell?	Quantity supplied
62		What is the quantity supplied of any good?	Willingness and ability to sell
63	32	What happens when the quantity supplied of a good rise?	Price of goods rises
64		What is called to the quantity supplied of a good rise when the price of the good rises?	Law of supply

65	33	What shows the relationship between the price of a good and the quantity supplied?	Supply schedule
66		Supply schedule shows the relationship between what?	Price and supply
67	34	What is the example of supply schedule?	Starbucks' supply of lattes
68		Starbucks' supply of lattes is an example of?	Supply schedule
69	35	What is called to the sum of the quantities supplied by all sellers at each price?	Quantity supplied in market
70		Quantity supplied in the market is the sum of what?	Supply by all sellers
71	36	What is full form of Qs?	Quantity Supplied
72		What is the short form of quantity supplied?	Qs
73	37	What shows how price affects quantity supplied?	Supply curve
74		What is shown by supply curve?	Effect of supply on price
75	38	What are the other things in the supply curve?	non-price determinants of supply
76		What happens to the supply curve when the non-price determinants of supply changes?	Shifts S curve
77	39	What are the examples of input prices?	wages, prices of raw materials
78		Wages, prices of raw materials are the examples of?	Input prices
79	40	What happens when input prices fall?	production becomes more profitable
80		A fall in input price shifts supply curve to ...	Right



81	41	What determines how much inputs are required to produce a unit of output?	Technology
82		What is determined by technology?	Requirements of inputs
83	42	What is the effect of cost-saving technological improvement?	fall in input prices
84		In which direction the technological improvements shift supply curve?	Right
85	43	What happens when the number of sellers increases?	Supply increases
86		In which direction the number of sellers shift supply curve?	Right
87	44	What happens when the firm expects the price of the good it sells to rise in the future?	reduce supply now
88		In which direction the firm expectations shift supply curve?	Left
89	45	What refers to the price that equates quantity supplied with quantity demanded?	Equilibrium price
90		What equates with quantity supplied in equilibrium price?	Quantity demanded
91	46	What refers to the quantity supplied and quantity demanded at the equilibrium price?	Equilibrium quantity
92		Where the equilibrium quantity is determined?	Equilibrium price
93	47	What it refers when the quantity supplied is greater than quantity demanded?	Surplus
94		What is surplus?	quantity supplied > quantity demanded



95	48	What refers when the when quantity demanded is greater than quantity supplied?	Shortage
96		What is shortage?	quantity demanded > quantity supplied?
97	49	How many steps are there to analyze the changes in equilibrium?	3 (Three)
98		What is determined by the analyzing the change in equilibrium?	Effect of any event
99	50	What is the first step to analyze the changes in equilibrium?	To decide whether event shifts S curve, D curve, or both
100			
101	51	What is the second step to analyze the changes in equilibrium?	To decide in which direction curve shifts
102			
103	52	What is the third step to analyze the changes in equilibrium?	To see how the shift change equilibrium P and Q
104			
105	53	Why D curve shifts?	price of gas affects demand for hybrids
106		Why S curve does not shift?	price of gas does not affect cost of producing hybrids
107	54	Why D shifts right?	high gas price makes hybrids more attractive
108		In which direction the price of gas shifts curve?	Right
109	55	What is caused by shifts in D curve?	increase in price and quantity of hybrid cars
110		What happens when increase in price and quantity of hybrid cars?	D curve shifts
111	56	When price rises, producer	Supply large quantity
112		Due to which factor, the producer supplies a large quantity?	Rise in price



113	57	What occurs when a non-price determinant of supply changes?	Change in supply
114		Change in supply...	Shift S curve
115	58	What occurs when P changes?	Quantity supplied changes
116		Change in Quantity supplied ...	movement along a fixed S curve
117	59	What occurs when a non-price determinant of demand changes?	Change in demand
118		What are the non-price determinants of demand?	Income, no. of buyers
119	60	What occurs when P changes?	Quantity demanded changes
120		Change in Quantity demanded...	movement along a fixed S curve
121	61	Why S curve shifts when new technology reduces cost of producing hybrid cars?	cost of production
122		Why D curve does not shift when new technology reduces cost of producing hybrid cars?	production technology is not one of the factors that affect demand
123	62	Why S shifts right?	event reduces cost
124		What happens when S shifts to the right?	Production profitable
125	63	What happens when S curve shifts?	price fall and quantity rise
126		What factor does price to fall and quantity to rise?	Shift in S curve
127	64	What happens when price of gas rises and new technology reduces production costs?	Both curve shifts
128		Why both curve shifts?	Price and technology
129	65	In which direction both curve shifts when the price of gas rises and new technology reduces production costs?	Right



130		Both curve shifts...	Right
131	66	What happens when the demand increases more than supply?	Price rises
132		What happens when the supply increases more than demand?	Price falls



MBA SEM 01
Module 01 Chapter 03

🌀 ELASTICITY AND ITS APPLICATION 🌀

❖ ELASTICITY

- Basic idea: Elasticity measures how much one variable responds to changes in another variable.¹
- One type of elasticity measures how much demand for your websites will fall if you raise your price.²
- **Definition:**
Elasticity is a numerical measure of the responsiveness of Q^d or Q^s to one of its determinants.³

❖ Price Elasticity of Demand

$$\text{Price Elasticity of Demand} = \frac{\text{Percentage Change in } Q^d}{\text{Percentage Change in } P}$$

- Price elasticity of demand measures how much Q^d responds to a change in P .⁴
- Loosely speaking, it measures the price-sensitivity of buyers' demand.⁵

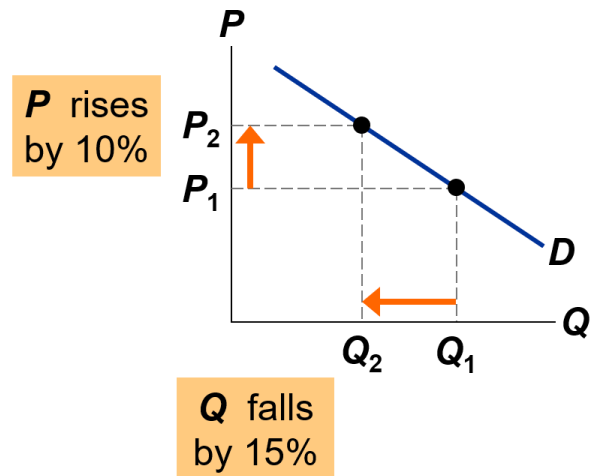
Example:

- Price elasticity of demand equals

$$\frac{15\%}{10\%} = 1.5$$

Along a **D** curve, **P** and **Q** move in opposite directions, which would make price elasticity negative.

(We will drop the minus sign and report all price elasticities as positive numbers.)⁶



❖ **Calculating Percentage Changes**

- Standard method of computing the percentage (%) change:

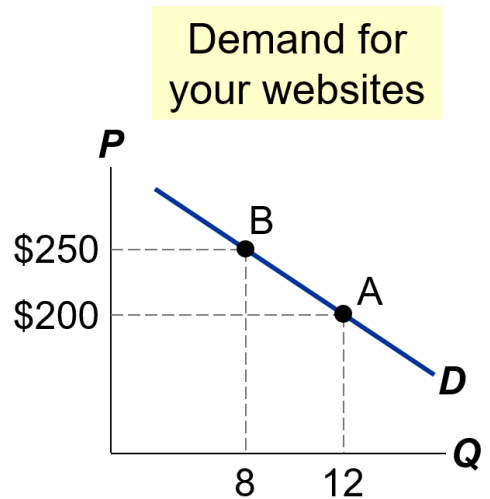
$$\frac{\text{end value} - \text{start value}}{\text{start value}} \times 100\%$$

Going from A to B, the % change in **P** equals $(\$250 - \$200) / \$200 = 25\%$ ⁷

- Problem:** The standard method gives different answers depending on where you start.⁸

- From A to B, **P** rises 25%, **Q** falls 33%, elasticity = $33/25 = 1.33$

- From B to A, **P** falls 20%, **Q** rises 50%, elasticity = $50/20 = 2.50$





- So, we instead use the **midpoint method**:⁹

$$\frac{\text{end value} - \text{start value}}{\text{midpoint}} \times 100\%$$

- The midpoint is the number halfway between the start & end values, also the average of those values.

It doesn't matter which value you use as the "start" and which as the "end" – you get the same answer either way!¹⁰

- Using the midpoint method, the % change in **P** equals

$$\frac{\$250 - \$200}{\$225} \times 100\% = 22.2\%$$

- The % change in **Q** equals

$$\frac{12 - 8}{10} \times 100\% = 40.0\%$$

- The price elasticity of demand equals

$$40/22.2 = 1.8$$

❖ What determines price elasticity?

- To learn the determinants of price elasticity, we look at a series of examples. Each compares two common goods.
- In each example:
 - Suppose the prices of both goods rise by 20%.



- The good for which Q^d falls the most (in percent) has the highest price elasticity of demand. Which good is it? Why?
- What lesson does the example teach us about the determinants of the price elasticity of demand?

➤ **EXAMPLE 1: Rice Krispies vs. Sunscreen**

- The prices of both of these goods rise by 20%. For which good does Q^d drop the most? Why?
 - Rice Krispies has lots of close substitutes (*e.g.*, Cap'n Crunch, Count Chocula), so buyers can easily switch if the price rises.¹¹
 - Sunscreen has no close substitutes, so consumers would probably not buy much less if its price rises.¹²
- Lesson:
Price elasticity is higher when close substitutes are available.¹³

➤ **EXAMPLE 2: “Blue Jeans” vs. “Clothing”**

- The prices of both goods rise by 20%. For which good does Q^d drop the most? Why?
 - For a narrowly defined good such as blue jeans, there are many substitutes (khakis, shorts, Speedos).¹⁴
 - There are fewer substitutes available for broadly defined goods. (Can you think of a substitute for clothing, other than living in a nudist colony?)¹⁵
- Lesson:
Price elasticity is higher for narrowly defined goods than broadly defined ones.¹⁶



➤ **EXAMPLE 3: Insulin vs. Caribbean Cruises**

- The prices of both of these goods rise by 20%. For which good does Q^d drop the most? Why?
 - To millions of diabetics, insulin is a necessity. A rise in its price would cause little or no decrease in demand.¹⁷
 - A cruise is a luxury. If the price rises, some people will forego it.¹⁸
- Lesson:
*Price elasticity is higher for luxuries than for necessities.*¹⁹

➤ **EXAMPLE 4: Gasoline in the Short Run vs. Gasoline in the Long Run**

- The price of gasoline rises 20%. Does Q^d drop more in the short run or the long run? Why?
 - There are not much people can do in the short run, other than ride the bus or carpool.
 - In the long run, people can buy smaller cars or live closer to where they work.
- Lesson:
*Price elasticity is higher in the long run than the short run.*²⁰

❖ **The Variety of Demand Curves**

- Economists classify demand curves according to their elasticity.²¹
- The price elasticity of demand is closely related to the slope of the demand curve.²²
- Rule of thumb:
The flatter the curve, the bigger the elasticity. The steeper the curve, the smaller the elasticity.²³

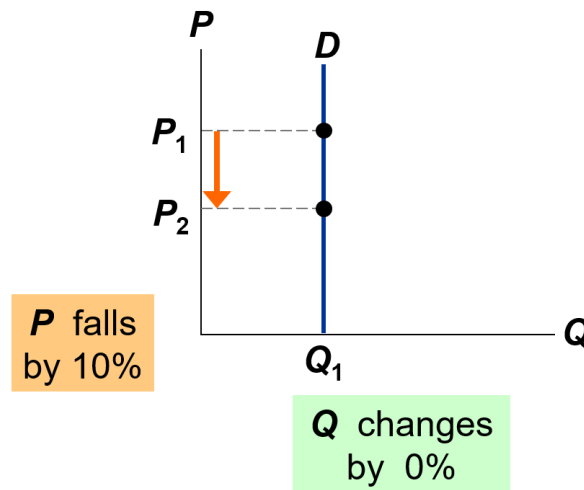
1. “Perfectly inelastic demand” (one extreme case)

$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{0\%}{10\%} = 0$$

D curve:
vertical

Consumers’ price sensitivity:
0

Elasticity:
0



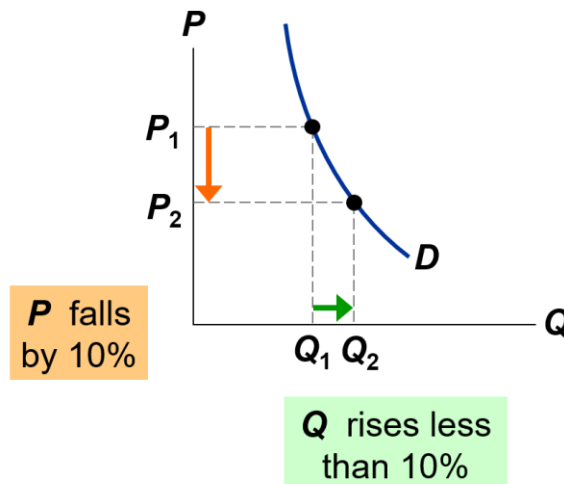
2. “Inelastic demand”

$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{< 10\%}{10\%} < 1$$

D curve:
relatively steep

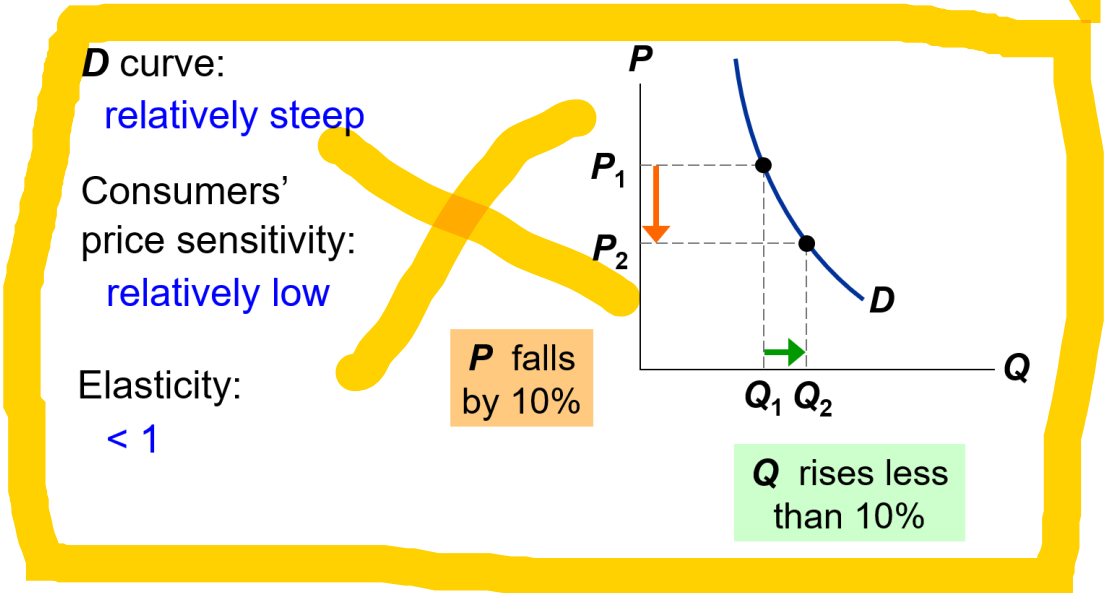
Consumers’ price sensitivity:
relatively low

Elasticity:
< 1



3. "Unit elastic demand"

$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{< 10\%}{10\%} < 1$$



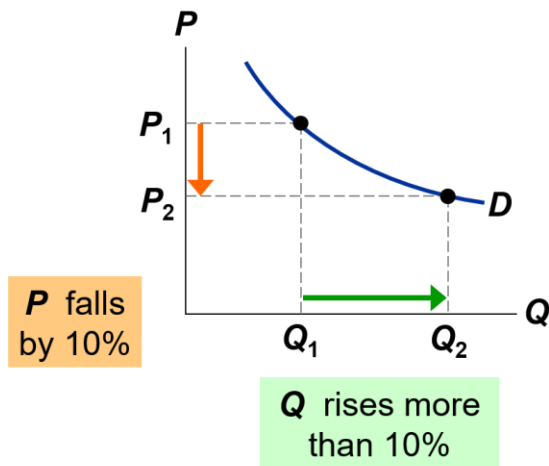
4. "Elastic demand"

$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{> 10\%}{10\%} > 1$$

D curve:
relatively flat

Consumers' price sensitivity:
relatively high

Elasticity:
> 1



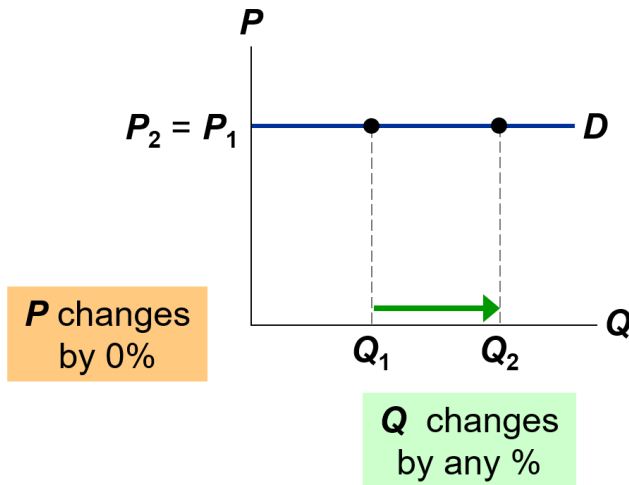
5. "Perfectly elastic demand" (the other extreme)

$$\text{Price elasticity of demand} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{\text{any } \%}{0\%} = \text{infinity}$$

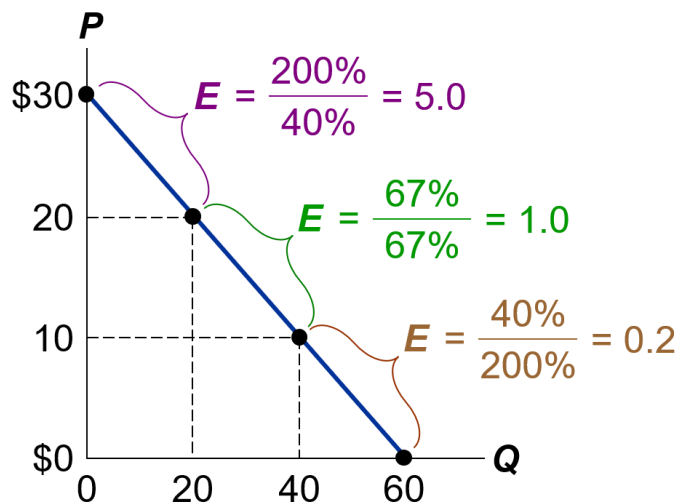
D curve:
horizontal

Consumers' price sensitivity:
extreme

Elasticity:
infinity



➤ Elasticity of a Linear Demand Curve



➤ Price Elasticity and Total Revenue

- Continuing our scenario, if you raise your price from \$200 to \$250, would your revenue rise or fall?

$$\text{Revenue} = P \times Q$$

- A price increase has two effects on revenue:²⁴
 - Higher P means more revenue on each unit you sell.
 - But you sell fewer units (lower Q), due to Law of Demand.
- Which of these two effects is bigger? It depends on the price elasticity of demand.

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in } Q}{\text{Percentage change in } P}$$

$$\text{Revenue} = P \times Q$$

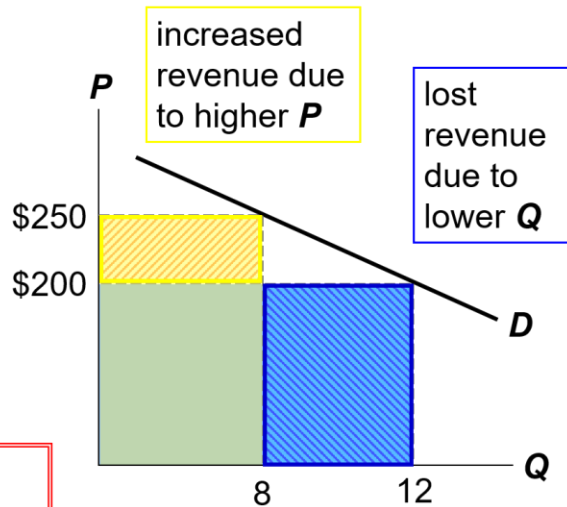
- If demand is elastic, then price elasticity of demand > 1 ²⁵
 $\% \text{ change in } Q > \% \text{ change in } P$
- The fall in revenue from lower Q is greater than the increase in revenue from higher P , so revenue falls.²⁶

Elastic demand
(elasticity = 1.8)

If $P = \$200$,
 $Q = 12$ and
revenue = \$2400.

If $P = \$250$,
 $Q = 8$ and
revenue = \$2000.

When D is elastic,
a price increase
causes revenue to fall.



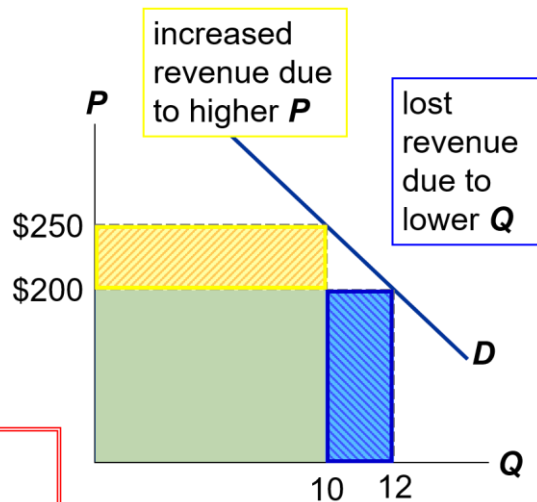
- If demand is inelastic, then price elasticity of demand < 1 ²⁷
 $\% \text{ change in } Q < \% \text{ change in } P$
- In our example, suppose that Q only falls to 10 (instead of 8) when you raise your price to \$250.

Now, demand is inelastic:
 elasticity = 0.82

If $P = \$200$,
 $Q = 12$ and
 revenue = \$2400.

If $P = \$250$,
 $Q = 10$ and
 revenue = \$2500.

When D is inelastic,
 a price increase
 causes revenue to rise.



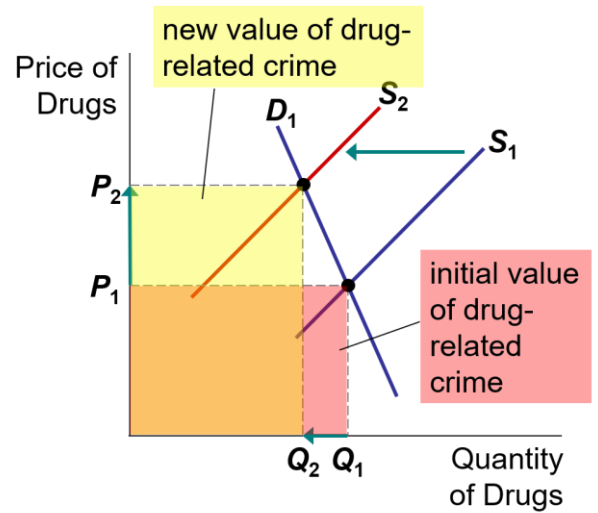
❖ APPLICATION:

Does Drug Interdiction Increase or Decrease Drug-Related Crime?

- One side effect of illegal drug use is crime: Users often turn to crime to finance their habit. ²⁸
- We examine two policies designed to reduce illegal drug use and see what effects they have on drug-related crime. ²⁹
- For simplicity, we assume the total dollar value of drug-related crime equals total expenditure on drugs. ³⁰
- Demand for illegal drugs is inelastic, due to addiction issues. ³¹

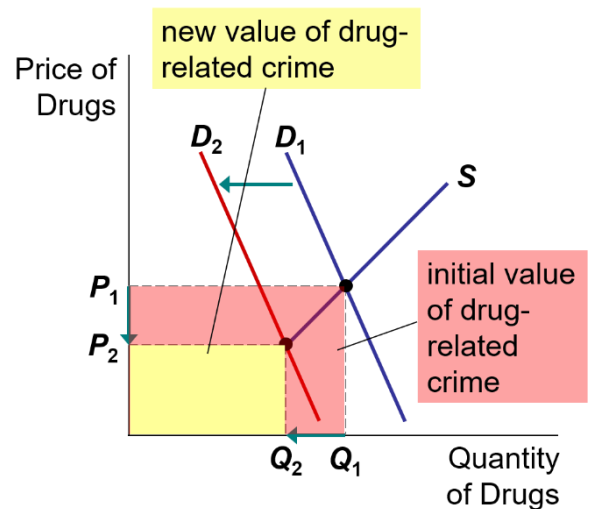
➤ **Policy 1: Interdiction**

- Interdiction reduces the supply of drugs.
Since demand for drugs is inelastic, P rises proportionally more than Q falls.³²
- **Result:**
an increase in total spending on drugs, and in drug-related crime.³³



➤ **Policy 2: Education**

- Education reduces the demand for drugs.
 P and Q fall.³⁴
- **Result:**
A decrease in total spending on drugs, and in drug-related crime.³⁵



❖ Price Elasticity of Supply

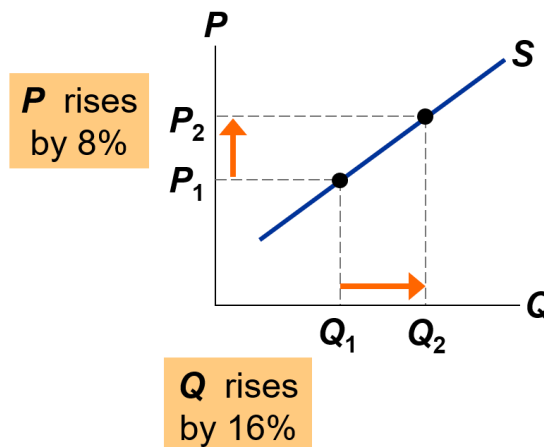
$$\text{Price elasticity of supply} = \frac{\text{Percentage change in } Q^s}{\text{Percentage change in } P}$$

- **Price elasticity of supply** measures how much Q^s responds to a change in P . Loosely speaking, it measures the price-sensitivity of sellers' supply. Again, use the midpoint method to compute the percentage changes.³⁶

Example:

Price elasticity of supply equals

$$\frac{16\%}{8\%} = 2.0$$



❖ The Variety of Supply Curves

- Economists classify supply curves according to their elasticity.³⁷
- The slope of the supply curve is closely related to price elasticity of supply.³⁸
- Rule of thumb:
The flatter the curve, the bigger the elasticity. The steeper the curve, the smaller the elasticity.³⁹

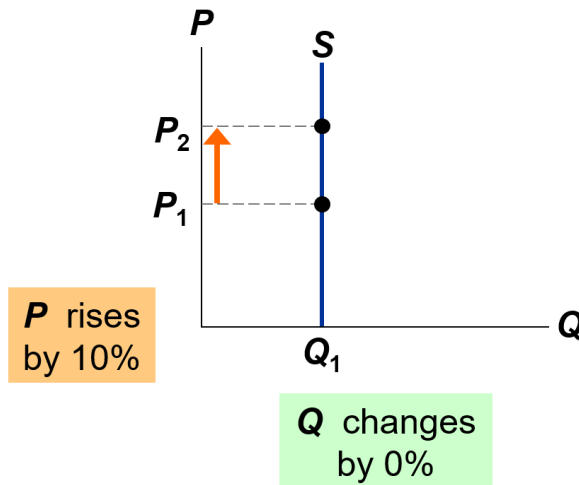
1. “Perfectly inelastic” (one extreme)

$$\text{Price elasticity of supply} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{0\%}{10\%} = 0$$

S curve:
vertical

Sellers’
price sensitivity:
0

Elasticity:
0



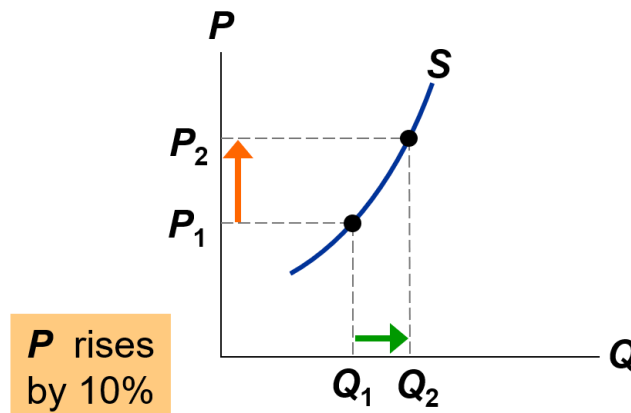
2. “Inelastic”

$$\text{Price elasticity of supply} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{< 10\%}{10\%} < 1$$

S curve:
relatively steep

Sellers’
price sensitivity:
relatively low

Elasticity:
< 1



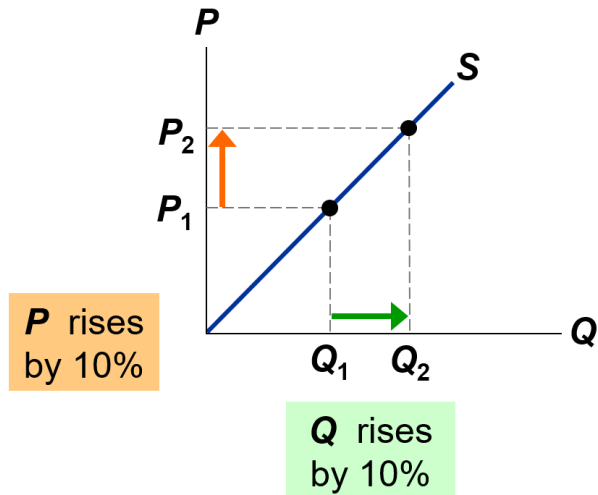
3. “Unit elastic”

$$\text{Price elasticity of supply} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{10\%}{10\%} = 1$$

S curve:
intermediate slope

Sellers' price sensitivity:
intermediate

Elasticity:
= 1



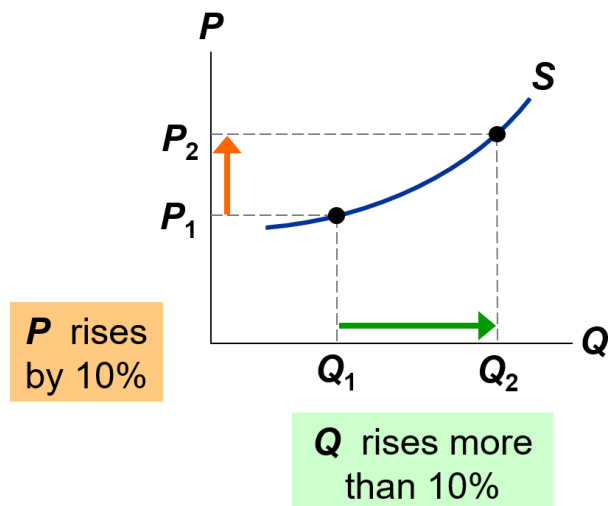
4. "Elastic"

$$\text{Price elasticity of supply} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{> 10\%}{10\%} > 1$$

S curve:
relatively flat

Sellers' price sensitivity:
relatively high

Elasticity:
> 1



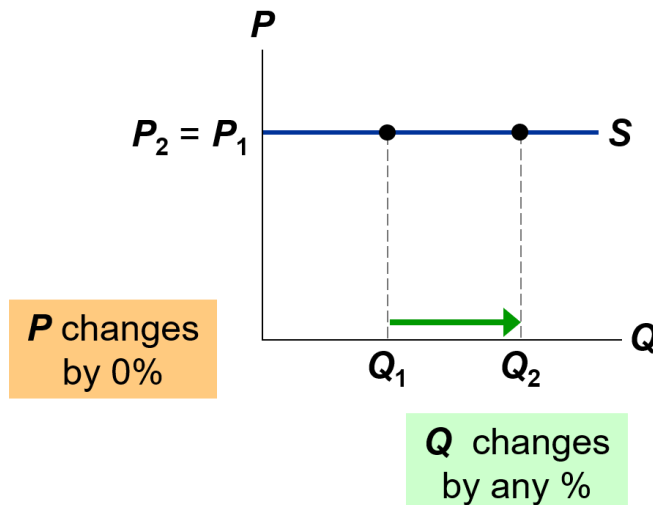
5. “Perfectly elastic” (the other extreme)

$$\text{Price elasticity of supply} = \frac{\% \text{ change in } Q}{\% \text{ change in } P} = \frac{\text{any } \%}{0\%} = \text{infinity}$$

S curve:
horizontal

Sellers’
price sensitivity:
extreme

Elasticity:
infinity



➤ The Determinants of Supply Elasticity

- The more easily sellers can change the quantity they produce, the greater the price elasticity of supply.⁴⁰
- Example: Supply of beachfront property is harder to vary and thus less elastic than supply of new cars.⁴¹
- For many goods, price elasticity of supply is greater in the long run than in the short run, because firms can build new factories, or new firms may be able to enter the market.⁴²

❖ Other Elasticities

- The income elasticity of demand measures the response of Q^d to a change in consumer income.⁴³

$$\text{Cross-price elasticity of demand} = \frac{\% \text{ change in } Q^d \text{ for good 1}}{\% \text{ change in price of good 2}}$$

- For substitutes, cross-price elasticity > 0
E.g., an increase in price of beef causes an increase in demand for chicken.⁴⁴
- For complements, cross-price elasticity < 0
E.g., an increase in price of computers causes decrease in demand for software.



EXERCISE

1. Use the following information to calculate the price elasticity of demand for hotel rooms:

if $P = \$70$, $Q^d = 5000$

if $P = \$90$, $Q^d = 3000$

ANSWER:

% change in Q^d

$$(5000 - 3000)/4000 = 50\%$$

% change in P

$$(\$90 - \$70)/\$80 = 25\%$$

The price elasticity of demand equals

$$\frac{50\%}{25\%} = 2.0$$



2. Elasticity and expenditure/revenue

- A. Pharmacies raise the price of insulin by 10%. Does total expenditure on insulin rise or fall?
- B. As a result of a fare war, the price of a luxury cruise falls 20%. Does luxury cruise companies' total revenue rise or fall?

ANSWER:

- A. Pharmacies raise the price of insulin by 10%. Does total expenditure on insulin rise or fall?

$$\text{Expenditure} = P \times Q$$

Since demand is inelastic, Q will fall less than 10%, so **expenditure rises**.

- B. As a result of a fare war, the price of a luxury cruise falls 20%. Does luxury cruise companies' total revenue rise or fall?

$$\text{Revenue} = P \times Q$$

The fall in P reduces revenue, but Q increases, which increases revenue. Which effect is bigger?

Since demand is elastic, Q will increase more than 20%, so **revenue rises**.

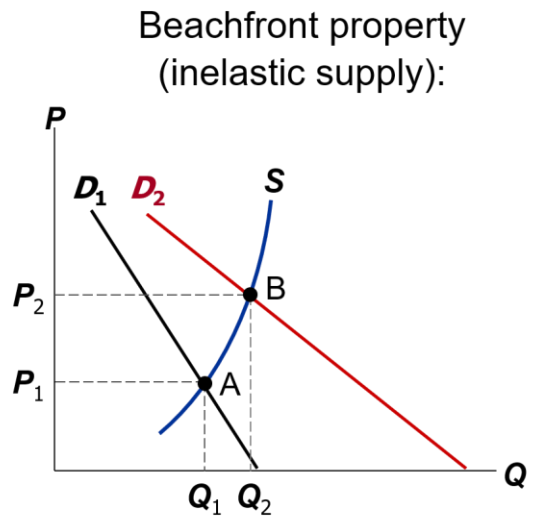
3. Elasticity and changes in equilibrium

The supply of beachfront property is inelastic. The supply of new cars is elastic. Suppose population growth causes demand for both goods to double (at each price, Q^d doubles).

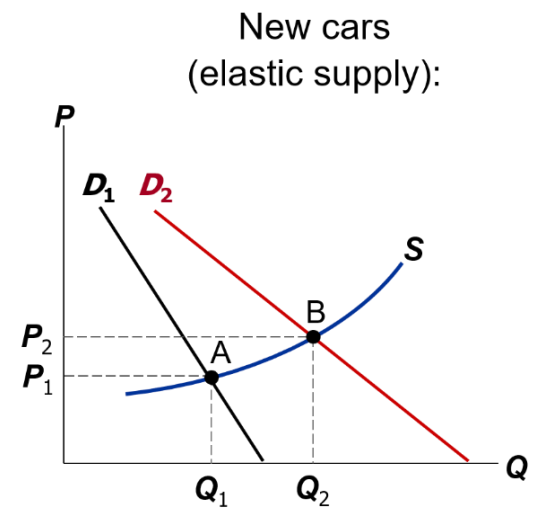
- A. For which product will P change the most?
- B. For which product will Q change the most?

ANSWER:

A. When supply is *inelastic*, an increase in demand has a bigger impact on price than on quantity.



B. When supply is *elastic*, an increase in demand has a bigger impact on quantity than on price.





ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What measures how much one variable responds to changes in another variable?	Elasticity
2		What refers to one variable responds to changes in another variable?	Elasticity
3	2	What happens when you raise price?	Demand falls
4		Why demand falls?	Due to price rise
5	3	What is a numerical measure of the responsiveness of Q^d or Q^s to one of its determinants?	Elasticity
6		Elasticity is a of the responsiveness of Q^d or Q^s to one of its determinants.	Numerical measure
7	4	What measures how much Q^d responds to a change in P ?	Price elasticity of demand
8		Price elasticity of demand responds to change in what?	Price
9	5	What is measured by price elasticity of demand of buyers?	price-sensitivity
10		What is measured by price elasticity of demand?	price-sensitivity of buyers' demand
11	6	What happens to price elasticity when P and Q move in opposite direction?	Negative
12		In which direction P and Q moves so that the price elasticity becomes negative?	Opposite



13	7	What is the formula of standard method for computing percentage change?	End value-start value/start value*100
14		End value-start value/start value*100 it is formula of?	Standard method
15	8	What is the problem of standard method for calculating percentage?	It gives different answers
16		It gives different answers depending on where you start is the problem of?	Standard method
17	9	Which method is use instead of standard method?	Midpoint method
18		What is the formula of midpoint method for computing percentage change?	End value-start value/midpoint*100
19	10	What refers to the number halfway between the start & end values?	Mid-point
20		What is known as the average of start and end value?	Mid-point
21	11	What happens when some goods have lots of close substitutes?	Buyers can easily switch to other goods
22		What if the price rises in one good which have lots of close substitutes?	Buyers can easily switch to other goods
23	12	What happens when some goods do not have lots of close substitutes?	Buyers cannot easily switch to other goods
24		What if the price rises in one good which do not have close substitutes?	Do not effect on sale
25	13	What is higher when close substitutes are available?	Price elasticity
26		What is lower when close substitutes are not available?	Price elasticity
27	14	Narrowly defined good have substitutes	Many
28		What are the substitutes of jeans?	Khakis, shorts, etc



29	15	Broadly defined good have substitutes	Fewer
30		Which goods have fewer substitutes?	Broadly defined goods
31	16	Which goods have higher price elasticity?	Narrowly defined good
32		Which goods have lower price elasticity?	Broadly defined good
33	17	To millions of diabetics, what is necessity?	Insulin
34		Rise in the price of necessary goods will increase or decrease the demand?	Neutral
35	18	What is a cruise?	Luxury goods
36		What happens when the prices rise in the luxury goods?	Some people will forgo it
37	19	Which goods have higher price elasticity?	Luxury goods
38		Which goods have lower price elasticity?	Necessity
39	20	Price elasticity is in the short run.	Lower
40		Price elasticity is in the long run.	Higher
41	21	Economists classify demand curves according to what?	Elasticity
42		Who classify demand curves according to its elasticity?	Economists
43	22	The price elasticity of demand is closely related to what?	Slope of demand curve
44		What is closely related to the slope of demand curve?	price elasticity of demand
45	23	The flatter the curve, the the elasticity.	Bigger
46		The steeper the curve, the the elasticity.	Smaller



47	24	How many effects has a price increase on revenue?	2 (Two)
48		What is the meaning of higher price?	More revenue
49	25	If demand is elastic, then price elasticity of demand	>1
50		Revenue is equals to what?	Price * Quantity
51	26	What if quantity sold is low?	Revenue falls
52		What if price is high?	Revenue rises
53	27	If demand is inelastic, then price elasticity of demand ...	<1
54		Percentage change in Q is less than what?	Price
55	28	What is the side effect of use of illegal drug?	Crime
56		Why crime happens?	To finance their needs
57	29	How many policies are designed to reduce illegal drug use?	2 (Two)
58		Why policies are designed to reduce illegal drug use and see what effects they have on?	drug-related crime
59	30	What is equals in the assumption in the total dollar value of drug-related crime?	total expenditure on drugs
60		total expenditure on drugs equals to what on the drug related crime?	total dollar value
61	31	Due to which factor demand for illegal drugs is inelastic?	Addiction issue
62		Due to addiction issue, demand for illegal drugs is?	Inelastic
63	32	What is reduced by interdiction?	Supply of drugs
64		Supply of drugs is reduced by what?	Interdiction



65	33	an increase in total spending on drugs, and in drug-related crime is the result of what?	Interdiction
66		On which point an increase in total spending on drugs, and in drug-related crime?	Interdiction
67	34	What is reduced by education?	Demand for drugs
68		Demand for drugs is reduced by?	Education
69	35	A decrease in total spending on drugs, and in drug-related crime is the result of what?	Education
70		What happens to total spending on drugs, and in drug-related crime with education?	Decreases
71	36	What measures how much Q^s responds to a change in P ?	Price elasticity of supply
72		What measures how much Q^s responds to a change in P ?	price-sensitivity of sellers' supply
73	37	Economists classify supply curves according to what?	Elasticity
74		Who classify supply curves according to its elasticity?	Economists
75	38	The price elasticity of supply is closely related to what?	Slope of supply curve
76		What is closely related to the slope of supply curve?	price elasticity of supply
77	39	The flatter the curve, the elasticity.	Bigger
78		The steeper the curve,.... the elasticity.	Smaller
79	40	The more easily sellers can change the quantity they produce, the greater	the price elasticity of supply
80		The greater the price elasticity of supply, the more easily sellers can change the	Quantity they produce



81	41	Supply of beachfront property is harder to vary?	True
82		supply of new cars is ... elastic	More
83	42	price elasticity of supply is in the long run.	Higher
84		price elasticity of supply is in the short run.	Lower
85	43	The income elasticity of demand measures the response of Q^d to a change in what?	Consumer income
86		What measures the response of Q^d to a change in consumer income?	Income elasticity of demand
87	44	For substitutes, cross-price elasticity ...	> 0
88		What is caused by an increase in price of beef?	an increase in demand for chicken
89	45	For complements, cross-price elasticity...	< 0
90		What is caused by an increase in price of computers?	decrease in demand for software



MBA SEM 01
Module 01 Chapter 04

🌀 THE COST OF PRODUCTION 🌀

❖ Total Revenue, Total Cost, Profit

- We assume that the firm's goal is to maximize profit.

$$\text{Profit} = \text{Total Revenue} - \text{Total Cost}^1$$

- **Total Revenue** = the amount a firm receives from the sale of its output²
- **Total Cost** = the market value of the inputs a firm uses in production³

❖ Costs: Explicit vs. Implicit

- **Explicit costs** – require an outlay of money, *e.g.* paying wages to workers⁴
- **Implicit costs** – do not require a cash outlay, *e.g.* the opportunity cost of the owner's time⁵
- This is true whether the costs are implicit or explicit. Both matter for firms' decisions.⁶



- **Example:**

You need \$100,000 to start your business.

The interest rate is 5%.

- Case 1: borrow \$100,000

explicit cost = \$5000 interest on loan

- Case 2: use \$40,000 of your savings, borrow the other \$60,000

explicit cost = \$3000 (5%) interest on the loan

implicit cost = \$2000 (5%) *foregone* interest you could have earned on your \$40,000.

In both cases, total (exp + imp) costs are \$5000.

- ❖ **Profits: Economic vs. Accounting**

- **Accounting profit** = total revenue minus total explicit costs⁷
- **Economic profit** = total revenue minus total costs (including explicit and implicit costs)⁸
- Accounting profit ignores implicit costs, so it's higher than economic profit.⁹

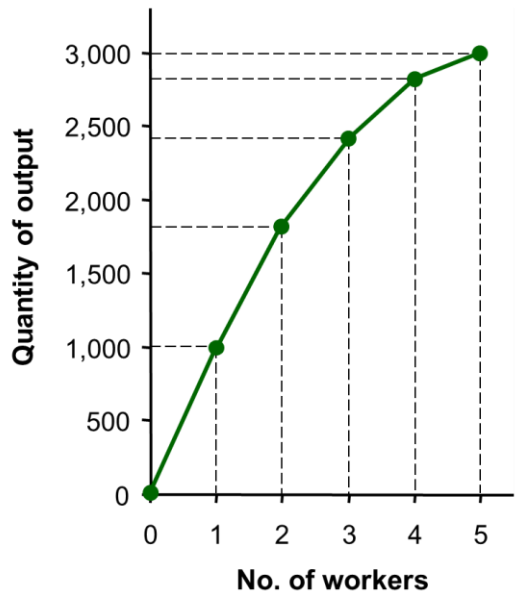
- ❖ **The Production Function**

- A **production function** shows the relationship between the quantity of inputs used to produce a good, and the quantity of output of that good. It can be represented by a table, equation, or graph.¹⁰
- **Example:**

- Farmer Jack grows wheat.
- He has 5 acres of land.
- He can hire as many workers as he wants.

➤ **Farmer Jack’s Production Function**

L (no. of workers)	Q (bushels of wheat)
0	0
1	1000
2	1800
3	2400
4	2800
5	3000



❖ **Marginal Product**

- The **marginal product** of any input is the increase in output arising from an additional unit of that input, holding all other inputs constant.¹¹
- *E.g.*, if Farmer Jack hires one more worker, his output rises by the marginal product of labor.
- Notation:
 Δ (delta) = “change in...”¹²



- **Examples:**

ΔQ = change in output, ΔL = change in labor

- Marginal product of labor (MPL) = $\frac{\Delta Q}{\Delta L}$

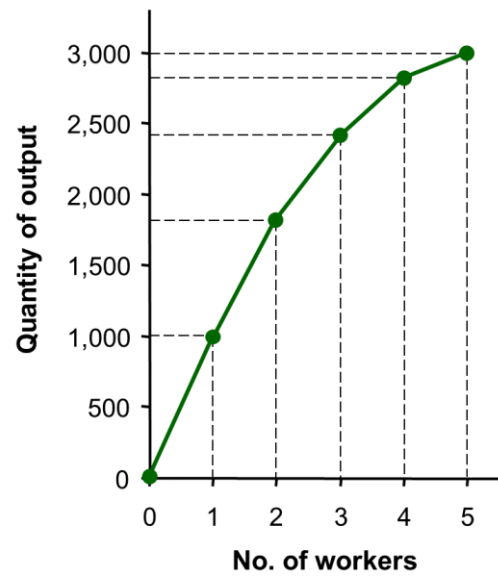
➤ **Total & Marginal Product**

	L (no. of workers)	Q (bushels of wheat)		<i>MPL</i>
	0	0		
$\Delta L = 1$	1	1000	$\Delta Q = 1000$	1000
$\Delta L = 1$	2	1800	$\Delta Q = 800$	800
$\Delta L = 1$	3	2400	$\Delta Q = 600$	600
$\Delta L = 1$	4	2800	$\Delta Q = 400$	400
$\Delta L = 1$	5	3000	$\Delta Q = 200$	200

➤ **MPL = Slope of Production Function**

- MPL equals the slope of the production function.
- Notice that MPL diminishes as L increases.
- This explains why the production function gets flatter as L increases.

L (no. of workers)	Q (bushels of wheat)	MPL
0	0	
1	1000	1000
2	1800	800
3	2400	600
4	2800	400
5	3000	200



➤ **Why MPL Is Important**

- When Farmer Jack hires an extra worker,
 - his costs rise by the wage he pays the worker
 - his output rises by MPL ¹³

(Comparing them helps Jack decide whether he would benefit from hiring the worker.)

➤ **Why MPL Diminishes**

- **Diminishing marginal product:** the marginal product of an input declines as the quantity of the input increases (other things equal)¹⁴
- *E.g.*, Farmer Jack’s output rises by a smaller and smaller amount for each additional worker. Why?



- If Jack increases workers but not land, the average worker has less land to work with, so will be less productive.¹⁵
- In general, *MPL* diminishes as *L* rises whether the fixed input is land or capital (equipment, machines, etc.).¹⁶

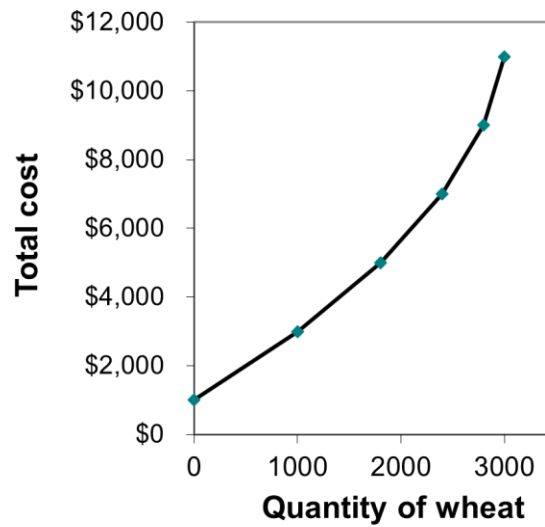
➤ **EXAMPLE 1: Farmer Jack's Costs**

- Farmer Jack must pay \$1000 per month for the land, regardless of how much wheat he grows.
- The market wage for a farm worker is \$2000 per month.
- So, Farmer Jack's costs are related to how much wheat he produces....

<i>L</i> (no. of workers)	<i>Q</i> (bushels of wheat)	cost of land	cost of labor	Total Cost
0	0	\$1,000	\$0	\$1,000
1	1000	\$1,000	\$2,000	\$3,000
2	1800	\$1,000	\$4,000	\$5,000
3	2400	\$1,000	\$6,000	\$7,000
4	2800	\$1,000	\$8,000	\$9,000
5	3000	\$1,000	\$10,000	\$11,000

➤ **EXAMPLE 1: Farmer Jack's Total Cost Curve**

Q (bushels of wheat)	Total Cost
0	\$1,000
1000	\$3,000
1800	\$5,000
2400	\$7,000
2800	\$9,000
3000	\$11,000



❖ **Marginal Cost**

$$MC = \frac{\Delta TC}{\Delta Q}$$

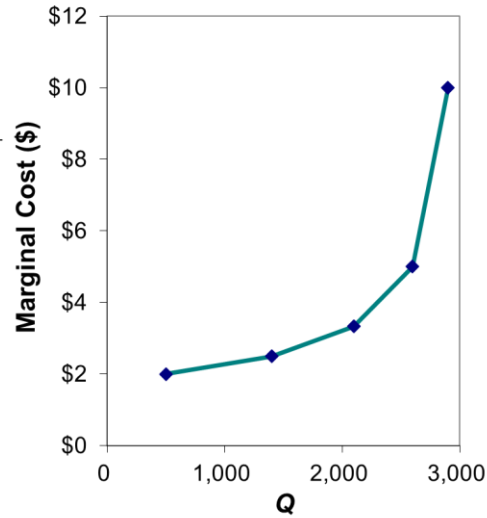
• **Marginal Cost (MC)** is the increase in Total Cost from producing one more unit:¹⁷

➤ **EXAMPLE 1: Total and Marginal Cost**

	Q (bushels of wheat)	Total Cost		Marginal Cost (MC)
	0	\$1,000		
$\Delta Q = 1000$	1000	\$3,000	$\Delta TC = \$2000$	\$2.00
$\Delta Q = 800$	1800	\$5,000	$\Delta TC = \$2000$	\$2.50
$\Delta Q = 600$	2400	\$7,000	$\Delta TC = \$2000$	\$3.33
$\Delta Q = 400$	2800	\$9,000	$\Delta TC = \$2000$	\$5.00
$\Delta Q = 200$	3000	\$11,000	$\Delta TC = \$2000$	\$10.00

➤ **EXAMPLE 1: The Marginal Cost Curve**

Q (bushels of wheat)	TC	MC
0	\$1,000	
1000	\$3,000	\$2.00
1800	\$5,000	\$2.50
2400	\$7,000	\$3.33
2800	\$9,000	\$5.00
3000	\$11,000	\$10.00



➤ **Why MC Is Important**

- Farmer Jack is rational and wants to maximize his profit. To increase profit, should he produce more wheat, or less?
- To find the answer, Farmer Jack needs to “think at the margin.”
- If the cost of additional wheat (*MC*) is less than the revenue he would get from selling it, then Jack’s profits rise if he produces more.¹⁸

❖ **Fixed and Variable Costs**

- **Fixed costs (FC)** – do not vary with the quantity of output produced.
 - For Farmer Jack, $FC = \$1000$ for his land
 - Other examples: cost of equipment, loan payments, rent¹⁹
- **Variable costs (VC)** – vary with the quantity produced.
 - For Farmer Jack, $VC =$ wages he pays workers

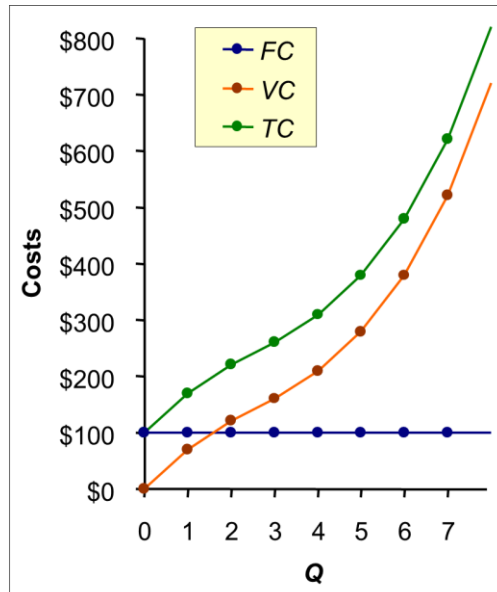
- Other example: cost of materials²⁰

Total cost (TC) = FC + VC

➤ **EXAMPLE 2: Costs**

- Our second example is more general, applies to any type of firm, producing any good with any types of inputs.

Q	FC	VC	TC
0	\$100	\$0	\$100
1	100	70	170
2	100	120	220
3	100	160	260
4	100	210	310
5	100	280	380
6	100	380	480
7	100	520	620



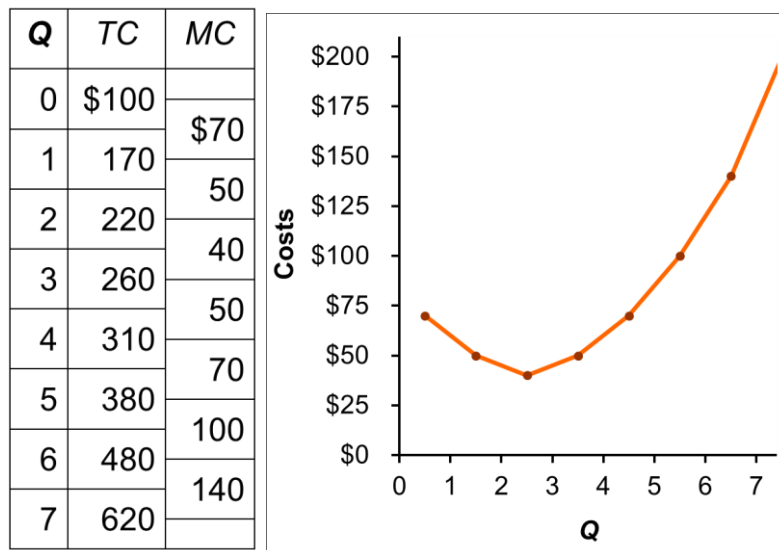
➤ **EXAMPLE 2: Marginal Cost**

- Recall, **Marginal Cost (MC)**

is the change in total cost from producing one more unit:

$$MC = \frac{\Delta TC}{\Delta Q}$$

- Usually, *MC* rises as *Q* rises, due to diminishing marginal product.
- Sometimes (as here), *MC* falls before rising.
- (In other examples, *MC* may be constant.)



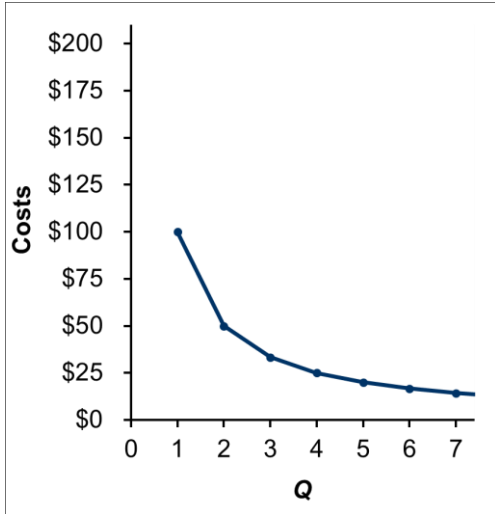
➤ **EXAMPLE 2: Average Fixed Cost**

- Average fixed cost (AFC)** is fixed cost divided by the quantity of output:²¹

$$AFC = FC/Q$$

- Notice that *AFC* falls as *Q* rises: The firm is spreading its fixed costs over a larger and larger number of units.²²

Q	FC	AFC
0	\$100	n.a.
1	100	\$100
2	100	50
3	100	33.33
4	100	25
5	100	20
6	100	16.67
7	100	14.29

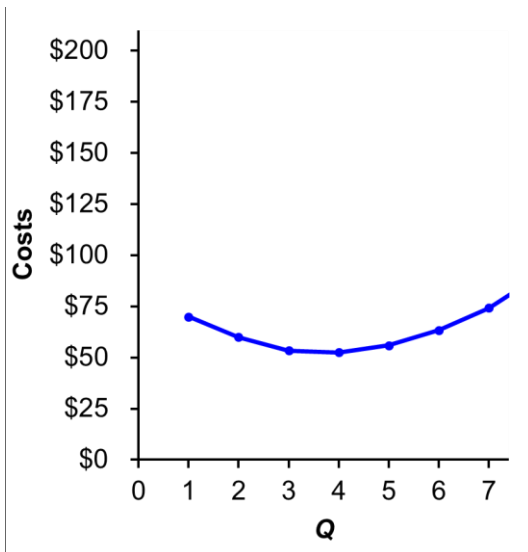


➤ **EXAMPLE 2: Average Variable Cost**

- **Average variable cost (AVC)** is variable cost divided by the quantity of output:²³

$$AVC = VC/Q$$
- As **Q** rises, **AVC** may fall initially. In most cases, **AVC** will eventually rise as output rises.²⁴

Q	VC	AVC
0	\$0	n.a.
1	70	\$70
2	120	60
3	160	53.33
4	210	52.50
5	280	56.00
6	380	63.33
7	520	74.29



➤ **EXAMPLE 2: Average Total Cost**

- **Average total cost (ATC)** equals total cost divided by the quantity of output:²⁵

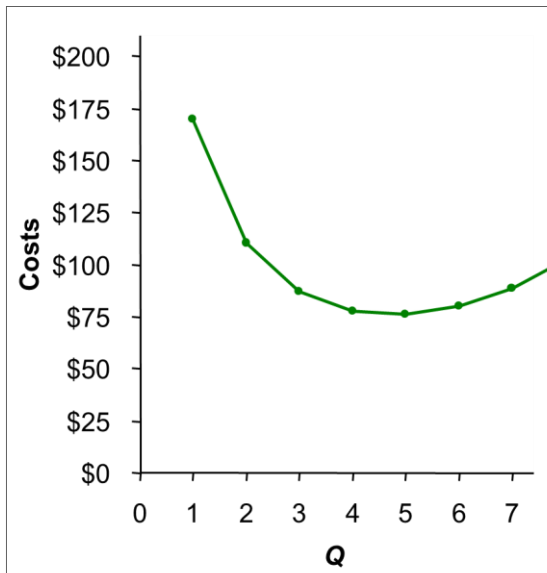
$$ATC = TC/Q$$

- Also,

$$ATC = AFC + AVC$$
²⁶

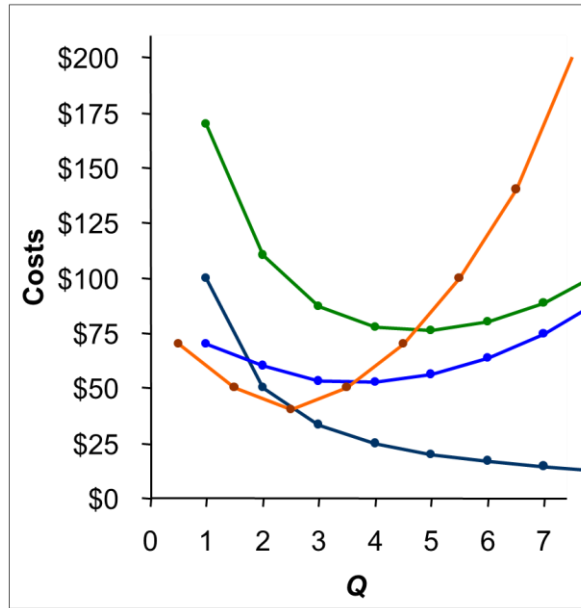
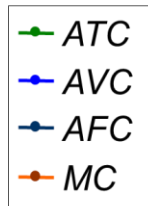
Q	TC	ATC	AFC	AVC
0	\$100	n.a.	n.a.	n.a.
1	170	\$170	\$100	\$70
2	220	110	50	60
3	260	86.67	33.33	53.33
4	310	77.50	25	52.50
5	380	76	20	56.00
6	480	80	16.67	63.33
7	620	88.57	14.29	74.29

Q	TC	ATC
0	\$100	n.a.
1	170	\$170
2	220	110
3	260	86.67
4	310	77.50
5	380	76
6	480	80
7	620	88.57



- *Usually, as in this example, the ATC curve is U-shaped.*

➤ **EXAMPLE 2: The Various Cost Curves Together**

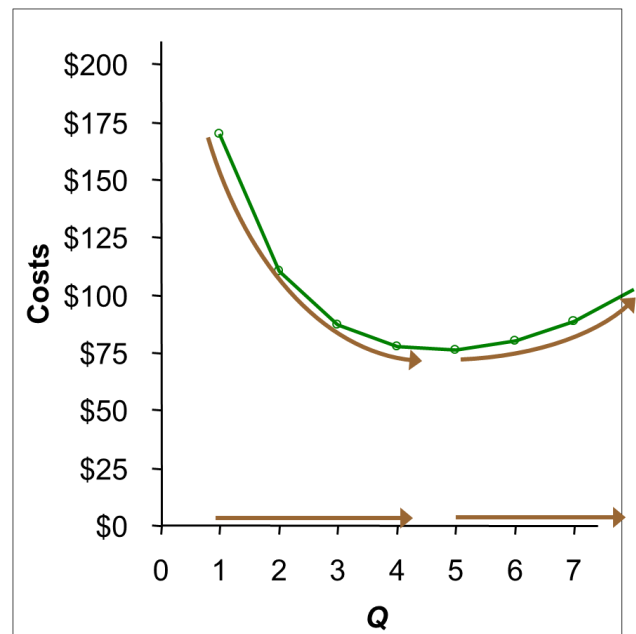


➤ **EXAMPLE 2: Why ATC Is Usually U-Shaped**

As Q rises:

Initially,
falling AFC pulls ATC down.

Eventually,
rising AVC pulls ATC up.

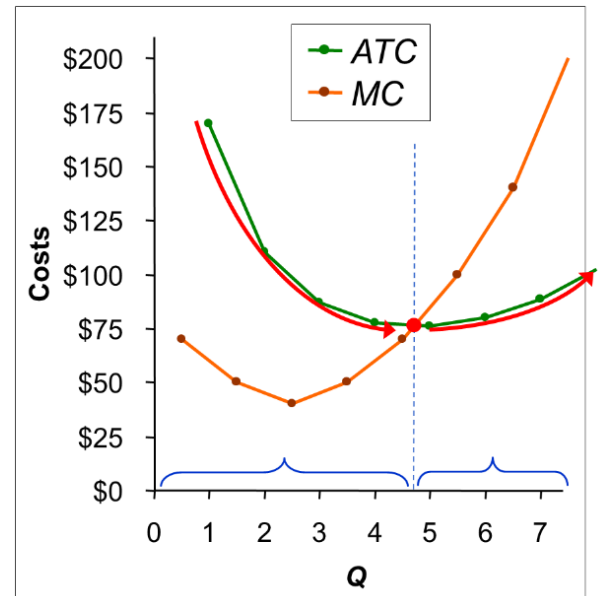


➤ **EXAMPLE 2: ATC and MC**

When $MC < ATC$,
 ATC is falling.

When $MC > ATC$,
 ATC is rising.

The MC curve crosses the ATC curve
at the ATC curve's minimum.



❖ **Costs in the Short Run & Long Run**

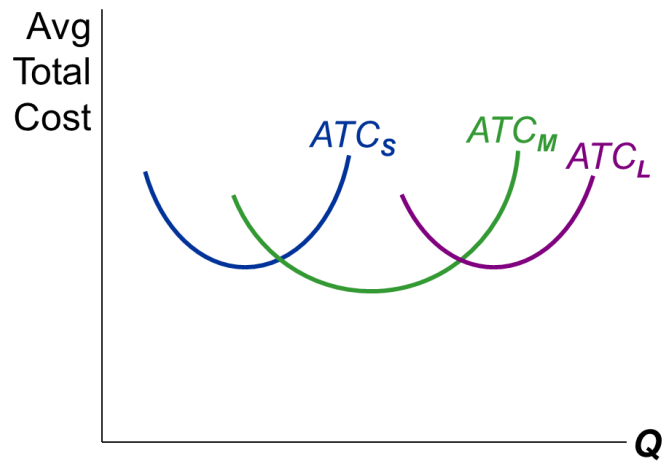
- **Short run:** Some inputs are fixed (e.g., factories, land).
The costs of these inputs are FC .²⁷
- **Long run:** All inputs are variable (e.g., firms can build more factories, or sell existing ones)
In the long run, ATC at any Q is cost per unit using the most efficient mix of inputs for that Q (e.g., the factory size with the lowest ATC).²⁸

➤ **EXAMPLE 3: LRATC with 3 factory Sizes**

Firm can choose from 3 factory sizes:
S, M, L.

Each size has its own *SRATC* curve.

The firm can change to a different factory size in the long run, but not in the short run.²⁹

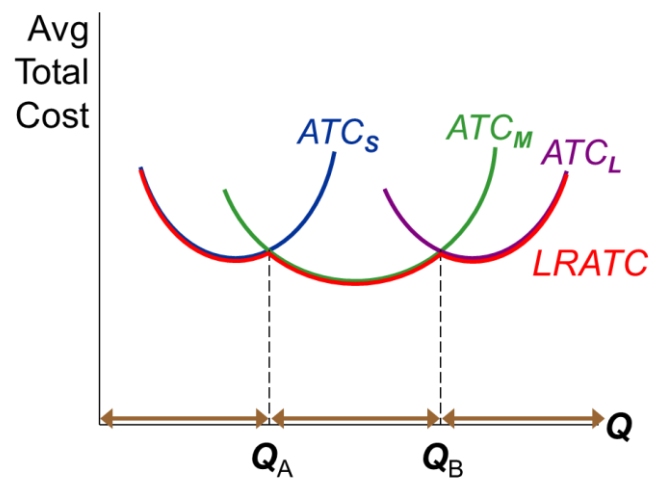


➤ **EXAMPLE 3: LRATC with 3 factory Sizes**

To produce less than Q_A , firm will choose size **S** in the long run.

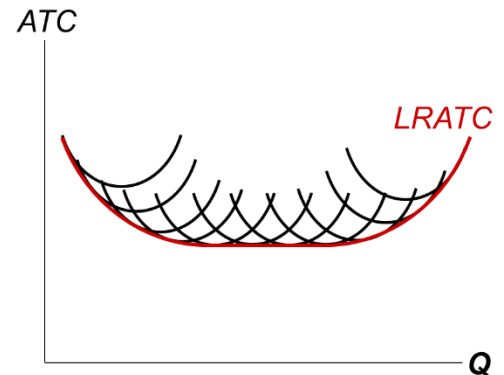
To produce between Q_A and Q_B , firm will choose size **M** in the long run.

To produce more than Q_B , firm will choose size **L** in the long run.³⁰



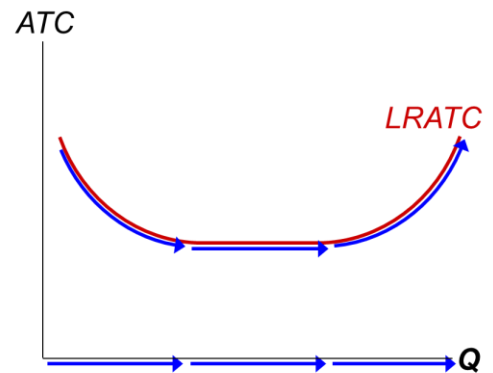
❖ A Typical LRATC Curve

- In the real world, factories come in many sizes, each with its own *SRATC* curve.
- So, a typical *LRATC* curve looks like this:



❖ How ATC Changes as the Scale of Production Changes

- **Economies of scale:** *ATC* falls as *Q* increases.³¹
 - **Constant returns to scale:** *ATC* stay the same as *Q* increases.³²
 - **Diseconomies of scale:** *ATC* rises as *Q* increases.³³
- Economies of scale occur when increasing production allows greater specialization: workers more efficient when focusing on a narrow task.
 - More common when *Q* is low.³⁴
 - Diseconomies of scale are due to coordination problems in large organizations. *E.g.*, management becomes stretched, can't control costs.
 - More common when *Q* is high.³⁵





EXERCISE

1. Economic profit vs. accounting profit:

The equilibrium rent on office space has just increased by \$500/month. Compare the effects on accounting profit and economic profit if

- A. you rent your office space
- B. you own your office space

ANSWER:

The rent on office space increases \$500/month.

A. You rent your office space.

Explicit costs increase \$500/month.

Accounting profit & economic profit each fall \$500/month.

B. You own your office space.

Explicit costs do not change,

so accounting profit does not change. Implicit costs increase \$500/month (opp. cost of using your space instead of renting it), so economic profit falls by \$500/month.



2. Costs: Fill in the blank spaces of this table.

Q	VC	TC	AFC	AVC	ATC	MC
0		\$50	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	
1	10			\$10	\$60.00	\$10
2	30	80				30
3			16.67	20	36.67	
4	100	150	12.50		37.50	
5	150			30		60
6	210	260	8.33	35	43.33	

ANSWER:

Q	VC	TC	AFC	AVC	ATC	MC
0	\$0	\$50	<i>n.a.</i>	<i>n.a.</i>	<i>n.a.</i>	
1	10	60	\$50.00	\$10	\$60.00	\$10
2	30	80	25.00	15	40.00	20
3	60	110	16.67	20	36.67	30
4	100	150	12.50	25	37.50	40
5	150	200	10.00	30	40.00	50
6	210	260	8.33	35	43.33	60

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What is the goal of any firm?	Maximize profit
2		What refers to the total revenue minus total cost?	Profit
3	2	What refers to the amount a firm receives from the sale of its output?	Total revenue
4		Total Revenue is the amount a firm receives from what?	sale of its output
5	3	What refers to the market value of the inputs a firm uses in production?	Total cost
6		Total cost is the market value of the inputs a firm uses in what?	production
7	4	Which cost requires an outlay of money?	Explicit costs
8		Paying wages to workers is which type of cost?	Explicit costs
9	5	Which cost do not require an outlay of money?	Implicit costs
10		The opportunity cost of the owner's time is which type of cost?	Implicit costs
11	6	Which costs matters for firms' decisions?	Implicit and explicit costs
12		Implicit and explicit costs matter in firms....	Decision making
13	7	What refers to the total revenue minus total explicit costs?	Accounting profit
14		What is accounting profit?	total revenue minus total explicit costs



15	8	What is economic profit?	total revenue minus total costs
16		What refers to the total revenue minus total costs?	Economic cost
17	9	What is ignored in the Accounting profit?	Implicit costs
18		Accounting profit is higher than which profit?	Economic profit
19	10	What refers to the relationship between the quantity of inputs used to produce a good, and the quantity of output of that good?	Production function
20		A production function shows the relationship between what?	Quantity of inputs and outputs
21	11	What refers to the increase in output arising from an additional unit of that input?	Marginal product
22		In the marginal product, all other inputs are...	Constant
23	12	What is the meaning of Δ (delta)?	Change in...
24		What refers to the change in...	Δ (delta)
25	13	What happens when farmer hires an extra worker?	Cost and output rises
26		When the cost and output rise in the farm?	Extra worker
27	14	What refers to the marginal product of an input declines as the quantity of the input increases?	Diminishing marginal product
28		The marginal product of an input declines as the quantity of the input...	Increases
29	15	What happens if farmer increases workers but not land?	Less productive
30		What happens when the average worker has less land to work?	Less productive



31	16	Why <i>MPL</i> diminishes?	<i>L</i> rises
32		equipment, machines are ...	Fixed inputs
33	17	What refers to the increase in Total Cost from producing one more unit?	Marginal cost
34		Marginal cost is the increase in from producing one more unit	Total Cost
35	18	If cost is less than the revenue...	Profit increases
36		If cost is more than the revenue...	Profit decreases
37	19	What is not vary with the quantity of output produced?	Fixed cost
38		cost of equipment, loan payments, rent are the examples of?	Fixed cost
39	20	What varies with the quantity produced?	Variable cost
40		cost of materials is the example of?	Variable cost
41	21	What refers to fixed cost divided by the quantity of output?	Average fixed cost
42		$FC/Q = ?$	AFC
43	22	What happens to AFC when Q rises?	Falls
44		What happens to AFC when Q falls?	Rises
45	23	What refers to variable cost divided by the quantity of output?	Average variable cost
46		$VC/Q = ?$	AVC
47	24	Initially what happens to the AVC when Q rises?	Falls
48		After that what happens to the AVC when Q rises?	Rises
49	25	What refers to the total cost divided by the quantity of output?	Average total cost
50		$TC/Q = ?$	ATC
51	26	What refers to the total of average fixed cost and average variable cost?	Average total cost
52		$AFC + AVC = ?$	ATC



53	27	In the short run, some inputs are ...	Fixed
54		What are the examples of fixed costs in the short run?	factories, land
55	28	In the long run, all inputs are...	Variable
56		What is ATC at any Q in the long run?	Cost per unit
57	29	How many factory size firms can choose?	3 (Three)
58		The firm can change to a different factory size in the ...	Long run
59	30	Which size firm will choose to produce less than Q_A ?	Small size (S)
60		Which size firm will choose to produce more than Q_A ?	Large size (L)
61	31	What refers to ATC falls as Q increases?	Economies of scale
62		What is Economies of scale?	ATC falls as Q rises
63	32	What is Constant returns to scale?	ATC stay the same as Q increases
64		What refers to ATC stay the same as Q increases?	Constant returns to scale
65	33	What is Diseconomies of scale?	ATC rises as Q increases
66		What refers to ATC rises as Q increases?	Diseconomies of scale
67	34	What occurs when increasing production allows greater specialization?	Economies of scale
68		When Economies of scale occurs?	greater specialization
69	35	What occurs due to coordination problems in large organizations?	Diseconomies of scale
70		Why Diseconomies of scale occurs?	Coordination problems

MBA SEM 01
Module 02 Chapter 01

☼ PERFECT COMPETITION ☼

❖ Characteristics of Perfect Competition

1. Many buyers and many sellers¹
2. The goods offered for sale are largely the same.²
3. Firms can freely enter or exit the market.³

Because of 1 & 2, each buyer and seller are “**price taker**” – takes the price as given.⁴

❖ The Revenue of a Competitive Firm

- Total revenue (TR)

$$TR = P \times Q$$

- Average revenue (AR)

$$AR = \frac{TR}{Q} = P$$

- Marginal Revenue (MR):

$$MR = \frac{\Delta TR}{\Delta Q}$$

The change in TR from selling one more unit.



❖ **MR = P for a Competitive Firm**

- A competitive firm can keep increasing its output without affecting the market price.⁵
- So, each one-unit increase in **Q** causes revenue to rise by **P**, i.e., $MR = P$.⁶

$MR = P$ is only true for firms in competitive markets.

❖ **Profit Maximization**

- If increase **Q** by one unit, revenue rises by **MR**, cost rises by **MC**.⁷
- If $MR > MC$, then increase **Q** to raise profit.⁸
- If $MR < MC$, then reduce **Q** to raise profit.⁹

(At any **Q** with $MR > MC$, increasing **Q** raises profit.

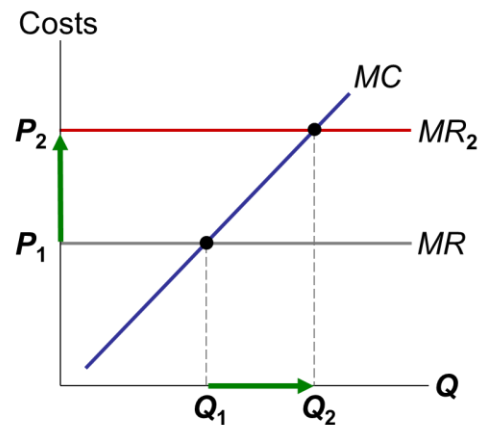
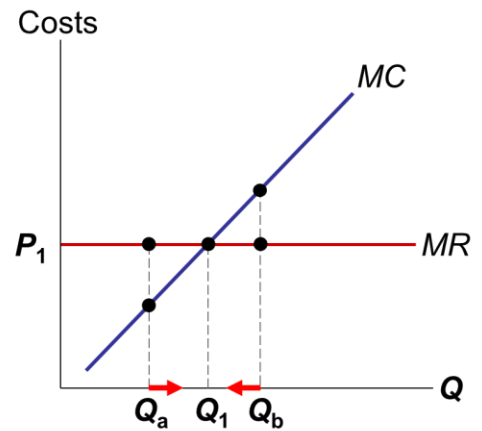
At any **Q** with $MR < MC$, reducing **Q** raises profit.)

Q	TR	TC	Profit	MR	MC	$\Delta\text{Profit} = MR - MC$
0	\$0	\$5	-\$5			
1	10	9	1	\$10	\$4	\$6
2	20	15	5	10	6	4
3	30	23	7	10	8	2
4	40	33	7	10	10	0
5	50	45	5	10	12	-2

❖ MC and the Firm's Supply Decision

Rule: $MR = MC$ at the profit-maximizing Q .

- At Q_a , $MC < MR$. So, increase Q to raise profit.
- At Q_b , $MC > MR$. So, reduce Q to raise profit.
- At Q_1 , $MC = MR$. Changing Q would lower profit.¹⁰
- If price rises to P_2 , then the profit-maximizing quantity rises to Q_2 .¹¹
- The MC curve determines the firm's Q at any price.¹²
- Hence, the MC curve is the firm's supply curve.¹³



❖ Shutdown vs. Exit

- **Shutdown:** A short-run decision not to produce anything because of market conditions.¹⁴
- **Exit:** A long-run decision to leave the market.¹⁵
- A firm that shuts down temporarily must still pay its fixed costs. A firm that exits the market does not have to pay any costs at all, fixed or variable.¹⁶

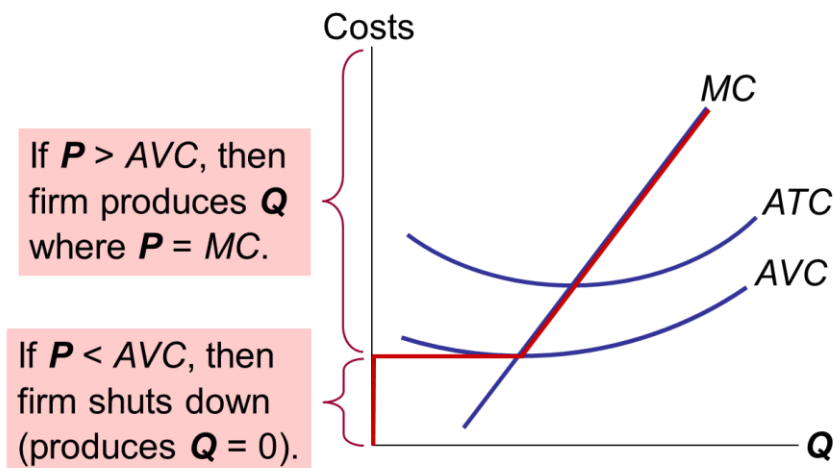
❖ A Firm's Short-run Decision to Shut Down

- If firm shuts down temporarily,
 - revenue falls by TR
 - costs fall by VC ¹⁷
 - So, the firm should shut down if $TR < VC$.¹⁸
 - Divide both sides by Q : $TR/Q < VC/Q$
- So, we can write the firm's decision as:

Shut down if $P < AVC$ ¹⁹

❖ A Competitive Firm's SR Supply Curve

- The firm's SR supply curve is the portion of its MC curve above AVC .





❖ The Irrelevance of Sunk Costs

- **Sunk cost:** a cost that has already been committed and cannot be recovered²⁰
- Sunk costs should be irrelevant to decisions; you must pay them regardless of your choice.²¹
- *FC* is a sunk cost: The firm must pay its fixed costs whether it produces or shuts down.
So, *FC* should not matter in the decision to shut down.²²

➤ A Firm's Long-Run Decision to Exit

- If firm exits the market,
 - revenue falls by *TR*
 - costs fall by *TC*²³
- So, the firm should exit if $TR < TC$.²⁴
- Divide both sides by *Q* to rewrite the firm's decision as:

$$\text{Exit if } P < ATC \text{ }^{25}$$

➤ A New Firm's Decision to Enter Market

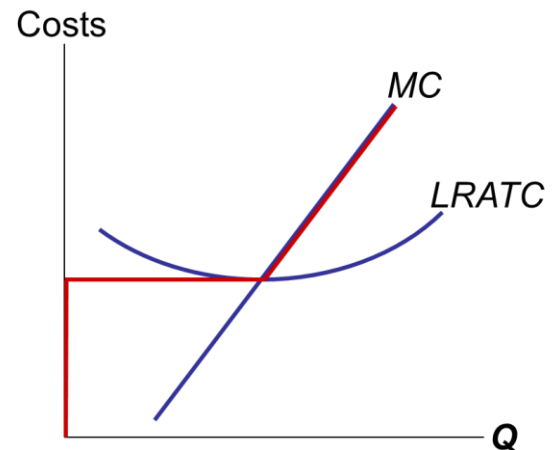
- In the long run, a new firm will enter the market if it is profitable to do so:
if $TR > TC$.

Divide both sides by *Q* to express the firm's entry decision as:

$$\text{Enter if } P > ATC \text{ }^{26}$$

➤ The Competitive Firm's Supply Curve

- The firm's LR supply curve is the portion of its *MC* curve above *LRATC*.

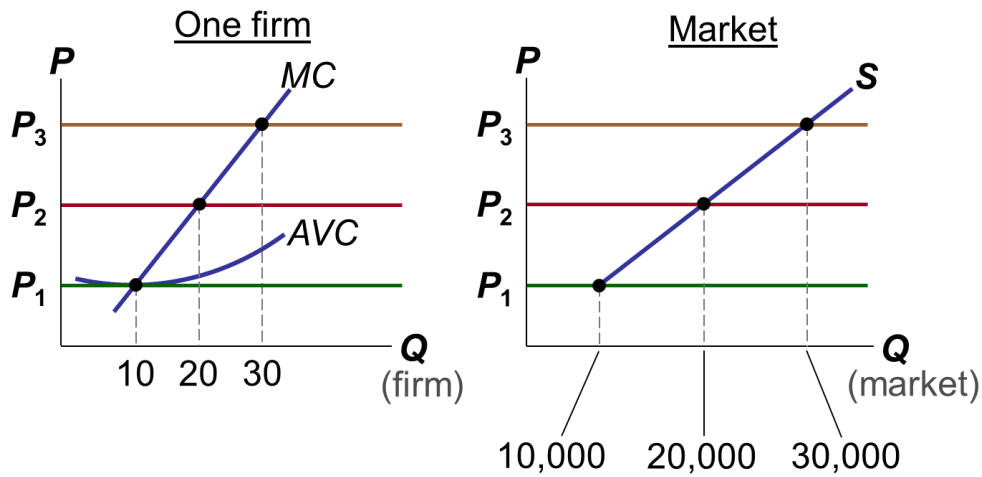


❖ Market Supply: Assumptions

1. All existing firms and potential entrants have identical costs.
2. Each firm's costs do not change as other firms enter or exit the market.
3. The number of firms in the market is
 - fixed in the short run (due to fixed costs)
 - variable in the long run (due to free entry and exit)

➤ The SR Market Supply Curve

- As long as $P \geq AVC$, each firm will produce its profit-maximizing quantity, where $MR = MC$.
- Example: 1000 identical firms.
- At each P , market $Q^s = 1000 \times$ (one firm's Q^s)



➤ Entry & Exit in the Long Run

- In the LR, the number of firms can change due to entry & exit.²⁷
- If existing firms earn positive economic profit,
 - New firms enter.
 - SR market supply curve shifts right.
 - P falls, reducing firms' profits.
 - Entry stops when firms' economic profits have been driven to zero.²⁸
- If existing firms incur losses,
 - Some will exit the market.
 - SR market supply curve shifts left.
 - P rises, reducing remaining firms' losses.
 - Exit stops when firms' economic losses have been driven to zero.²⁹

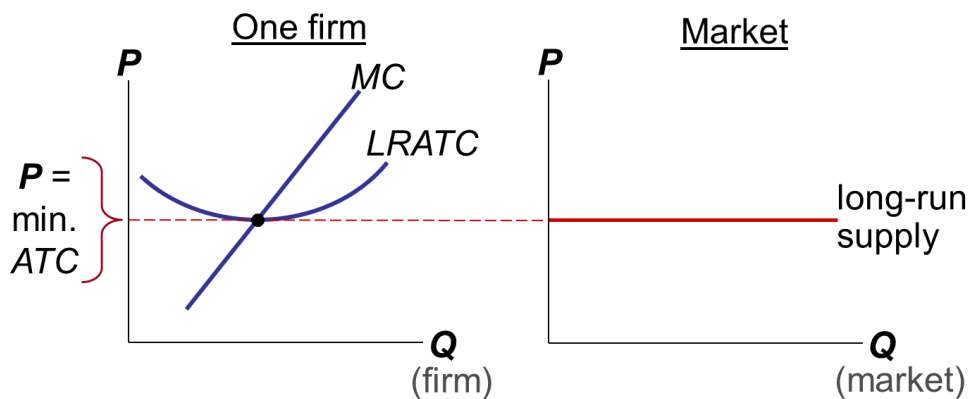
❖ The Zero-Profit Condition

- **Long-run equilibrium:** The process of entry or exit is complete – remaining firms earn zero economic profit.³⁰
- Zero economic profit occurs when $P = ATC$.³¹
- Since firms produce where $P = MR = MC$, the zero-profit condition is $P = MC = ATC$.³²
- Recall that MC intersects ATC at minimum ATC .
Hence, in the long run, $P = \text{minimum } ATC$.³³

➤ The LR Market Supply Curve

In the long run, the typical firm earns zero profit.

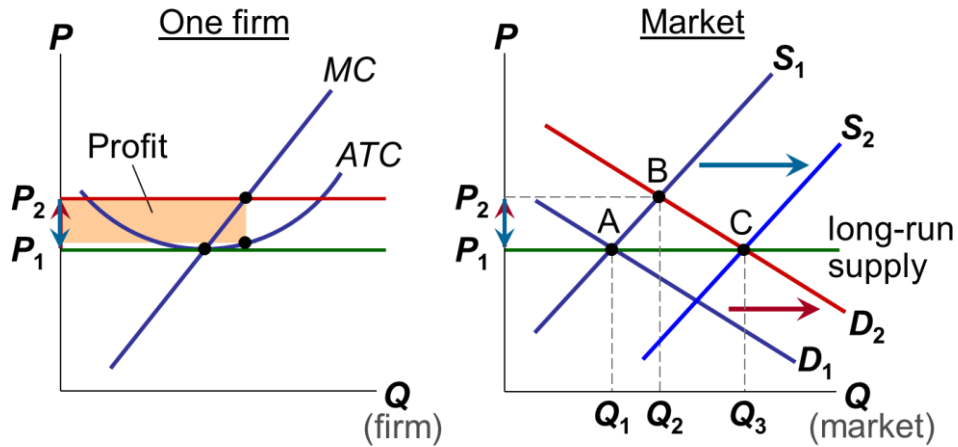
The LR market supply curve is horizontal at $P = \text{minimum } ATC$.



➤ Why Do Firms Stay in Business if Profit = 0?

- Recall, economic profit is revenue minus all costs – including implicit costs, like the opportunity cost of the owner’s time and money.
In the zero-profit equilibrium, firms earn enough revenue to cover these costs.³⁴

➤ **SR & LR Effects of an Increase in Demand**



- A firm begins in long-run equilibrium...
...but then an increase in demand raises P ...
...leading to SR profits for the firm.³⁵
- Over time, profits induce entry, shifting S to the right, reducing P ...
...driving profits to zero and restoring long-run equilibrium.³⁶

➤ **Why the LR Supply Curve Might Slope Upward**

- The LR market supply curve is horizontal if
 1. all firms have identical costs, and
 2. costs do not change as other firms enter or exit the market.³⁷
- If either of these assumptions is not true,
then LR supply curve slopes upward.³⁸

EXERCISE

1. Fill in the empty spaces of the table.

Q	P	TR	AR	MR
0	\$10		n.a.	
1	\$10		\$10	
2	\$10			
3	\$10			
4	\$10	\$40		\$10
5	\$10	\$50		

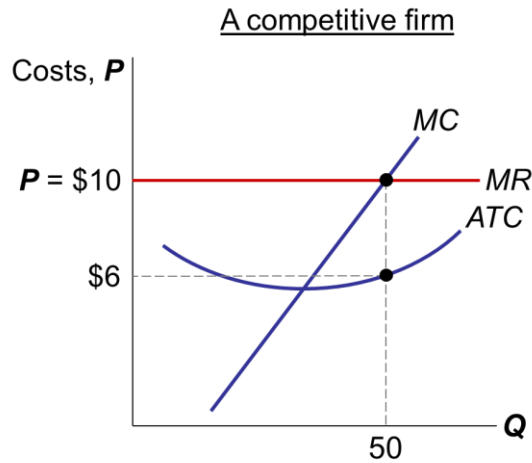
ANSWER:

Notice that MR=MC

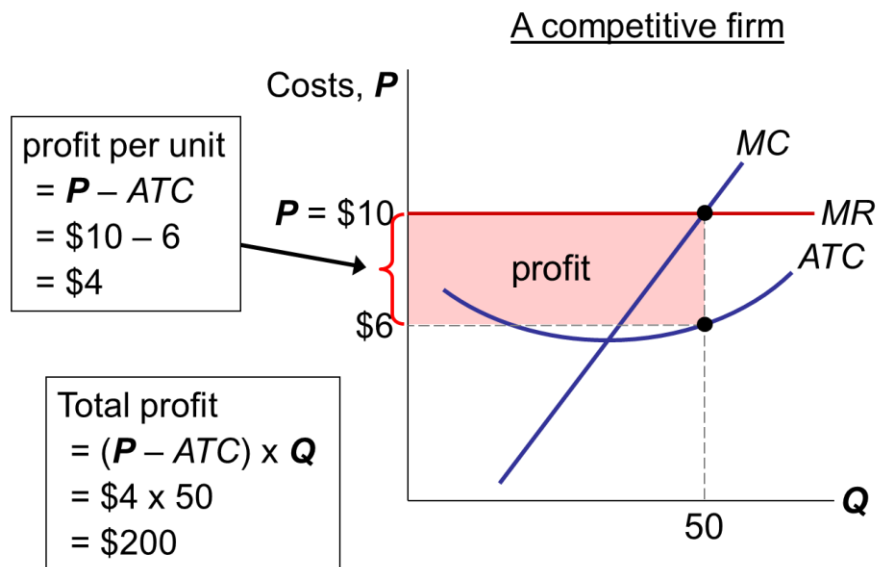
Q	P	TR = P x Q	AR = $\frac{TR}{Q}$	MR = $\frac{\Delta TR}{\Delta Q}$
0	\$10	\$0	n.a.	
1	\$10	\$10	\$10	\$10
2	\$10	\$20	\$10	\$10
3	\$10	\$30	\$10	\$10
4	\$10	\$40	\$10	\$10
5	\$10	\$50	\$10	\$10

2. Identifying a firm's profit:

Determine this firm's total profit. Identify the area on the graph that represents the firm's profit.

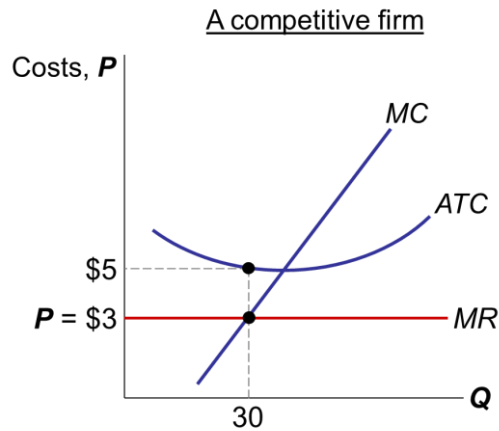


ANSWER:

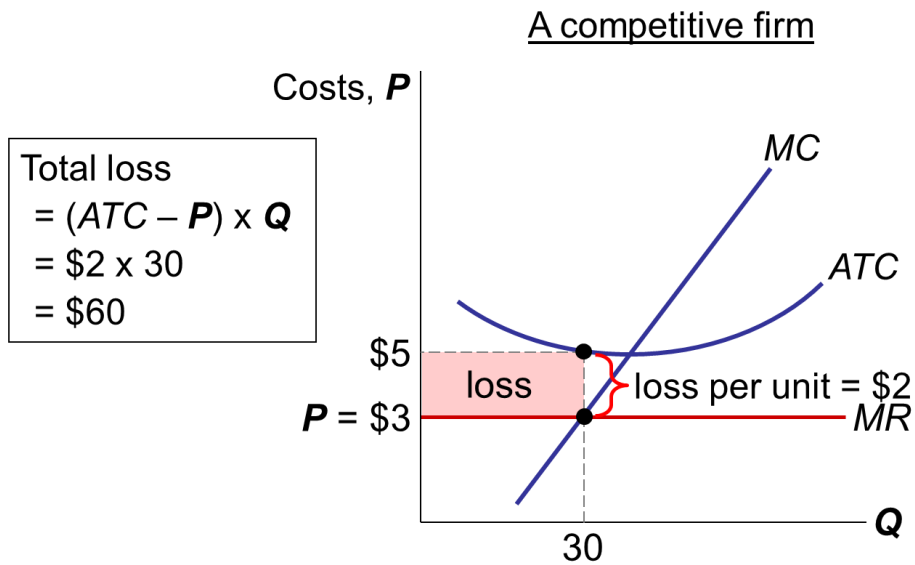


3. Identifying a firm's loss

Determine this firm's total loss. Identify the area on the graph that represents the firm's loss.



ANSWER:



ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	Many buyers and many sellers is the characteristic of?	Perfect Competition
2		Seller and buyers are in perfect competition?	Many
3	2	The goods offered for sale are largely the same in which market?	Perfect competition
4		In perfect competition, goods offered are usually?	Same
	3	Firms can freely enter or exit in which market?	Perfect competition
6		In perfect competition, firms can ... enter or exit.	Freely
7	4	In perfect competition, buyers and sellers are...	Price taker
8		Who takes the price as given are known as?	Price taker
9	5	A competitive firm can keep increasing its output without affecting....	Market price
10		Which firm can keep increasing its output without affecting the market price?	Competitive firm
11	6	$MR = P$ is true for firms in which market?	Competitive market
12		In competitive firm, MR is equal to?	Price
13	7	In competitive firm, if Q increased by one unit, revenue rises by what?	MR
14		In competitive firm, if Q increased by one unit, cost rises by what?	MC



15	8	If $MR > MC$, then increase Q to raise ...	Profit
16		When to increase Q to raise profit?	$MR > MC$
17	9	If $MR < MC$, then reduce Q to raise ...	Profit
18		When to decrease Q to raise profit?	$MR < MC$
19	10	At the profit maximizing Q , MR is equal to what?	MC
20		At the point $MC = MR$, changing Q would ... profit	Lower
21	11	If price rises to P_2 , then the profit-maximizing quantity rises to...	Q_2
22		If price rises, then what happens to the profit maximizing quantity?	Rises
23	12	What determines the firm's Q at any price?	MC Curve
24		What is determined by the MC Curve?	Firms' Q
25	13	What is the firm's supply curve?	MC Curve
26		What is MC Curve also known as?	Supply curve
27	14	What refers to the short-run decision not to produce anything because of market conditions?	Shutdown
28		Shutdown is decision.	Short run
29	15	What refers to the long-run decision to leave the market?	Exit
30		Exit is decision	Long run
31	16	Which costs is to be paid by the firm that shuts down temporarily?	Fixed costs
32		A firm that the market does not have to pay any costs at all.	Exit
33	17	What happens to the revenue of the firm if shuts down temporarily?	Falls by TR
34		What happens to the costs of the firm if shuts down temporarily?	falls by VC



35	18	What should firm do if $TR < VC$?	Shut down
36		When the firm should shut down?	$TR < VC$
37	19	When the firm should shut down?	$P < AVC$
38		What should firm do if $P < AVC$?	Shut down
39	20	What refers to a cost that has already been committed and cannot be recovered?	Sunk cost
40		Which cost cannot be recovered?	Sunk cost
41	21	Which cost are irrelevant to decisions?	Sunk cost
42		Which cost must be paid regardless of our choice?	Sunk cost
43	22	Fixed costs are also?	Sunk cost
44		Which refers to the firm must pay its fixed costs whether it produces or shuts down?	Sunk cost
45	23	What happens to the revenue of the firm if exit the market?	Falls by TR
46		What happens to the costs of the firm if exit the market?	Falls by TC
47	24	What should firm do if $TR < TC$?	Exit
48		When firm should exit the market?	$TR < TC$
49	25	When firm should exit the market?	$P < ATC$
50		What should firm do if $P < ATC$?	Exit
51	26	When should the new firm enter in the market?	$TR > TC$
52		When should the new firm enter in the market?	$P > ATC$
53	27	In the long run, the number of firms can change due to what?	entry & exit
54		In the , the number of firms can change due to entry & exit.	Long run

55		What happens if existing firms earn positive economic profit?	New firms enter
56	28	What happens when existing firms' economic profits have been driven to zero?	Entry stops
57	29	What happens if existing firms incur losses?	Some firms exit the market
58		What happens when firms' economic losses have been driven to zero?	Exit stops
59	30	The process of entry or exit is complete when?	Long-run equilibrium
60		What happens in the Long-run equilibrium?	entry or exit is complete
61	31	When zero economic profit occurs?	$P = ATC$
62		What happens when $P = ATC$?	zero economic profit
63	32	What happens to the cost when firms produce where $P = MR = MC$?	$P = MC = ATC$
64		What happens to the revenue when firms produce where $P = MC = ATC$?	$P = MR = MC$
65	33	MC intersects ATC at?	minimum ATC
66		what intersects ATC at minimum ATC ?	MC
67	34	What is economic profit?	revenue minus all costs
68		What refers to the revenue minus all costs?	economic profit
69	35	What happens to the price when an increase in demand?	Increases
70		A firm begins in...	long-run equilibrium
71	36	What happens to the supply curve when the entry of the firms increases?	Shifts to right
72		What induces the new firms to enter in the market?	Profits



73	37	The long run market supply curve is horizontal if?	all firms have identical costs
74		The long run market supply curve is horizontal if?	costs do not change
75	38	What if assumptions are not true of long run market supply curve?	slopes upward
76		Why long run market supply curve slopes upward?	Assumptions are failed

MBA SEM 01
Module 02 Chapter 02

❁ MONOPOLY COMPETITION ❁

❖ Introduction

- A **monopoly** is a firm that is the sole seller of a product without close substitutes.¹
- The key difference:
A monopoly firm has **market power**, the ability to influence the market price of the product it sells.
A competitive firm has no market power.²

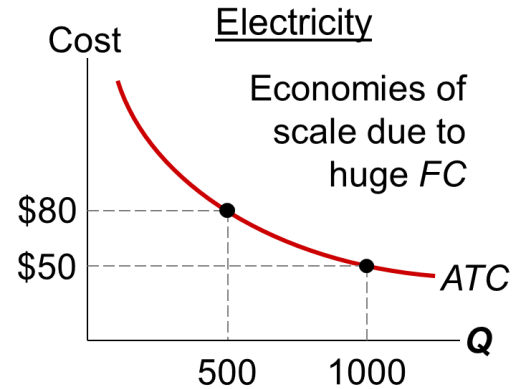
❖ Why Monopolies Arise

- The main cause of monopolies is **barriers to entry** – other firms cannot enter the market.³
- Three sources of barriers to entry:
 1. A single firm owns a key resource.
E.g., DeBeers owns most of the world's diamond mines⁴
 2. The Government gives a single firm the exclusive right to produce the good.
E.g., patents, copyright laws⁵

3. Natural monopoly: a single firm can produce the entire market Q at lower ATC than could several firms.

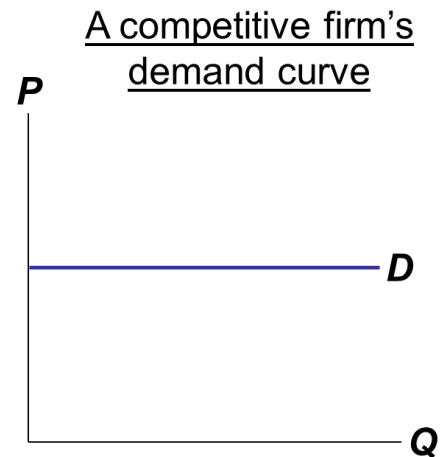
Example: 1000 homes need electricity.⁶

ATC is lower if one firm services all 1000 homes than if two firms each service 500 homes.

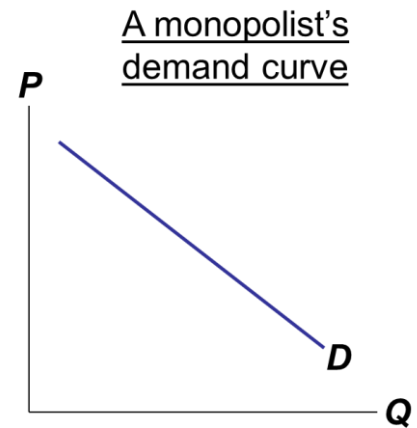


❖ **Monopoly vs. Competition: Demand Curves**

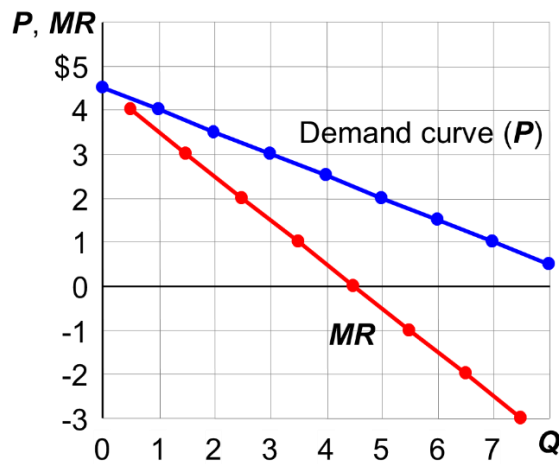
- In a competitive market, the market demand curve slopes downward. but the demand curve for any individual firm's product is horizontal at the market price.⁷
- The firm can increase Q without lowering P , so $MR = P$ for the competitive firm.⁸



- A monopolist is the only seller, so it faces the market demand curve.⁹
- To sell a larger Q , the firm must reduce P .
Thus, $MR \neq P$.¹⁰



❖ Moon buck's D and MR Curves



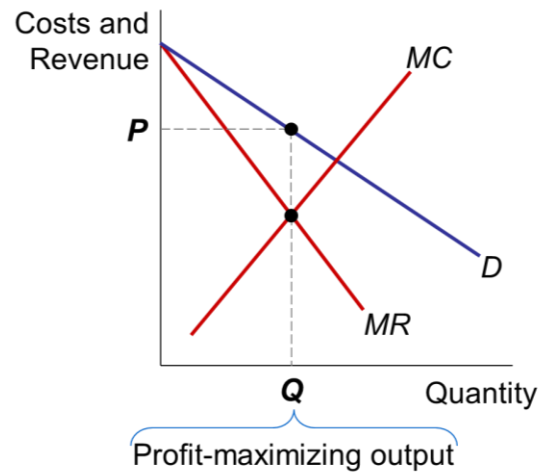
❖ Understanding the Monopolist's MR

- Increasing Q has two effects on revenue:
 - The **output effect**: More output is sold, which raises revenue¹¹
 - The **price effect**: The price falls, which lowers revenue¹²
- To sell a larger Q , the monopolist must reduce the price on all the units it sells. Hence, $MR < P$ ¹³
- MR could even be negative if the price effect exceeds the output effect (e.g., when Moon bucks increases Q from 5 to 6).¹⁴

❖ Profit-Maximization

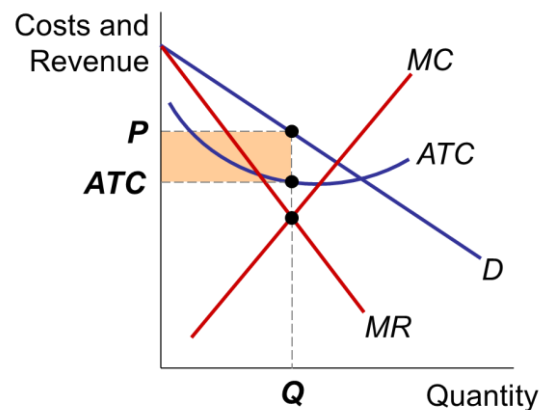
- Like a competitive firm, a monopolist maximizes profit by producing the quantity where $MR = MC$.¹⁵
- Once the monopolist identifies this quantity, it sets the highest price consumers are willing to pay for that quantity.¹⁶
It finds this price from the D curve.

1. The profit-maximizing Q is where $MR = MC$.
2. Find P from the demand curve at this Q .



❖ The Monopolist's Profit

- As with a competitive firm, the monopolist's profit equals $(P - ATC) \times Q$



❖ A Monopoly Does Not Have an S Curve

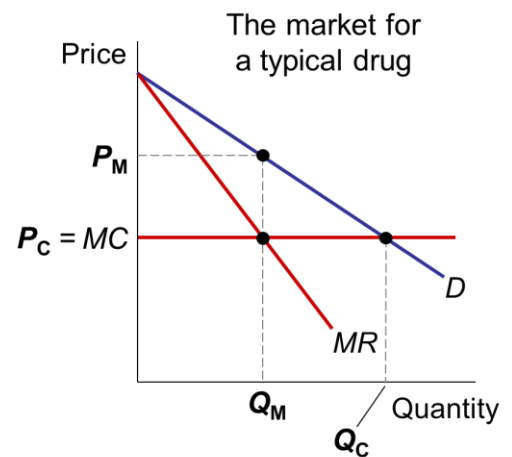
- A competitive firm,
 - takes P as given
 - has a supply curve that shows how its Q depends on P ¹⁷

- A monopoly firm,
 - is a “price-maker,” not a “price-taker”
 - Q does not depend on P ;
rather, Q and P are jointly determined by MC , MR , and the demand curve.¹⁸

- So, there is no supply curve for monopoly.¹⁹

❖ Case Study: Monopoly vs. Generic Drugs

- Patents on new drugs give a temporary monopoly to the seller.
- When the patent expires, the market becomes competitive, generics appear.

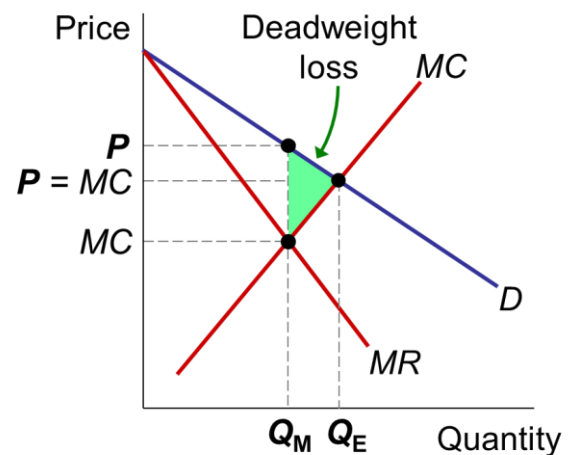


❖ The Welfare Cost of Monopoly

- In the monopoly equilibrium, $P > MR = MC$
 - The value to buyers of an additional unit (P) exceeds the cost of the resources needed to produce that unit (MC).
The monopoly Q is too low – could increase total surplus with a larger Q .²⁰
 - Thus, monopoly results in a **deadweight loss**.²¹

- Competitive equilibrium:
 - quantity = Q_E
 - $P = MC$
 - total surplus is maximized

- Monopoly equilibrium:
 - quantity = Q_M
 - $P > MC$
 - deadweight loss



❖ Public Policy Toward Monopolies

- Increasing competition with **antitrust laws**
 - Examples: Sherman Antitrust Act (1890), Clayton Act (1914)
 - Antitrust laws ban certain anticompetitive practices, allow government to break up monopolies.²²



- **Regulation**

- Government agencies set the monopolist's price²³
- For natural monopolies, $MC < ATC$ at all Q , so marginal cost pricing would result in losses.²⁴
- If so, regulators might subsidize the monopolist or set $P = ATC$ for zero economic profit.²⁵

- **Public ownership**

- Example: U.S. Postal Service
- Problem: Public ownership is usually less efficient since no profit motive to minimize costs²⁶

- **Doing nothing**

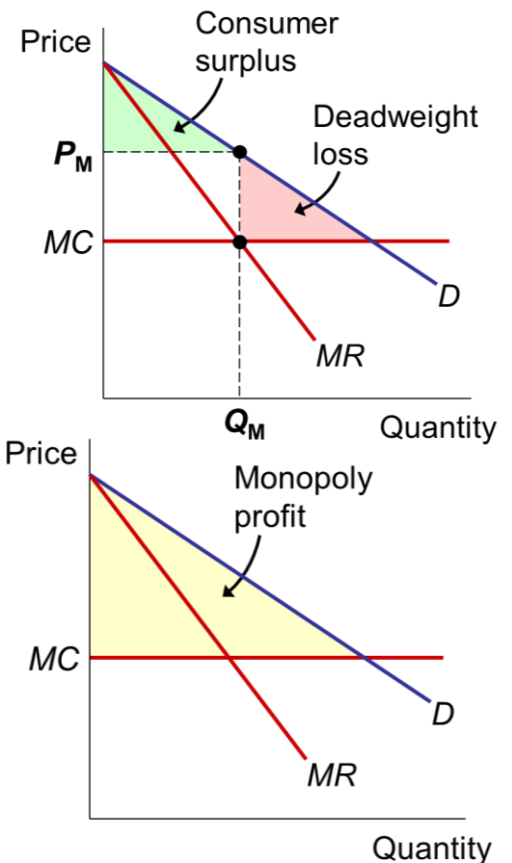
- The foregoing policies all have drawbacks, so the best policy may be no policy.²⁷

- ❖ **Price Discrimination**

- Discrimination is the practice of treating people differently based on some characteristic, such as race or gender.²⁸
- **Price discrimination** is the business practice of selling the same good at different prices to different buyers.²⁹
- The characteristic used in price discrimination is willingness to pay (WTP):
A firm can increase profit by charging a higher price to buyers with higher WTP.³⁰

❖ Perfect Price Discrimination vs. Single Price Monopoly

- Here, the monopolist charges the same price (P_M) to all buyers.
A deadweight loss results.³¹
- Here, the monopolist produces the competitive quantity, but charges each buyer his or her WTP. This is called **perfect price discrimination**. The monopolist captures all CS as profit. But there's no DWL.³²



❖ Price Discrimination in the Real World

- In the real world, perfect price discrimination is not possible:
 - no firm knows every buyer's WTP
 - buyers do not announce it to sellers³³
- So, firms divide customers into groups based on some observable trait that is likely related to WTP, such as age.³⁴



❖ Examples of Price Discrimination

1. **Movie tickets**: Discounts for seniors, students, and people who can attend during weekday afternoons. They are all more likely to have lower WTP than people who pay full price on Friday night.
2. **Airline prices**: Discounts for Saturday-night stayovers help distinguish business travelers, who usually have higher WTP, from more price-sensitive leisure travelers.
3. **Discount coupons**: People who have time to clip and organize coupons are more likely to have lower income and lower WTP than others.
4. **Need-based financial aid**: Low income families have lower WTP for their children's college education. Schools price-discriminate by offering need-based aid to low income families.
5. **Quantity discounts**: A buyer's WTP often declines with additional units, so firms charge less per unit for large quantities than small ones.

Example:

A movie theater charges \$4 for a small popcorn and \$5 for a large one that's twice as big.

EXERCISE

1. A monopoly's revenue:

Moonbucks is the only seller of cappuccinos in town.

The table shows the market demand for cappuccinos.

Fill in the missing spaces of the table.

What is the relation between P and AR ? Between P and MR ?

Q	P	TR	AR	MR
0	\$4.50		n.a.	
1	4.00			
2	3.50			
3	3.00			
4	2.50			
5	2.00			
6	1.50			

ANSWER:

Here, $P = AR$, same as for a competitive firm.

Here, $MR < P$, whereas $MR = P$ for a competitive firm.

Q	P	TR	AR	MR
0	\$4.50	\$ 0	n.a.	
1	4.00	4	\$4.00	\$4
2	3.50	7	3.50	3
3	3.00	9	3.00	2
4	2.50	10	2.50	1
5	2.00	10	2.00	0
6	1.50	9	1.50	-1

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What is Monopoly?	sole seller of a product
2		What refers to is a firm that is the sole seller of a product without close substitutes?	Monopoly
3	2	Which firm has a Market Power?	Monopoly firm
4		Which firm does not have market power?	Competitive firm
	3	What is the main cause of monopoly?	Barriers to entry
6		In which market there are barriers to entry?	Monopoly
7	4	What happens when a single firm owns a key resource?	Monopoly
8		One firm owns most of the world's diamond mines is an example of?	Monopoly
9	5	What happens when Government gives a single firm the exclusive right to produce the good?	Monopoly
10		Patents, copyright laws are examples of?	Monopoly
11	6	What happens when a single firm can produce the entire market Q at lower ATC than could several firms?	Natural Monopoly
12		When natural monopoly arises?	When single firm produce for entire market
13	7	In which market, the market demand curve slopes downward?	Competitive market
14		In a competitive market, the market D curve slopes in which direction?	Downward



15	8	MR = ? for the competitive firm?	Price
16		The competitive firm can increase Q without ...	lowering Price
17	9	In which market there is only one seller?	Monopoly
18		Why monopolist faces the market demand curve?	Only seller
19	10	To sell a larger quantity, the firm must reduce ...	Price
20		In monopoly MR is not equal to?	Price
21	11	What refers to more output is sold, which raises revenue for monopoly?	The Output effect
22		What is the Output effect?	More output is sold, which raises revenue
23	12	What refers to the price falls, which lowers revenue?	The Price effect
24		What is the Price effect?	The price falls, which lowers revenue
25	13	What should the monopolist do to sell a larger quantity?	Reduce price
26		Why should the monopolist must reduce the price on all the units it sells?	To sell large quantity
27	14	What happens to the MR if the price effect exceeds the output effect?	Negative
28		Why MR could even be negative?	price effect exceeds the output effect
29	15	A monopolist maximizes profit by producing the quantity at ...	$MR = MC$
30		What happens when $MR=MC$ in monopoly?	Profit maximization
31	16	What monopolist do once the monopolist identifies profit maximization quantity?	Sets highest price



32		On which curve monopolist identifies profit maximization quantity?	Demand curve
33	17	Which firm is a price taker?	Competitive firm
34		Which curve shows that how its Q depends on P ?	Supply curve
35	18	Which firm is a price maker?	Monopoly firm
36		What is jointly determined by MC , MR , and the demand curve in monopoly?	Q and P
37	19	Which curve does not exist for monopoly firm?	Supply curve
38		Which firm does not have a supply curve?	Monopoly firm
39	20	What is monopoly equilibrium?	$P > MR = MC$
40		What is greater than $MR=MC$ in a monopoly?	Price
41	21	What happens when the monopoly Q is too low?	Deadweight loss
42		When deadweight loss occurs?	monopoly Q is too low
43	22	Which is public policy towards monopolists?	Antitrust laws
44		Which laws ban certain anti-competitive practices?	Antitrust laws
45	23	Which agencies sets the monopolists price?	Government
46		What government agencies do for monopolist?	Sets price
47	24	$MC < ATC$ for which monopoly?	Natural monopoly
48		Why marginal cost pricing would result in losses in natural monopoly?	$MC < ATC$
49	25	Where zero economic profit occurs for monopoly?	$P = ATC$
50		What it means $P = ATC$ in monopoly?	Zero economics profit



51	26	Which is public policy towards monopolists?	Public ownership
52		Postal service is an example of?	Public ownership
53	27	Which is public policy towards monopolists?	Doing nothing
54		The best policy may be no policy for what?	Monopoly
55	28	What refers to the practice of treating people differently based on some characteristic?	Discrimination
56		What are the examples of discrimination?	Race or gender
57	29	What refers to the business practice of selling the same good at different prices to different buyers?	Price discrimination
58		What is price discrimination?	Selling same goods at different prices
59	30	Which characteristic used in price discrimination?	willingness to pay
60		A firm can increase profit by charging a higher price to buyers with higher...	willingness to pay
61	31	What happens if the monopolist charges the same price to all buyers?	deadweight loss
62		Why deadweight loss occurs in monopoly?	Same price to all buyers
63	32	What is called if monopolist produces the competitive quantity, but charges each buyer his or her WTP?	Perfect Price discrimination
64		In a Perfect Price Discrimination there is no	<i>Deadweight loss</i>
65	33	In the real world, perfect price discrimination is	not possible
66		In a real world what is not possible?	perfect price discrimination
67	34	firms divide customers into what?	Groups



68		firms divide customers into groups based on what?	observable trait
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MBA SEM 01
Module 02 Chapter 03

🌀 OLIGIPOLY 🌀

❖ **Introduction: Between Monopoly and Competition**

- *Two extremes*
 - Competitive markets: many firms, identical products¹
 - Monopoly: one firm²
- *In between these extremes*
 - **Oligopoly**: only a few sellers offer similar or identical products.³
 - **Monopolistic competition**: many firms sell similar but not identical products.⁴

❖ **Measuring Market Concentration**

- **Concentration Ratio**: The percentage of the market's total output supplied by its four largest firms.⁵
- The higher the concentration ratio, the less competition.
This chapter focuses on oligopoly, a market structure with high concentration ratios.⁶



➤ EXAMPLE: Cell Phone Duopoly in Small Town

- One possible duopoly outcome: collusion
Collusion: an agreement among firms in a market about quantities to produce or prices to charge⁷
- Ex. Cingular and Verizon could agree to each produce half of the monopoly output:
 - For each firm: $Q = 30$, $P = \$40$, profits = \$900
- **Cartel**: a group of firms acting in unison, *e.g.*, Cingular and Verizon in the outcome with collusion⁸

❖ The Equilibrium for an Oligopoly

- **Nash Equilibrium**: a situation in which economic participants interacting with one another each choose their best strategy given the strategies that all the others have chosen.⁹
- Our duopoly example has a Nash equilibrium in which each firm produces $Q = 40$.
 - Given that Verizon produces $Q = 40$, Cingular's best move is to produce $Q = 40$.
 - Given that Cingular produces $Q = 40$, Verizon's best move is to produce $Q = 40$.

❖ The Output & Price Effects

- Increasing output has two effects on a firm's profits:
 - **output effect**: If $P > MC$, selling more output raises profits.¹⁰



- **price effect:** Raising production increases market quantity, which reduces market price and reduces profit on all units sold.¹¹
- If output effect > price effect,
 - the firm increases production.¹²
- If price effect > output effect,
 - the firm reduces production.¹³

❖ The Size of the Oligopoly

- As the number of firms in the market increases,
 1. the price effect becomes smaller
 2. the oligopoly looks more and more like a competitive market
 3. P approaches MC
 4. the market quantity approaches the socially efficient quantity¹⁴

*Another benefit of international trade: Trade increases the number of firms competing, increases Q , keeps P closer to marginal cost.*¹⁵

❖ Prisoners' Dilemma Example

- The police have caught Bonnie and Clyde, two suspected bank robbers, but only have enough evidence to imprison each for 1 year.
- The police question each in separate rooms, offer each the following deal:

1. If you confess and implicate your partner, you go free.
2. If you do not confess but your partner implicates you, you get 20 years in prison.
3. If you both confess, each gets 8 years in prison.

- Confessing is the dominant strategy for both players.¹⁶
- Nash equilibrium: both confess

		Bonnie's decision	
		→ Confess	→ Remain silent
Clyde's decision	→ Confess	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%; text-align: left;">Clyde gets 8 years</div> <div style="width: 45%; text-align: right;">Bonnie gets 8 years</div> </div>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%; text-align: left;">Clyde goes free</div> <div style="width: 45%; text-align: right;">Bonnie gets 20 years</div> </div>
	→ Remain silent	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%; text-align: left;">Clyde gets 20 years</div> <div style="width: 45%; text-align: right;">Bonnie goes free</div> </div>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%; text-align: left;">Clyde gets 1 year</div> <div style="width: 45%; text-align: right;">Bonnie gets 1 year</div> </div>

- Outcome: Bonnie and Clyde both confess, each gets 8 years in prison.
- Both would have been better off if both remained silent.
- But even if Bonnie and Clyde had agreed before being caught to remain silent, the logic of self-interest takes over and leads them to confess.



➤ Other Examples of the Prisoners' Dilemma

- **Ad Wars:**

Two firms spend millions on TV ads to steal business from each other. Each firm's ad cancels out the effects of the other, and both firms' profits fall by the cost of the ads.¹⁷

- **Organization of Petroleum Exporting Countries:**

Member countries try to act like a cartel, agree to limit oil production to boost prices and profits. But agreements sometimes break down when individual countries renege.¹⁸

- **Arms race between military superpowers:**

Each country would be better off if both disarm, but each has a dominant strategy of arming.¹⁹

- **Common resources:**

All would be better off if everyone conserved common resources, but each person's dominant strategy is overusing the resources.²⁰

➤ Prisoners' Dilemma and Society's Welfare

- The non-cooperative oligopoly equilibrium

- Bad for Oligopoly Firms: prevents them from achieving monopoly profits²¹
- Good for Society: Q is closer to the socially efficient output, P is closer to MC ²²

- In other prisoners' dilemmas, the inability to cooperate may reduce social welfare.

- *e.g.*, arms race, overuse of common resources²³



❖ Why People Sometimes Cooperate

- When the game is repeated many times, cooperation may be possible.
- Strategies which may lead to cooperation:
 - If your rival reneges in one round, you renege in all subsequent rounds.²⁴
- **“Tit-for-tat”**
Whatever your rival does in one round (whether renege or cooperate), you do in the following round.²⁵

❖ Public Policy Toward Oligopolies

- In oligopolies, production is too low and prices are too high, relative to the social optimum.²⁶
- Role for policymakers: promote competition, prevent cooperation to move the oligopoly outcome closer to the efficient outcome²⁷

1. Resale Price Maintenance (“Fair Trade”)

- Occurs when a manufacturer imposes lower limits on the prices retailers can charge.²⁸
- Is often opposed because it appears to reduce competition at the retail level.²⁹
- Yet, any market power the manufacturer has is at the wholesale level; manufacturers do not gain from restricting competition at the retail level.³⁰
- The practice has a legitimate objective: preventing discount retailers from free-riding on the services provided by full-service retailers.³¹



2. Predatory Pricing

- Occurs when a firm cuts prices to prevent entry or drive a competitor out of the market, so that it can charge monopoly prices later.³²
- Illegal under antitrust laws, but hard for the courts to determine when a price cut is predatory and when it is competitive & beneficial to consumers.³³
- Many economists doubt that predatory pricing is a rational strategy:
 - It involves selling at a loss, which is extremely costly for the firm.
 - It can backfire.³⁴

3. Tying

- Occurs when a manufacturer bundles two products together and sells them for one price (*e.g.*, Microsoft including a browser with its operating system)³⁵
- Critics argue that tying gives firms more market power by connecting weak products to strong ones.³⁶
- Others counter that tying cannot change market power: Buyers are not willing to pay more for two goods together than for the goods separately.³⁷
- Firms may use tying for price discrimination, which is not illegal, and which sometimes increases economic efficiency.³⁸

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	In which market there are many firms, identical products?	Competitive market
2		Competitive markets have ...	many firms, identical products
3	2	In which market there is only one firm?	Monopoly market
4		Monopoly have...	One firm
	3	What refers to only a few sellers offer similar or identical products?	Oligopoly
6		Oligopoly have...	only a few sellers with identical products
7	4	What refers to the many firms sell similar but not identical products?	Monopolistic competition
8		Monopolistic competition has...	Many firms selling similar but not identical products
9	5	What refers to the percentage of the market's total output supplied by its four largest firms?	Concentration ratio
10		Concentration ratio is the percentage of the market's total output supplied by its how many largest firms?	4 (Four)
11	6	The higher the concentration ratio, ...	less competition
12		The lower the concentration ratio, ...	More competition
13	7	What refers to an agreement among firms in a market about quantities to produce or prices to charge?	Collusion
14		Collusion is one type of...	Agreement

15	8	What refers to a group of firms acting in unison?	Cartel
16		What is Cartel?	a group of firms acting in unison
17	9	What refers to a situation in which economic participants interacting with one another each choose their best strategy given the strategies that all the others have chosen?	Nash Equilibrium
18		Nash Equilibrium is used for?	Choosing best strategy
19	10	What if $P > MC$, selling more output raises profits?	Output effect
20		What is Output effect?	selling more output raises profits
21	11	What if raising production increases market quantity, which reduces market price and reduces profit on all units sold?	Price effect
22		What is price effect?	Increasing output reduces price and profit
23	12	What if output effect $>$ price effect?	firm increases production
24		When the firm increases production?	if output effect $>$ price effect
25	13	What if price effect $>$ output effect?	firm reduces production
26		When the firm reduces production?	if price effect $>$ output effect
27	14	What happens to price effect as the number of firms in the market increases?	the price effect becomes smaller
28		What happens to oligopoly as the number of firms in the market increases?	It looks like a competitive market
29	15	What is the benefit of international trade?	Increases competing firms



30		What is the benefit of international trade?	increases Q , keeps P closer to marginal cost
31	16	Which is the dominant strategy for both players in dilemma?	Confessing
32		Confessing is the dominant strategy for ...	Both players
33	17	What are the other Examples of the Prisoners' Dilemma?	Ad wars
34		Why firms spend millions on TV ads?	to steal business from other
35	18	What are the other Examples of the Prisoners' Dilemma?	Organization of Petroleum Exporting Countries
36		When the Cartel agreements break down?	individual countries renege
37	19	What are the other Examples of the Prisoners' Dilemma?	Arms race between military superpowers
38		Each country would be better off if ...	both disarm
39	20	What are the other Examples of the Prisoners' Dilemma?	Common resources
40		What is each person's dominant strategy for common resources?	overusing the resources
41	21	The non-cooperative oligopoly equilibrium is bad for what?	Oligopoly
42		What prevents oligopoly firms from achieving monopoly profits?	non-cooperative oligopoly equilibrium
43	22	The non-cooperative oligopoly equilibrium is good for what?	Society
44		What makes Q closer to the socially efficient output, P closer to MC ?	non-cooperative oligopoly equilibrium
45	23	What reduced by the inability to cooperate?	Social welfare
46		Social welfare is reduced by what?	Inability to cooperate
47	24	What should you do if your rival reneges in one round?	renege in all subsequent rounds



48		What is lead by If your rival reneges in one round, you renege in all subsequent rounds?	Lead to cooperation
49	25	What refers to whatever your rival does in one round you do in the following round?	Tit for tat
50		What should you do in tit for tat to your rival does in one round?	Do same in following round
51	26	In oligopolies, production is...	Too low
52		In oligopolies, price is...	Too high
53	27	What is the role for policymakers in oligopoly?	promote competition
54		What is the role for policymakers preventing cooperation to move the oligopoly outcome closer to?	the efficient outcome
55	28	When Fair Trade occurs?	a manufacturer imposes lower limits on the prices retailers can charge
56		What happens when a manufacturer imposes lower limits on the prices retailers can charge?	Fair Trade
57	29	Why Fair Trade often opposed?	Reduce competition
58		What reduce competition at the retail level?	Fair Trade
59	30		
60			
61	31		
62			
63	32	When Predatory Pricing occurs?	a firm cuts prices to prevent entry
64		What occurs when a firm cuts prices to prevent entry or drive a competitor out of the market?	Predatory Pricing
65	33	What is Illegal under antitrust laws?	Predatory Pricing



66		What is hard for courts to determine when a price cut is predatory and when it is beneficial to consumers?	Predatory Pricing
67	34	What is Predatory Pricing?	a rational strategy
68		Predatory Pricing involves selling at a loss, which is extremely costly for?	Firms
69	35	When Tying occurs?	two products sold for one price
70		What refers to a manufacturer bundles two products together and sells them for one price?	Tying
71	36	Tying gives firms....	more market power
72		How Tying gives firms more market power?	by connecting weak products to strong ones
73	37		
74			
75	38	Firms may use tying for what?	price discrimination
76		What is illegal in Tying?	price discrimination

MBA SEM 01
Module 02 Chapter 04

✿ **MONOPOLISTIC COMPETITION** ✿

❖ Introduction

- **Monopolistic Competition:** a market structure in which many firms sell products that are similar but not identical.¹
- Examples: apartments, books, bottled water, clothing, fast food, night clubs...²

❖ Comparing Perfect & Monopolistic Competition

POINTS	PERFECT COMPETITION	MONOPOLISTIC COMPETITION
Number of Sellers	Many	Many
Free Entry/Exit	Yes	Yes
Long Run Economic Profits	Zero	Zero
The Products Firms Sell	Identical	Differentiated
Firm has Market Power?	None, Price-taker	Yes
<i>D</i> Curve Facing Firm	Horizontal	Downward-sloping

❖ Comparing Monopoly & Monopolistic Competition

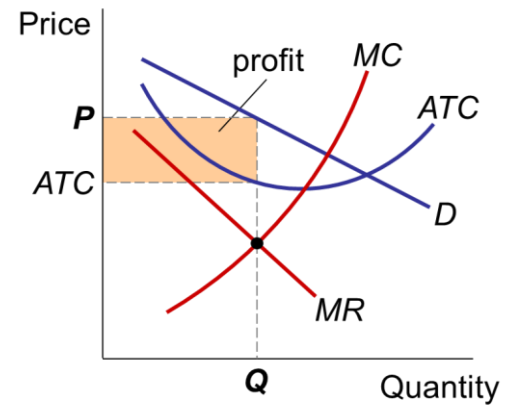
POINTS	MONOPOLY	MONOPOLISTIC COMPETITION
Number of Sellers	One	Many
Free Entry/Exit	No	Yes
Long Run Economic Profits	Positive	Zero
Close Substitutes	None	Many
Firm has Market Power?	Yes	Yes
<i>D</i> Curve Facing Firm	Downward-sloping	Downward-sloping

❖ Comparing Oligopoly & Monopolistic Competition

POINTS	OLIGOPOLY	MONOPOLISTIC COMPETITION
Number of Sellers	Few	Many
Importance of Strategic Interactions between Firms	High	Low
Likelihood of Fierce Competition	Low	High

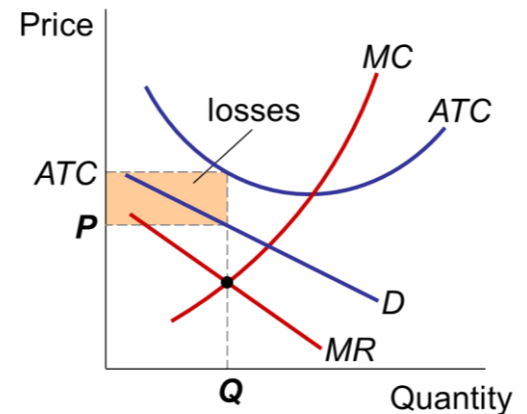
❖ A Monopolistically Competitive Firm Earning Profits in the Short Run

- The firm faces a downward-sloping D curve. At each Q , $MR < P$.³
- To maximize profit, firm produces Q where $MR = MC$. The firm uses the D curve to set P .⁴



❖ A Monopolistically Competitive Firm with Losses in the Short Run

- For this firm, $P < ATC$ at the output where $MR = MC$. The best this firm can do is to minimize its losses.

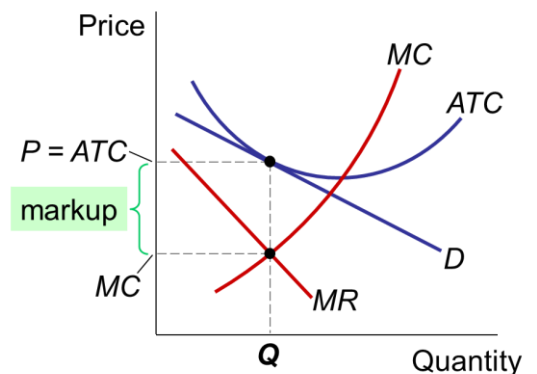


❖ Monopolistic Competition and Monopoly

- **Short Run:** Under monopolistic competition, firm behavior is very similar to monopoly.⁵
- **Long Run:** In monopolistic competition, entry and exit drive economic profit to zero.⁶
- If profits in the short run:
 - New firms enter market,
 - taking some demand away from existing firms,
 - prices and profits fall.⁷
- If losses in the short run:
 - Some firms exit the market,
 - remaining firms enjoy higher demand and prices.⁸

❖ A Monopolistic Competitor in the Long Run

- Entry and exit occur until $P = ATC$ and profit = zero.
- Notice that the firm charges a markup of price over marginal cost, and does not produce at minimum ATC .





❖ Why Monopolistic Competition Is Less Efficient than Perfect Competition

1. Excess capacity

- The monopolistic competitor operates on the downward-sloping part of its *ATC* curve, produces less than the cost-minimizing output.⁹
- Under perfect competition, firms produce the quantity that minimizes *ATC*.¹⁰

2. Markup over marginal cost

- Under monopolistic competition, $P > MC$.
- Under perfect competition, $P = MC$.¹¹

❖ Monopolistic Competition and Welfare

- Monopolistically competitive markets do not have all the desirable welfare properties of perfectly competitive markets.
Because $P > MC$, the market quantity is below the socially efficient quantity.¹²
- Yet, not easy for policymakers to fix this problem: Firms earn zero profits, so cannot require them to reduce prices.¹³
- Number of firms in the market may not be optimal, due to external effects from the entry of new firms:¹⁴
 - **The product-variety externality:** surplus consumers get from the introduction of new products
 - **The business-stealing externality:** losses incurred by existing firms when new firms enter market¹⁵
- The inefficiencies of monopolistic competition are subtle and hard to measure. No easy way for policymakers to improve the market outcome.¹⁶



❖ Advertising

- In monopolistically competitive industries, product differentiation and markup pricing lead naturally to the use of advertising.¹⁷
- In general, the more differentiated the products, the more advertising firms buy. Economists disagree about the social value of advertising.¹⁸

➤ The Critique of Advertising

- Critics of advertising believe:
 - Society is wasting the resources it devotes to advertising.
 - Firms advertise to manipulate people's tastes.
 - Advertising impedes competition – it creates the perception that products are more differentiated than they really are, allowing higher markups.¹⁹

➤ The Defense of Advertising

- Defenders of advertising believe:
 - It provides useful information to buyers.
 - Informed buyers can more easily find and exploit price differences.
 - Thus, advertising promotes competition and reduces market power.²⁰
- Ex. Results of a prominent study: Eyeglasses were more expensive in states that prohibited advertising by eyeglass makers than in states that did not restrict such advertising.

➤ Advertising as a Signal of Quality

- A firm's willingness to spend huge amounts on advertising may signal the quality of its product to consumers, *regardless of the content of ads*.²¹
 - Ads may convince buyers to try a product once, but the product must be of high quality for people to become repeat buyers.²²
 - The most expensive ads are not worthwhile unless they lead to repeat buyers.²³
 - When consumers see expensive ads, they think the product must be good if the company is willing to spend so much on advertising.²⁴

❖ Brand Names

- In many markets, brand name products coexist with generic ones.²⁵
- Firms with brand names usually spend more on advertising, charge higher prices for the products.
As with advertising, there is disagreement about the economics of brand names...²⁶

➤ The Critique of Brand Names

- Critics of brand names believe:
 - Brand names cause consumers to perceive differences that do not really exist.
 - Consumers' willingness to pay more for brand names is irrational, fostered by advertising.
 - Eliminating govt protection of trademarks would reduce influence of brand names, result in lower prices.²⁷



➤ The Defense of Brand Names

- Defenders of brand names believe:
- Brand names provide information about quality to consumers.
- Companies with brand names have incentive to maintain quality, to protect the reputation of their brand names.²⁸



ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What refers to a market structure in which many firms sell products that are similar but not identical?	Monopolistic competition
2		In a Monopolistic competition...	many firms sell products that are similar but not identical
3	2	What are the examples of Monopolistic competition?	Apartments, books
4		Apartments, books are the example of?	Monopolistic competition
	3	Monopolistic competition firms faces D curve sloping...	Downward sloping
6		In Monopolistic competition, At each Q , $MR < ?$	Price
7	4	To maximize profit, firm produces Q where?	$MR = MC$
8		Which curve used by firms to set price?	D curve
9	5	In the ... under monopolistic competition, firm behavior is very similar to monopoly	Short run
10		In the short run, firm behavior is very similar to?	Monopoly
11	6	In the ... In monopolistic competition, entry and exit drive economic profit to zero.	Long run
12		In the long run, entry and exit drive economic profit to?	Zero



13	7	What if there is a profit in the short run?	New firms enter market
14		What if there is a profit in the short run?	prices and profits fall
15	8	What if there is a loss in the short run?	Some firms exit the market
16		What if there is a loss in the short run?	remaining firms enjoy higher demand and prices
17	9	Why Monopolistic Competition Is Less Efficient than Perfect Competition?	Excess capacity
18		What happens when the monopolistic competitor operates on downward-sloping part of its <i>ATC</i> curve?	produces less than the cost-minimizing output
19	10	In perfect competition, firms produce the quantity that minimizes?	<i>ATC</i>
20		firms produce the quantity that minimizes <i>ATC</i> in which competition?	Perfect competition
21	11	In monopolistic competition, price is greater than?	<i>MC</i>
22		In perfect competition, price is equal to?	<i>MC</i>
23	12	Monopolistically competitive markets do not have all the desirable welfare properties of?	perfectly competitive markets
24		When the market quantity is below the socially efficient quantity?	$P > MC$
25	13	When firms cannot reduce prices?	Firms earn zero profits
26		What if firms earn zero profits?	Cannot reduce price
27	14	Why Number of firms in the market may not be optimal?	external effects from the entry of new firms
28		What happens to oligopoly as the number of firms in the market increases?	It looks like a competitive market



29	15	What refers to surplus consumers get from the introduction of new products?	product-variety externality
30		What refers to losses incurred by existing firms when new firms enter market?	business-stealing externality
31	16	The inefficiencies of monopolistic competition are..	subtle and hard to measure
32		What is subtle and hard to measure?	inefficiencies of monopolistic competition
33	17	product differentiation and markup pricing lead naturally to the use of?	Advertising
34		What lead naturally to the use of advertising?	product differentiation and markup pricing
35	18	the more differentiated the products, the more ... firms buy	advertising
36		What Economists disagree about?	social value of advertising
37	19	What Critics of advertising believe about society?	wasting the resources it devotes to advertising
38		What Critics of advertising believe about firms?	advertise to manipulate people's tastes
39	20	What Defenders of advertising believe?	It provides useful information to buyers
40		What Defenders of advertising believe?	promotes competition and reduces market power
41	21	A firm's willingness to spend huge amounts on advertising may signal what?	quality of its product to consumers
42		How the quality of its product signals to consumers?	Advertising
43	22	Ads may convince buyers to try a product ...	Once
44		product must be of high quality for people to become...	repeat buyers



45	23	The most expensive ads are not worthwhile unless...	lead to repeat buyers
46			
47	24	When consumers see expensive ads, they think the product must be ...	Good
48		What if the company is willing to spend so much on advertising?	Product must be good
49	25	In many markets, brand name products coexist with what?	generic ones
50		What coexist with generic ones?	Brand names
51	26	Firms with brand names usually spend more on what?	Advertising
52		Firms with brand names usually charge...	Higher price
53	27	What Critics of brand names believe to consumers?	perceive differences that do not really exist
54		What Critics of brand names believe to consumers' willingness to pay more for brand names?	Irrational
55	28	What Defenders of brand names believe to consumers?	provide information about quality
56		What Defenders of brand names believe to firms?	incentive to maintain quality



MBA SEM 01
Module 03 Chapter 01

✿ MEASURING A NATION'S INCOME ✿

❖ Micro vs. Macro

- **Microeconomics:** The study of how individual households and firms make decisions, interact with one another in markets.¹
- **Macroeconomics:** The study of the economy as a whole.²

❖ Income and Expenditure

- **Gross Domestic Product (GDP)** measures total income of everyone in the economy³
- GDP also measures total expenditure on the economy's output of goods & services.⁴

*For the economy as a whole, **income equals expenditure**, because every dollar of expenditure by a buyer is a dollar of income for the seller⁵*

❖ The Circular-Flow Diagram

- It is a simple depiction of the macroeconomy.
It illustrates GDP as spending, revenue, factor payments, and income.⁶
- First, some preliminaries:
 - **Factors of production** are inputs like labor, land, capital, and natural resources.⁷
 - **Factor payments** are payments to the factors of production. (*e.g.*, wages, rent)⁸

Households:

- own the factors of production, sell/rent them to firms for income
- buy and consume g&s

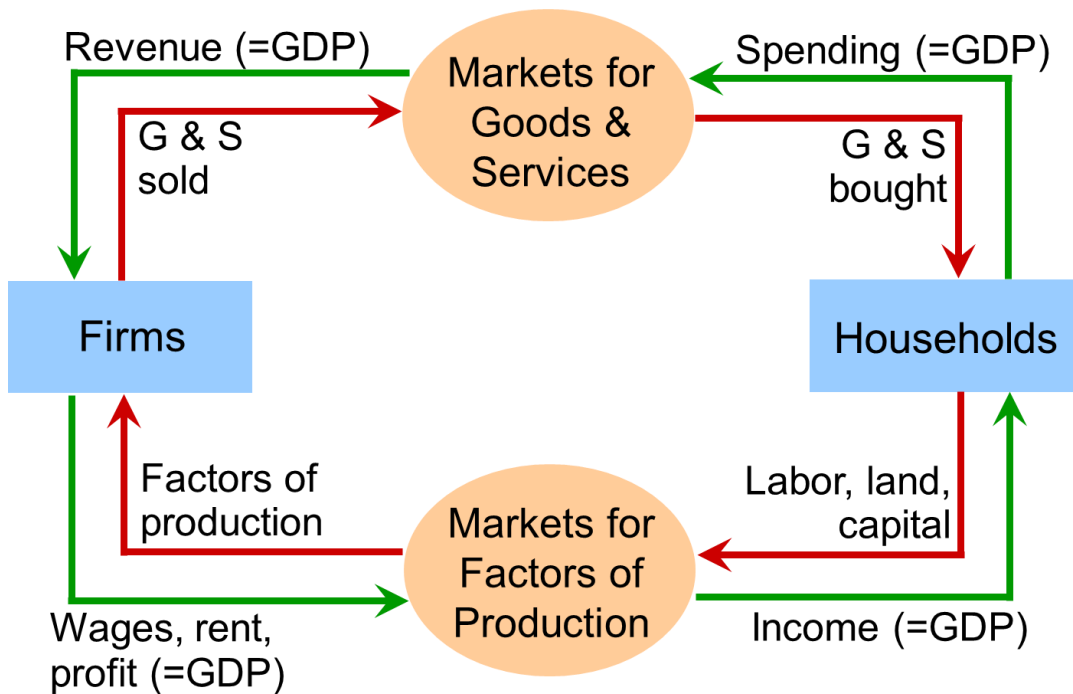
Households

Firms

Firms:

- buy/hire factors of production, use them to produce g&s
- sell g&s

➤ **FIGURE 1: The Circular-Flow Diagram**



❖ **Gross Domestic Product (GDP)**

...is the market value of all final goods & services produced within a country in a given period of time.⁹

• **Market value:**

Goods are valued at their market prices, so:

- *GDP measures all goods using the same units (e.g., dollars in the U.S.), rather than “adding apples to oranges.”*
- *Things that don’t have a market value are excluded, e.g., housework you do for yourself.¹⁰*



- **Final:**
 - *Final goods are intended for the end user.*¹¹
- *Intermediate goods are used as components or ingredients in the production of other goods.*¹²
- *GDP only includes final goods, as they already embody the value of the intermediate goods used in their production.*¹³
- **Goods & services:**
 - *GDP includes tangible goods (like DVDs, mountain bikes, beer)*¹⁴
 - *and intangible services (dry cleaning, concerts, cell phone service).*¹⁵
- **Produced:**
 - *GDP includes currently produced goods, not goods produced in the past.*¹⁶
- **Within a country:**
 - *GDP measures the value of production that occurs within a country's borders, whether done by its own citizens or by foreigners located there.*¹⁷
- **In a given period of time:**
 - *usually a year or a quarter (3 months).*¹⁸



❖ The Components of GDP

- Recall: GDP is total spending.

Four components:

1. Consumption (C)
 2. Investment (I)
 3. Government Purchases (G)
 4. Net Exports (NX)¹⁹
- These components add up to GDP (denoted Y):²⁰

$$Y = C + I + G + NX$$

1. Consumption (C)

- Consumption is total spending by households on goods & services.²¹
- Notes on housing costs:
 - For renters, consumption includes rent payments.
 - For homeowners, consumption includes the imputed rental value of the house, but not the purchase price or mortgage payments.²²

2. Investment (I)

- Investment is total spending on goods that will be used in the future to produce more goods.²³
- It includes spending on:
 - capital equipment (e.g., machines, tools)
 - structures (factories, office buildings, houses)
 - inventories (goods produced but not yet sold)²⁴
- *Note: “Investment” does not mean the purchase of financial assets like stocks and bonds.*



3. Government Purchases (G)

- Government Purchases are all spending on the goods & services purchased by govt at the federal, state, and local levels.²⁵
- **G** excludes **transfer payments**, such as Social Security or unemployment insurance benefits.

These payments represent transfers of income, not purchases of goods & services.²⁶

4. Net Exports (NX)

- **NX** = exports – imports²⁷
- Exports represent foreign spending on the economy's goods & services.²⁸
- Imports are the portions of **C**, **I**, and **G** that are spent on goods & services produced abroad.²⁹
- Adding up all the components of GDP gives:

$$Y = C + I + G + NX$$

➤ U.S. GDP and Its Components, 2005

	billions	% of GDP	per capita
Y	\$12,480	100.0	\$42,035
C	8,746	70.1	29,460
I	2,100	16.8	7,072
G	2,360	18.9	7,950
NX	-726	-5.8	-2,444



❖ Real versus Nominal GDP

- Inflation can distort economic variables like GDP, so we have two versions of GDP: One is corrected for inflation, the other is not.³⁰
- **Nominal GDP** values output using current prices. It is not corrected for inflation.³¹
- **Real GDP** values output using the prices of a **base year**. Real GDP is corrected for inflation.³²

- **EXAMPLE:**

year	Pizza		Latte	
	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
2002	\$10	400	\$2.00	1000
2003	\$11	500	\$2.50	1100
2004	\$12	600	\$3.00	1200

Compute nominal GDP in each year:

$$\begin{array}{l} 2002: \$10 \times 400 + \$2 \times 1000 = \$6,000 \\ 2003: \$11 \times 500 + \$2.50 \times 1100 = \$8,250 \\ 2004: \$12 \times 600 + \$3 \times 1200 = \$10,800 \end{array} \quad \begin{array}{l} \text{Increase:} \\ \left. \begin{array}{l} 37.5\% \\ 30.9\% \end{array} \right\} \end{array}$$

Compute real GDP in each year,
using 2002 as the base year:

$$\begin{array}{l} 2002: \$10 \times 400 + \$2 \times 1000 = \$6,000 \\ 2003: \$10 \times 500 + \$2 \times 1100 = \$7,200 \\ 2004: \$10 \times 600 + \$2 \times 1200 = \$8,400 \end{array} \quad \begin{array}{l} \text{Increase:} \\ \left. \begin{array}{l} 20.0\% \\ 16.7\% \end{array} \right\} \end{array}$$

year	Nominal GDP		Real GDP	
2002	\$6000	}	\$6000	}
2003	\$8250		\$7200	
2004	\$10,800		\$8400	

37.5%

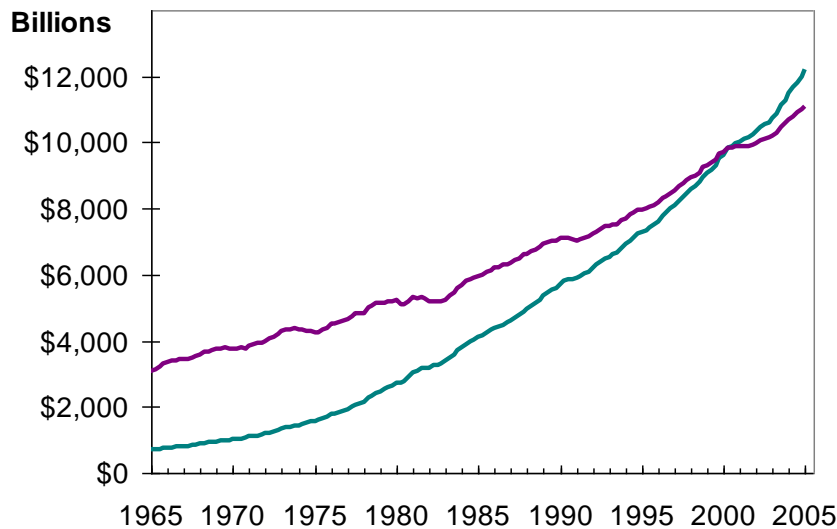
30.9%

20.0%

16.7%

- In each year,
 - nominal GDP is measured using the current prices.
 - real GDP is measured using constant prices from the base year (2002 in this example).
- The change in nominal GDP reflects both prices and quantities.
- The change in real GDP is the amount that GDP would change if prices were constant (*i.e.*, if zero inflation).
- ***Hence, real GDP is corrected for inflation.***

➤ **Nominal and Real GDP in the U.S., (1965-2005)**



❖ The GDP Deflator

- The GDP deflator is a measure of the overall level of prices.³³
- Definition:

$$\text{GDP deflator} = 100 \times \frac{\text{nominal GDP}}{\text{real GDP}}$$

- One way to measure the economy's **inflation rate** is to compute the percentage increase in the GDP deflator from one year to the next.³⁴
- Example:

year	Nominal GDP	Real GDP	GDP Deflator	
2002	\$6000	\$6000	100.0	} 14.6%
2003	\$8250	\$7200	114.6	
2004	\$10,800	\$8400	128.6	} 12.2%

Compute the GDP deflator in each year:

$$2002: 100 \times (6000/6000) = 100.0$$

$$2003: 100 \times (8250/7200) = 114.6$$

$$2004: 100 \times (10,800/8400) = 128.6$$

❖ GDP and Economic Well-Being

- *Real GDP per capita is the main indicator of the average person's standard of living.*

But GDP is not a perfect measure of well-being.³⁵

- Robert Kennedy issued a very eloquent yet harsh criticism of GDP:

Gross Domestic Product...

“... does not allow for the health of our children, the quality of their education, or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials.

It measures neither our courage, nor our wisdom, nor our devotion to our country. It measures everything, in short, except that which makes life worthwhile, and it can tell us everything about America except why we are proud that we are Americans.”

- *Senator Robert Kennedy, 1968*



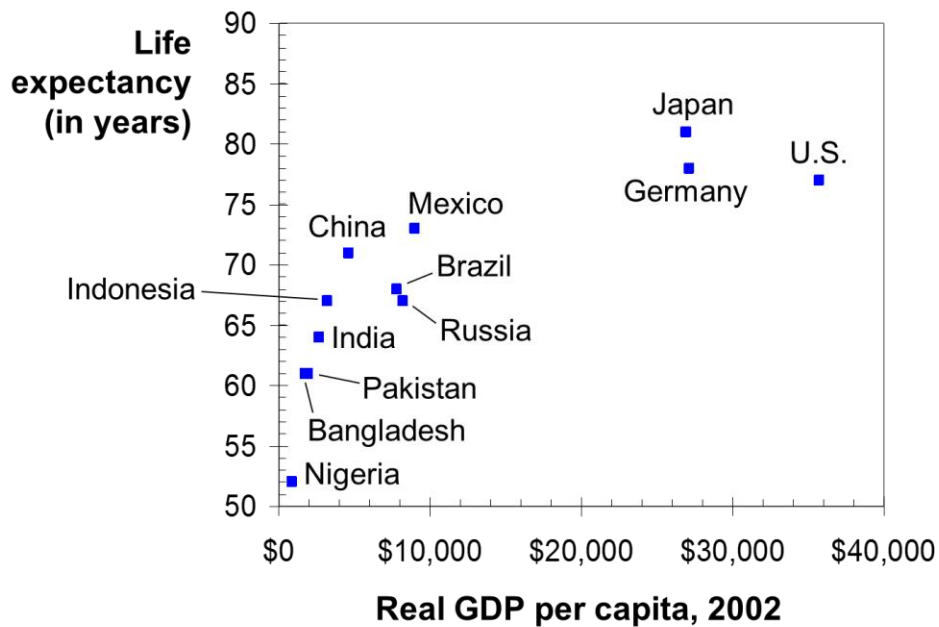
➤ **GDP Does Not Value:**

- The quality of the environment
- Leisure time
- Non-market activity, such as the child care a parent provides his or her child at home
- An equitable distribution of income³⁶

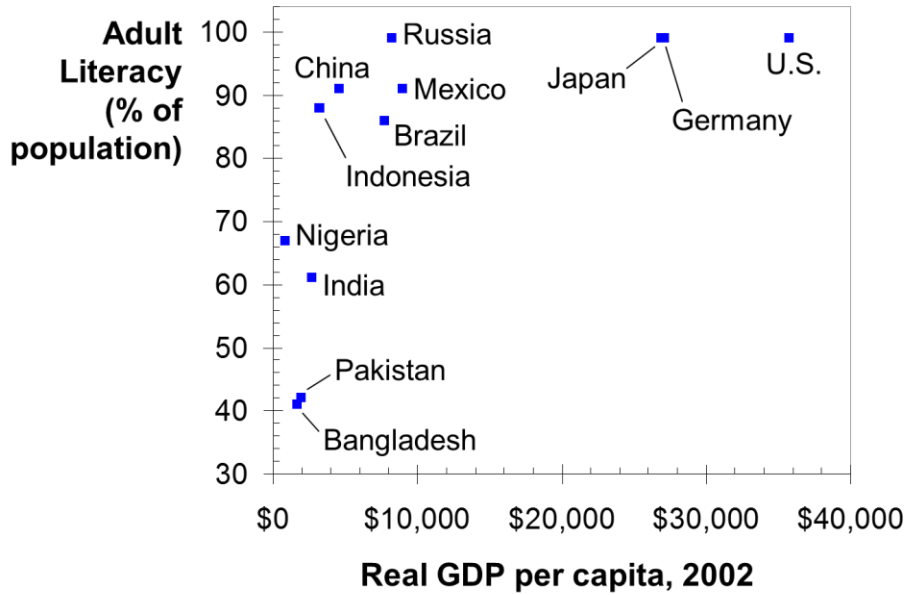
➤ **Then Why Do We Care About GDP?**

- Having a large GDP enables a country to afford better schools, a cleaner environment, health care, etc.³⁷
- Many indicators of the quality of life are positively correlated with GDP.³⁸
For example, ...

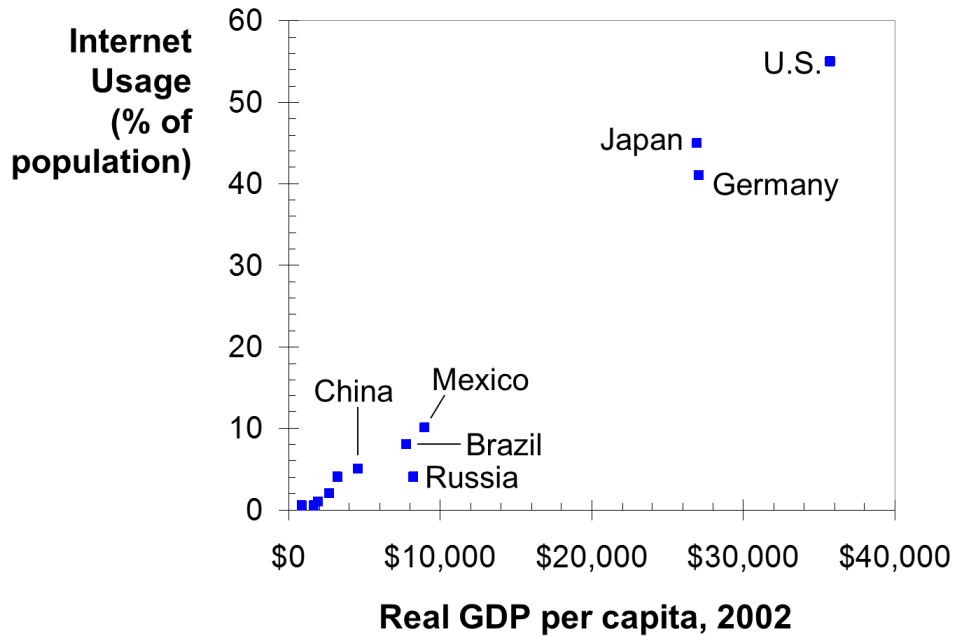
GDP and Life Expectancy in 12 Countries



GDP and Adult Literacy in 12 Countries



GDP and Internet Usage in 12 Countries





EXERCISE

1. In each of the following cases, determine how much GDP and each of its components is affected (if at all).
 - A. Debbie spends \$200 to buy her husband dinner at the finest restaurant in Boston.
 - B. Sarah spends \$1800 on a new laptop to use in her publishing business. The laptop was built in China.
 - C. Jane spends \$1200 on a computer to use in her editing business. She got last year's model on sale for a great price from a local manufacturer.
 - D. General Motors builds \$500 million worth of cars, but consumers only buy \$470 million worth of them.

ANSWER:

- A. *Consumption and GDP rise by \$200.*
- B. *Investment rises by \$1800, net exports fall by \$1800, GDP is unchanged.*
- C. *Current GDP and investment do not change, because the computer was built last year.*
- D. *Consumption rises by \$470 million; inventory investment rises by \$30 million, and GDP rises by \$500 million.*



2. Computing GDP:

	2004 (base yr)		2005		2006	
	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>	<i>Q</i>
good A	\$30	900	\$31	1,000	\$36	1050
good B	\$100	192	\$102	200	\$100	205

Use the above data to solve these problems:

- A. Compute nominal GDP in 2004.
- B. Compute real GDP in 2005.
- C. Compute the GDP deflator in 2006.

ANSWER:

A. $\$30 \times 900 + \$100 \times 192 = \underline{\$46,200}$

B. $\$30 \times 1000 + \$100 \times 200 = \underline{\$50,000}$

C. Nom GDP = $\$36 \times 1050 + \$100 \times 205 = \underline{\$58,300}$

Real GDP = $\$30 \times 1050 + \$100 \times 205 = \underline{\$52,000}$

GDP deflator = $100 \times (\text{Nom GDP}) / (\text{Real GDP})$
 $= 100 \times (\$58,300) / (\$52,000) = \underline{112.1}$

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What refers to the study of how individual households and firms make decisions?	Microeconomics
2		Microeconomics is the study between what make decisions?	households and firms
3	2	What refers to the study of the economy as a whole?	Macroeconomics
4		Macroeconomics is the study of?	economy as a whole
	3	What measures total income of everyone in the economy?	GDP
6		What is the full form of GDP?	Gross Domestic Product
7	4	What measures total expenditure on the economy's output of goods & services?	GDP
8		GDP measures ... on the economy's output of goods & services	total expenditure
9	5	For the economy as a whole, income equals to what?	Expenditure
10		What is every dollar of expenditure by a buyer for the seller?	dollar of income for the seller
11	6	What is the simple depiction of the macroeconomy?	Circular-Flow Diagram
12		What illustrates GDP as spending, revenue, factor payments, and income?	Circular-Flow Diagram
13	7	What refers to inputs like labor, land, capital, and natural resources?	Factors of production
14		How many factors of production?	4 (Four)



15	8	What refers to payments to the factors of production?	Factor payments
16		What is factor payment?	payments to the factors of production
17	9	What is the market value of all final goods & services produced within a country in a given period of time?	GDP
18		What is the full form of GDP?	Gross Domestic Product
19	10	What is market value in GDP?	Value of goods at market price
20		Which things are excluded from GDP?	Things that don't have a market value
21	11	Which goods are intended for the end user?	Final goods
22		Final goods are intended for which users?	End users
23	12	Which goods are used as components or ingredients in the production of other goods?	Intermediate goods
24		Intermediate goods are used for what in the production of other goods?	components or ingredients
25	13	Which goods are included in GDP?	Final goods
26		Which goods embody the value of the intermediate goods used in their production?	Final goods
27	14	What are examples of tangible goods?	DVD, mountain bikes
28		DVD, mountain bikes are the examples of what?	Tangible goods
29	15	What are the examples of intangible services?	dry cleaning, concerts
30		dry cleaning, concerts are the examples of what?	Intangible services
31	16	GDP includes ... produced goods.	Currently



32		GDP does not include the goods which are produced in...	Past
33	17	GDP measures the value of production that occurs within...	Country
34			
35	18	What is the time period of GDP?	usually a year or a quarter
36		What are quarter months?	3 months
37	19	What is GDP?	Total spending
38		How many components of GDP?	4 (Four)
39	20	GDP is denoted by what?	Y
40		What makes the total of C+I+N+G+NX?	GDP
41	21	What refers to total spending by households on goods & services?	Consumption
42		What is Consumption?	total spending by households on g&s
43	22	What includes in consumption for renters?	rent payments
44		What includes in consumption for homeowners?	imputed rental value of the house
45	23	What refers to total spending on goods that will be used in the future to produce more goods?	Investment
46		Investment is total spending on goods that will be used in?	future to produce more goods
47	24	Investment includes spending on?	capital equipment, structures
48		What are inventories in investment?	goods produced not sold
49	25	What refers to all spending on the goods & services purchased by govt?	Government Purchases
50		Government Purchases are all spending on the goods & services purchased by?	Government



51	26	What is excluded in Government Purchases?	Transfer Payments
52		Social Security or unemployment insurance benefits are?	Transfer payments
53	27	What is NX?	Exports -Imports
54		Exports -Imports are referred as?	NX
55	28	What refers to foreign spending on the economy's goods & services?	Exports
56		Exports represent ... on the economy's goods & services.	foreign spending
57	29	What refers to the portions of C , I , and G that are spent on goods & services produced abroad?	Imports
58		Imports are the ... that are spent on goods & services produced abroad.	portions of C , I , and G
59	30	What can distort economic variables like GDP?	Inflation
60		How many versions of GDP?	2 (Two)
61	31	What values output using current prices?	Nominal GDP
62		Which GDP is not corrected for inflation?	Nominal GDP
63	32	What values output using the prices of a base year?	Real GDP
64		Which GDP is corrected for inflation?	Real GDP
65	33	What refers to a measure of the overall level of prices?	GDP Deflator
66		What is the GDP deflator?	measure of overall level of prices
67	34	What can be measured by percentage increase in the GDP deflator from one year to the next?	Inflation rate
68		How inflation rate is measured by GDP Deflator?	percentage increase from one to next year



69	35	What is the main indicator of the average person's standard of living?	GDP per capita
70		GDP per capita is the main indicator of what?	average person's standard of living
71	36	What is not valued by GDP?	quality of the environment
72		What is not valued by GDP?	Leisure time
73	37	Having a large GDP enables a country to afford what?	better schools, a cleaner environment
74		better schools, a cleaner environment is enabled by what?	Large GDP
75	38	What is positively correlated with GDP?	indicators of quality of life
76		indicators of the quality of life are positively correlated with?	GDP



MBA SEM 01
Module 03 Chapter 02

✿ MEASURING THE COST OF LIVING ✿

❖ **The Consumer Price Index (CPI)**

- Measures the typical consumer's cost of living.¹
- The basis of cost of living adjustments (COLAs) in many contracts and in Social Security.²

➤ **How the CPI Is Calculated**

1. Fix the "basket."

The Bureau of Labor Statistics (BLS) surveys consumers to determine what's in the typical consumer's "shopping basket."³

2. Find the prices.

The BLS collects data on the prices of all the goods in the basket.⁴

3. Compute the basket's cost.

Use the prices to compute the total cost of the basket.⁵



4. Choose a base year and compute the index.

The CPI in any year equals⁶

$$100 \times \frac{\text{cost of basket in current year}}{\text{cost of basket in base year}}$$

5. Compute the inflation rate.

The percentage change in the CPI from the preceding period.⁷

$$\text{inflation rate} = \frac{\text{CPI this year} - \text{CPI last year}}{\text{CPI last year}} \times 100\%$$

EXAMPLE:

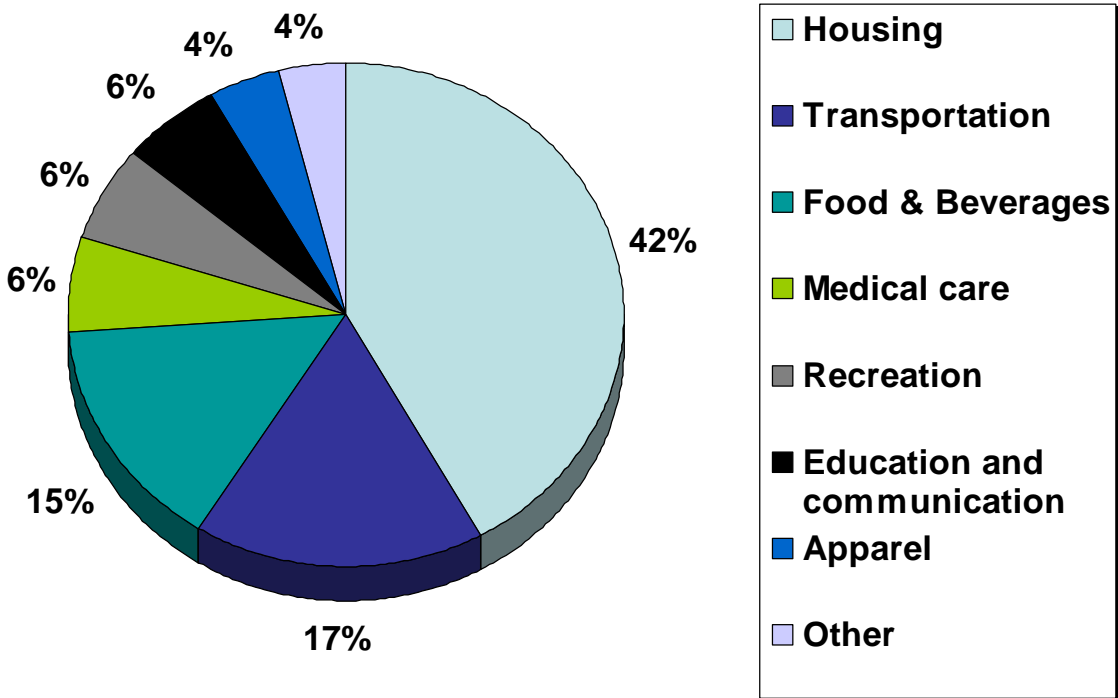
Year	Price of Pizza	Price of Latte	Cost of Basket
2003	\$10	\$2.00	$\$10 \times 4 + \$2 \times 10 = \$60$
2004	\$11	\$2.50	$\$11 \times 4 + \$2.5 \times 10 = \$69$
2005	\$12	\$3.00	$\$12 \times 4 + \$3 \times 10 = \$78$

Compute CPI in each year:

Inflation rate:

$$\begin{array}{l} 2003: 100 \times (\$60/\$60) = 100 \\ 2004: 100 \times (\$69/\$60) = 115 \\ 2005: 100 \times (\$78/\$60) = 130 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l} 15\% \\ 13\% \end{array}$$

➤ **What's in the CPI's Basket?**



➤ **Problems With the CPI:**

- Each of these problems causes the CPI to overstate cost of living increases.⁸
- The BLS has made technical adjustments, but the CPI probably still overstates inflation by about 0.5 percent per year.⁹
- This is important, because Social Security payments and many contracts have COLAs tied to the CPI.¹⁰



- ***Substitution Bias:***

- Over time, some prices rise faster than others. Consumers substitute toward goods that become relatively cheaper.¹¹
- The CPI misses this substitution because it uses a fixed basket of goods. Thus, the CPI overstates increases in the cost of living.¹²

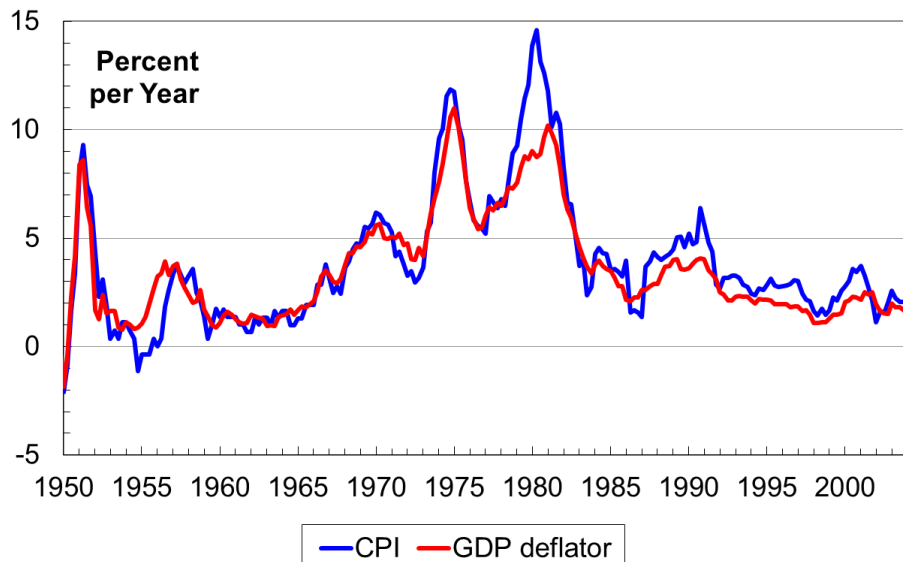
- ***Introduction of New Goods:***

- When new goods become available, variety increases, allowing consumers to find products that more closely meet their needs. This has the effect of making each dollar more valuable.¹³
- The CPI misses this effect because it uses a fixed basket of goods. Thus, the CPI overstates increases in the cost of living.¹⁴

- ***Unmeasured Quality Change:***

- Improvements in the quality of goods in the basket increase the value of each dollar.¹⁵
- The BLS tries to account for quality changes, but probably misses some quality improvements, as quality is hard to measure. Thus, the CPI overstates increases in the cost of living.¹⁶

❖ Two Measures of Inflation



➤ Contrasting the CPI and GDP Deflator

- **Imported consumer goods:**
 - included in CPI
 - excluded from GDP deflator¹⁷
- **Capital goods:**
 - excluded from CPI
 - included in GDP deflator (if produced domestically)¹⁸
- **The basket:**
 - CPI uses fixed basket
 - GDP deflator uses basket of currently produced goods & services
 - This matters if different prices are changing by different amounts.¹⁹



➤ **Correcting Variables for Inflation:**

1. Comparing Dollar Figures from Different Times

- Inflation makes it harder to compare dollar amounts from different times. We can use the CPI to adjust figures so that they can be compared.²⁰

- **EXAMPLE: The High Price of Gasoline**

- Price of a gallon of regular unleaded gas:
 - \$1.42 in March 1981
 - \$2.50 in August 2005
- To compare these figures, we will use the CPI to express the 1981 gas price in “2005 dollars,” what gas in 1981 would have cost if the cost of living were the same then as in 2005.
- Multiply the 1981 gas price by the ratio of the CPI in 2005 to the CPI in 1981.

date	Price of gas	CPI	Gas price in 2005 dollars
3/1981	\$1.42/gallon	88.5	\$3.15 /gallon
8/2005	\$2.50/gallon	196.4	\$2.50/gallon

- 1981 gas price in 2005 dollars
= $\$1.42 \times 196.4/88.5$
= **\$3.15**
- After correcting for inflation, gas was more expensive in 1981.



2. Indexation

- A dollar amount is **indexed** for inflation if it is automatically corrected for inflation by law or in a contract.²¹
- For example, the increase in the CPI automatically determines
 - the COLA in many multi-year labor contracts
 - the adjustments in Social Security payments and federal income tax brackets

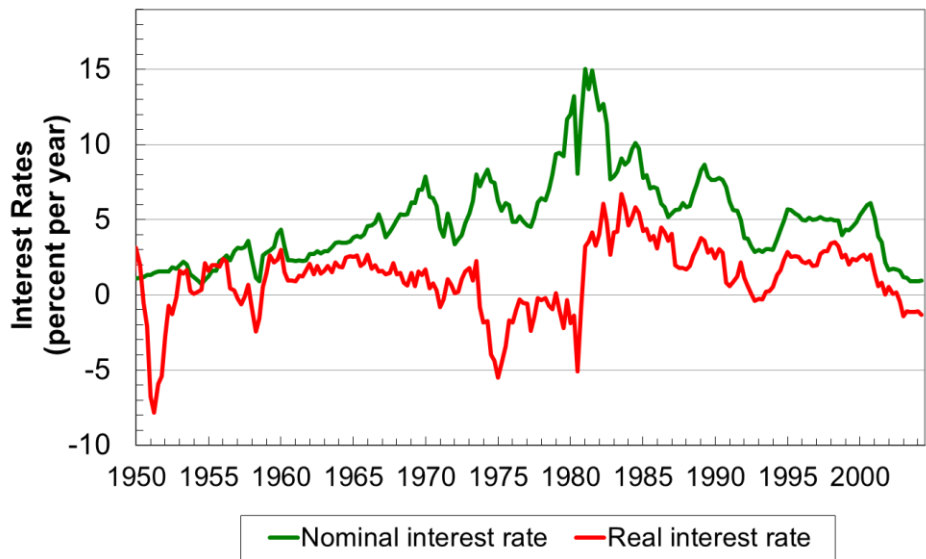
3. Real vs. Nominal Interest Rates

- The nominal interest rate:
 - the interest rate not corrected for inflation
 - the rate of growth in the dollar value of a deposit or debt²²
- The real interest rate:
 - corrected for inflation
 - the rate of growth in the purchasing power of a deposit or debt²³
- **Real interest rate = (nominal interest rate) – (inflation rate)**²⁴

• EXAMPLE

- Deposit \$1,000 for one year.
- Nominal interest rate is 9%.
- During that year, inflation is 3.5%.
- Real interest rate = Nominal interest rate – Inflation
= 9.0% – 3.5%
= **5.5%**
- The purchasing power of the \$1000 deposit has grown 5.5%.

➤ Real and Nominal Interest Rates in the U.S.





EXERCISE

1. Calculate the CPI:

The basket contains 20 movie tickets and 10 textbooks.

The table shows their prices for 2004-2006.

The base year is 2004.

	movie tickets	text-books
2004	\$10	\$50
2005	\$10	\$60
2006	\$12	\$60

A. How much did the basket cost in 2004?

B. What is the CPI in 2005?

C. What is the inflation rate from 2005-2006?

ANSWER:

A. $(\$10 \times 20) + (\$50 \times 10) = \underline{\$700}$

B. Cost of basket in 2005 = $(\$10 \times 20) + (\$60 \times 10) = \$800$

CPI in 2005 = $100 \times (\$800/\$700) = \underline{114.3}$

C. Cost of basket in 2006 = $(\$12 \times 20) + (\$60 \times 10) = \$840$

CPI in 2006 = $100 \times (\$840/\$700) = 120$

Inflation rate = $(120 - 114.3)/114.3 = \underline{5\%}$



2. CPI vs. GDP deflator:

In each scenario, determine the effects on the CPI and the GDP deflator.

- A. Starbucks raises the price of Frappuccino.
- B. Caterpillar raises the price of the industrial tractors it manufactures at its Illinois factory.
- C. Armani raises the price of the Italian jeans it sells in the U.S.

ANSWER:

- A. *The CPI and GDP deflator both rises.*
- B. *The GDP deflator rises, the CPI does not.*
- C. *The CPI rises, the GDP deflator does not.*

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What measures the typical consumer's cost of living?	CPI
2		What is CPI?	Consumer Price Index
3	2	What is the full form COLAs?	Cost of Living Adjustments
4		The basis of cost of living adjustments is in what?	Social Security and Contracts
	3	What is the full form of BLS?	Bureau of Labor Statistics
6		BLS surveys consumers to determine what?	Consumer's shopping basket
7	4	BLS collects data on the what?	prices of all the goods
8		BLS collects data on the prices of all the goods in...	Basket
9	5	What is used to compute total cost of the basket?	Price
10		The prices are used to compute what in the basket?	Total cost
11	6	CPI is calculated on?	Base year
12		$CPI = \text{Cost of basket in current year} \div \text{what?}$	Cost of basket in base year
13	7	The percentage change in the CPI from...	preceding period
14		How Inflation rate is calculated?	% change in the CPI from the preceding period
15	8	What is caused by problems in CPI?	cost of living increases
16		Why cost of living increases?	problems in the CPI
17	9	CPI probably still overstates inflation by what?	0.5 % per year



18		What BLS has made to overcome problems of CPI?	technical adjustments
19	10	What is tied to the CPI?	Social Security payments and many contracts
20		Social Security payments and many contracts are tied with what?	CPI
21	11	some prices rise faster than ...	Other goods
22		Consumers substitute toward goods that becomes what?	relatively cheaper
23	12	What CPI misses?	Consumers substitute toward goods
24		What CPI misses Consumers substitute toward goods?	because of a fixed basket
25	13	What increases when new goods become available?	Variety
26		What is the effect of new goods on dollar?	more valuable
27	14	Why CPI misses the effect on value of dollar?	because of a fixed basket
28		What happens when CPI misses the effect on value of dollar?	cost of living increases
29	15	What happens when improvements in the quality of goods?	value of dollar increases
30		When the value of each dollar increases?	Improvements in quality of goods
31	16	Why improvements in the quality is missed in CPI?	Hard to measure
32		What increases when improvements in the quality is missed in CPI?	Cost of living
33	17	Imported consumer goods are included in what?	CPI
34		Imported consumer goods are excluded in what?	GDP Deflator



35	18	Capital goods are included in what?	GDP Deflator
36		Capital goods are excluded in what?	CPI
37	19	Which basket is used in CPI?	Fixed basket
38		Which basket is used in GDP Deflator?	basket of currently produced g&s
39	20	What makes it harder to compare dollar amounts from different times?	Inflation
40		What can be used to adjust figures so that they can be compared?	CPI
41	21	What is indexed for inflation?	A dollar amount
42		A dollar amount is indexed for what?	Inflation
43	22	The nominal interest rate is not corrected for?	Inflation
44		What is nominal interest rate?	rate of growth in the dollar value of a deposit or debt
45	23	The real interest rate is corrected for?	Inflation
46		What refers to the rate of growth in the purchasing power of a deposit or debt?	Real interest rate
47	24	Real Interest rate is equal to?	(nominal interest rate) – (inflation rate)
48		What equals to (nominal interest rate) – (inflation rate)?	Real Interest Rate



MBA SEM 01
Module 03 Chapter 03

🌀 SAVING AND INVESTMENT 🌀

❖ **Financial Institutions**

- **Financial System:** the group of institutions that helps match the saving of one person with the investment of another.¹
- **Financial Markets:** institutions through which savers can directly provide funds to borrowers.²

Examples:

- The Bond Market: A **bond** is a certificate of indebtedness.³
- The Stock Market: A **stock** is a claim to partial ownership in a firm.⁴

- **Financial Intermediaries:** institutions through which savers can indirectly provide funds to borrowers.⁵

Examples:

- Banks
- **Mutual funds** – institutions that sell shares to the public and use the proceeds to buy portfolios of stocks and bonds⁶



❖ Different Kinds of Saving

- **Private Saving:**

= The portion of households' income that is not used for consumption or paying taxes⁷

$$= Y - T - C$$

- **Public Saving:**

= Tax revenue less government spending⁸

$$= T - G$$

- **National Saving:**

= Private saving + Public saving

$$= (Y - T - C) + (T - G)$$

$$= Y - C - G$$

= the portion of national income that is not used for consumption or government purchases⁹



❖ Saving and Investment

- Recall the national income accounting identity:

$$Y = C + I + G + NX$$

- For the rest of this chapter, focus on the closed economy case:

$$Y = C + I + G$$

- Solve for I:

$$I = Y - C - G = \overbrace{(Y - T - C) + (T - G)}^{\text{National Saving}}$$

❖ Budget Deficits and Surpluses

- Budget Surplus:**

= an excess of tax revenue over govt spending

$$= T - G$$

= Public saving¹⁰

- Budget Deficit:**

= a shortfall of tax revenue from govt spending

$$= G - T$$

= - (public saving)¹¹



❖ The Meaning of Saving and Investment

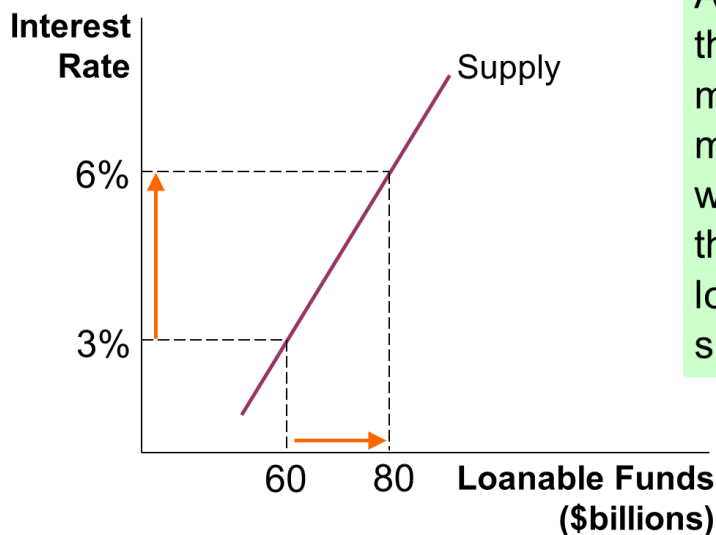
- **Private saving** is the income remaining after households pay their taxes and pay for consumption.¹²
- Examples of what households do with saving:
 - Buy corporate bonds or equities
 - Purchase a certificate of deposit at the bank
 - Buy shares of a mutual fund
 - Let accumulate in saving or checking accounts
- **Investment** is the purchase of new capital.¹³
- Examples of investment:
 - General Motors spends \$250 million to build a new factory in Flint, Michigan.
 - You buy \$5000 worth of computer equipment for your business.
 - Your parents spend \$300,000 to have a new house built.

❖ The Market for Loanable Funds

- A supply-demand model of the financial system¹⁴
- Helps us understand
 - how the financial system coordinates saving & investment
 - how government policies and other factors affect saving, investment, the interest rate¹⁵
- Assume: only one financial market
 - All savers deposit their saving in this market.

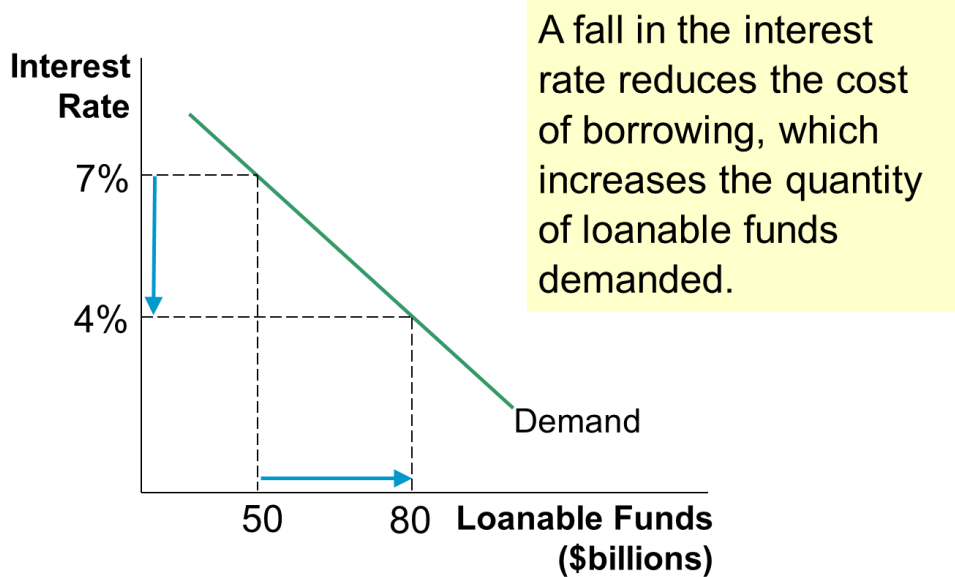
- All borrowers take out loans from this market.
 - There is one interest rate, which is both the return to saving and the cost of borrowing.
- The supply of loanable funds comes from saving:¹⁶
 - Households with extra income can loan it out and earn interest.
 - Public saving, if positive, adds to national saving and the supply of loanable funds.¹⁷
 - If negative, it reduces national saving and the supply of loanable funds.¹⁸
 - The demand for loanable funds comes from investment:
 - Firms borrow the funds they need to pay for new equipment, factories, etc.
 - Households borrow the funds they need to purchase new houses.¹⁹

➤ **The Slope of the Supply Curve**

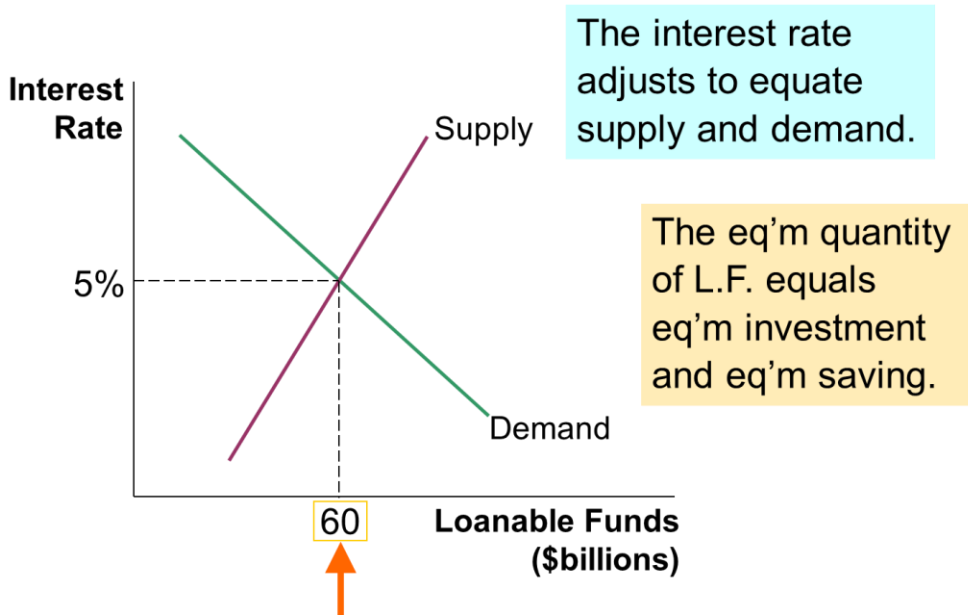


An increase in the interest rate makes saving more attractive, which increases the quantity of loanable funds supplied.

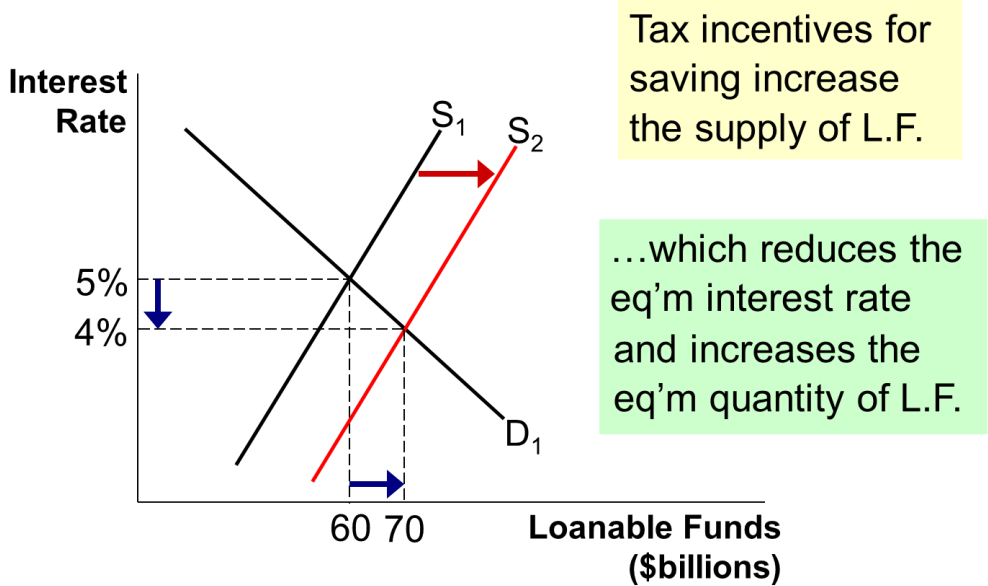
➤ **The Slope of the Demand Curve**



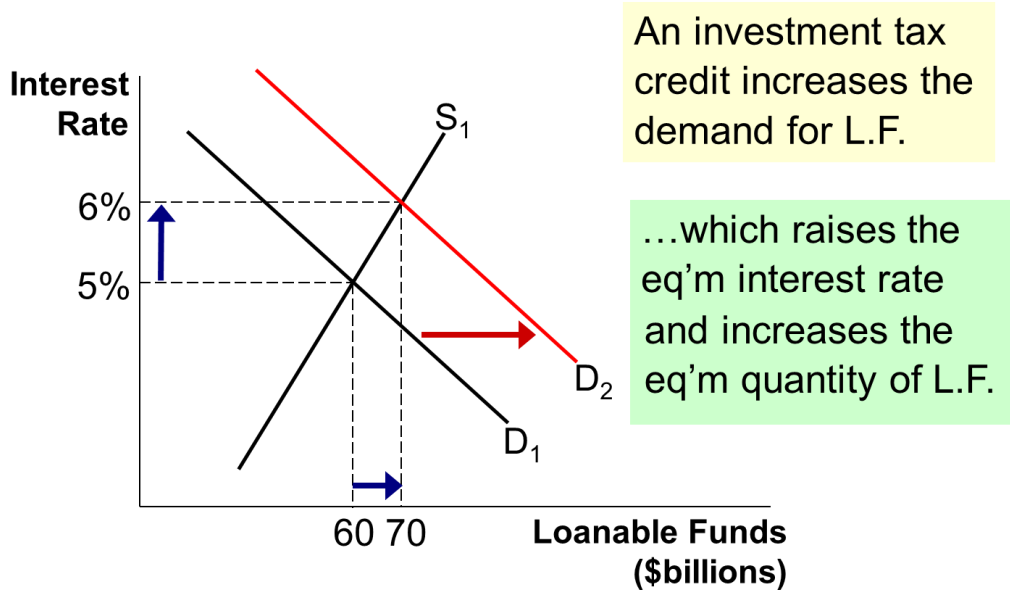
➤ **Equilibrium**



❖ **Policy 1: Saving Incentives**



❖ **Policy 2: Investment Incentives**





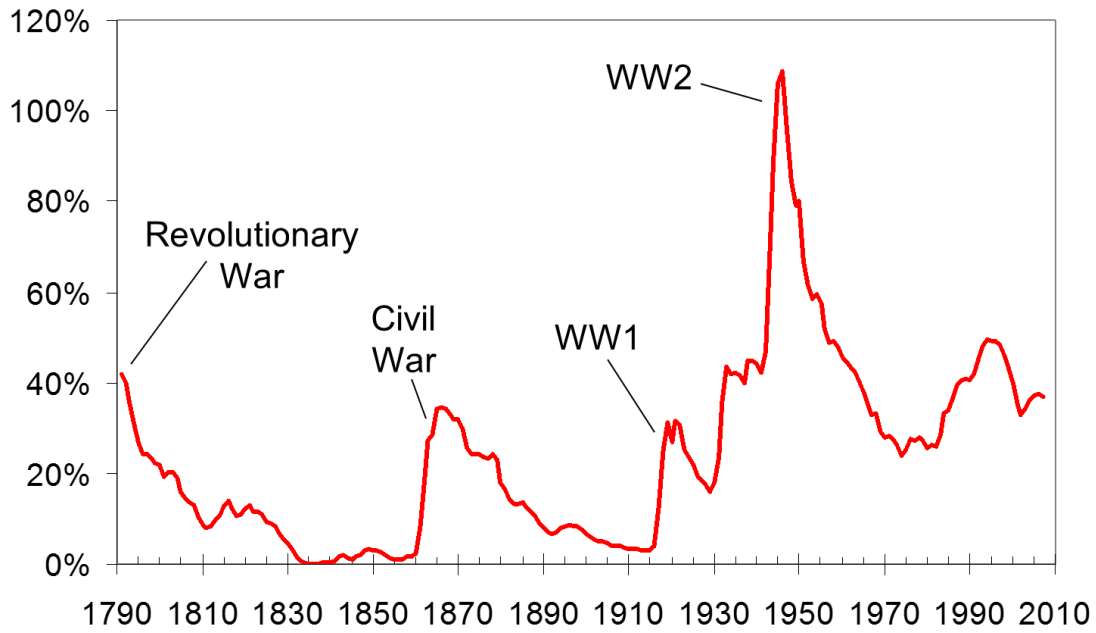
❖ Budget Deficits, Crowding Out, and Long-Run Growth

- Our analysis: Increase in budget deficit causes fall in investment.²⁰
- The govt borrows to finance its deficit, leaving less funds available for investment. This is called **crowding out**.²¹
- Recall from the preceding chapter: Investment is important for long-run economic growth. Hence, budget deficits reduce the economy's growth rate and future standard of living.²²

❖ The U.S. Government Debt

- The government finances deficits by borrowing (selling government bonds). Persistent deficits lead to a rising govt debt.²³
- The ratio of govt debt to GDP is a useful measure of the government's indebtedness relative to its ability to raise tax revenue.²⁴
- Historically, the debt-GDP ratio usually rises during wartime and falls during peacetime – until the early 1980s.²⁵

➤ **U.S. Government Debt as a Percentage of GDP, 1970-2007**





EXERCISE

1. Calculations:

Suppose GDP equals \$10 trillion,
consumption equals \$6.5 trillion,
the government spends \$2 trillion
and has a budget deficit of \$300 billion.

Find public saving, taxes, private saving, national saving, and investment.

ANSWER:

Given:

$$Y = 10.0, \quad C = 6.5, \quad G = 2.0, \quad G - T = 0.3$$

$$\text{Public saving} = T - G = \underline{-0.3}$$

$$\text{Taxes: } T = G - 0.3 = \underline{1.7}$$

$$\text{Private saving} = Y - T - C = 10 - 1.7 - 6.5 = \underline{1.8}$$

$$\text{National saving} = Y - C - G = 10 - 6.5 = 2 = \underline{1.5}$$

$$\text{Investment} = \text{national saving} = \underline{1.5}$$



2. How a tax cut affects saving:

Use the numbers from the preceding exercise, but suppose now that the government cuts taxes by \$200 billion.

In each of the following two scenarios, determine what happens to public saving, private saving, national saving, and investment.

- A. Consumers save the full proceeds of the tax cut.
- B. Consumers save $1/4$ of the tax cut and spend the other $3/4$.

ANSWER:

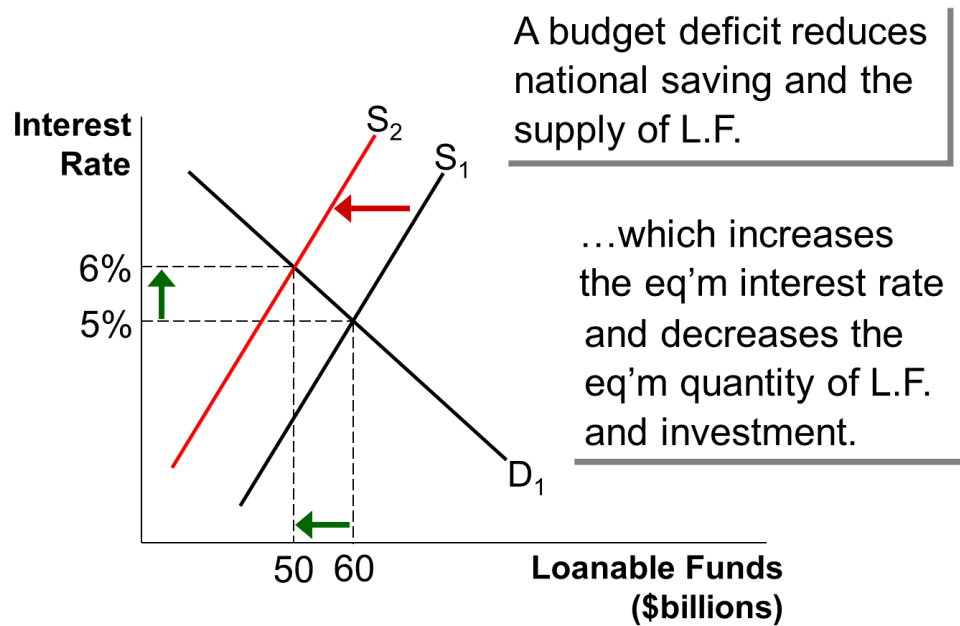
In both scenarios, public saving falls by \$200 billion, and the budget deficit rises from \$300 billion to \$500 billion.

- A. If consumers save the full \$200 billion, national saving is unchanged, so investment is unchanged.
- B. If consumers save \$50 billion and spend \$150 billion, then national saving and investment each fall by \$150 billion.

3. Use the loanable funds model to analyze the effects of a government budget deficit:

- Draw the diagram showing the initial equilibrium.
- Determine which curve shifts when the government runs a budget deficit.
- Draw the new curve on your diagram.
- What happens to the equilibrium values of interest rate and investment?

ANSWER:





ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What refers to the group of institutions that helps match the saving of one person with the investment of another?	Financial System
2		Financial System helps to match the saving of one person with the ...	investment of another
3	2	What refers to the institutions through which savers can directly provide funds to borrowers?	Financial Markets
4		What is Financial Markets?	savers can directly provide funds to borrowers
	3	What is a certificate of indebtedness?	Bond
6		What is Bond?	certificate of indebtedness
7	4	What is a claim to partial ownership in a firm?	Stock
8		What is Stock?	claim to partial ownership in a firm
9	5	What refers to the institutions through which savers can indirectly provide funds to borrowers?	Financial Intermediaries
10		What is Financial Intermediaries?	savers can indirectly provide funds to borrowers
11	6	What refers to the institutions that sell shares to the public and use the proceeds to buy portfolios of stocks and bonds?	Mutual Funds



12		In Mutual funds, institutions that sell shares to the public and use the proceeds for what?	buy portfolios of stocks and bonds
13	7	What is the portion of households' income that is not used for consumption or paying taxes?	Private Saving
14		What is Private Saving?	portion of households' income that is not used
15	8	What is Tax revenue less government spending?	Public Saving
16		What is Public Saving?	Tax revenue less government spending
17	9	What refers to the portion of national income that is not used consumption or government purchases?	National Saving
18		What is National Saving?	Private saving + Public saving
19	10	What is an excess of tax revenue over govt spending?	Budget Surplus
20		What is Budget Surplus?	excess of tax revenue over govt spending
21	11	What is a shortfall of tax revenue from govt spending?	Budget Deficit
22		What is Budget Deficit?	a shortfall of tax revenue from govt spending
23	12	What refers to the income remaining after households pay their taxes and pay for consumption?	Private Saving
24		What is Private Saving?	portion of households' income that is not used
25	13	What refers to the purchase of new capital?	Investment
26		What is Investment?	Purchase of new capital



27	14	What is a supply-demand model of the financial system?	Market for Loanable Funds
28		What is Market for Loanable Funds?	supply-demand model of the financial system
29	15	What supply-demand model of the financial system help to understand?	how the financial system coordinates saving & investment
30		What supply-demand model of the financial system help to understand?	how government policies and other factors affect saving, investment
31	16	What comes from the supply of loanable funds?	Saving
32		Saving comes from what?	supply of loanable funds
33	17	Where the positive Public Saving is added?	National saving
34		Households with extra income can earn what?	Interest from loan
35	18	What if public saving is negative?	reduces national saving
36		Why national saving reduced?	Negative public saving
37	19	The demand for loanable funds comes from what?	Investment
38		What comes from investments?	demand for loanable funds causes fall in investment
39	20	What happens when increase in budget deficit?	
40		What causes fall in investment?	Increase in budget deficit
41	21	Why government borrows funds?	To finance its deficit
42		What happens when government borrows funds?	less funds available for investment
43	22	What is reduced by budget deficits?	economy's growth rate
44		Why Economy's growth rate is reduced?	budget deficits



45	23	How the government finances deficits?	By borrowing
46		How the government finances deficits?	selling government bonds
47	24	What is useful measure of the government's indebtedness?	ratio of govt debt to GDP
48		The ratio of govt debt to GDP is useful measure in what?	government's indebtedness
49	25	What rises during wartime?	debt-GDP ratio
50		What falls during peacetime?	debt-GDP ratio

MBA SEM 01
Module 03 Chapter 04

✿ PRODUCTION AND GROWTH,
GDP, GNP, PPP ✿

A typical family with all their possessions in the U.K., an advanced economy



GDP per capita: \$35,580

Life expectancy: 79 years

Adult literacy: 99%

A typical family with all their possessions in Mexico, a middle-income country



GDP per capita: \$11,410

Life expectancy: 76 years

Adult literacy: 92%

A typical family with all their possessions in Mali, a poor country



GDP per capita: \$1,130

Life expectancy: 50 years

Adult literacy: 46%

Incomes and Growth Around the World

	GDP per capita, 2005	Growth rate, 1960-2005
China	\$6,572	5.8%
Singapore	29,921	5.4%
Japan	30,821	3.8%
Spain	26,125	3.2%
India	3,486	2.7%
Israel	25,670	2.7%
United States	41,854	2.2%
Canada	32,886	2.1%
Colombia	7,769	1.8%
New Zealand	22,511	1.4%
Philippines	4,920	1.4%
Argentina	14,421	1.0%
Saudi Arabia	14,729	0.8%
Rwanda	1,333	0.3%
Haiti	1,836	-1.2%

FACT 1: There are vast differences in living standards around the world.

FACT 2: There is also great variation in growth rates across countries.

Since growth rates vary, the country rankings can change over time:

- Poor countries are not necessarily doomed to poverty forever *e.g.*, Singapore, incomes were low in 1960 and are quite high now.
- Rich countries can't take their status for granted: They may be overtaken by poorer but faster-growing countries.



❖ Productivity

- Recall one of the Ten Principles from Chapter 1: ***A country's standard of living depends on its ability to produce goods & services.***¹
- This ability depends on **productivity**, the average quantity of goods & services produced per unit of labor input.²
- **Y** = real GDP = quantity of output produced
L = quantity of labor
so productivity = **Y/L** (output per worker)³

➤ Why Productivity Is So Important

- When nation's workers are very productive, real GDP is large and incomes are high.⁴
- When productivity grows rapidly, so do living standards.
What, then, determines productivity and its growth rate?⁵

1. Physical Capital Per Worker

- Recall: The stock of equipment and structures used to produce goods & services is called [**physical**] **capital**, denoted **K**.⁶
K/L = capital per worker.
- Productivity is higher when the average worker has more capital (machines, equipment, etc.).
i.e., an increase in **K/L** causes an increase in **Y/L**.⁷



2. Human Capital Per Worker

- **Human capital (H):** the knowledge and skills workers acquire through education, training, and experience
 H/L = the average worker's human capital⁸
- Productivity is higher when the average worker has more human capital (education, skills, etc.).
i.e., an increase in H/L causes an increase in Y/L .⁹

3. Natural Resources Per Worker

- **Natural resources (N):** the inputs into production that nature provides, *e.g.*, land, mineral deposits
Other things equal, more N allows a country to produce more Y .¹⁰
- In per-worker terms, an increase in N/L causes an increase in Y/L .¹¹
- Some countries are rich because they have abundant natural resources (*e.g.*, Saudi Arabia has lots of oil). But countries need not have much N to be rich (*e.g.*, Japan imports the N it needs).¹²

4. Technological Knowledge

- **Technological knowledge:** society's understanding of the best ways to produce goods & services.¹³
- Technological progress does not only mean a faster computer, a higher definition TV, or a smaller cell phone.
It means any advance in knowledge that boosts productivity (allows society to get more output from its resources).
 - *E.g.*, Henry Ford and the assembly line.¹⁴



❖ The Production Function

- The production function is a graph or equation showing the relation between output and inputs:¹⁵

$$Y = A F(L, K, H, N)$$

- $F()$ – a function that shows how inputs are combined to produce output¹⁶
- “ A ” – the level of technology¹⁷
- “ A ” multiplies the function $F()$, so improvements in technology (increases in “ A ”) allow more output (Y) to be produced from any given combination of inputs.¹⁸

- The production function has the property **constant returns to scale**: Changing all inputs by the same percentage causes output to change by that percentage.¹⁹

- For example,

- Doubling all inputs (multiplying each by 2) causes output to double:

$$2Y = A F(2L, 2K, 2H, 2N)$$

- Increasing all inputs 10% (multiplying each by 1.1) causes output to increase by 10%:

$$1.1Y = A F(1.1L, 1.1K, 1.1H, 1.1N)$$

- If we multiply each input by $1/L$, then output is multiplied by $1/L$:

$$Y/L = A F(1, K/L, H/L, N/L)$$

- This equation shows that productivity (output per worker) depends on:
 - the level of technology (A)
 - physical capital per worker



- human capital per worker
- natural resources per worker

❖ ECONOMIC GROWTH AND PUBLIC POLICY

Next, we look at the ways public policy can affect long-run growth in productivity and living standards.²⁰

➤ Saving and Investment

- We can boost productivity by increasing K , which requires investment.²¹
- Since resources are scarce, producing more capital requires producing fewer consumption goods.²²
- Reducing consumption = increasing saving.

This extra saving funds the production of investment goods. (*More details in the next chapter.*)

Hence, a tradeoff between current and future consumption.²³

➤ Diminishing Returns and the Catch-Up Effect

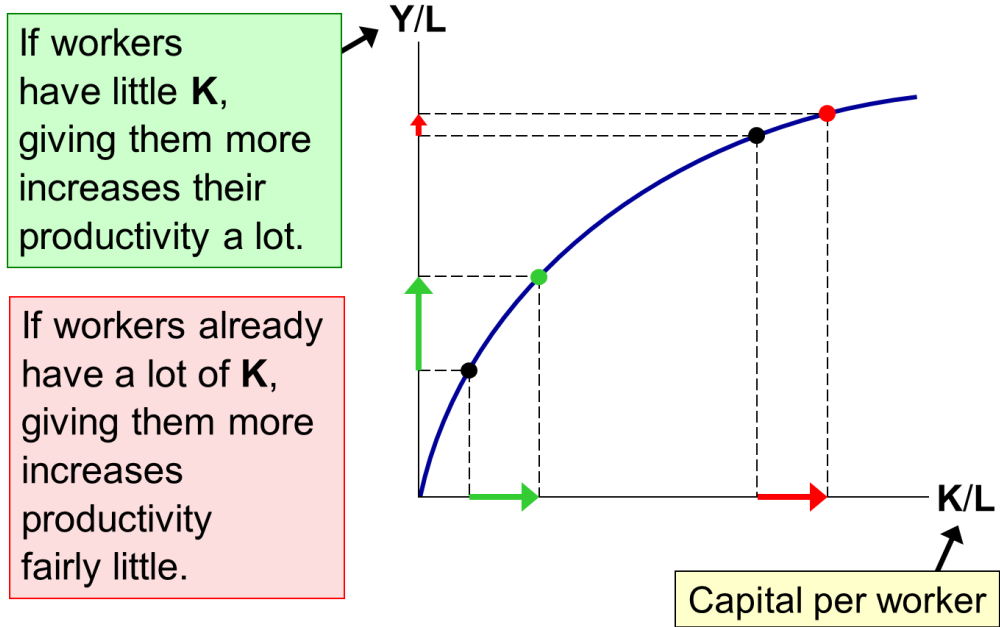
- The government can implement policies that raise saving and investment. (*Details in next chapter.*)

Then K will rise, causing productivity and living standards to rise.²⁴

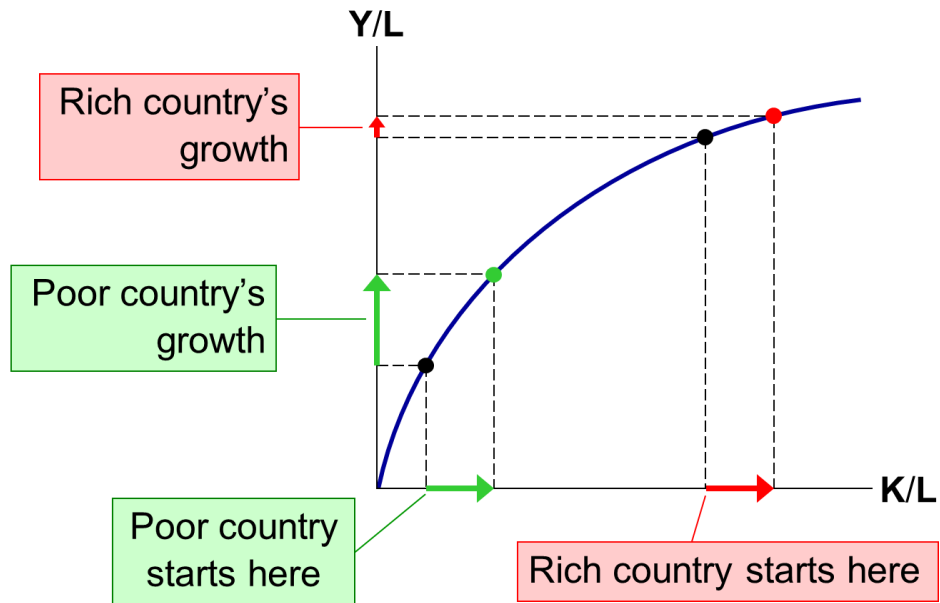
- But this faster growth is temporary, due to **diminishing returns to capital**:

As K rises, the extra output from an additional unit of K falls....²⁵

➤ The Production Function & Diminishing Returns



- **The catch-up effect:** the property whereby poor countries tend to grow more rapidly than rich ones.



➤ **Example of the Catch-Up Effect**

- Over 1960-1990, the U.S. and S. Korea devoted a similar share of GDP to investment, so you might expect they would have similar growth performance.
- But growth was >6% in Korea and only 2% in the U.S.
- **Explanation of the catch-up effect:**

In 1960, K/L was far smaller in Korea than in the U.S., hence Korea grew faster.



➤ Investment from Abroad

- To raise **K/L** and hence productivity, wages, and living standards, the govt can also encourage²⁶
 - **Foreign Direct Investment:** a capital investment (*e.g.*, factory) that is owned & operated by a foreign entity.²⁷
 - **Foreign Portfolio Investment:** a capital investment financed with foreign money but operated by domestic residents.²⁸
- Some of the returns from these investments flow back to the foreign countries that supplied the funds.²⁹
- Especially beneficial in poor countries that cannot generate enough saving to fund investment projects themselves.

Also helps poor countries learn state-of-the-art technologies developed in other countries.³⁰

➤ Education

- Government can increase productivity by promoting education–investment in human capital (**H**).

Public schools, subsidized loans for college³¹

- Education has significant effects: In the U.S., each year of schooling raises a worker's wage by 10%. But investing in **H** also involves a tradeoff between the present & future:

Spending a year in school requires sacrificing a year's wages now to have higher wages later.³²



➤ Health and Nutrition

- Health care expenditure is a type of investment in human capital – healthier workers are more productive.³³
- In countries with significant malnourishment, raising workers' caloric intake raises productivity:
 - Over 1962-95, caloric consumption rose 44% in S. Korea, and economic growth was spectacular.
 - Nobel winner Robert Fogel: 30% of Great Britain's growth from 1790-1980 was due to improved nutrition.³⁴

➤ Property Rights and Political Stability

- The price system allocates resources to their most efficient uses. This requires respect for **property rights**, the ability of people to exercise authority over the resources they own.³⁵
- In many poor countries, the justice system doesn't work very well:
 - Contracts aren't always enforced
 - Fraud, corruption often go unpunished
 - In some, firms must bribe government officials for permits³⁶
- Political instability (*e.g.*, frequent coups) creates uncertainty over whether property rights will be protected in the future.³⁷
- When people fear their capital may be stolen by criminals or confiscated by a corrupt government, there is less investment, including from abroad, and the economy functions less efficiently. **Result:** lower living standards.³⁸
- Economic stability, efficiency, and healthy growth require law enforcement, effective courts, a stable constitution, and honest government officials.³⁹



➤ Free Trade

- **Inward-oriented policies**

(*e.g.*, tariffs, limits on investment from abroad) aim to raise living standards by avoiding interaction with other countries.⁴⁰

- **Outward-oriented policies**

(*e.g.*, the elimination of restrictions on trade or foreign investment) promote integration with the world economy.⁴¹

- Trade has similar effects as discovering new technologies – it improves productivity and living standards.⁴²
- Countries with inward-oriented policies have generally failed to create growth.⁴³
 - *E.g.*, Argentina during the 20th century.
- Countries with outward-oriented policies have often succeeded.⁴⁴
 - *E.g.*, South Korea, Singapore, Taiwan after 1960.

➤ Research and Development

- Technological progress is the main reason why living standards rise over the long run.⁴⁵
- One reason is that knowledge is a **public good**: Ideas can be shared freely, increasing the productivity of many.⁴⁶
- Policies to promote technical progress:
 - Patent laws
 - Tax incentives or direct support for private sector R&D
 - Grants for basic research at universities⁴⁷



➤ Population Growth

...may affect living standards in 3 different ways:

1. Stretching Natural Resources

- 200 years ago, Malthus argued that population growth would strain society's ability to provide for itself.⁴⁸
- Since then, the world population has increased six-fold. If Malthus was right, living standards would have fallen. Instead, they've risen.

Malthus failed to account for technological progress and productivity growth.⁴⁹

2. Diluting the Capital Stock

- Bigger population = higher L = lower K/L = lower productivity & living standards. This applies to H as well as K : fast population growth = more children = greater strain on educational system.⁵⁰
- Countries with fast population growth tend to have lower educational attainment.⁵¹
- To combat this, many developing countries use policy to control population growth.
 - China's one child per family laws
 - Contraception education & availability
 - Promote female literacy to raise opportunity cost of having babies⁵²

3. Promoting technical progress

- More people
= more scientists, inventors, engineers
= more frequent discoveries



= faster technical progress & economic growth⁵³

- Evidence from Michael Kremer: Over the course of human history,
 - growth rates increased as the world's population increased
 - more populated regions grew faster than less populated ones⁵⁴

❖ Are Natural Resources a Limit to Growth?

- Some argue that population growth is depleting the Earth's non-renewable resources, and thus will limit growth in living standards.⁵⁵
- But technological progress often yields ways to avoid these limits:
 - Hybrid cars use less gas.
 - Better insulation in homes reduces the energy required to heat or cool them.⁵⁶
- As a resource becomes scarcer, its market price rises, which increases the incentive to conserve it and develop alternatives.⁵⁷



❖ What is GDP?

- Gross Domestic Product (GDP)'s technical definition is the total value of the production and consumption of all the goods and services of the country.⁵⁸

➤ How is GDP computed?

- GDP can be solved using the formula:

$$\text{GDP} = \text{Consumer Spending (C)} + \text{Investment (I)} + \text{Government Spending (G)} + (\text{Exports (X)} - \text{Imports (M)})^{59}$$

• Explanation of Formula

- **Consumer** spending is the sum of expenditures by households on durable goods, nondurable goods, and services. Examples include clothing, food, and health care.⁶⁰
- **Investment** is the sum of expenditures on capital equipment, inventories, and structures. Examples include machinery, unsold products, and housing.⁶¹
- **Government spending** is the sum of expenditures by all government bodies on goods and services. Examples include naval ships and salaries to government employees.⁶²
- **Net exports** equal the difference between spending on domestic goods by foreigners and spending on foreign goods by domestic residents. In other words, net exports describe the difference between exports and imports.⁶³



➤ What does GDP indicate?

- This number is important because it gives an indication of how successfully society is addressing the scarcity problem.⁶⁴
- A larger gross domestic product, there are more goods and services that can be used to satisfy unlimited wants and needs.⁶⁵

➤ What is excluded in GDP?

- Intermediate goods
- Transfer payments
- Home Production
- Pollution/environmental damage
- Illegal Goods⁶⁶

➤ Types of GDP

• Nominal GDP

It is the sum value of all produced goods and services *at current prices*.⁶⁷

• Real GDP

It is the sum value of all produced goods and services *at constant prices (price from a specified base year)*⁶⁸

- By keeping the prices constant in the computation of real GDP, it is possible to compare the economic growth from one year to the next in terms of production of goods and services rather than the market value of these goods and services.⁶⁹



➤ ***GDP Deflator:**

- It is the ratio of nominal GDP to real GDP for a given year minus 1.

The GDP deflator illustrates how much of the change in the GDP from a base year is reliant on changes in the price level.⁷⁰

- While Real GDP captures changes in quantities and Nominal GDP captures both changes in prices and changes in quantities, the GDP deflator captures changes in the price level.⁷¹

➤ **Is GDP an effective indicator?**

- GDP can show a country's production, but it is not a reliable indicator for a country's welfare or well-being.⁷²



❖ What is GNP?

- Gross National Product (GNP)'s technical definition is the combined value of all the final goods and services produced in a country during an accounting year, including net factor income from foreign countries.⁷³

➤ How is GNP computed?

- GNP can be solved using the formula:

GNP = GDP + Net factor income from abroad (difference between income earned in foreign countries by residents of a country and income earned by foreign nationals domestically).⁷⁴

• Explanation of Formula

- GNP includes the final value of goods and services produced by the residents of a country, without considering their geographical location.⁷⁵
- Based on this definition, net income from abroad is necessary since in order to focus only on a specific country, income from foreign residents must be subtracted.⁷⁶

➤ What does GNP indicate?

- GNP helps to measure the contribution of residents of a country to the flow of goods and services within and outside the national territory.⁷⁷

➤ What is excluded in GNP?



- Similar to that of GDP (household work and illegal goods/services, etc.)⁷⁸

➤ **Is GNP a good indicator?**

- It is not an effective indicator for a country's welfare.⁷⁹

❖ **GDP vs. GNP**

POINTS	GDP	GNP
Definition	An estimated value of the total worth of a country's production and services, calculated over the course on one year	GDP (+) total capital gains from overseas investment (-) income earned by foreign nationals domestically
Stands for	Gross Domestic Product	Gross National Product
Formula for Calculation	$GDP = \text{consumption} + \text{investment} + (\text{government spending}) + (\text{exports} - \text{imports})$	$GNP = GDP + NR$ (Net income from assets abroad (Net Income Receipts))
Layman Usage:	Total value of products & Services produced within the territorial boundary of a country	Total value of Goods and Services produced by all nationals of a country (whether within or outside the country)
Application	To see the strength of a country's local economy	To see how the nationals of a country are doing economically



EXERCISE

1. Review productivity concepts:

- A. List the determinants of productivity.
- B. List three policies that attempt to raise living standards by increasing one of the determinants of productivity.

ANSWER:

A. Determinants of productivity:

K/L, physical capital per worker

H/L, human capital per worker

N/L, natural resources per worker

A, technological knowledge

B. Policies to boost productivity:

- Encourage saving and investment, to raise K/L
- Encourage investment from abroad, to raise K/L
- Provide public education, to raise H/L
- Patent laws or grants, to increase **A**
- Control population growth, to increase **K/L**

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What depends on a country's ability to produce goods & services?	Standard of living
2		A country's standard of living depends on what?	ability to produce goods & services
3	2	What refers to the average quantity of goods & services produced per unit of labor input?	Productivity
4		A country's ability to produce goods & services depended on?	Productivity
	3	Productivity = ?	Y/L (output per worker)
6		What is real GDP?	quantity of output produced
7	4	What happens to GDP when nation's workers are very productive?	Increases
8		What happens to incomes when nation's workers are very productive?	Increases
9	5	What happens when productivity grows rapidly?	living standards increases
10		When living standards increases?	Productivity increases?
11	6	What refers to the stock of equipment and structures used to produce goods & services?	Physical Capital
12		Physical Capital is denoted by?	K
13	7	Productivity is higher when the average worker has...	More capital
14		What are the examples of physical capital?	machines, equipment



15	8	What refers to the knowledge and skills workers acquire through education, training, and experience?	Human Capital
16		How workers acquire knowledge and skills?	through education, training, and experience
17	9	Productivity is higher when the average worker has....	More human capital
18		What are the examples of Human Capital?	education, skills
19	10	What refers to the inputs into production that nature provides?	Natural resources
20		What are the examples of natural resources?	land, mineral deposits
21	11	What happens when an increase in N/L ?	increase in Y/L
22		more N allows a country to produce...	More Y
23	12	Why some countries are rich?	More natural resources
24		Why Saudi Arabia is rich country?	lots of oil
25	13	What refers to society's understanding of the best ways to produce goods & services?	Technical Knowledge
26		What is Technical Knowledge?	society's understanding of the best ways to produce
27	14	How Technical Knowledge help?	Boosts productivity
28		What allows society to get more output from its resources?	Technical Knowledge
29	15	What is a graph or equation showing the relation between output and inputs?	Production Function
30		What is production function?	Shows the relation between output and inputs
31	16	What shows how inputs are combined to produce output in production function?	$F()$



32		What is $F()$ in production function?	how inputs are combined to produce output
33	17	What shows the level of technology in production function?	A
34		What is A in production function?	shows the level of technology
35	18	What multiplies the function $F()$ in the production function?	A
36		What is increased by improvements in technology?	A
37	19	The production function has which property?	constant returns to scale
38		What is caused changing all inputs by the same percentage?	output to change by that percentage
39	20	public policy can affect in...	long-run growth in productivity
40		public policy can affect in...	living standards
41	21	How to boost productivity?	increasing K
42		What is required to increase in K ?	Investment
43	22	What is required producing more capital?	producing fewer consumption goods
44		Why producing more capital requires producing fewer consumption goods?	Resources are scare
45	23	Reducing consumption = ?	increasing saving
46		The extra saving funds the production of what?	investment goods
47	24	The government can implement policies that raise what?	saving and investment
48		What increases when K rise?	productivity and living standards
49	25	Why faster growth is temporary?	diminishing returns to capital
50		What is diminishing returns to capital?	faster growth is temporary



51	26	productivity, wages, and living standards increases by?	Raise in K/L
52		The government can also encourage to promote?	productivity, wages, and living standards
53	27	What is full form of FDI?	Foreign Direct Investment
54		What refers to a capital investment that is owned & operated by a foreign entity?	Foreign Direct Investment
55	28	What refers to a capital investment financed with foreign money but operated by domestic residents?	Foreign Portfolio Investment
56		What is full form of FPI?	Foreign Portfolio Investment
57	29	the returns from these investments flow back to which foreign countries?	Which supplied the funds
58			
59	30	What is beneficial in poor countries?	Investment from abroad
60		How Investment from abroad helps poor countries?	To learn technologies
61	31	How Government can increase productivity?	education–investment
62		How Government can increase productivity by education?	Public schools, subsidized loans for college
63	32	Spending a year in school requires sacrificing...	wages now to have higher wages later
64		investing in H also involves a tradeoff between what?	present & future
65	33	Health care expenditure is a type of investment in what?	Human capital
66		healthier workers are more...	Productive
67	34	What increases by raising workers' caloric intake?	Productivity
68		30% of Great Britain's growth from 1790-1980 was due to what?	improved nutrition



69		What allocates resources to their most efficient uses?	The price system
70	35	What refers to the ability of people to exercise authority over the resources they own?	property rights
71	36	In many poor countries, which system doesn't work very well?	Justice System
72		Give an example of poor justice system.	Fraud, corruption often go unpunished
73	37	Give an example of Political instability.	frequent coups
74		What creates uncertainty over whether property rights will be protected in the future?	Political Instability
75	38	What happens when people fear their capital may be stolen by criminals or confiscated by a corrupt government?	Less investment
76		What is the result of less investment?	lower living standards
77	39	What is required for economic stability, efficiency, and healthy growth?	law enforcement, effective courts
78		Why law enforcement, effective courts are required?	for economic stability, efficiency, and growth
79	40	What aim to raise living standards by avoiding interaction with other countries?	Inward-oriented policies
80		What are the examples of Inward-oriented policies?	tariffs, limits on investment from abroad
81	41	What promote integration with the world economy?	Outward-oriented policies
82		Give examples of Outward-oriented policies?	the elimination of restrictions on trade or foreign investment
83	42	What has similar effects as discovering new technologies?	Trade



84		What is improved by trade?	productivity and living standards
85	43	Which country have generally failed to create growth?	with inward-oriented policies
86		What happened to countries with inward-oriented policies?	failed to create growth
87	44	Which policies have often succeeded?	Countries with outward-oriented
88		What happened to countries with outward-oriented policies?	Succeeded
89	45	What is the main reason why living standards rise over the long run?	Technological progress
90		What happens by Technological progress?	Living standard increases
91	46	What is public good?	Knowledge
92		What increases by new idea?	Productivity
93	47	Which policies promotes technical progress?	Patent laws
94		Which policies promotes technical progress?	Grants for basic research at universities
95	48	What Malthus argued?	population growth would strain society's ability
96		How many years ago, Malthus argued that population growth would strain society's ability?	200 years
97	49	Malthus failed to account for what?	technological progress and productivity growth
98		What if Malthus was right?	living standards would have fallen
99	50	What if Bigger population?	lower productivity & living standards
100		Why lower productivity & living standards?	Bigger population



101	51	Countries with fast population growth tend to have what?	lower educational attainment
102		Which countries have lower educational attainment?	Fast population growth
103	52	many developing countries use policy to control what?	Population growth
104		What is China's policy to control Population growth?	one child per family laws
105	53		
106			
107	54	What is increased as the world's population increased?	Growth rate
108		Which regions grew faster than less populated ones?	More populated
109	55	What is depleting the Earth's non-renewable resources?	population growth
110		What limit growth in living standards?	population growth
111	56	Which cars use less gas?	Hybrid cars
112		What reduces the energy required to heat or cool?	Better insulation in homes
113	57	What increases as a resource becomes scarcer?	Market prices
114		What increases the incentive to conserve it and develop alternatives?	Increased market price
115	58	What refers to the total value of the production and consumption of all the goods and services of the country?	GDP
116		What is the full form of GDP?	Gross Domestic Product
117	59	What is C in GDP?	Consumer Spending
118		What is G in GDP?	Government Spending
119	60	What refers to the sum of expenditures by households on	Consumer spending



		<p>durable goods, nondurable goods, and services?</p> <p>What are the examples of consumer spending?</p>	<p>clothing, food, and health care</p>
120			
121	61	<p>What refers to the sum of expenditures on capital equipment, inventories, and structures?</p>	Investment
122		<p>What are the examples of Investment?</p>	machinery, unsold products, and housing
123	62	<p>What refers to the sum of expenditures by all government bodies on goods and services?</p>	Government spending
124		<p>What are the examples of government spending?</p>	naval ships and salaries to government employees
125	63	<p>What refers to the difference between spending on domestic goods by foreigners and spending on foreign goods by domestic residents?</p>	Net Exports
126		<p>What is known as the difference between exports and imports?</p>	Net Exports
127	64	<p>What gives an indication of how successfully society is addressing the scarcity problem?</p>	GDP
128		<p>Which problem of the society is indicated by GDP?</p>	Scarcity
129	65	<p>What satisfied by larger gross domestic product?</p>	Unlimited wants
130		<p>When the g&s can be used to satisfy unlimited wants and needs?</p>	Larger GDP
131	66	<p>What is excluded in GDP?</p>	Intermediate goods
132		<p>What is excluded in GDP?</p>	Illegal Goods
133	67	<p>What refers to the sum value of all produced goods and services at current prices?</p>	Nominal GDP



134		What is Nominal GDP?	sum value of all produced g&s <i>at current prices</i>
135	68	What is the sum value of all produced goods and services <i>at constant prices</i> ?	Real GDP
136		What is Real GDP?	sum value of all produced g&s <i>at constant prices</i>
137	69	When it is possible to compare the economic growth from one year to the next in terms of production of g&s?	keeping the prices constant
138		What is possible by keeping the prices constant in the computation of real GDP?	Compare economic growth
139	70	What is the ratio of nominal GDP to real GDP for a given year minus 1?	GDP Deflator
140		What illustrates how much of the change in the GDP from a base year is reliant on changes in the price level?	GDP Deflator
141	71	Which GDP captures changes in quantities?	Real GDP
142		Which GDP captures both changes in prices and changes in quantities?	Nominal GDP
143	72		
144			
145	73	What refers to the combined value of all the final goods and services produced in a country during an accounting year?	GNP
146		What is full form of GNP?	Gross National Product
147	74	what refers to difference between income earned in foreign countries by residents of a country and income earned by foreign nationals domestically?	Net factor income from abroad



148		What equals to GDP + Net factor income from abroad?	GNP
149	75	What includes the final value of goods and services produced by the residents of a country?	GNP
150		What does not consider the geographical location?	GNP
151	76	income from foreign residents must be subtracted in what?	GNP
152		What is necessary for GNP?	net income from abroad
153	77	What helps to measure the contribution of residents of a country?	GNP
154		What GNP measures?	contribution of residents of a country
155	78	What is excluded from GNP?	household work
156		What is excluded from GNP?	illegal goods/services
157	79	What is not effective indicator for a country's welfare?	GNP
158		GNP is not an effective indicator for a country's....?	Welfare



MBA SEM 01
Module 03 Chapter 05

☼ THE MONETARY SYSTEM ☼

❖ What Money Is, and Why It's Important

- Without money, trade would require **barter**, the exchange of one good or service for another.¹
- Every transaction would require a **double coincidence of wants** – the unlikely occurrence that two people each have a good the other wants.²
- Most people would have to spend time searching for others to trade with – a huge waste of resources.

This searching is unnecessary with **money**, the set of assets that people regularly use to buy goods & services from other people.³

❖ The 3 Functions of Money

1. **Medium of Exchange**: an item buyer gives to sellers when they want to purchase goods & services.⁴

2. **Unit of Account:** the yardstick people use to post prices and record debts.⁵

3. **Store of Value:** an item people can use to transfer purchasing power from the present to the future.⁶

❖ The 2 Kinds of Money

1. Commodity Money:

takes the form of a commodity with intrinsic value

Examples: gold coins, cigarettes in POW camps⁷



2. Fiat Money:

money without intrinsic value, used as money because of government decree

Example: the U.S. dollar⁸



❖ The Money Supply

- The **money supply** (or **money stock**): the quantity of money available in the economy⁹
- What assets should be considered part of the money supply? Here are two candidates:



- **Currency:** the paper bills and coins in the hands of the (non-bank) public¹⁰
- **Demand deposits:** balances in bank accounts that depositors can access on demand by writing a check¹¹

❖ Measures of the U.S. Money Supply

- **M1:**

currency, demand deposits, traveler's checks, and other checkable deposits.

M1 = \$1.4 trillion (October 2005)¹²

- **M2:**

everything in M1 plus savings deposits, small time deposits, money market mutual funds, and a few minor categories.

M2 = \$6.6 trillion (October 2005)¹³

❖ Central Banks & Monetary Policy

- **Central Bank:** an institution that oversees the banking system and regulates the money supply¹⁴
- **Monetary Policy:** the setting of the money supply by policymakers in the central bank¹⁵
- **Federal Reserve (Fed):** the central bank of the U.S.¹⁶



➤ The Structure of the Fed

- The Federal Reserve System consists of:
- **Board of Governors** (7 members), located in Washington, DC
- **12 regional Fed banks**, located around the U.S.
- **Federal Open Market Committee (FOMC)**, includes the Bd of Govs and presidents of some of the regional Fed banks The FOMC decides monetary policy.¹⁷

❖ Bank Reserves

- In a **fractional reserve banking system**, banks keep a fraction of deposits as **reserves**, and use the rest to make loans.¹⁸
- The Fed establishes **reserve requirements**, regulations on the minimum amount of reserves that banks must hold against deposits. Banks may hold more than this minimum amount if they choose.¹⁹
- The **reserve ratio, R**

= fraction of deposits that banks hold as reserves

= total reserves as a percentage of total deposits²⁰

❖ Bank T-account

- **T-account:** a simplified accounting statement that shows a bank's assets & liabilities.²¹



- Example:
- Banks' liabilities include deposits
- Banks' assets include loans & reserves.
- In this example, notice that $R = \$10/\$100 = 10\%$.

FIRST NATIONAL BANK			
Assets		Liabilities	
Reserves	\$ 10	Deposits	\$100
Loans	\$ 90		

➤ **Banks and the Money Supply: An Example**

- Suppose \$100 of currency is in circulation.
- To determine banks' impact on money supply, we calculate the money supply in 3 different cases:
 1. No banking system
 2. 100% reserve banking system: banks hold 100% of deposits as reserves, make no loan
 3. Fractional reserve banking system
- **CASE 1:** No banking system
 - Public holds the \$100 as currency.
 - Money supply = \$100.

- **CASE 2:** 100% reserve banking system
 - Public deposits the \$100 at First National Bank (FNB).
 - FNB holds 100% of deposit as reserves:

FIRST NATIONAL BANK			
Assets		Liabilities	
Reserves	\$100	Deposits	\$100
Loans	\$ 0		

- Money supply = currency + deposits = \$0 + \$100 = **\$100**
- *In a 100% reserve banking system, banks do not affect size of money supply.*²²



• **CASE 3:** fractional reserve banking system

- Suppose $R = 10\%$. FNB loans all but 10% of the deposit:

FIRST NATIONAL BANK			
Assets		Liabilities	
Reserves	\$100	Deposits	\$100
Loans	\$ 0		

- Money supply = \$190 (!!!)
- depositors have \$100 in deposits; borrowers have \$90 in currency.

- When banks make loans, they create money.
- The borrower gets
 - \$90 in currency (an asset counted in the money supply)
 - \$90 in new debt (a liability)
- ***A fractional reserve banking system creates money, but not wealth.***²³

- Suppose borrower deposits the \$90 at Second National Bank (SNB).

SECOND NATIONAL BANK			
Assets		Liabilities	
Reserves	\$ 90	Deposits	\$ 90
Loans	\$ 0		

- Initially, SNB's T-account looks like this:

- If $R = 10\%$ for SNB, it will loan all but 10% of the deposit.

- The borrower deposits the \$81 at Third National Bank (TNB).

THIRD NATIONAL BANK			
Assets		Liabilities	
Reserves	\$ 81	Deposits	\$ 81
Loans	\$ 0		

- Initially, TNB's T-account looks like this:

- If $R = 10\%$ for TNB, it will loan all but 10% of the deposit.



- The process continues, and money is created with each new loan.

Original deposit = \$ 100.00

FNB lending = \$ 90.00

SNB lending = \$ 81.00

TNB lending = \$ 72.90

⋮

⋮

Total money supply = \$1000.00

❖ The Money Multiplier

- **Money multiplier:** the amount of money the banking system generates with each dollar of reserves

The money multiplier equals $1/R$.²⁴

- In our example,
 - $R = 10\%$
 - money multiplier = $1/R = 10$
 - \$100 of reserves creates \$1000 of money

❖ The Fed's 3 Tools of Monetary Control

1. Open-Market Operations (OMOs)
2. Reserve Requirements (RR)
3. The Discount Rate

1. **Open-Market Operations (OMOs):** the purchase and sale of U.S. government bonds by the Fed.²⁵

- To increase money supply, Fed buys govt bonds, paying with new dollars.



...which are deposited in banks, increasing reserves

...which banks use to make loans, causing the money supply to expand.²⁶

- To reduce money supply, Fed sells government bonds, taking dollars out of circulation, and the process works in reverse. OMOs are easy to conduct, and are the Fed's monetary policy tool of choice.²⁷

2. Reserve Requirements (RR): Affect how much money banks can create by making loans.²⁸

- To increase money supply, Fed reduces RR.
- Banks make more loans from each dollar of reserves, which increases money multiplier and money supply.²⁹
- To reduce money supply, Fed raises RR, and the process works in reverse.

Fed rarely uses reserve requirements to control money supply: Frequent changes would disrupt banking.³⁰

3. The Discount Rate: the interest rate on loans the Fed makes to banks³¹

- When banks are running low on reserves, they may borrow reserves from the Fed.³²
- To increase money supply, Fed can lower discount rate, which encourages banks to borrow more reserves from Fed. Banks can then make more loans, which increases the money supply.³³
- To reduce money supply, Fed can raise discount rate.³⁴
- Ex. The Fed often uses discount lending to provide extra liquidity when financial institutions are in trouble, such as after the stock market crash of Oct. 1987.

❖ The Federal Funds Rate

- On any given day, banks with insufficient reserves can borrow from banks with excess reserves.

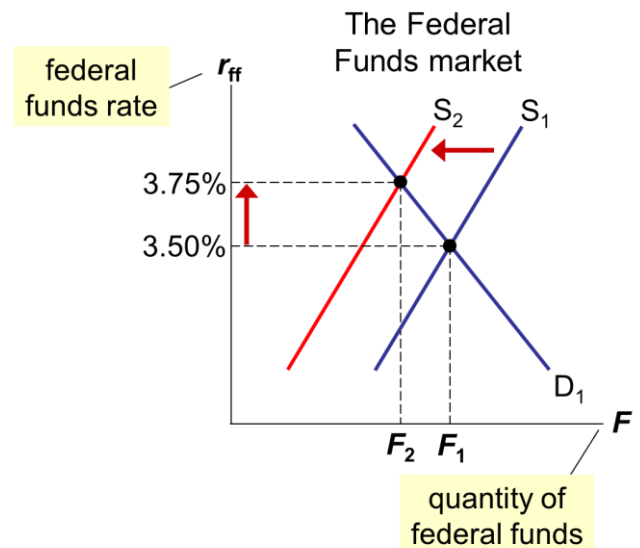
The interest rate on these loans is the **federal funds rate**.³⁵

- Many interest rates are highly correlated, so changes in the fed funds rate cause changes in other rates and have a big impact in the economy.³⁶
- The FOMC uses OMOs to target the fed funds rate.

So fed funds rate policy & monetary policy are connected.³⁷

- To raise fed funds rate, Fed sells government bonds (OMO).

This removes reserves from the banking system, reduces the supply of fed funds, causes r_{ff} to rise.³⁸



❖ Problems Controlling the Money Supply

- If households hold more of their money as currency, banks have fewer reserves, make fewer loans, & money supply falls.³⁹
- If banks hold more reserves than required, they make fewer loans, & money supply falls.

Yet, Fed can compensate for household & bank behavior to retain fairly precise control over the money supply.⁴⁰



❖ Bank Runs and the Money Supply

- **A run on banks:**

When people suspect their banks are in trouble, they may “run” to the bank to withdraw their funds, holding more currency and less deposits.⁴¹

- Under fractional-reserve banking, banks don't have enough reserves to pay off ALL depositors, hence banks may have to close. Also, banks may make fewer loans & hold more reserves to satisfy depositors.⁴²
- These events increase R , reverse the process of money creation, cause money supply to fall.⁴³
- Ex. During 1929-1933, a wave of bank runs and bank closings caused money supply to fall 28%.

Many economists believe this contributed to the severity of the Great Depression.

Bank runs not a problem today due to federal deposit insurance.



EXERCISE

1. While cleaning your apartment, you look under the sofa cushion find a \$50 bill (and a half-eaten taco).

You deposit the bill in your checking account.

The Fed's reserve requirement is 20% of deposits.

- A. What is the maximum amount that the money supply could increase?
B. What is the minimum amount that the money supply could increase?

ANSWER:

You deposit \$50 in your checking account.

- A. If banks hold no excess reserves, then money multiplier = $1/R = 1/0.2 = 5$

The maximum possible increase in deposits is $5 \times \$50 = \250

But money supply also includes currency, which falls by \$50.

Hence, max increase in money supply = **\$200.**

- B. Answer: **\$0**

If your bank makes no loans from your deposit, currency falls by \$50, deposits increase by \$50, money supply remains unchanged.

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What refers to the exchange of one good or service for another?	Barter system
2		What would require trade without money?	Barter system
3	2	What refers to the unlikely occurrence that two people each have a good the other wants?	double coincidence of wants
4		What is double coincidence of wants?	unlikely occurrence that two people each have a good the other wants
	3	In barter system, most people would have to spend time searching for what?	others to trade with
6		What is limitation of barter system?	huge waste of resources
7	4	What refers to an item buyer gives to sellers when they want to purchase goods & services?	Medium of Exchange
8		What is the function of money?	Medium of Exchange
9	5	What is the yardstick people use to post prices and record debts?	Unit of Account
10		What is the function of money?	Unit of Account
11	6	What is an item people can use to transfer purchasing power from the present to the future?	Store of Value
12		What is the function of money?	Store of Value



13	7	What refers to the money that takes the form of a commodity with intrinsic value?	Commodity Money
14		What are the examples of Commodity Money?	gold coins, cigarettes
15	8	What is money without intrinsic value, used as money because of government decree?	Fiat Money
16		What are the examples of Fiat Money?	U.S. dollar
17	9	What refers to the quantity of money available in the economy?	money supply
18		money supply is also known as?	money stock
19	10	What refers to the paper bills and coins in the hands of the public?	Currency
20		What is currency?	paper bills and coins in the hands of the public
21	11	What refers to balances in bank accounts that depositors can access on demand by writing a check?	Demand deposits
22		What is Demand deposits?	balances in bank accounts
23	12	What is M1?	currency, demand deposits, traveler's checks, and other checkable deposits
24		currency, demand deposits, traveler's checks, and other checkable deposits are included in what?	M1
25	13	What is M2?	M1 plus savings deposits, small time deposits, money market mutual funds
26		What refers to the M1 plus savings deposits, small time deposits, money market mutual funds?	M2



27	14	What is an institution that oversees the banking system and regulates the money supply?	Central Bank
28		What is the function of Central Bank?	oversees the banking system
29	15	What is the setting of the money supply by policymakers in the central bank?	Monetary Policy
30		What is Monetary Policy?	the setting of the money supply by policymakers
31	16	Which is the central bank of the U.S.?	Federal Reserve (Fed)
32		What is Federal Reserve (Fed)?	central bank of the U.S.
33	17	The Federal Reserve System consists how many Board of Governors?	7 Members
34		What is full form of FOMC?	Federal Open Market Committee
35	18	In which system, banks keep a fraction of deposits as reserves, and use the rest to make loans?	fractional reserve banking system
36		In a fractional reserve banking system, banks keep a fraction of deposits as what?	Reserves
37	19	What establishes The Fed?	Reserve requirements
38		What refers to regulations on the minimum amount of reserves that banks must hold against deposits?	Reserve requirements
39	20	What is fraction of deposits that banks hold as reserves?	Reserve Ratio
40		What refers to the total reserves as a percentage of total deposits?	Reserve Ratio
41	21	What is a simplified accounting statement that shows a bank's assets & liabilities?	T-account



42		What is T-account in bank?	simplified accounting statement
43	22	In which banking system, banks do not affect size of money supply?	100% Reserve
44		What do not affect in the 100% Reserve banking system?	Size of Money supply
45	23	What is created by fractional reserve banking system?	Money
46		What is not created by fractional reserve banking system?	Wealth
47	24	What refers to the amount of money the banking system generates with each dollar of reserves?	Money multiplier
48		Money multiplier is related with what?	Reserves
49	25	What is the purchase and sale of U.S. government bonds by the Fed?	Open-Market Operations
50		What is the full form of OMOs?	Open-Market Operations
51	26	In OMOs, Fed buys govt bonds, paying with new dollars to increase what?	Money supply
52		In OMOs, what govt buys to increase money supply?	Govt bonds
53	27	In OMOs, Fed sells government bonds, taking dollars out of circulation to reduce what?	Money supply
54		In OMOs, what govt sells to reduce money supply?	Govt bonds
55	28	What is the full form of RR?	Reserve Requirements
56		What affect how much money banks can create by making loans?	Reserve Requirements
57	29	Why Fed reduces RR?	To increase money supply
58		What happens when banks make more loans from each dollar of reserves?	increases money multiplier and money supply



59	30	Why Fed raises RR?	To reduce money supply
60		What Fed do to reduce money supply in RR?	Raises RR
61	31	What refers to the interest rate on loans the Fed makes to banks?	Discount Rate
62		What is Discount Rate?	the interest rate on loans the Fed makes to banks
63	32	What banks do when running low on reserves?	borrow reserves from the Fed
64		When banks borrow reserves from the Fed?	running low on reserves
65	33	Fed can lower discount rate to?	To increase money supply
66		What if Fed lower discount rate?	encourages banks to borrow more reserves
67	34	Fed can raise discount rate to?	To reduce money supply
68		What Fed do to reduce money supply?	raise discount rate
69	35	banks with insufficient reserves can borrow from banks with...	excess reserves
70		What is interest rate on these loans?	federal funds rate
71	36	What causes changes in the fed funds rate?	changes in other rates
72		changes in the fed funds rate cause changes in other rates and have a big impact on?	economy
73	37	The FOMC uses what to target the fed funds rate?	OMOs
74		fed funds rate policy & monetary policy are...	Connected
75	38	What Fed do to raise fed funds rate?	sells government bonds
76		What happens to reserves when Fed sells government bonds?	Reduces reserve



77	39	What happens to bank reserves, if households hold more of their money as currency?	fewer reserves
78		What happens to bank loans, if households hold more of their money as currency?	fewer loans
79	40	What happens to money supply, if banks hold more reserves than required?	Falls
80		What happens to bank loans, if banks hold more reserves than required?	fewer loans
81	41	What refers when people suspect their banks are in trouble, they may run to bank to withdraw their funds?	Run on banks
82		What happens when people suspect their banks are in trouble?	Run on banks
83	42	In which system, banks don't have enough reserves?	fractional-reserve banking
84		What if banks don't have enough reserves to pay off all depositors?	may have to close
85	43	What happens to money supply when reverse process of money creation?	Money supply falls
86		What happens to reserves when money supply falls?	Reserve increases



MBA SEM 01
Module 03 Chapter 06

❁ **MONETARY GROWTH AND INFLATION** ❁

❖ Introduction

- This chapter introduces the **quantity theory of money** to explain one of the Ten Principles of Economics from Chapter 1: *Prices rise when the govt prints too much money.*¹
- Most economists believe the quantity theory is a good explanation of the long run behavior of inflation.²

❖ The Value of Money

- P = the price level
(e.g., the CPI or GDP deflator)
- P is the price of a basket of goods, measured in money.
- $1/P$ is the value of \$1, measured in goods.
- Example: basket contains one candy bar.
 - If $P = \$2$, value of \$1 is 1/2 candy bar
 - If $P = \$3$, value of \$1 is 1/3 candy bar
- Inflation drives up prices, and drives down the value of money.



❖ The Quantity Theory of Money

- Developed by 18th century philosopher **David Hume**, and the classical economists. Advocated more recently by **Nobel Prize Laureate Milton Friedman**.³
- Asserts that the quantity of money determines the value of money.

We study this theory using two approaches:

- a supply-demand diagram
- an equation⁴

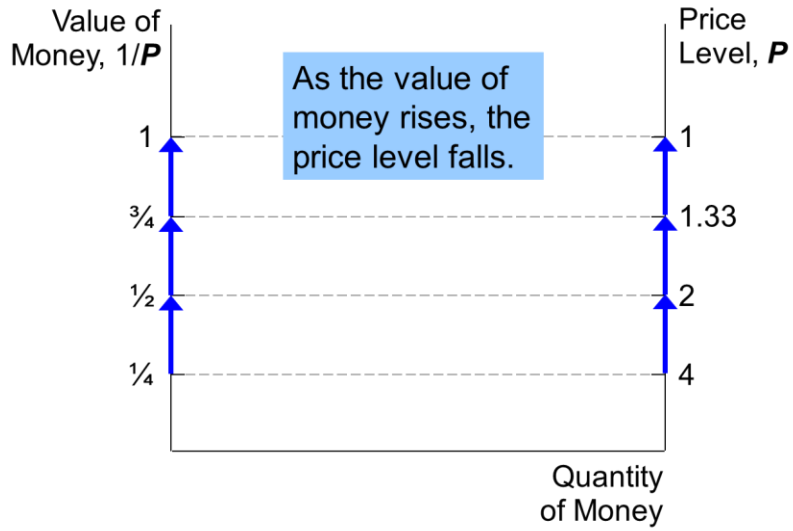
❖ Money Supply (MS)

- In real world, determined by Federal Reserve, the banking system, consumers. In this model, we assume the Fed precisely controls MS and sets it at some fixed amount.⁵

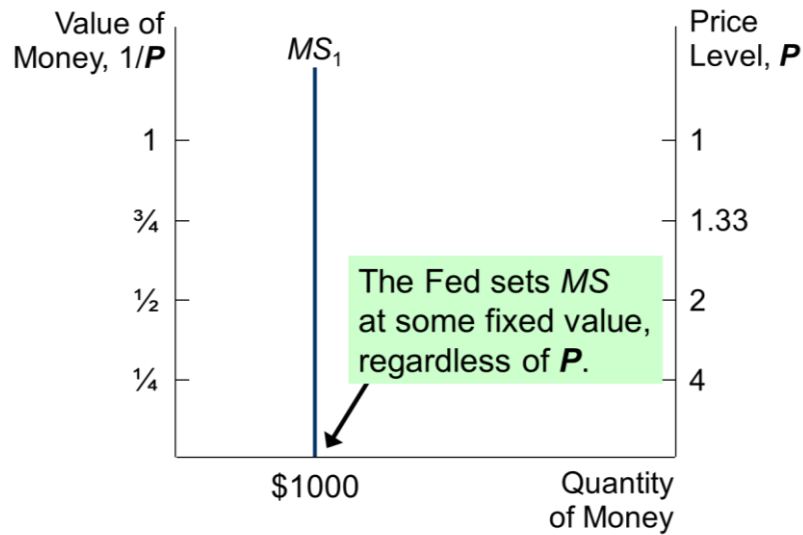
❖ Money Demand (MD)

- Refers to how much wealth people want to hold in liquid form.⁶
- Depends on **P**:
An increase in **P** reduces the value of money, so more money is required to buy goods & services.⁷
- Thus, quantity of money demanded is negatively related to the value of money and positively related to **P**, other things equal.
(These “other things” include real income, interest rates, availability of ATMs.)⁸

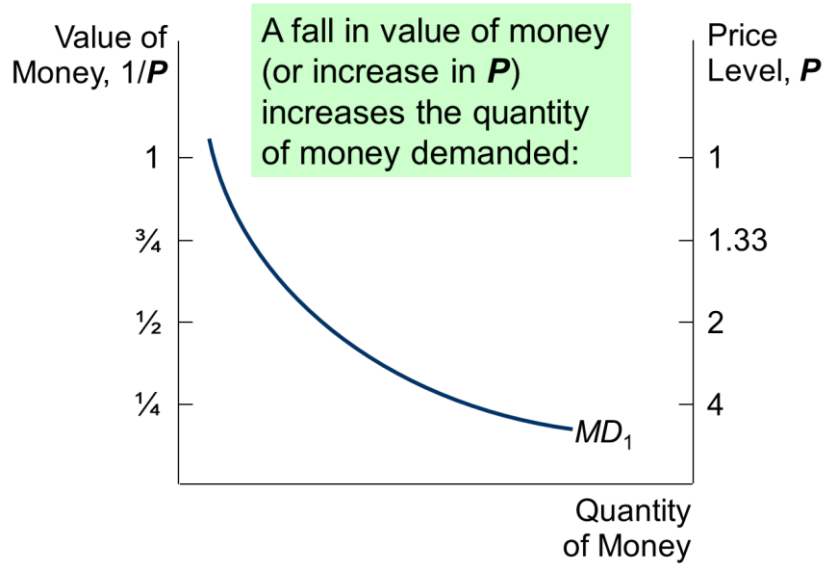
❖ The Money Supply-Money Demand Diagram



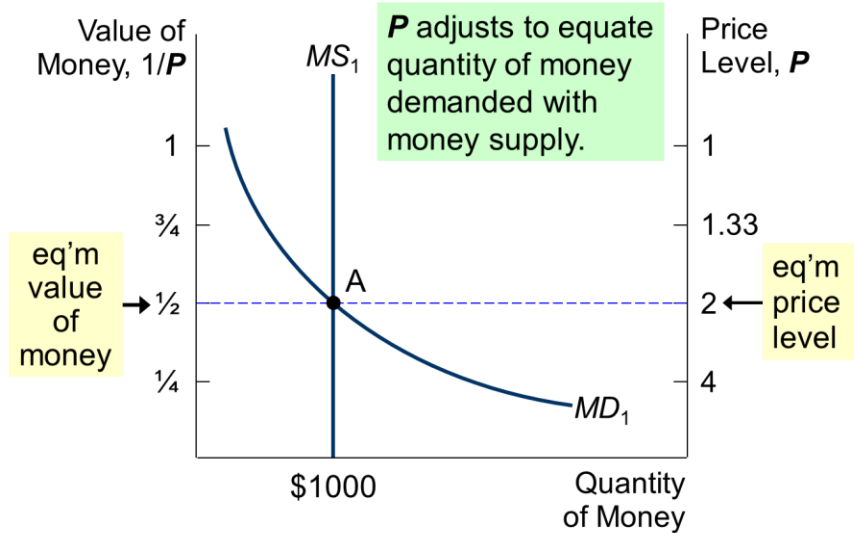
❖ The Money Supply-Demand Diagram



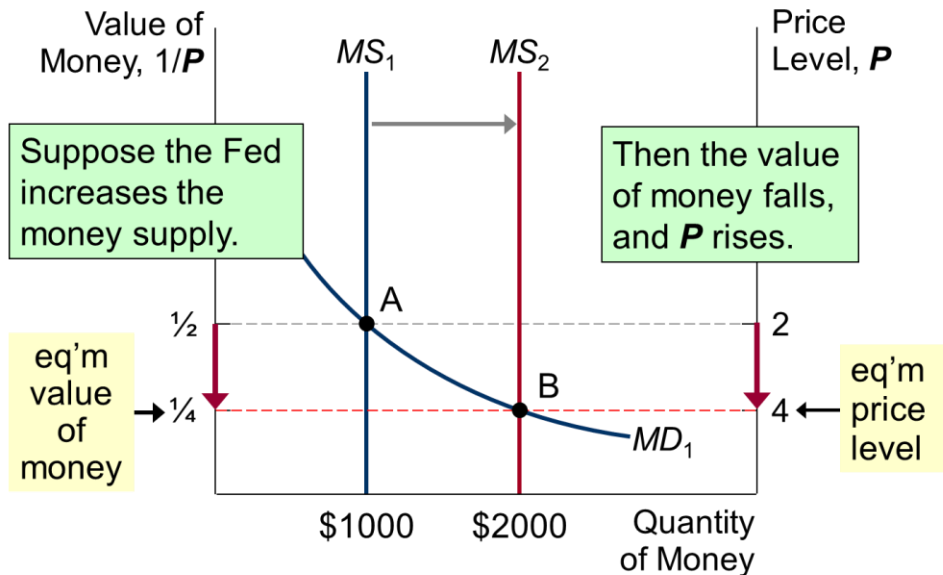
❖ The Money Supply-Demand Diagram



❖ The Money Supply-Demand Diagram



❖ The Effects of a Monetary Injection



❖ A Brief Look at the Adjustment Process

- Result from graph: Increasing MS causes P to rise.⁹
- How does this work? Short version:
 - At the initial P , an increase in MS causes excess supply of money.
 - People get rid of their excess money by spending it on goods & services or by loaning it to others, who spend it.

Result: increased demand for goods.

- But supply of goods does not increase, so prices must rise.¹⁰



❖ Real vs. Nominal Variables

- **Nominal variables** are measured in monetary units.¹¹
- *Examples:* nominal GDP,
nominal interest rate (rate of return measured in \$)
nominal wage (\$ per hour worked)
- **Real variables** are measured in physical units.¹²
- *Examples:* real GDP,
real interest rate (measured in output)
real wage (measured in output)
- Prices are normally measured in terms of money.¹³
 - Price of a compact disc: \$15/cd
 - Price of a pepperoni pizza: \$10/pizza
- A **relative price** is the price of one good relative to (divided by) another:¹⁴
 - Relative price of CDs in terms of pizza:
$$\frac{\text{price of cd}}{\text{price of pizza}} = \frac{\$15/\text{cd}}{\$10/\text{pizza}} = 1.5 \text{ pizzas per cd}$$
- Relative prices are measured in physical units, so they are real variables.¹⁵
- An important relative price is the real wage:
 - W = nominal wage = price of labor, e.g., \$15/hour
 - P = price level = price of goods & services, e.g., \$5/unit of output
- Real wage is the price of labor relative to the price of output:

$$\frac{W}{P} = \frac{\$15/\text{hour}}{\$5/\text{unit of output}} = 3 \text{ units output per hour}$$



❖ The Classical Dichotomy

- **Classical Dichotomy:** the theoretical separation of nominal and real variables. Hume and the classical economists suggested that monetary developments affect nominal variables, but not real variables.¹⁶

- If central bank doubles the money supply, Hume & classical thinkers contend
 - all nominal variables – including prices – will double.
 - all real variables – including relative prices – will remain unchanged.¹⁷

❖ The Neutrality of Money

- **Monetary Neutrality:** the proposition that changes in the money supply do not affect real variables. Doubling money supply causes all nominal prices to double; what happens to relative prices?¹⁸

- Initially, relative price of cd in terms of pizza is

$$\frac{\text{price of cd}}{\text{price of pizza}} = \frac{\$15/\text{cd}}{\$10/\text{pizza}} = 1.5 \text{ pizzas per cd}$$

The relative price is unchanged.

- After nominal prices double,

$$\frac{\text{price of cd}}{\text{price of pizza}} = \frac{\$30/\text{cd}}{\$20/\text{pizza}} = 1.5 \text{ pizzas per cd}$$



- Similarly, the real wage W/P remains unchanged, so
 - quantity of labor supplied does not change
 - quantity of labor demanded does not change
 - total employment of labor does not change

The same applies to employment of capital and other resources.¹⁹

- Since employment of all resources is unchanged, total output is also unchanged by the money supply.²⁰
- Most economists believe the classical dichotomy and neutrality of money describe the economy in the long run.²¹

❖ The Velocity of Money

- **Velocity of money:** the rate at which money changes hands²²
- Notation:

$$P \times Y = \text{nominal GDP} \\ = (\text{price level}) \times (\text{real GDP})$$

M = money supply

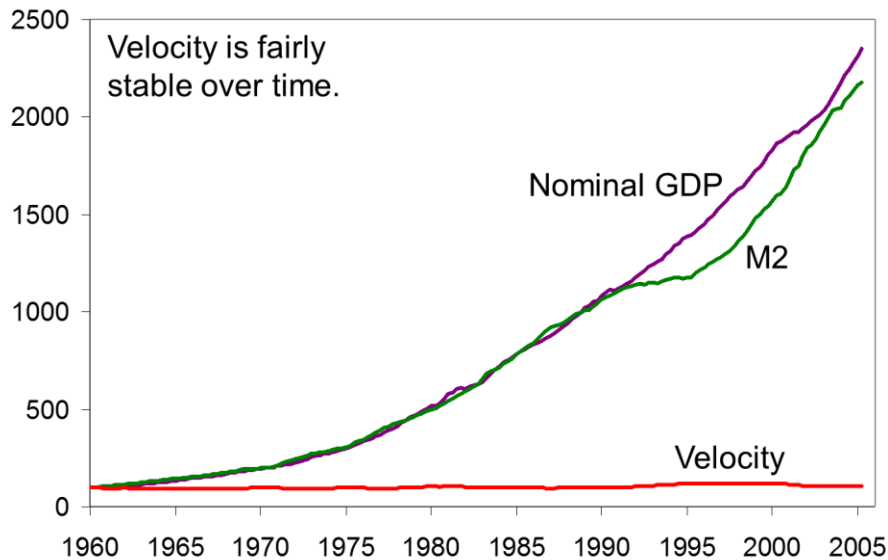
V = velocity

- Velocity formula:
$$V = \frac{P \times Y}{M}$$

- Example with one good: pizza. In 2006,
 - Y = real GDP = 3000 pizzas
 - P = price level = price of pizza = \$10
 - $P \times Y$ = nominal GDP = value of pizzas = \$30,000
 - M = money supply = \$10,000
 - V = velocity = \$30,000/\$10,000 = 3

The average dollar was used in 3 transactions.

➤ U.S. Nominal GDP, M2, and Velocity (1960=100) 1960-2005



❖ The Quantity Equation

- Velocity formula:
$$V = \frac{P \times Y}{M}$$

- Multiply both sides of formula by M :

$$M \times V = P \times Y$$

- Called the **quantity equation**

➤ The Quantity Theory in 5 Steps

- Start with quantity equation: $M \times V = P \times Y$

1. V is stable.
2. So, a change in M causes nominal GDP ($P \times Y$) to change by the same percentage.
3. A change in M does not affect Y :
money is neutral,



Y is determined by technology & resources

4. So, P changes by same percentage as $P \times Y$ and M .
5. Rapid money supply growth causes rapid inflation.

❖ Hyperinflation

- Hyperinflation is generally defined as inflation exceeding 50% per month.²³
- Recall one of the Ten Principles from Chapter 1:

Prices rise when the government prints too much money.

Excessive growth in the money supply always causes hyperinflation.²⁴

❖ The Inflation Tax

- When tax revenue is inadequate and ability to borrow is limited, govt may print money to pay for its spending.

Almost all hyperinflations start this way.²⁵

- The revenue from printing money is the **inflation tax**: printing money causes inflation, which is like a tax on everyone who holds money.²⁶
- Ex. In the U.S., the inflation tax today accounts for less than 3% of total revenue.



❖ The Fisher Effect

- Rearrange the definition of the real interest rate:

$$\text{Nominal Interest Rate} = \text{Inflation Rate} + \text{Real Interest Rate}$$

- The real interest rate is determined by saving & investment in the loanable funds market.²⁷
- Money supply growth determines inflation rate.

So, this equation shows how the nominal interest rate is determined.²⁸

- In the long run, money is neutral, so a change in the money growth rate affects the inflation rate but not the real interest rate.²⁹
- So, the nominal interest rate adjusts one-for-one with changes in the inflation rate.

This relationship is called the **Fisher effect** after Irving Fisher, who studied it.³⁰

❖ The Fisher Effect & the Inflation Tax

- The inflation tax applies to people's holdings of money, not their holdings of wealth.³¹
- The Fisher effect: an increase in inflation causes an equal increase in the nominal interest rate, so the real interest rate (on wealth) is unchanged.³²



❖ The Costs of Inflation

- **The inflation fallacy:** most people think inflation erodes real incomes.

But inflation is a general increase in prices, of the things people buy and the things they sell (*e.g.*, their labor).³³

- In the long run, real incomes are determined by real variables, not the inflation rate.³⁴
- **Shoe-leather costs:** the resources wasted when inflation encourages people to reduce their money holdings
 - includes the time and transactions costs of more frequent bank withdrawals³⁵
- **Menu costs:** the costs of changing prices
 - printing new menus, mailing new catalogs, etc.³⁶
- **Misallocation of resources from relative-price variability:** Firms don't all raise prices at the same time, so relative prices can vary which distorts the allocation of resources.³⁷
- **Confusion & inconvenience:** Inflation changes the yardstick we use to measure transactions.

Complicates long-range planning and the comparison of dollar amounts over time.³⁸

- **Tax distortions:** Inflation makes nominal income grow faster than real income. Taxes are based on nominal income, and some are not adjusted for inflation.³⁹
- So, inflation causes people to pay more taxes even when their real incomes don't increase.⁴⁰



- All these costs are quite high for economies experiencing hyperinflation. For economies with low inflation (< 10% per year), these costs are probably much smaller, though their exact size is open to debate.⁴¹

❖ A Special Cost of Unexpected Inflation

- **Arbitrary redistributions of wealth**
- Higher-than-expected inflation transfers purchasing power from creditors to debtors: Debtors get to repay their debt with dollars that aren't worth as much.⁴²
- Lower-than-expected inflation transfers purchasing power from debtors to creditors.⁴³
- High inflation is more variable and less predictable than low inflation. So, these arbitrary redistributions are frequent when inflation is high.⁴⁴



EXERCISE

1. One good: Corn.

The economy has enough labor, capital, and land to produce $Y = 800$ bushels of corn. V is constant.

In 2005, $MS = \$2000$, $P = \$5/\text{bushel}$.

A. Compute nominal GDP and velocity in 2005.

For 2006, the Fed increases MS by 5%, to $\$2100$.

B. Compute the 2006 values of nominal GDP and P .

Compute the inflation rate for 2005-2006.

C. Suppose tech. progress causes Y to increase to 824 in 2006.

Compute 2005-2006 inflation rate.

ANSWER:

Given: $Y = 800$, V is constant,

$MS = \$2000$ and $P = \$5$ in 2005.

A. Compute nominal GDP and velocity in 2005.

$$\text{Nominal GDP} = P \times Y = \$5 \times 800 = \$4000$$

$$V = \frac{P \times Y}{M} = \frac{\$4000}{\$2000} = 2$$



**B. Compute the 2006 values of nominal GDP and P .
Compute the inflation rate for 2005-2006.**

$$\begin{aligned}\text{Nominal GDP} &= P \times Y = M \times V \text{ (Quantity Eq'n)} \\ &= \$2100 \times 2 = \$4200\end{aligned}$$

$$P = \frac{P \times Y}{Y} = \frac{\$4200}{800} = \$5.25$$

$$\text{Inflation rate} = \frac{\$5.25 - 5.00}{5.00} = 5\% \text{ (same as MS!)}$$

**C. Suppose tech. progress causes Y to increase to 824 in 2006.
Compute 2005-2006 inflation rate.**

First, use Quantity Eq'n to compute P :

$$P = \frac{M \times V}{Y} = \frac{\$4200}{824} = \$5.10$$

$$\text{Inflation rate} = \frac{\$5.10 - 5.00}{5.00} = 2\%$$



2. Tax Distortions:

You deposit \$1000 in the bank for one year.

CASE 1: inflation = 0%, nom. interest rate = 10%

CASE 2: inflation = 10%, nom. interest rate = 20%

A. In which case does the real value of your deposit grow the most?

Assume the tax rate is 25%.

B. In which case do you pay the most taxes?

C. Compute the after-tax nominal interest rate, then subtract off inflation to get the after-tax real interest rate for both cases.

ANSWER:

A. In both cases, the real interest rate is 10%,
so the real value of the deposit grows 10% (before taxes).

B. **CASE 1:** interest income = \$100,
so you pay \$25 in taxes.

CASE 2: interest income = \$200,
so you pay \$50 in taxes.

C. **CASE 1:** Nominal = $0.75 \times 10\% = 7.5\%$
Real = $7.5\% - 0\% = 7.5\%$

CASE 2: Nominal = $0.75 \times 20\% = 15\%$
Real = $15\% - 10\% = 5\%$

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	Which theory introduced by Money Growth and Inflation?	Quantity theory of money
2		What happens to prices when the govt prints too much money?	Rises
3	2	What economists believe about the quantity theory?	Explains about long run behavior of inflation
4		What is good explanation of the long run behavior of inflation?	Quantity theory of money
	3	The Quantity Theory of Money is Developed by whom?	David Hume
6		The Quantity Theory of Money advocated more recently by whom?	Laureate Milton Friedman
7	4	What is determined by the Quantity Theory of Money?	Value of money
8		How many approaches are used in the Quantity Theory of Money?	2 (Two)
9	5	What is the full form of MS?	Money Supply
10		In real world, the money supply is determined by whom?	Federal Reserve, the banking system
11	6	What is the full form of MD?	Money Demand
12		What refers to how much wealth people want to hold in liquid form?	Money Demand
13	7	An increase in P reduces what?	Value of money
14		What happens when the value of money reduces?	more money is required

15	8	Quantity of money demanded is negatively related what?	Value of money
16		Quantity of money demanded is positively related what?	Price
17	9	When price rises?	Increases in MS
18		What happens to price when MS increases?	Rises
19	10	At the initial P , what causes an increase in MS?	excess supply of money
20		How people get rid of their excess money?	spending it on g&s or by loaning
21	11	What is measured in monetary units?	Nominal variables
22		Nominal variables are measured in?	Monetary units
23	12	What is measured in physical units?	Real variables
24		Real variables are measured in?	Physical units
25	13	What are normally measured in terms of money?	Prices
26		Prices are normally measured in terms of what?	Money
27	14	What refers to the price of one good relative to another?	Relative Price
28		What is Relative Price?	the price of one good relative to another
29	15	Relative prices are measured in?	Physical units
30		Relative prices are which variables?	Real variables
31	16	What refers to the theoretical separation of nominal and real variables?	Classical Dichotomy
32		What is Classical Dichotomy?	theoretical separation of nominal and real variables



33	17	What happens to nominal variables if Central Bank doubles the money supply?	all nominal variables will double
34		What happens to real variables if Central Bank doubles the money supply?	remain unchanged
35	18	What refers to the proposition that changes in the money supply do not affect real variables?	Monetary Neutrality
36		Doubling money supply causes all nominal prices to?	Double
37	19	What happens to quantity of labor supplied if the real wage remains unchanged?	Do not change
38		What happens to total employment of labor if the real wage remains unchanged?	Do not change
39	20	What happens to total output if employment of all resources is unchanged?	Do not change
40		total output is also unchanged by what?	Money Supply
41	21	What Economists believe about the classical dichotomy and neutrality of money?	describe the economy in the long run
42		What describe the economy in the long run?	Classical Dichotomy and Neutrality of Money
43	22	What refers to the rate at which money changes hands?	Velocity of Money
44		What is Velocity of Money?	rate at which money changes hands



45	23	What refers to the inflation exceeding 50% per month?	Hyperinflation
46		What is Hyperinflation?	inflation exceeding 50% per month
47	24	What happens to price when the government prints too much money?	Rises
48		What is caused by excessive growth in the money supply?	Hyperinflation
49	25	What govt do when tax revenue is inadequate and ability to borrow is limited?	Prints money
50		All hyperinflations start when...	Govt prints money
51	26	What refers to the revenue from printing money?	Inflation Tax
52		What is Inflation Tax?	Revenue from printing money
53	27	What is determined by saving & investment in the loanable funds market?	Real Interest Rate
54		How the real interest rate is determined?	Saving & Investment
55	28	What is determined by money supply growth?	Inflation rate
56		Inflation rate is determined by?	money supply growth
57	29	In.... money is neutral.	Long run
58		What is neutral in the long run?	Money
59	30	Who studied the Fisher Effect?	Irving Fisher
60		Irving Fisher studied what?	Fisher Effect
61	31	What applies to people's holdings of money?	Inflation tax
62		What is not applied to people's holdings of wealth?	Inflation tax



63		An increase in inflation causes an equal increase in what?	Nominal interest rate
64	32	an increase in inflation causes an equal increase in the nominal interest rate, so the real interest rate is...	Unchanged
65	33	What is the inflation fallacy?	inflation erodes real incomes
66		Inflation erodes real incomes is?	Inflation fallacy
67	34	Real incomes are determined by?	Real variables
68		What is not determined by the inflation rate?	Real incomes
69	35	What refers to the resources wasted when inflation encourages people to reduce their money holdings?	Shoe-leather costs
70		What is included in the Shoe-leather costs?	Time and transactions costs
71	36	What refers to the costs of changing prices?	Menu Costs
72		What are the examples of Menu Costs?	printing new menus, mailing new catalogs
73	37	What happens when firms don't all raise prices at the same time?	relative prices can vary
74		What happens when relative prices vary?	distorts the allocation of resources
75	38	What changes the yardstick we use to measure transactions?	Inflation
76		What complicates long-range planning and the comparison of dollar amounts?	Inflation
77	39	Inflation makes nominal income grow faster than what?	Real income
78		What is based on nominal income?	Taxes
79	40	What causes people to pay more taxes?	Inflation



80		What causes inflation to people?	Pay more taxes
81	41	All these costs are quite high for which economies?	Hyperinflation
82		All these costs are quite low for which economies?	low inflation
83	42	Higher-than-expected inflation transfers purchasing power from creditors to...	Debtors
84		Who get to repay their debt with dollars that aren't worth as much?	Debtors
85	43	Lower-than-expected inflation transfers purchasing power from debtors to...	Creditors
86		What transfers purchasing power from debtors to creditors?	Lower-than-expected inflation
87	44	Which inflation is more variable?	High
88		Which inflation is less predictive?	High



MBA SEM 01
Module 03 Chapter 07

🌀 OPEN-ECONOMY MACROECONOMICS 🌀

❖ Closed vs. Open Economies

- A **closed economy** does not interact with other economies in the world.¹
- An **open economy** interacts freely with other economies around the world.²

❖ The Flow of Goods & Services

- **Exports:** domestically-produced goods & services sold abroad³
- **Imports:** foreign-produced goods & services sold domestically⁴
- **Net exports (NX)** = value of exports – value of imports⁵
- Another name for **NX**: the **trade balance**.⁶

❖ Variables that Influence Net Exports

- Consumers' preferences for foreign and domestic goods
- Prices of goods at home and abroad
- Incomes of consumers at home and abroad



- The exchange rates at which foreign currency trades for domestic currency
- Transportation costs
- Government policies

❖ Trade Surpluses & Deficits

- ***NX*** measures the imbalance in a country's trade in goods and services.⁷
- **Trade deficit:** an excess of imports over exports⁸
- **Trade surplus:** an excess of exports over imports⁹
- **Balanced trade:** when exports = imports¹⁰

❖ The Flow of Capital

- **Net capital outflow (NCO):** domestic residents' purchases of foreign assets minus foreigners' purchases of domestic assets
NCO is also called **net foreign investment**.¹¹
- The flow of capital abroad takes two forms:
 1. **Foreign direct investment:** Domestic residents actively manage the foreign investment, *e.g.*, McDonalds opens a fast-food outlet in Moscow.¹²
 2. **Foreign portfolio investment:** Domestic residents purchase foreign stocks or bonds, supplying "loanable funds" to a foreign firm.¹³



- **NCO** measures the imbalance in a country's trade in assets:¹⁴
 - When **NCO** > 0, "capital outflow"
Domestic purchases of foreign assets exceed foreign purchases of domestic assets.¹⁵
 - When **NCO** < 0, "capital inflow"
Foreign purchases of domestic assets exceed domestic purchases of foreign assets.¹⁶

❖ Variables that Influence NCO

- Real interest rates paid on foreign assets
- Real interest rates paid on domestic assets
- Perceived risks of holding foreign assets
- Government policies affecting foreign ownership of domestic assets

❖ The Equality of NX and NCO

- An accounting identity: **NCO** = **NX**
 - arises because every transaction that affects **NX** also affects **NCO** by the same amount (and vice versa)¹⁷
- When a foreigner purchases a good from the U.S.,
 - U.S. exports and **NX** increase
 - the foreigner pays with currency or assets, so the U.S. acquires some foreign assets, causing **NCO** to rise.¹⁸



- When a U.S. citizen buys foreign goods,
 - U.S. imports rise, **NX** falls
 - the U.S. buyer pays with U.S. dollars or assets, so the other country acquires U.S. assets, causing U.S. **NCO** to fall.¹⁹

❖ Saving, Investment, and International Flows of Goods & Assets

- $Y = C + I + G + NX$ accounting identity
- $Y - C - G = I + NX$ rearranging terms
- $S = I + NX$ since $S = Y - C - G$
- $S = I + NCO$ since $NX = NCO$

- When $S > I$,

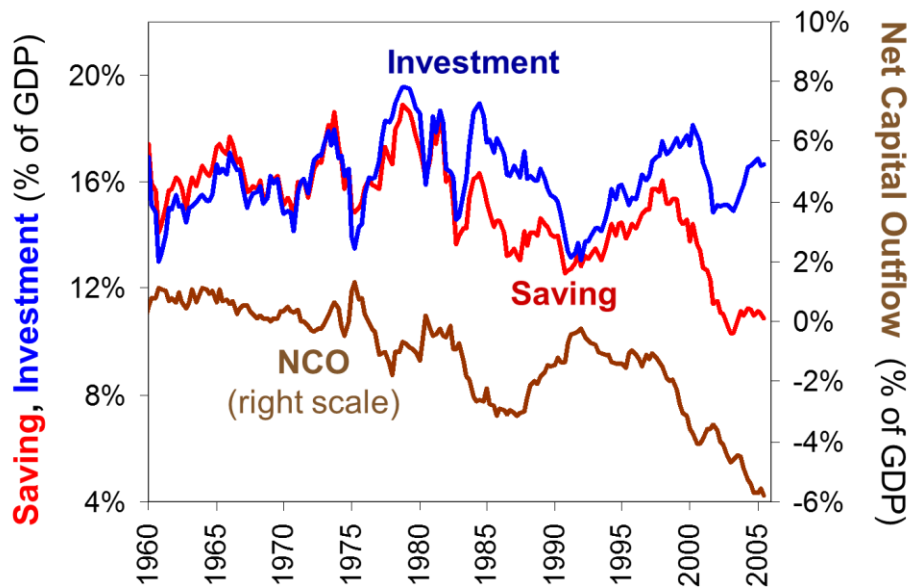
the excess loanable funds flow abroad in the form of positive net capital outflow.²⁰

- When $S < I$,

foreigners are financing some of the country's investment, and $NCO < 0$.²¹

➤ Case Study: The U.S. Trade Deficit

- In 2004, the U.S. had a record trade deficit.
- Recall, $NX = S - I = NCO$.
- A trade deficit means $I > S$, so the nation borrows the difference from foreigners.
- In 2004, foreign purchases of U.S. assets exceeded U.S. purchases of foreign assets by \$585 million.
- Such deficits have been the norm since 1980...



- Why U.S. saving has been less than investment:
 - In the 1980s and early 2000s, huge budget deficits and low private saving depressed national saving.²²
 - In the 1990s, national saving increased as the economy grew, but domestic investment increased even faster due to the information technology boom.²³

- Is the U.S. trade deficit a problem?
 - The extra capital stock from the '90s investment boom may well yield large returns²⁴
 - The fall in saving of the '80s and '00s, while not desirable, at least did not depress domestic investment, as firms could borrow from abroad²⁵

- A country, like a person, can go into debt for good reasons or bad ones. A trade deficit is not necessarily a problem, but might be a symptom of a problem.²⁶



❖ The Nominal Exchange Rate

- **Nominal exchange rate:** rate at which one country's currency trades for another

We express all exchange rates as foreign currency per unit of domestic currency.²⁷

- Some exchange rates as of 6 Jan 2006, all per US\$

Canadian dollar:	1.16
Euro:	0.82
Japanese yen:	114.43
Mexican peso:	10.56

❖ Appreciation and Depreciation

- **Appreciation (strengthening):**

an increase in the value of a currency as measured by the amount of foreign currency it can buy²⁸

- **Depreciation (weakening):**

a decrease in the value of a currency as measured by the amount of foreign currency it can buy²⁹

- Examples:

During 2005, the U.S. dollar...

- appreciated 15% against the euro
- depreciated 5% against the Mexican peso



❖ The Real Exchange Rate

- **Real Exchange Rate:** the rate at which the goods & services of one country trade for the goods & services of another³⁰

- Real exchange rate = $\frac{e \times P}{P^*}$

where

P = domestic price

P^* = foreign price (in foreign currency)

e = nominal exchange rate, *i.e.*, foreign currency per unit of domestic currency

- **Example:**
- A Big Mac costs \$2.50 in U.S., 400 yen in Japan
- e = 120 yen per \$
- $e \times P$ = price in yen of a U.S. Big Mac
= (120 yen per \$) x (\$2.50 per Big Mac)
= 300 yen per U.S. Big Mac
- Compute the real exchange rate:

$$\frac{e \times P}{P^*} = \frac{300 \text{ yen per U.S. Big Mac}}{400 \text{ yen per Japanese Big Mac}}$$
$$= 0.75 \text{ Japanese Big Macs per US Big Mac}$$



❖ Interpreting the Real Exchange Rate

- “The real exchange rate = 0.75 Japanese Big Macs per U.S. Big Mac”
- This does not mean a Japanese citizen literally exchanges Japanese burgers for American ones.
- Correct interpretation:
To buy a Big Mac in the U.S., a Japanese citizen must sacrifice an amount that could purchase 0.75 Big Macs in Japan.

➤ The Real Exchange Rate with Many Goods

- P = U.S. price level, e.g., Consumer Price Index, which measures the price of a basket of goods
- P^* = foreign price level
- Real exchange rate
 $= (e \times P)/P^*$
= price of a domestic basket of goods relative to price of a foreign basket of goods
- An appreciation of the U.S. real exchange rate means U.S. goods are becoming more expensive relative to foreign goods.



❖ The Law of One Price

- **Law of one price:**
the notion that a good should sell for the same price in all markets³¹
- Suppose, coffee sells for \$4/pound in Seattle and \$5/pound in Boston, and can be costlessly transported.
 - There is an opportunity for **arbitrage**, making a quick profit by buying coffee in Seattle and selling it in Boston.
 - Such arbitrage drives up the price in Seattle and drives down the price in Boston, until the two prices are equal.

❖ Purchasing-Power Parity (PPP)

- **Purchasing-power parity:**
a theory of exchange rates whereby a unit of any currency should be able to buy the same quantity of goods in all countries³²
- Based on the law of one price, implies that nominal exchange rates adjust to equalize the price of a basket of goods across countries³³

Example:

- The “basket” contains a Big Mac.
- P = price of US Big Mac (in dollars)
- P^* = price of Japanese Big Mac (in yen)
- e = exchange rate, yen per dollar

- According to PPP,

$$e \times P = P^*$$

price of US
Big Mac, in yen

price of Japanese
Big Mac, in yen

- Solve for e :

$$e = \frac{P^*}{P}$$

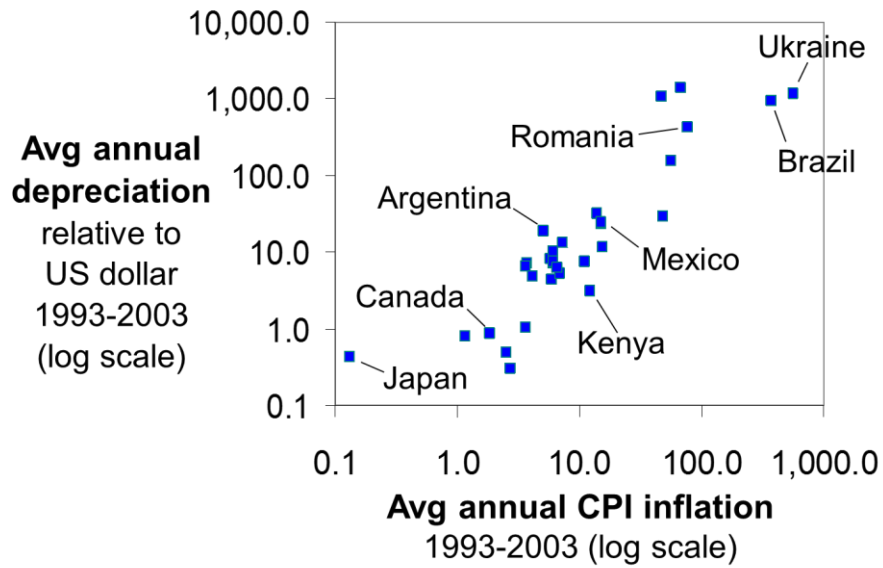
➤ PPP and Its Implications

- PPP implies that the nominal exchange rate between two countries should equal the ratio of price levels.³⁴
- If the two countries have different inflation rates, then e will change over time:
 - Ex. If inflation is higher in Mexico than in the U.S., then P^* rises faster than P , so e rises – the dollar appreciates against the peso.
 - Ex. If inflation is higher in the U.S. than in Japan, then P rises faster than P^* , so e falls – the dollar depreciates against the yen.

➤ Limitations of PPP Theory

- Nonetheless, PPP works well in many cases, especially as an explanation of long-run trends.
- For example, PPP implies:
- The greater a country’s inflation rate, the faster its currency should depreciate (relative to a low-inflation country like the US).

Inflation & Depreciation in a Cross-Section of 31 Countries





EXERCISE

1. Variables that affect NX:

What do you think would happen to U.S. net exports if:

- A. Canada experiences a recession
(falling incomes, rising unemployment)
- B. U.S. consumers decide to be patriotic and
buy more products “Made in the U.S.A.”
- C. Prices of goods produced in Mexico rise faster than prices of goods
produced in the U.S.

ANSWER:

- A. U.S. net exports would **fall** due to a fall in Canadian consumers’ purchases of U.S. exports
- B. U.S. net exports would **rise** due to a fall in imports
- C. This makes U.S. goods more attractive relative to Mexico’s goods. Exports to Mexico increase, imports from Mexico decrease, so U.S. net exports **increase**.



2. Compute a real exchange rate:

$e = 10$ pesos per \$

price of Tall Starbucks Latte

$P = \$3$ in U.S., $P^* = 24$ pesos in Mexico

A. What is the price of a US latte measured in pesos?

B. Calculate the real exchange rate, measured as Mexican lattes per US latte.

ANSWER:

A. $e \times P = (10 \text{ pesos per } \$) \times (3 \$ \text{ per US latte})$

= 30 pesos per US latte

B. $\frac{e \times P}{P^*} = \frac{30 \text{ pesos per U.S. latte}}{24 \text{ pesos per Mexican latte}}$

= 1.25 Mexican lattes per US latte

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	Which economy does not interact with other economies in the world?	Closed Economy
2		What is Closed Economy?	does not interact with other economies
3	2	Which economy interacts freely with other economies around the world?	Open Economy
4		What is Open Economy?	interacts freely with other economies
	3	What refers to the domestically-produced goods & services sold abroad?	Exports
6		What is Export?	domestically-produced g&s sold abroad
7	4	What is Import?	foreign-produced g&s sold domestically
8		What refers to the foreign-produced goods & services sold domestically?	Imports
9	5	What is equal to value of exports – value of imports?	Net Exports
10		What is Net Export?	value of exports – value of imports
11	6	What is the full form of NX?	Net Exports
12		What is another name for NX ?	Trade Balance
13	7	What measures the imbalance in a country's trade in goods and services?	NX
14		What measures NX?	imbalance in a country's trade in g&s



15	8	What is an excess of imports over exports?	Trade deficit
16		What is Trade deficit?	An excess of imports over exports
17	9	What is an excess of exports over imports?	Trade Surplus
18		What is Trade Surplus?	An excess of exports over imports
19	10	When Trade Balance occurs?	Exports = Imports
20		What happens when exports = imports?	Trade Balance
21	11	What refers to domestic residents' purchases of foreign assets minus foreigners' purchases of domestic assets?	Net capital outflow
22		What is the full form of NCO?	Net capital outflow
23	12	What refers to the domestic residents actively manage the foreign investment?	Foreign direct investment
24		McDonalds opens a fast-food outlet in Moscow is an example of?	Foreign direct investment
25	13	What refers to the domestic residents purchase foreign stocks or bonds?	Foreign portfolio investment
26		What is the full form of FPI?	Foreign portfolio investment
27	14	What measures the imbalance in a country's trade in assets?	NCO
28		What NCO measures?	imbalance in a country's trade in assets
29	15	What happens when NCO > 0?	capital outflow
30		When the domestic purchases of foreign assets exceed foreign purchases of domestic assets?	capital outflow



31	16	When the foreign purchases of domestic assets exceed domestic purchases of foreign assets?	Capital inflow
32		What happens when $NCO < 0$?	Capital inflow
33	17	Why $NCO = NX$ happens?	because every transaction affect both
34		What arises when every transaction that affects NX also affects NCO ?	$NCO = NX$
35	18	What happens when a foreigner purchases a good from the country?	exports and NX increase
36		What happens when a foreigner purchases a good from the country?	acquires foreign assets, and NCO rises
37	19	What happens when citizen buys foreign goods?	imports rise, NX falls
38		What happens when citizen buys foreign goods?	other country acquires assets and NCO falls
39	20	What if $S > I$?	excess loanable funds flow abroad
40		What is the excess loanable funds flow abroad in the form of positive net capital outflow?	$S > I$
41	21	What if foreigners are financing some of the country's investment?	$S < I$
42		What if $S < I$?	foreigners are financing country's investment
43	22	What is depressed by huge budget deficits and low private saving depressed?	National Saving
44		Saving has been less than what?	Investment
45	23	In the 1990s, what increased as the economy grew?	National Saving
46		Domestic investment increased even faster due to what?	information technology boom



47	24	Extra capital stock from the '90s investment boom may well yield what?	Large returns
48		What may yield large returns?	Capital Stock
49	25	The fall in saving did not depressed what?	Domestic investment
50		The fall in saving did not depressed domestic investment due to what?	firms could borrow from abroad
51	26	A trade deficit is not necessarily a problem, but might be...	symptom of a problem
52		What is not a problem?	Trade deficit
53	27	What refers to the rate at which one country's currency trades for another?	Nominal exchange rate
54		What is the Nominal exchange rate?	one country's currency trades for another
55	28	What refers to an increase in the value of a currency as measured by the amount of foreign currency it can buy?	Appreciation
56		What Appreciation is also known as?	Strengthening
57	29	What refers to a decrease in the value of a currency as measured by the amount of foreign currency it can buy?	Depreciation
58		What Depreciation is also known as?	Weakening
59	30	What refers to the rate at which the goods & services of one country trade for the goods & services of another?	Real Exchange Rate
60		What is Real Exchange Rate?	one country trade to another
61	31	What refers to the notion that a good should sell for the same price in all markets?	Law of one price
62		What is Law of one price?	good should sell for the same price in all markets



63	32	What refers to a theory of exchange rates whereby a unit of any currency should be able to buy the same quantity of goods in all countries?	Purchasing-power parity
64		What is the Purchasing-power parity?	unit of any currency able to buy the same quantity of goods in all countries
65	33	Nominal exchange rates adjust to equalize the price of what?	Basket
66		What implies that nominal exchange rates adjust to equalize the price of a basket of goods across countries?	Purchasing-power parity
67	34	What implies nominal exchange rate between two countries should equal the ratio of price levels?	PPP
68		What is the full form of PPP?	Purchasing-power parity
69	35	What if the two countries have different inflation rates?	e will change
70		When e will change overtime?	two countries have different inflation rates

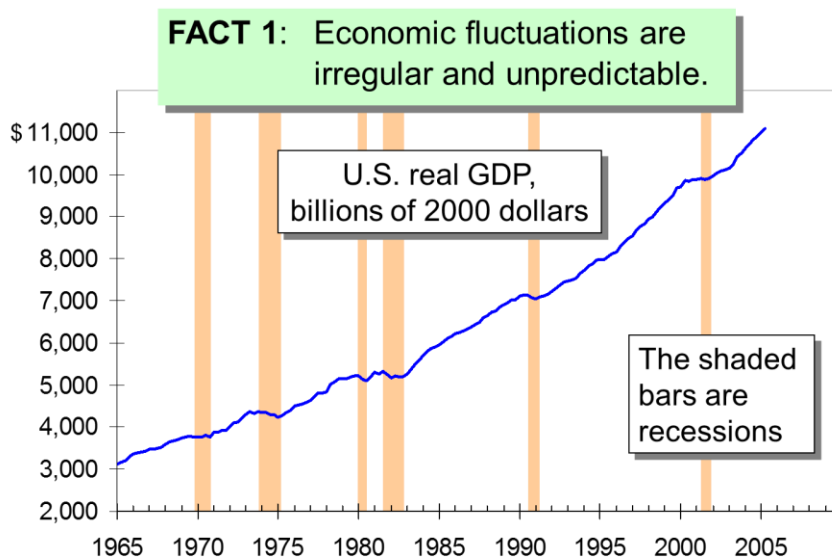
MBA SEM 01
Module 04 Chapter 01

**AGGREGATE DEMAND AND
AGGREGATE SUPPLY**

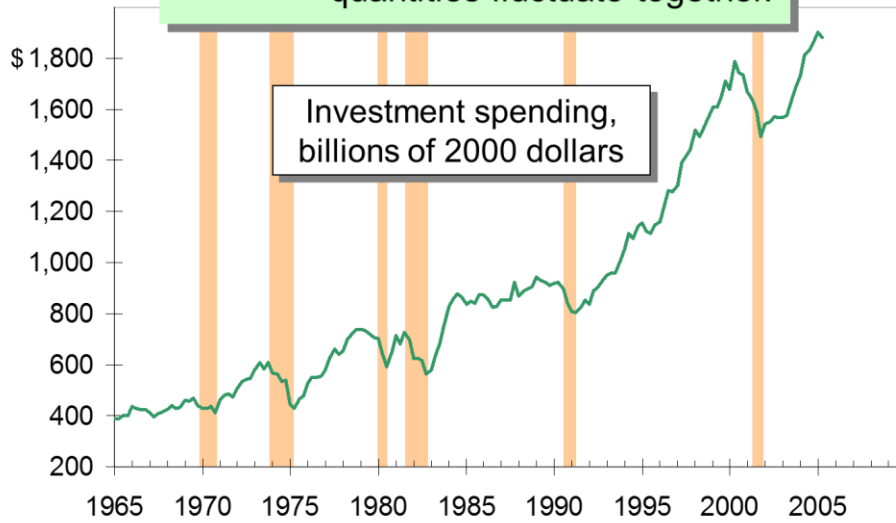
❖ Introduction

- Over the long run, real GDP grows about 3% per year on average.¹
- In the short run, GDP fluctuates around its trend.
 - **Recessions:** periods of falling real incomes and rising unemployment
 - **Depressions:** severe recessions (very rare)²
- Short-run economic fluctuations are often called **business cycles**.³

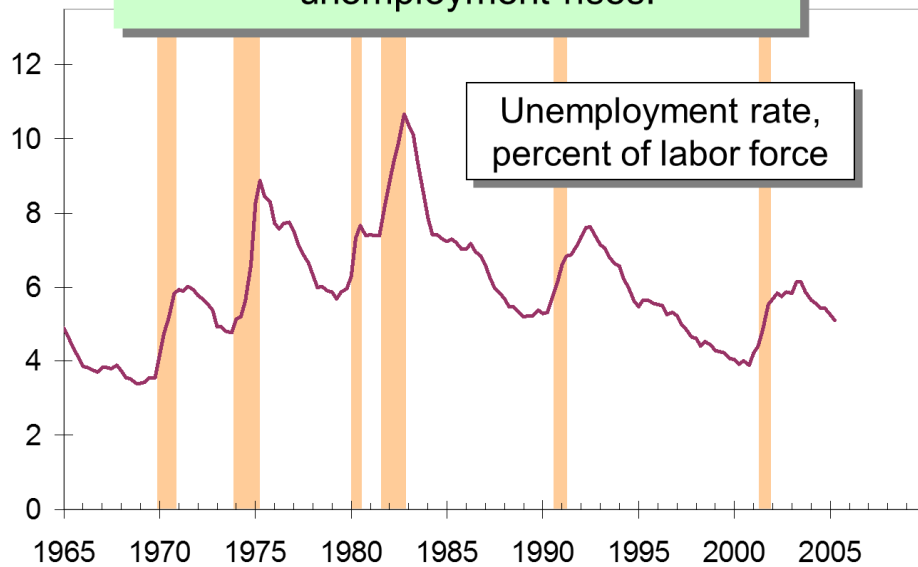
❖ Three Facts About Economic Fluctuations



FACT 2: Most macroeconomic quantities fluctuate together.



FACT 3: As output falls, unemployment rises.





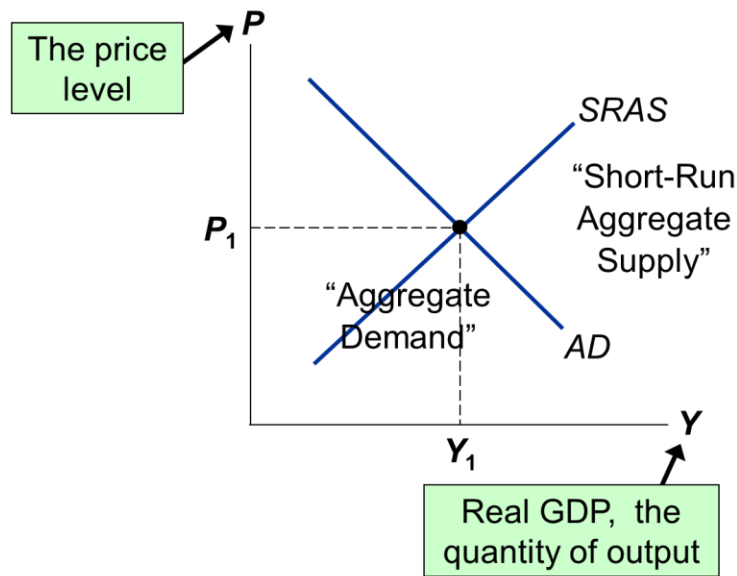
- Explaining these fluctuations is difficult, and the theory of economic fluctuations is controversial.⁴
- Most economists use the **model of aggregate demand and aggregate supply** to study fluctuations.
This model differs from the classical economic theories which economists use to explain the long run.⁵

❖ Classical Economics—A Recap

- Most economists believe classical theory describes the world in the long run, but not the short run.⁶
- In the short run, changes in nominal variables (like the money supply or P) can affect real variables (like Y or the u-rate).⁷
To study the short run, we use a new model.

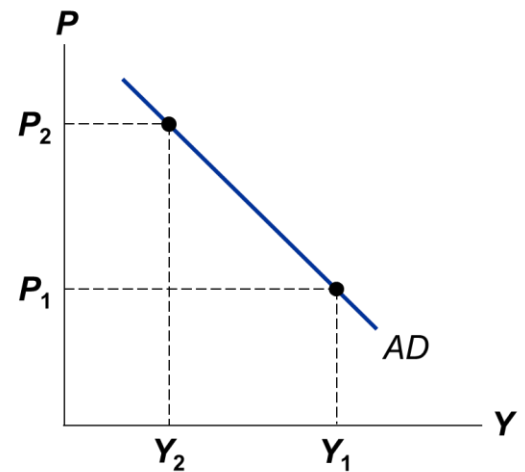
❖ The Model of Aggregate Demand and Aggregate Supply

- The model determines the equilibrium price level and the equilibrium level of output (real GDP).⁸



❖ **The Aggregate-Demand (AD) Curve**

The AD curve shows the quantity of all goods & services demanded in the economy at any given price level.⁹



➤ **Why the AD Curve Slopes Downward**

$$Y = C + I + G + NX$$

- **C, I, G, NX** are the components of aggregate demand.

Assume **G** fixed by government policy.

To understand the slope of AD, must determine how a change in **P** affects **C, I,** and **NX**.¹⁰



➤ The Wealth Effect (P and C)

- Suppose P rises.
- The dollars people hold buy fewer goods & services, so real wealth is lower. People feel poorer, so they spend less.
- Thus, an increase in P causes a fall in C , which means a smaller quantity of goods & services demanded.¹¹

➤ The Interest-Rate Effect (P and I)

- Suppose P rises.
Buying goods & services requires more dollars.
- To get these dollars, people sell some of their bonds or other assets, which drives up interest rates and increases the cost of borrowing to fund investment projects.¹²
- Thus, an increase in P causes a decrease in I , which means a smaller quantity of goods & services demanded.¹³

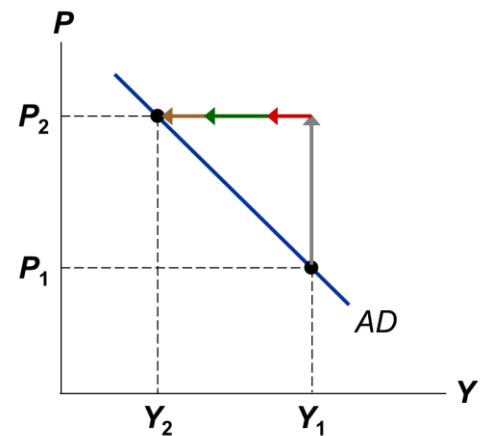
➤ The Exchange-Rate Effect (P and NX)

- Suppose P rises.
Interest rates go up (the interest-rate effect).
U.S. bonds more attractive relative to foreign bonds.¹⁴

- Foreign investors purchase more U.S. bonds, but first must convert their currency into \$, which appreciates the U.S. exchange rate. Makes U.S. exports more expensive to people abroad, imports cheaper to U.S. residents.¹⁵
- Thus, an increase in P causes a decrease in NX , which means a smaller quantity of goods & services demanded.¹⁶

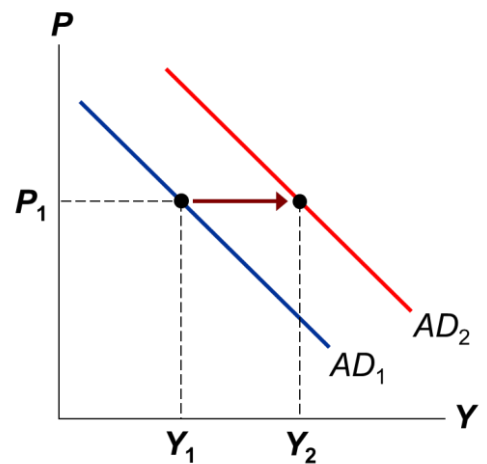
➤ **The Slope of the AD Curve: Summary**

- An increase in P reduces the quantity of goods & services demanded because:
 - the wealth effect (C falls)
 - the interest-rate effect (I falls)
 - the exchange-rate effect (NX falls)¹⁷



➤ **Why the AD Curve Might Shift**

- Any event that changes C , I , G , or NX – except a change in P – will shift the AD curve.
- Example:
A stock market boom makes households feel wealthier, C rises, the AD curve shifts right.





➤ **AD Shifts Arising from Changes in C**

- People decide to save more:
 C falls, AD shifts left ¹⁸
- Stock market crash:
 C falls, AD shifts left ¹⁹
- Tax cut:
 C rises, AD shifts right ²⁰

➤ **AD Shifts Arising from Changes in I**

- Firms decide to upgrade their computers:
 I rises, AD shifts right ²¹
- Firms become pessimistic about future demand:
 I falls, AD shifts left ²²
- Central bank uses monetary policy to reduce interest rates:
 I rises, AD shifts right ²³
- Investment Tax Credit or other tax incentive:
 I rises, AD shifts right ²⁴

➤ AD Shifts Arising from Changes in G

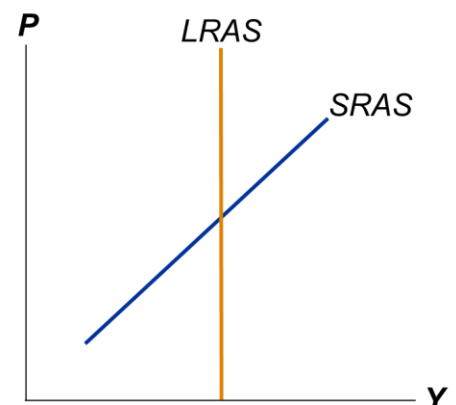
- Congress increases spending on homeland security:
 G rises, AD shifts right ²⁵
- State govts cut spending on road construction:
 G falls, AD shifts left ²⁶

➤ AD Shifts Arising from Changes in NX

- A boom overseas increases foreign demand for our exports:
 NX rises, AD shifts right ²⁷
- International speculators cause exchange rate to appreciate:
 NX falls, AD shifts left ²⁸

❖ The Aggregate-Supply (AS) Curves

- The AS curve shows the total quantity of $g\&s$ firms produce and sell at any given price level.²⁹
- In the short run, AS is upward-sloping.³⁰
- In the long run, AS is vertical.³¹



➤ **The Long-Run Aggregate-Supply Curve (LRAS)**

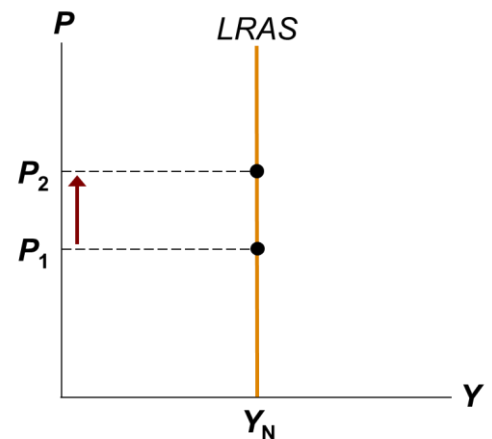
- The **natural rate of output (Y_N)** is the amount of output the economy produces when unemployment is at its natural rate.

Y_N is also called **potential output** or **full-employment output**.³²

➤ **Why LRAS Is Vertical**

- Y_N depends on the economy's stocks of labor, capital, and natural resources, and on the level of technology.

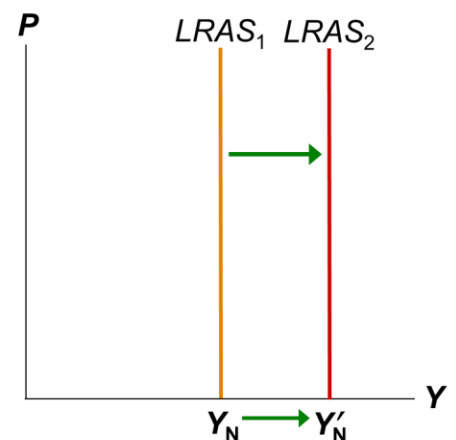
An increase in P does not affect any of these, so it does not affect Y_N . (*Classical dichotomy*)³³



➤ **Why the LRAS Curve Might Shift**

- Any event that changes any of the determinants of Y_N will shift LRAS.

- Example:
Immigration increases L , causing Y_N to rise.





➤ **LRAS Shifts Arising from Changes in L**

- The Baby Boom generation retires:
 L falls, *LRAS* shifts left ³⁴
- New government policies reduce the natural rate of unemployment:
the % of the labor force normally employed rises, *LRAS* shifts right ³⁵

➤ **LRAS Shifts Arising from Changes in Physical or Human Capital**

- Investment in factories or equipment:
 K rises, *LRAS* shifts right ³⁶
- More people get college degrees:
Human capital rises, *LRAS* shifts right ³⁷
- Earthquakes or hurricanes destroy factories:
 K falls, *LRAS* shifts left ³⁸

➤ **LRAS Shifts Arising from Changes in Natural Resources**

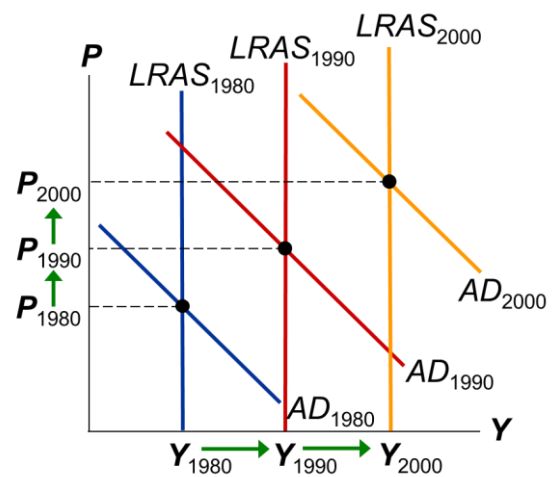
- A change in weather patterns makes farming more difficult:
LRAS shifts left
- Discovery of new mineral deposits:
LRAS shifts right
- Reduction in supply of imported oil or other resources: *LRAS* shifts right ³⁹

➤ **LRAS Shifts Arising from Changes in Technology**

- Technological advances allow more output to be produced from a given bundle of inputs: *LRAS* shifts right. ⁴⁰

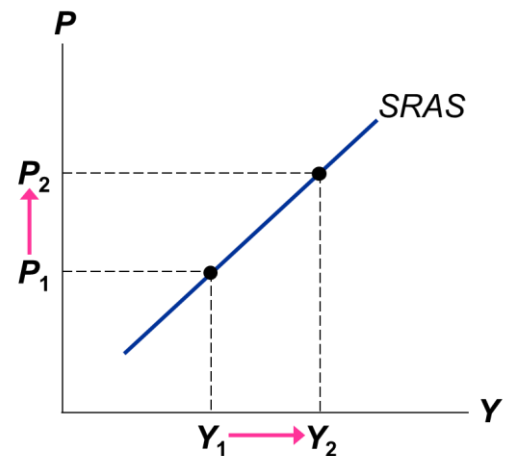
❖ **Using AD & AS to Depict LR Growth and Inflation**

- Over the long run, tech. progress shifts *LRAS* to the right and growth in the money supply shifts *AD* to the right.⁴¹
Result:
ongoing inflation and growth in output.



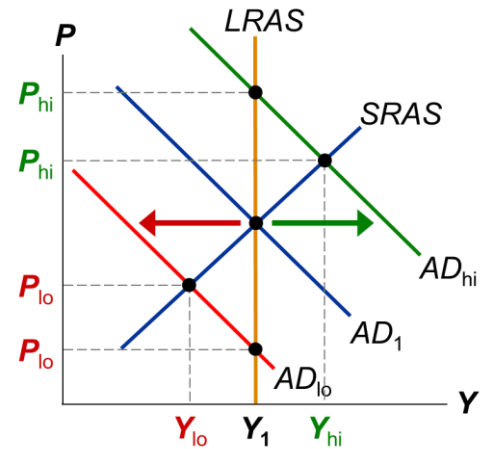
❖ **Short Run Aggregate Supply (SRAS)**

- The *SRAS* curve is upward sloping:
Over the period of 1-2 years, an increase in *P* causes an increase in the quantity of goods & services supplied.⁴²



➤ Why the Slope of SRAS Matters?

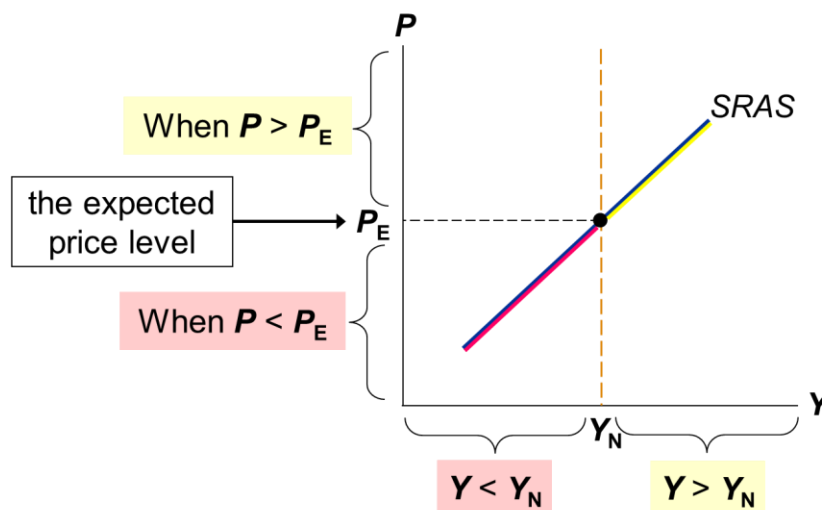
- If AS is vertical, fluctuations in AD do not cause fluctuations in output or employment.
If AS slopes up, then shifts in AD do affect output and employment.⁴³



❖ Three Theories of SRAS

- In each, some type of market imperfection
- Result:

*Output deviates from its natural rate when the actual price level deviates from the price level people expected.*⁴⁴





1. The Sticky-Wage Theory

- Imperfection:
Nominal wages are **sticky** in the short run, they adjust sluggishly.
Due to labor contracts, social norms.⁴⁵
- Firms and workers set the nominal wage in advance based on P_E , the price level they expect to prevail.⁴⁶
- If $P > P_E$, revenue is higher, but labor cost is not.⁴⁷
- Production is more profitable, so firms increase output and employment.
Hence, higher P causes higher Y , so the **SRAS curve slopes upward**.⁴⁸

2. The Sticky-Price Theory

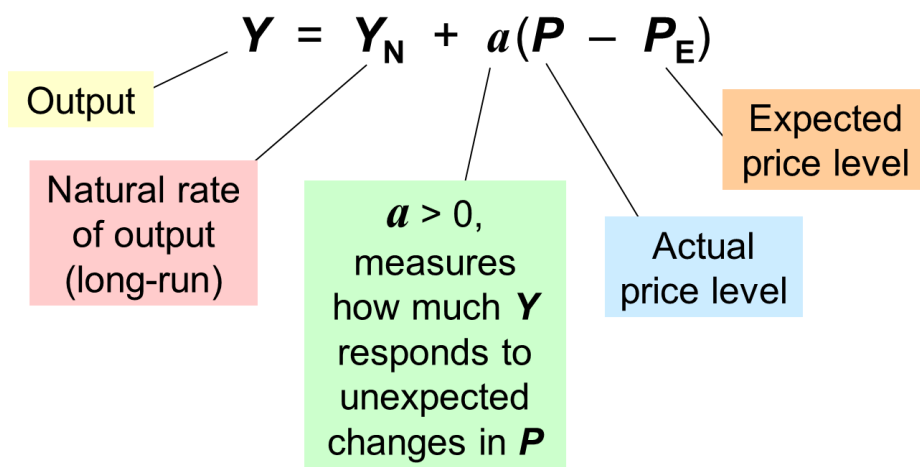
- Imperfection:
Many prices are sticky in the short run.
Due to **menu costs**, the costs of adjusting prices.⁴⁹
 - Ex. cost of printing new menus, the time required to change price tags.
- Firms set sticky prices in advance based on P_E .
Suppose the Fed increases the money supply unexpectedly. In the long run, P will rise.⁵⁰
- In the short run, firms without menu costs can raise their prices immediately. Firms with menu costs wait to raise prices. Meantime, their prices are relatively low, which increases demand for their products, so they increase output and employment.⁵¹
- Hence, higher P is associated with higher Y , so the **SRAS curve slopes upward**.⁵²

3. The Misperceptions Theory

- Imperfection:
Firms may confuse changes in P with changes in the relative price of the products they sell.⁵³
- If P rises above P_E , firm sees its price rise before realizing all prices are rising.⁵⁴
- The firm may believe its *relative* price is rising, and may increase output and employment.
So, an increase in P can cause an increase in Y , making the **SRAS curve upward-sloping**.⁵⁵

➤ **What the 3 Theories Have in Common:**

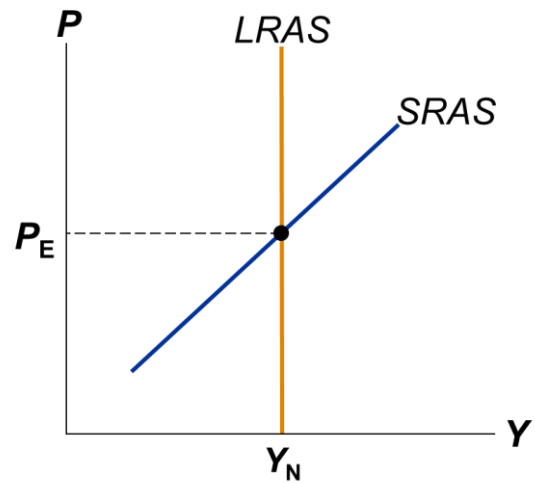
Each of the 3 theories implies Y deviates from Y_N when P deviates from P_E .



❖ **SRAS and LRAS**

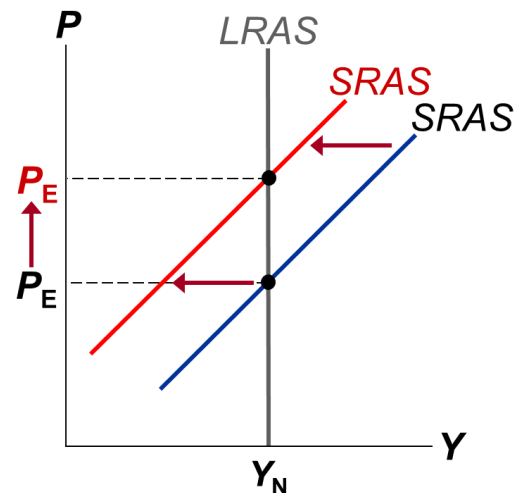
- The imperfections in these theories are temporary. Over time, sticky wages and prices become flexible misperceptions are corrected⁵⁶
- In the LR,
 - $P_E = P$
 - AS curve is vertical⁵⁷

$$Y = Y_N + a(P - P_E)$$



➤ **Why the SRAS Curve Might Shift**

- Everything that shifts LRAS shifts SRAS, too. Also, P_E shifts SRAS:⁵⁸
- If P_E rises, workers & firms set higher wages. At each P , production is less profitable, Y falls, SRAS shifts left.⁵⁹



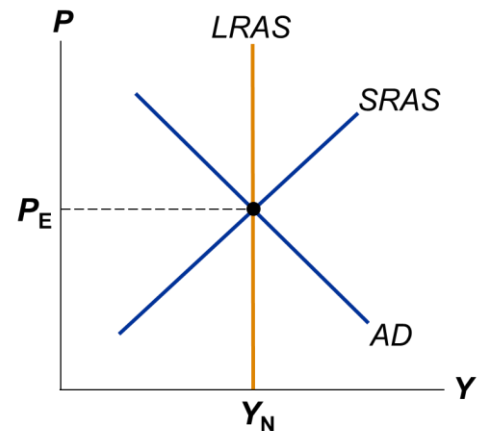
❖ The Long-Run Equilibrium

- In the long-run equilibrium,

$$P_E = P,$$

$$Y = Y_N,$$

and unemployment is at its natural rate.⁶⁰

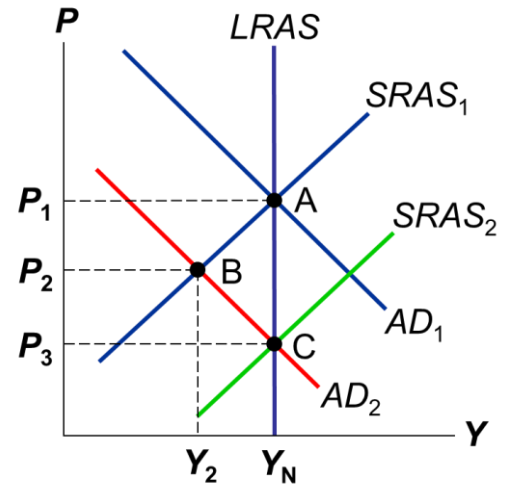


❖ Economic Fluctuations

- Caused by events that shift the *AD* and/or *AS* curves.⁶¹
- Four steps to analyzing economic fluctuations:
 1. Determine whether the event shifts *AD* or *AS*.⁶²
 2. Determine whether curve shifts left or right.⁶³
 3. Use *AD-AS* diagram to see how the shift changes *Y* and *P* in the short run.⁶⁴
 4. Use *AD-AS* diagram to see how economy moves from new *SR* equilibrium to new *LR* equilibrium.⁶⁵

❖ The Effects of a Shift in AD

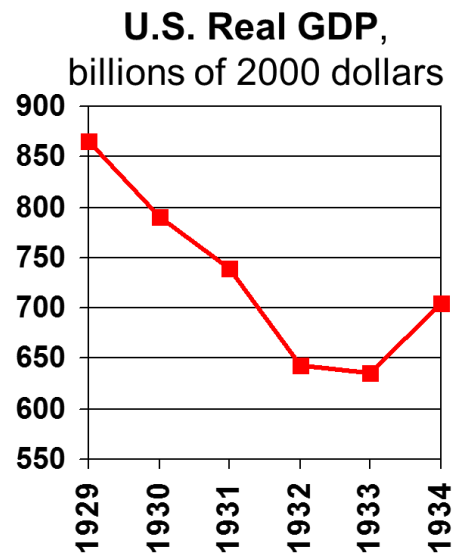
- Ex: stock market crash
 1. affects C , AD curve
 2. C falls, so AD shifts left
 3. SR equilibrium at B.
 P and Y lower, unemployment higher
 4. Over time, P_E falls,
SRAS shifts right, until LR equilibrium at C.
 Y and unemployment back at initial levels.



❖ Two Big AD Shifts

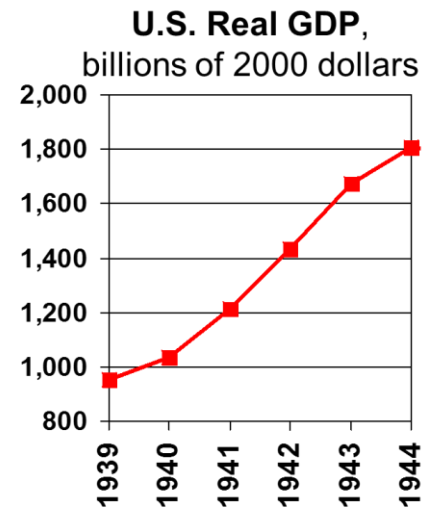
1. The Great Depression

- From 1929-1933, Money supply fell 28% due to problems in banking system⁶⁶
- Stock prices fell 90%, reducing C and I
 Y fell 27%
 P fell 22%
Unemployment rose from 3% to 25%⁶⁷



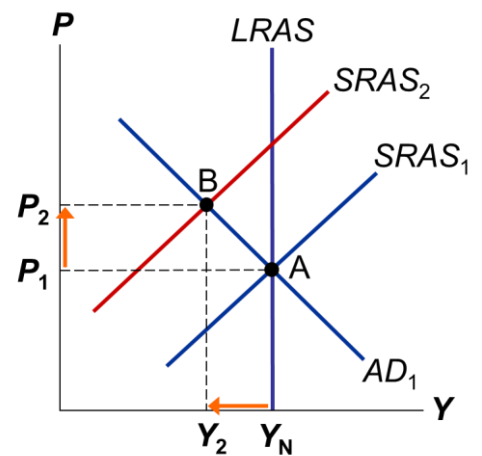
2. The World War II Boom

- From 1939-1944, Government outlays rose from \$9.1 billion to \$91.3 billion ⁶⁸
- Y rose 90%
- P rose 20%
- Unemployment fell from 17% to 1% ⁶⁹



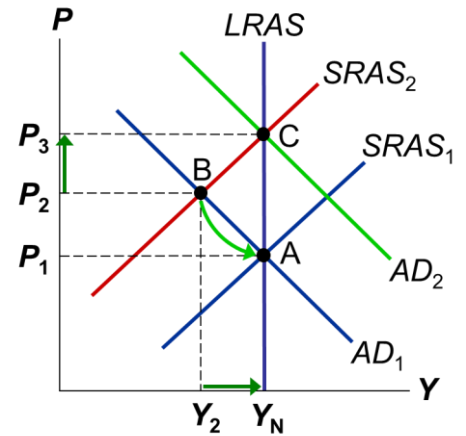
❖ The Effects of a Shift in *SRAS*

- Ex: oil prices rise
 1. increases costs, shifts *SRAS* (assume *LRAS* constant)
 2. *SRAS* shifts left
 3. SR equilibrium at point B.
 P higher, Y lower, unemployment higher
- From A to B, **stagflation**, a period of falling output and rising prices. ⁷⁰



❖ **Accommodating an Adverse Shift in SRAS**

- If policymakers do nothing,
 4. Low employment causes wages to fall, SRAS shifts right, until LR equilibrium at A.⁷¹
- Or, policymakers could use fiscal or monetary policy to increase AD and accommodate the AS shift: Y back to Y_N , but P permanently higher.⁷²



❖ **The 1970s Oil Shocks and Their Effects**

	1973-75	1978-80
Real oil prices	+ 138%	+ 99%
CPI	+ 21%	+ 26%
Real GDP	- 0.7%	+ 2.9%
# of unemployed persons	+ 3.5 million	+ 1.4 million



EXERCISE

1. What happens to the *AD* curve in each of the following scenarios?
 - A. A ten-year-old investment tax credit expires.
 - B. The U.S. exchange rate falls.
 - C. A fall in prices increases the real value of consumers' wealth.
 - D. State governments replace their sales taxes with new taxes on interest, dividends, and capital gains.

ANSWER:

- A. A ten-year-old investment tax credit expires.

I falls, *AD* curve shifts left.

- B. The U.S. exchange rate falls.

NX rises, *AD* curve shifts right.

- C. A fall in prices increases the real value of consumers' wealth.

Move down along *AD* curve (wealth-effect).

- D. State governments replace sales taxes with new taxes on interest, dividends, and capital gains.

C rises, *AD* shifts right.

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	In the long run, real GDP grows about how many % per year on average?	3%
2		In the long run, what grows about 3% per year on average	Real GDP
3	2	What refers to periods of falling real incomes and rising unemployment?	Recessions
4		What refers to the severe recessions?	Depressions
	3	What refers to the short-run economic fluctuations?	Business Cycle
6		What is Business Cycle?	Short-run economic fluctuations
7	4	Explaining these fluctuations is ...	difficult
8		theory of economic fluctuations...	controversial
9	5	Why Economists use the model of aggregate demand and aggregate supply?	to study fluctuations
10		Which model is used by Economists to study fluctuations?	aggregate demand and aggregate supply model
11	6	What Economists believes about classical theory?	describes in the long run
12		Economists believes which theory describes the world in the long run?	Classical theory
13	7	In the short run, changes in nominal variables can affect to what?	Real variables
14		What affect real variables?	changes in nominal variables



15	8	What is determined by the model of aggregate demand and aggregate supply?	equilibrium price level and the equilibrium level of output
16		What is equilibrium price level and the equilibrium level of output?	Real GDP
17	9	What is the full form of AD?	Aggregate Demand
18		Which curve shows the quantity of all goods & services demanded in the economy at any given price level?	AD Curve
19	10	What are the components of aggregate demand?	C, I, G, NX
20		What must be determined to understand the slope of AD?	change in P affects C, I, and NX
21	11	What is caused by an increase in P ?	fall in C
22		What causes a fall in C ?	Increase in price
23	12	Why people sell some of their bonds or other assets?	To get more money
24		What people do to get more money?	sell some of their bonds or other assets
25	13	An increase in P causes a decrease in what?	I
26		What causes a decrease in I ?	Price
27	14	What happens to interest rate if P rises?	Increases
28		Why interest rate increases?	Price rises
29	15	What should foreign investors first do for purchase bonds?	convert their currency
30		What makes exports more expensive to people abroad?	convert their currency
31	16	An increase in P causes a decrease in what?	NX
32		What causes a decrease in NX ?	Price



33	17	In which effect C falls?	Wealth effect
34		In which effect I falls?	Interest rate effect
35	18	What happens to C if people decide to save more?	C falls
36		What happens to AD Curve if people decide to save more?	AD shifts left
37	19	What happens to C when Stock market crash?	C falls
38		What happens to AD Curve when Stock market crash?	AD shifts left
39	20	What happens to C when tax cuts?	C rises
40		What happens to AD Curve when tax cuts?	AD shifts right
41	21	What happens to I when firms decide to upgrade their computers?	I rises
42		What happens to AD Curve when firms decide to upgrade their computers?	AD shifts right
43	22	What happens to I when firms become pessimistic about future demand?	I falls
44		What happens to AD Curve when firms become pessimistic about future demand?	AD shifts left
45	23	What happen to I when Central bank uses monetary policy to reduce interest rates?	I rises
46		What happen to AD Curve when Central bank uses monetary policy to reduce interest rates?	AD shifts right
47	24	What happens to I when investment tax credit or other tax incentive?	I rises
48		What happens to AD Curve when investment or other tax incentive?	AD shifts right



49	25	What happens to G when Central govt increases spending on homeland security?	G rises
50		What happens to AD Curve when Central govt increases spending on homeland security?	AD shifts right
51	26	What happens to G when State govts cut spending on road construction?	G falls
52		What happens to AD Curve when State govts cut spending on road construction?	AD shifts left
53	27	What happens to NX when a boom overseas increases foreign demand for our exports?	NX rises
54		What happens to AD Curve when a boom overseas increases foreign demand for our exports?	AD shifts right
55	28	What happens to NX when international speculators cause exchange rate to appreciate?	NX falls
56		What happens to AD Curve when international speculators cause exchange rate to appreciate?	AD shifts left
57	29	What shows the total quantity of goods & services firms produce and sell at any given price level?	AS Curve
58		What shows the AS Curve?	Shows the total quantity of g&s firms produce and sell
59	30	In the short run, AS is ...	Upward-sloping
60		In the..., AS is upward-sloping	Short run
61	31	In the long run, AS is ...	Vertical
62		In the..., AS is vertical	long run



63	32	What refers to the amount of output the economy produces when unemployment is at its natural rate?	Natural rate of output
64		How the Natural rate of output is denoted?	Y_N
65	33	Y_N depends on what?	economy's stocks of labor, capital, and natural resources
66		What depend on the economy's stocks of labor, capital, and natural resources?	Y_N
67	34	What happens to L when the Baby Boom generation retires?	L falls
68		What happens to $LRAS$ when the Baby Boom generation retires?	$LRAS$ shifts left
69	35	What happens to the % of labor employed when new government policies reduce the natural rate of unemployment?	% rises
70		What happens to $LRAS$ when new government policies reduce the natural rate of unemployment?	$LRAS$ shifts right
71	36	What happens to K when investment in factories or equipment?	K rises
72		What happens to $LRAS$ when investment in factories or equipment?	$LRAS$ shifts right
73	37	What happens to Human Capital when more people get college degrees?	Human capital rises
74		What happens to $LRAS$ when more people get college degrees?	$LRAS$ shifts right
75	38	What happens to K when earthquakes or hurricanes destroy factories?	K falls
76		What happens to $LRAS$, earthquakes or hurricanes destroy factories?	$LRAS$ shifts left



77	39	What happens to LRAS when change in weather patterns makes farming more difficult?	LRAS shifts left
78		What happens to LRAS when discovery of new mineral deposits?	LRAS shifts right
79	40	What happens to LRAS when technological advances allow more output to be produced from a given bundle of inputs?	LRAS shifts right
80		What allow more output to be produced from a given bundle of inputs?	Technological advances
81	41	In the long run, what shifts LRAS to the right?	Tech. progress
82		In the long run, Tech. progress shifts LRAS to the what?	Right
83	42	The SRAS curve is ...	upward sloping
84		What causes an increase in the quantity of goods & services supplied?	increase in P
85	43	When the fluctuations in AD do not cause fluctuations in output or employment?	If AS is vertical
86		When the shifts in AD do affect output and employment?	If AS slopes up
87	44	What deviates from its natural rate?	Output
88		What deviates from the price level people expected?	Actual price level
89	45	Nominal wages are ... in the short run	sticky
90		Why Nominal wages are sticky in the short run?	Due to labor contracts, social norms
91	46	Firms and workers set the nominal wage in advance based on what?	P_E
92		What is expected price level?	P_E



93	47	What happens to revenue when If $P > P_E$?	revenue is higher
94		What happens to labor cost when If $P > P_E$?	Not higher
95	48	What if Production is more profitable?	increase output and employment
96		Why SRAS curve slopes upward?	higher P causes higher Y
97	49	Many prices are ... in the short run	Sticky
98		Why Many prices are sticky in the short run?	Due to menu costs
99	50	Firms set sticky prices in advance based on what?	P_E
100		What happens to Price when Fed increases the money supply unexpectedly?	Price rises
101	51	firms without menu costs can raise their ... immediately	Prices
102		What if increases demand for their products?	increase output and employment
103	52	higher P is associated with what?	higher Y
104		Why SRAS curve slopes upward?	higher P is associated with higher Y
105	53	Which theory states that firms may confuse changes in P with changes in the relative price of the products they sell?	Misperception Theory
106		Firms may confuse changes in P with changes in the relative price with what?	products they sell
107	54	What if P rises above P_E ?	firm sees its price rise before realizing all prices
108		When a firm sees its price rise before realizing all prices?	P rises above P_E



109	55	An increase in P can cause an increase in what?	Y
110		An increase in P can cause an increase in Y makes SRAS Curve...	Upward-sloping
111	56	The imperfections in these theories are...	Temporary
112		In long time what happens to sticky wages and prices?	Flexible
113	57	In the long run, $P_E = ?$	P
114		In the long run, AS Curve is?	Vertical
115	58	Everything that shifts LRAS shifts which curve?	SRAS
116		P_E shifts which curve?	SRAS
117	59	What if P_E rises is SRAS?	workers & firms set higher wages
118		In SRAS, what happens to production at each P ?	less profitable
119	60	In the long-run equilibrium, $P_E = ?$	P
120		In the long-run equilibrium, unemployment?	at its natural rate
121	61	What is caused by events that shift the AD and/or AS curves?	Economic Fluctuations
122		How Economic Fluctuations are caused?	Shifts in AD and AS Curve
123	62	What is the first step to analyze economic fluctuations?	Determine whether the event shifts AD or AS
124		What is determined in the first step to analyze economic fluctuations?	event that shifts AD or AS
125	63	What is the second step to analyze economic fluctuations?	Determine whether curve shifts left or right
126		What is determined in the second step to analyze economic fluctuations?	curve shifts left or right



127	64	What is the third step to analyze economic fluctuations?	Use <i>AD-AS</i> diagram to see how the shift changes <i>Y</i> and <i>P</i> in the short run
128		What is used to see how the shift changes <i>Y</i> and <i>P</i> in the short run?	<i>AD-AS</i> diagram
129	65	What is the fourth step to analyze economic fluctuations?	Use <i>AD-AS</i> diagram to see how economy moves from new SR equilibrium to new LR equilibrium
130		What is used to see how economy moves from new SR equilibrium to new LR equilibrium?	<i>AD-AS</i> diagram
131	66	What was the period of the Great Depression?	1929-1933
132		What was happened to the money supply due to problems in banking system in the Great Depression?	Money supply fell
133	67	What was happened to the stock prices in the Great Depression?	fell 90%
134		What was happened to the unemployment in the Great Depression?	rose from 3% to 25%
135	68	What is the period of World War II Boom?	1939-1944
136		What is known as the period of 1939-1944?	World War II Boom
137	69	What was happened to the unemployment in the World War II Boom?	fell from 17% to 1%
138		What was happened to the <i>P</i> in the World War II Boom?	<i>P</i> rose 20%
139	70	What refers to a period of falling output and rising prices?	Stagflation
140		What is Stagflation?	Output falls, price rises



141	71	What happens to the wages in the low employment if policymakers do nothing?	Wages falls
142		What happens to the SRAS in the low employment if policymakers do nothing?	SRAS shifts right
143	72	Which policy policymakers could use to increase AD ?	fiscal or monetary policy
144		What happens to P if policymakers use fiscal or monetary policy?	P permanently higher



MBA SEM 01
Module 04 Chapter 02

❁ THE INFLUENCE OF MONETARY AND FISCAL
POLICY ON AGGREGATE DEMAND ❁

❖ Aggregate Demand

- Recall, the *AD* curve slopes downward for three reasons:
 - The wealth effect
 - The interest-rate effect
 - The exchange-rate effect ¹
- Next:
A supply-demand model that helps explain the interest-rate effect and how monetary policy affects aggregate demand.²

❖ The Theory of Liquidity Preference

- A simple theory of the interest rate (denoted *r*)
r adjusts to balance supply and demand for money³
- Money supply:
assume fixed by central bank, does not depend on interest rate⁴

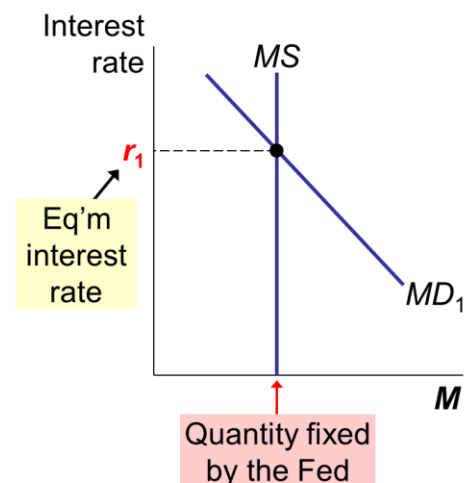
- Money demand reflects how much wealth people want to hold in liquid form.⁵
- For simplicity, suppose household wealth includes only two assets:
 - Money – liquid but pays no interest
 - Bonds – pay interest but not as liquid⁶
- A household’s “money demand” reflects its *preference for liquidity*.
The variables that influence money demand: Y , r , and P .⁷

❖ Money Demand

- Suppose real income (Y) rises. Other things equal, what happens to money demand?
- If Y rises:
 - Households want to buy more goods & services, so they need more money.⁸
 - To get this money, they attempt to sell some of their bonds.⁹
- *i.e.*, an increase in Y causes an increase in money demand, other things equal.¹⁰

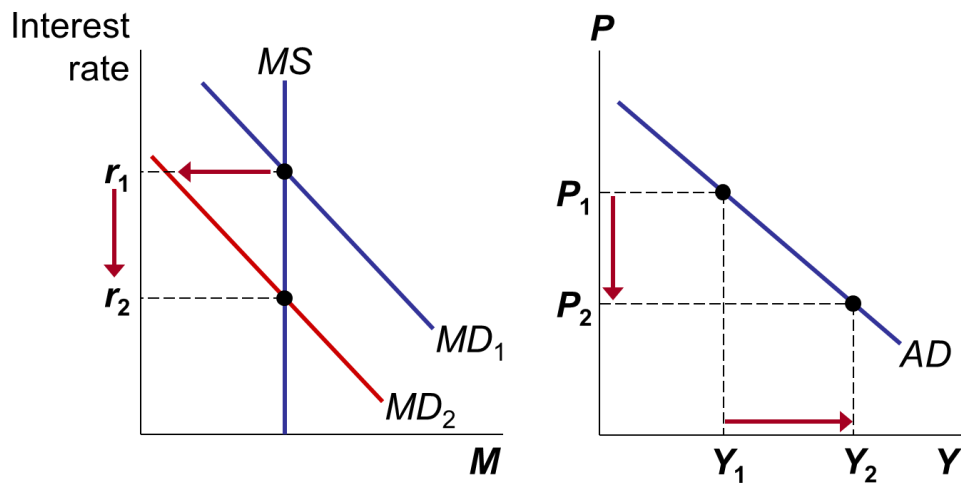
❖ How r is Determined

- **MS curve is vertical:** Changes in r do not affect MS , which is fixed by the Fed.¹¹
- **MD curve is downward sloping:** A fall in r increases money demand.¹²



❖ How the Interest-Rate Effect Works

- A fall in P reduces money demand, which lowers r .¹³
- A fall in r increases I and the quantity of goods & services demanded.¹⁴

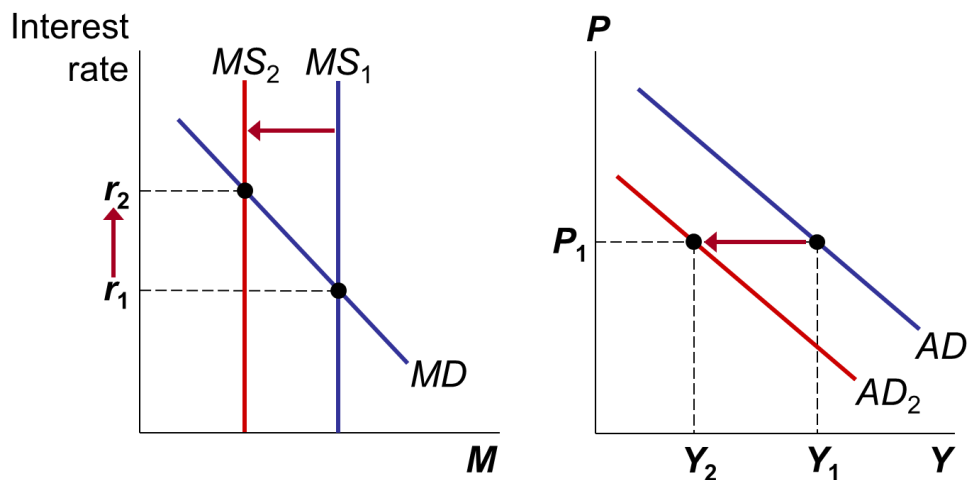


❖ Monetary Policy and Aggregate Demand

- To achieve macroeconomic goals, the Fed can use monetary policy to shift the AD curve.¹⁵
- The Fed's policy instrument is MS .¹⁶
- The news often reports that the Fed targets the interest rate. More precisely, the **federal funds rate** – which banks charge each other on short-term loans¹⁷
- To change the interest rate and shift the AD curve, the Fed conducts open market operations to change MS .¹⁸

❖ The Effects of Reducing the Money Supply

- The Fed can raise r by reducing the money supply.
An increase in r reduces the quantity of goods & services demanded.¹⁹



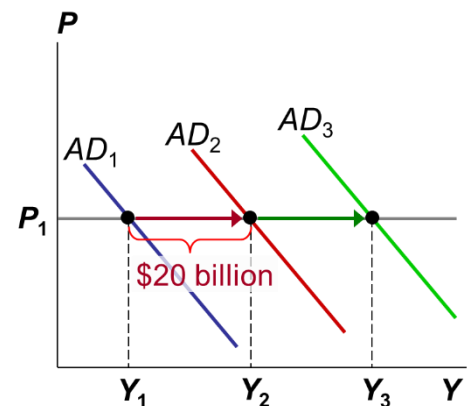
❖ Fiscal Policy and Aggregate Demand

- **Fiscal policy:** the setting of the level of govt spending and taxation by government policymakers²⁰
- **Expansionary** fiscal policy
an increase in G and/or decrease in T , shifts AD right²¹
- **Contractionary** fiscal policy
a decrease in G and/or increase in T , shifts AD left²²
- Fiscal policy has two effects on AD ...

1. The Multiplier Effect

- If the government buys \$20b of planes from Boeing, Boeing's revenue increases by \$20b.²³
- This is distributed to Boeing's workers (as wages) and owners (as profits or stock dividends).²⁴
- These people are also consumers and will spend a portion of the extra income. This extra consumption causes further increases in aggregate demand.²⁵
- **Multiplier effect: the additional shifts in AD that result when fiscal policy increases income and thereby increases consumer spending**²⁶

- Ex. A \$20b increase in G initially shifts AD to the right by \$20b.
The increase in Y causes C to rise, which shifts AD further to the right.



➤ Marginal Propensity to Consume

- How big is the multiplier effect?
It depends on how much consumers respond to increases in income.²⁷
- **Marginal propensity to consume (MPC):**
the fraction of extra income that households consume rather than save²⁸
E.g., if $MPC = 0.8$ and income rises \$100, C rises \$80.

➤ A Formula for the Multiplier

- Notation: ΔG is the change in G ,
 ΔY and ΔC are the ultimate changes in Y and C ²⁹
- $Y = C + I + G + NX$ identity
- $\Delta Y = \Delta C + \Delta G$ I and NX do not change
- $\Delta Y = MPC \Delta Y + \Delta G$ because $\Delta C = MPC \Delta Y$
- solved for ΔY

$$\Delta Y = \frac{1}{1 - MPC} \Delta G$$

The multiplier

- The size of the multiplier depends on MPC .³⁰
 - E.g., if $MPC = 0.5$ multiplier = 2
 - if $MPC = 0.75$ multiplier = 4
 - if $MPC = 0.9$ multiplier = 10
- A bigger MPC means changes in Y cause bigger changes in C , which in turn cause more changes in Y .³¹

➤ Other Applications of the Multiplier Effect

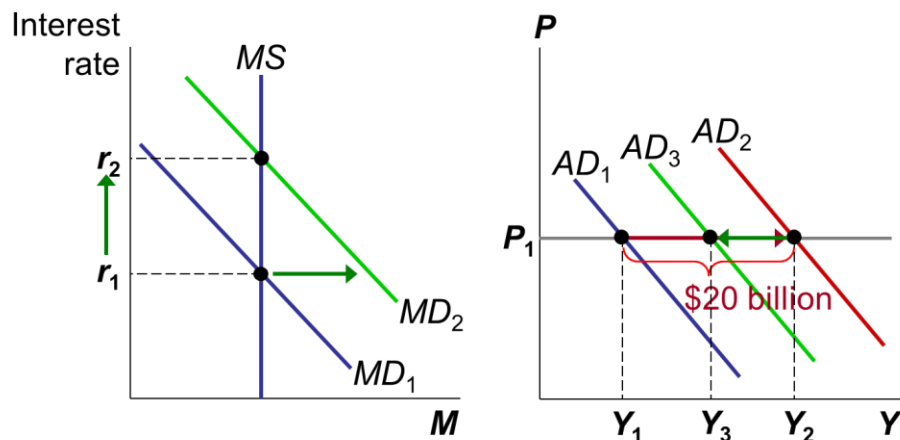
- The multiplier effect: Each \$1 increase in G can generate more than a \$1 increase in aggregate demand. Also true for the other components of GDP.³²
- Example: Suppose a recession overseas reduces demand for U.S. NX by \$10b. Initially, aggregate demand falls by \$10b. The fall in Y causes C to fall, which further reduces aggregate demand and income.

2. The Crowding-Out Effect

- Fiscal policy has another effect on AD that works in the opposite direction.³³
- A fiscal expansion raises r ,
 which reduces investment, which reduces the net increase in aggregate demand.³⁴
- So, the size of the AD shift may be smaller than the initial fiscal expansion. This is called the **crowding-out effect**.³⁵

➤ How the Crowding-Out Effect Works

- A \$20b increase in G initially shifts AD right by \$20b
 But higher Y increases MD and r , which reduces AD .³⁶





❖ Changes in Taxes

- A tax cut increases households' take-home pay. Households respond by spending a portion of this extra income, shifting AD to the right.³⁷
- The size of the shift is affected by the multiplier and crowding-out effects.³⁸
- Another factor:
whether households perceive the tax cut to be temporary or permanent.
A permanent tax cut causes a bigger increase in C – and a bigger shift in the AD curve – than a temporary tax cut.³⁹

❖ Fiscal Policy and Aggregate Supply

- Most economists believe the short-run effects of fiscal policy mainly work through aggregate demand.
But fiscal policy might also affect aggregate supply.⁴⁰
- A cut in the tax rate gives workers incentive to work more, so it might increase the quantity of goods & services supplied and shift AS to the right.⁴¹
- People who believe this effect is large are called “**Supply-siders.**” Govt purchases might affect aggregate supply.⁴²
- Example: Govt increases spending on roads.
Better roads may increase business productivity, which increases the quantity of goods & services supplied, shifts AS to the right.
This effect is probably more relevant in the long run: it takes time to build the new roads and put them into use.



❖ Using Policy to Stabilize the Economy

- Since the Employment Act of 1946, economic stabilization has been a goal of U.S. policy. Economists debate how active a role the govt should take to stabilize the economy.⁴³

❖ The Case for Active Stabilization Policy

- Keynes: “Animal spirits” cause waves of pessimism and optimism among households and firms, leading to shifts in aggregate demand and fluctuations in output and employment.⁴⁴
- Also, other factors cause fluctuations, e.g., booms and recessions abroad, stock market booms and crashes⁴⁵
- If policymakers do nothing, these fluctuations are destabilizing to businesses, workers, consumers.⁴⁶
- Proponents of active stabilization policy believe the govt should use policy to reduce these fluctuations:⁴⁷
 - When GDP falls below its natural rate, use expansionary monetary or fiscal policy to prevent or reduce a recession.⁴⁸
 - When GDP rises above its natural rate, use contractionary policy to prevent or reduce an inflationary boom.⁴⁹



- Monetary policy affects economy with a long lag:
 - Firms make investment plans in advance, so I takes time to respond to changes in r .⁵⁰
 - Most economists believe it takes at least 6 months for monetary policy to affect output and employment.⁵¹
- Fiscal policy also works with a long lag:
 - Changes in G and T require Acts of Congress. The legislative process can take months or years.⁵²
- Due to these long lags, critics of active policy argue that such policies may destabilize the economy rather than help it:⁵³
- By the time the policies affect aggregate demand, the economy's condition may have changed. These critics contend that policymakers should focus on long-run goals like economic growth and low inflation.⁵⁴

❖ Automatic Stabilizers

- Changes in fiscal policy that stimulate aggregate demand when economy goes into recession, without policymakers having to take any deliberate action⁵⁵

Examples:

- The tax system:
In recession, taxes fall automatically, which stimulates aggregate demand.
- Government spending:
In recession, more people apply for public assistance (welfare, unemployment insurance).
Government spending on these programs automatically rises, which stimulates aggregate demand.



EXERCISE

1. The determinants of money demand:

- A. Suppose r rises, but Y and P are unchanged. What happens to money demand?
- B. Suppose P rises, but Y and r are unchanged. What happens to money demand?

ANSWER:

- A. r is the opportunity cost of holding money.

An increase in r reduces money demand: households attempt to buy bonds to take advantage of the higher interest rate.

Hence, **an increase in r causes a decrease in money demand, other things equal.**

- B. If Y is unchanged, people will want to buy the same amount of goods & services.

Since P is higher, they will need more money to do so.

Hence, **an increase in P causes an increase in money demand, other things equal.**



2. Monetary policy:

For each of the events below,

- determine the short-run effects on output
- determine how the Fed should adjust the money supply and interest rates to stabilize output

- A. Congress tries to balance the budget by cutting govt spending.
- B. A stock market boom increases household wealth.
- C. War breaks out in the Middle East, causing oil prices to soar.

ANSWER:

- A. This event would reduce aggregate demand and output.
To offset this event, the Fed should increase MS and reduce r to increase aggregate demand.
- B. This event would increase aggregate demand, raising output above its natural rate.
To offset this event, the Fed should reduce MS and increase r to reduce aggregate demand.
- C. This event would reduce aggregate supply, causing output to fall.
To offset this event, the Fed should increase MS and reduce r to increase aggregate demand.

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	The <i>AD</i> curve slopes downward for how many reasons?	3 (Three)
2		What happens to the <i>AD</i> Curve with Wealth, interest-rate, exchange-rate?	Slopes downward
3	2	What is explained by a supply-demand model?	the interest-rate effect
4		What shows how monetary policy affects aggregate demand?	supply-demand model
	3	Which is a simple theory of the interest rate?	Liquidity Preference Theory
6		Liquidity Preference Theory is denoted by what?	<i>r</i>
7	4	What is assumed for money supply in Liquidity Preference Theory?	fixed by central bank
8		What is assumed for money supply in Liquidity Preference Theory?	not depend on interest rate
9	5	What reflects how much wealth people want to hold in liquid form?	Money demand
10		What is reflected by Money demand?	wealth people want to hold in liquid form
11	6	What is liquid but household do not pay interest?	Money
12		What is liquid but household pay interest?	Bonds
13	7	What reflects household's preference for liquidity?	money demand
14		What are the variables that influence money demand?	<i>Y</i> , <i>r</i> , and <i>P</i>



15	8	What if Y rises?	Households want to buy more goods & services
16		What household need if they want to buy more goods & services?	Money
17	9	What households do to get money?	sell some of their bonds
18		Why household sell bonds?	To get money
19	10	An increase in Y causes an increase in what?	money demand
20		What causes an increase in money demand?	Increase in Y
21	11	When the changes in r do not affect MS ?	When MS curve is vertical
22		What is fixed by the central govt?	Changes in r
23	12	What increases when MD curve is downward sloping?	Money demand
24		What increases money demand?	fall in r
25	13	What is reduced by fall in P ?	Money demand
26		A fall in P reduces money demand, which lowers...	r
27	14	What is increased by fall in r ?	I
28		What increases the quantity of goods & services demanded?	fall in r
29	15	Fed can use monetary policy for what?	to shift the AD curve
30		To shift the AD curve, what Fed do?	Use monetary policy
31	16	What is the Fed's policy instrument?	MS
32		MS id=s what for the Fed?	policy instrument
33	17	What refers to the charge of banks that each other on short-term loans?	federal funds rate
34		What is federal funds rate?	banks charge each other on short-term loans
35	18	Why Fed conducts OMOs?	To change MS
36		What Fed do to change the interest rate and shift the AD curve?	Conducts OMOs



37	19	How Fed can raise r ?	Reducing the MS
38		An increase in r reduces what?	Quantity of goods & services demanded
39	20	What refers to the setting of the level of govt spending and taxation by government policymakers?	Fiscal policy
40		What is fiscal policy?	setting of the level of govt spending and taxation
41	21	Which policy an increase in G and/or decrease in T , shifts AD right?	Expansionary fiscal policy
42		In Expansionary fiscal policy, an increase in G and/or decrease in T shifts AD ...	Right
43	22	In Contractionary fiscal policy, a decrease in G and/or increase in T , shifts AD ...	Left
44		Which policy decreases in G and/or increase in T , shifts AD left?	Contractionary fiscal policy
45	23	What happens when the government buys planes from Boeing?	Boeing's revenue increases
46		Why Boeing's revenue increases?	If the government buys planes from Boeing
47	24	Revenue is distributed to workers as?	as wages
48		Revenue is distributed to owners as?	as profits
49	25	What happens when extra consumption increases?	Increases in aggregate demand
50		What causes increase in aggregate demand?	extra consumption
51	26	What happens to AD when fiscal policy increases income?	additional shifts in AD
52		Fiscal policy increases income and thereby increases what?	Consumer spending



53	27	What depends on how much consumers respond to increases in income?	Multiplier effect
54		Multiplier effect depends on?	consumers respond to increases in income
55	28	What refers to the fraction of extra income that households consume rather than save?	Marginal propensity to consume
56		What is the full form of MPS?	Marginal propensity to consume
57	29	What is ΔG ?	the change in G
58		ΔY and ΔC are the ultimate changes in what?	Y and C
59	30	The size of the multiplier depends on what?	MPC
60		What is depended on MPC ?	size of the multiplier
61	31	What is the meaning of a bigger MPC ?	changes in Y cause bigger changes in C
62		What is the meaning of changes in Y cause bigger changes in C ?	bigger MPC
63	32	Each \$1 increase in G can generate more than a \$1 increase in what?	aggregate demand
64		Each \$1 increase in G can generate more than a \$1 increase in aggregate demand is which effect?	The multiplier effect
65	33	Fiscal policy has another effect on AD that works in the which direction?	Opposite
66		Fiscal policy has another effect on <i>what</i> that works in the opposite direction?	AD
67	34	What raised by a fiscal expansion?	Raises r
68		A fiscal expansion raises r which reduces what?	Reduces investment



69	35	What refers to the size of the <i>AD</i> shift may be smaller than the initial fiscal expansion?	Crowding-out effect
70		What is the smaller than the initial fiscal expansion?	Size of the <i>AD</i> shift
71	36	Increase in <i>G</i> initially shifts <i>AD</i> ...	Right
72		What shifts <i>AD</i> right?	Increase in <i>G</i>
73	37	What increases households' take-home pay?	Tax cut
74		What happens to <i>AD</i> when households respond by spending a portion of this extra income?	<i>AD</i> shifts right
75	38	The size of the shift is affected by what?	Multiplier and crowding-out effects
76		What is affected by multiplier and crowding-out effects?	Size of the shift
77	39	What causes a bigger increase in <i>C</i> ?	Permanent tax cut
78		What causes a bigger shift in the <i>AD</i> curve?	Permanent tax cut
79	40	The short-run effects of fiscal policy mainly work through?	Aggregate demand
80		Fiscal policy might also affect what?	Aggregate supply
81	41	What gives workers incentive to work more?	Cut in the tax rate
82		What increase the quantity of <i>g&s</i> supplied and shift <i>AS</i> to the right?	Cut in the tax rate
83	42	What is called to people who believe this effect is large?	Supply-siders
84		What is affected by Govt purchases?	Aggregate supply
85	43	When the Employment Act was established?	1946
86		What is the goal of the Employment Act of 1946?	Economic stabilization



87	44	What caused waves of pessimism and optimism among households and firms?	Animal spirits
88		Animal Spirits lead to shifts in aggregate demand and fluctuations in what?	output and employment
89	45	What causes fluctuations?	Booms and recessions abroad
90		What causes fluctuations?	Stock market booms and crashes
91	46	What happens if policymakers do nothing to these fluctuations?	Destabilizing to businesses, workers, consumers
92		What is destabilizing to businesses, workers, consumers?	If policymakers do nothing
93	47	What believes that the govt should use policy to reduce these fluctuations?	Proponents of active stabilization policy
94		What is believed by proponents of active stabilization policy?	Govt should use policy to reduce fluctuations
95	48	Which policy should be used when GDP falls below its natural rate?	expansionary monetary or fiscal policy
96		When should expansionary monetary or fiscal policy used?	GDP falls below its natural rate
97	49	Which policy should be used when GDP rises above its natural rate?	Contractionary policy
98		When should contractionary policy be used?	GDP rises above its natural rate
99	50	When I takes time to respond to changes in r ?	Firms make investment plans in advance
100		What happens to I when firms make investment plans in advance?	Takes time to respond to changes in r
101	51	How many months for monetary policy to affect output and employment?	At least 6 months



102		Monetary policy takes at least 6 months to affect what?	output and employment
103	52	What requires Acts of Central Govt?	Changes in G and T
104		Changes in G and T requires what?	Acts of Central Govt
105	53	What critics of active policy argue?	Such policies may destabilize the economy
106		Why critics of active policy argue that such policies may destabilize the economy?	Due to long lags
107	54	Monetary and Fiscal policies affect what?	Aggregate demand
108		What happened to the economy by the time the policies affect aggregate demand?	Condition may have changed
109	55	What stimulates changes in fiscal policy?	Aggregate demand
110		When changes in fiscal policy that stimulate aggregate demand?	Economy goes into recession



MBA SEM 01
Module 04 Chapter 03

❁ THE SHORT-RUN TRADE-OFF BETWEEN
INFLATION AND UNEMPLOYMENT ❁

❖ Introduction

- In the long run, inflation & unemployment are unrelated: ¹
 - The inflation rate depends mainly on growth in the money supply.²
 - Unemployment (the “natural rate”) depends on the minimum wage, the market power of unions, efficiency wages, and the process of job search.³

❖ The Phillips Curve

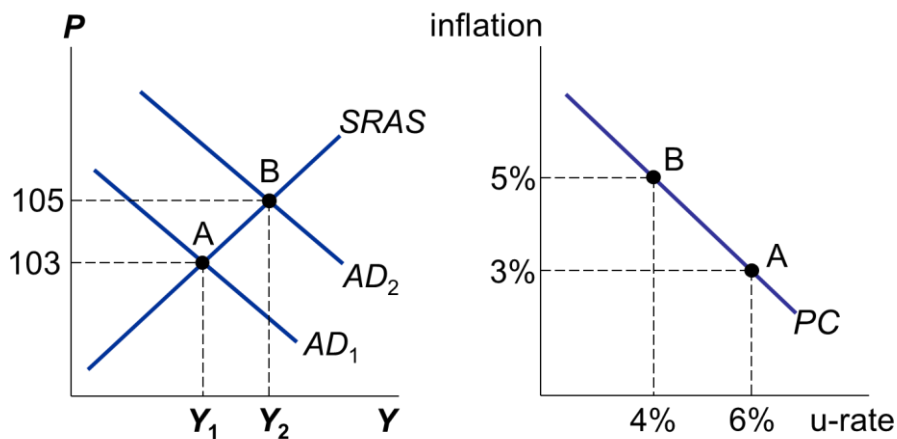
- **Phillips curve:**
shows the short-run trade-off between inflation and unemployment ⁴
- 1958: A.W. Phillips showed that nominal wage growth was negatively correlated with unemployment in the U.K. ⁵
- 1960: Paul Samuelson & Robert Solow found a negative correlation between U.S. inflation & unemployment, named it “the Phillips Curve.” ⁶

➤ Deriving the Phillips Curve

- Suppose $P = 100$ this year.

The following graphs show two possible outcomes for next year:

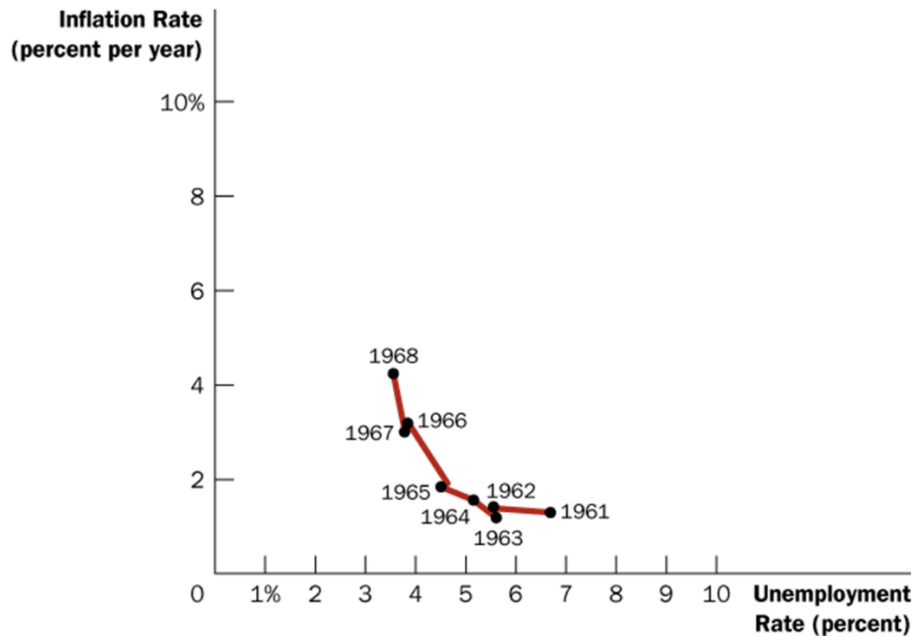
- Aggregate demand low, small increase in P (i.e., low inflation), low output, high unemployment. ⁷
- Aggregate demand high, big increase in P (i.e., high inflation), high output, low unemployment. ⁸



➤ The Phillips Curve: A Policy Menu?

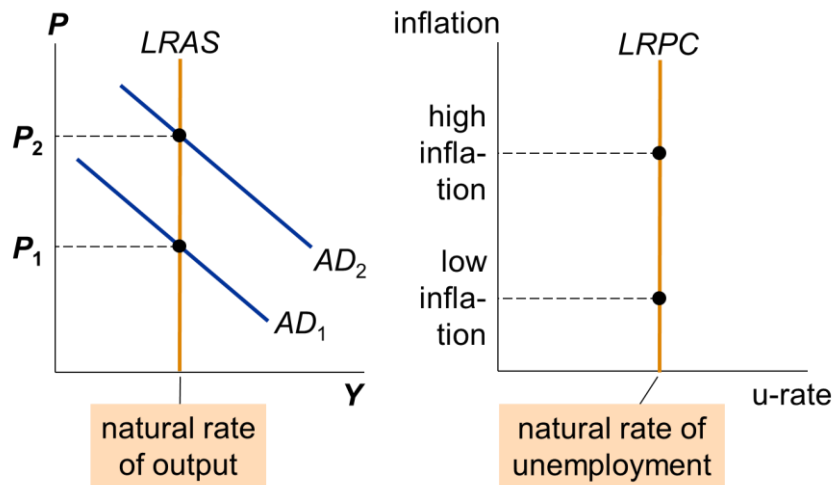
- Since fiscal and monetary policy affect aggregate demand, the PC appeared to offer policymakers a menu of choices:
 - low unemployment with high inflation
 - low inflation with high unemployment
 - anything in between ⁹
- 1960s: U.S. data supported the Phillips curve. Many believed the PC was stable and reliable. ¹⁰

➤ Evidence for the Phillips Curve?



➤ The Vertical Long-Run Phillips Curve

- 1968: Milton Friedman and Edmund Phelps argued that the tradeoff was temporary. ¹¹
- **Natural-rate hypothesis:**
the claim that unemployment eventually returns to its normal or “natural” rate, regardless of the inflation rate ¹²
- Based on the classical dichotomy and the vertical *LRAS* curve.
In the long run, faster money growth only causes faster inflation. ¹³



➤ **Reconciling Theory and Evidence**

- Evidence (from '60s): *PC* slopes downward. ¹⁵
- Theory (Friedman and Phelps' work): *PC* is vertical in the long run. ¹⁶
- To bridge the gap between theory and evidence, Friedman and Phelps introduced a new variable: **expected inflation** – a measure of how much people expect the price level to change. ¹⁷

➤ **The Phillips Curve Equation**

$$\text{Unemployment rate} = \text{Natural rate of unemployment} - a \left(\text{Actual inflation} - \text{Expected inflation} \right)$$

- **Short run**

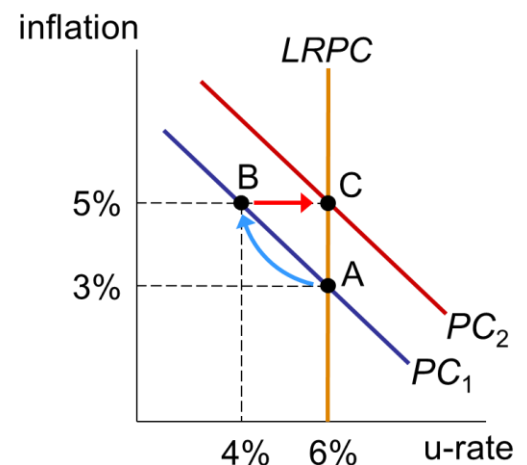
Fed can reduce u-rate below the natural u-rate by making inflation greater than expected. ¹⁸

- **Long run**

Expectations catch up to reality, u-rate goes back to natural u-rate whether inflation is high or low. ¹⁹

❖ **How Expected Inflation Shifts the PC**

- Ex. Initially, expected & actual inflation = 3%, unemployment = natural rate (6%).
- Fed makes inflation 2% higher than expected, u-rate falls to 4%.
- In the long run, expected inflation increases to 5%, PC shifts upward, unemployment returns to its natural rate.

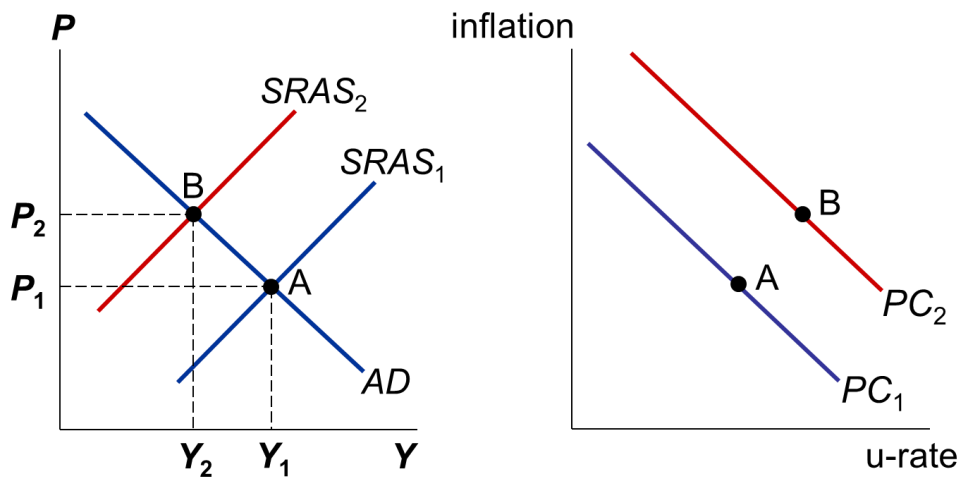


❖ **Another PC Shifter: Supply Shocks**

- **Supply shock:** an event that directly alters firms' costs and prices, shifting the AS and PC curves ²⁰
- Example: large increase in oil prices

➤ **How an Adverse Supply Shock Shifts the *PC***

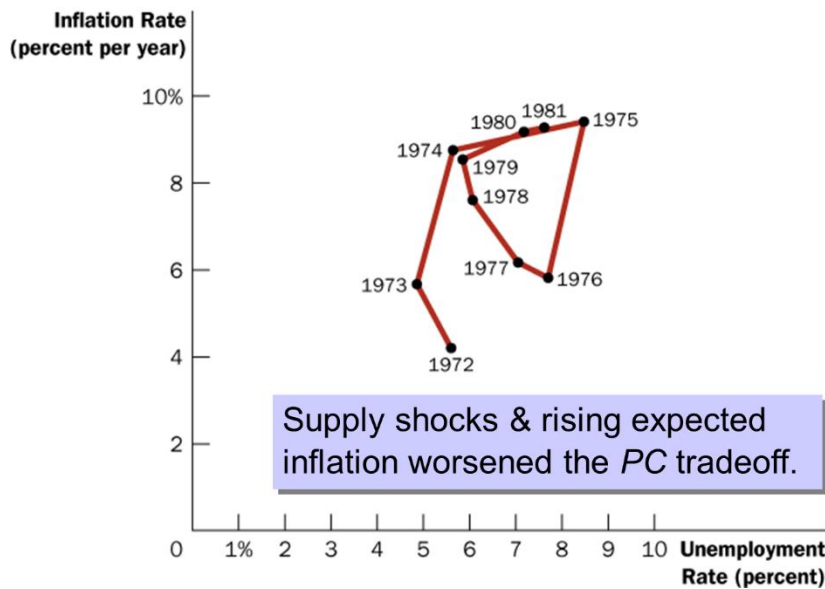
- *SRAS* shifts left, prices rise, output & employment fall.
Inflation & u-rate both increase as the *PC* shifts upward. ²¹



➤ **Example: The 1970s Oil Price Shocks**

- The Fed chose to accommodate the first shock in 1973 with faster money growth.
- Result:
Higher expected inflation, which further shifted *PC*.
- 1979:
Oil prices surged again, worsening the Fed's tradeoff.

Oil price per barrel	
1/1973	\$ 3.56
1/1974	10.11
1/1979	14.85
1/1980	32.50
1/1981	38.00

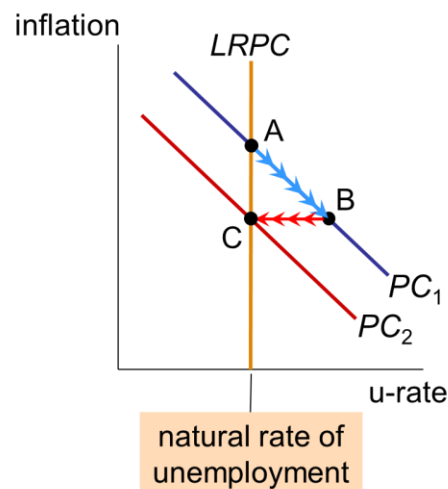


❖ The Cost of Reducing Inflation

- **Disinflation:** a reduction in the inflation rate ²²
- To reduce inflation, Fed must slow the rate of money growth, which reduces aggregate demand. ²³
- Short run: output falls and unemployment rises. ²⁴
- Long run: output & unemployment return to their natural rates. ²⁵

❖ Disinflationary Monetary Policy

- Contractionary monetary policy moves economy from A to B. Over time, expected inflation falls, *PC* shifts downward. ²⁶
- In the long run, point C: the natural rate of unemployment, and lower inflation. ²⁷



- Disinflation requires enduring a period of high unemployment and low output. ²⁸
- **Sacrifice ratio**: the number of percentage points of annual output lost in the process of reducing inflation by 1 percentage point ²⁹
- Typical estimate of the sacrifice ratio: 5
 - Reducing inflation rate 1% requires a sacrifice of 5% of a year's output. ³⁰
- This cost can be spread over time.
- Example: To reduce inflation by 6%, can either
 - sacrifice 30% of GDP for one year
 - sacrifice 10% of GDP for three years

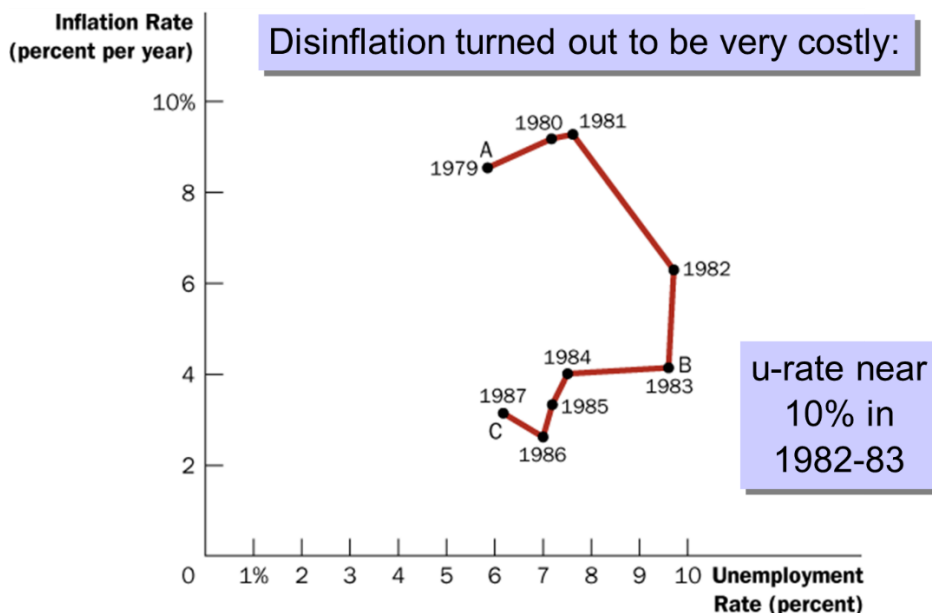
❖ Rational Expectations, Costless Disinflation?

- **Rational expectations**: a theory according to which people optimally use all the information they have, including info about govt policies, when forecasting the future ³¹
- Early proponents: Robert Lucas, Thomas Sargent, Robert Barro implied that disinflation could be much less costly... ³²

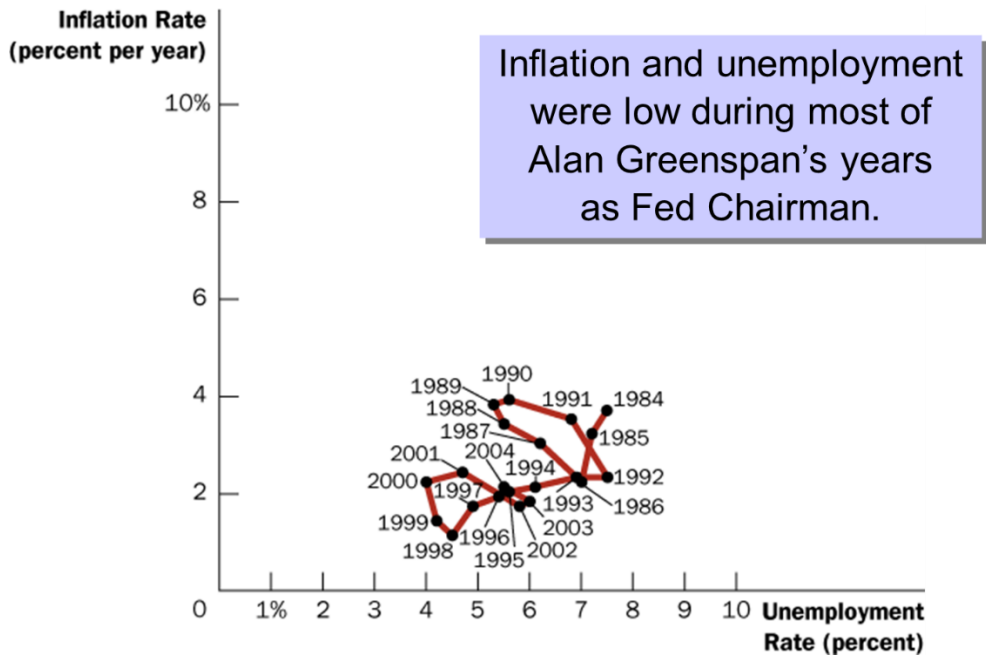
- Suppose the Fed convinces everyone it is committed to reducing inflation. Then, expected inflation falls, the short-run *PC* shifts downward. ³³
- Result:
Disinflations can cause less unemployment than the traditional sacrifice ratio predicts. ³⁴

❖ The Volcker Disinflation

- Fed Chairman Paul Volcker, appointed in late 1979 under high inflation & unemployment and changed Fed policy to disinflation. ³⁵
- 1981-1984:
 - Fiscal policy was expansionary, so Fed policy needed to be very contractionary to reduce inflation. ³⁶
- Success: Inflation fell from 10% to 4%, but at the cost of high unemployment... ³⁷



❖ **The Greenspan Era: 1987-2006**



❖ **1990s: The End of the Phillips Curve?**

- During the 1990s, inflation fell to about 1%, unemployment fell to about 4%. Many felt *PC* theory was no longer relevant. ³⁸
- Many economists believed the Phillips curve was still relevant; it was merely shifting down: Expected inflation fell due to the policies of Volcker and Greenspan. ³⁹
- Three favorable supply shocks occurred:
 1. Declining commodity prices (including oil) ⁴⁰
 2. Labor-market changes (reduced the natural rate of unemployment) ⁴¹
 3. Technological advance (the information technology boom of 1995-2000) ⁴²

ONE WORD QUESTION ANSWERS - TWO QUESTIONS FROM EACH LINE

SR NO.	LINE NO.	QUESTIONS	ANSWERS
1	1	What are unrelated in the long run?	Inflation & Unemployment
2		Inflation & Unemployment are what in the long run?	Unrelated
3	2	What is depended on growth in the money supply?	The inflation rate
4		The inflation rate depends on what?	Growth in the money supply
	3	Unemployment depends on what?	Minimum wage
6		What is depended on minimum wage?	Unemployment
7	4	What shows the short-run trade-off between inflation & unemployment?	Phillips curve
8		Phillips curve shows the relationship between what?	Inflation & Unemployment
9	5	Who showed that nominal wage growth was negatively correlated with unemployment?	A.W. Phillips
10		When A.W. Phillips showed that nominal wage growth was negatively correlated with unemployment?	1958
11	6	Who found a negative correlation between inflation & unemployment?	Paul Samuelson & Robert Solow
12		What is named to Paul & Robert Solow found a negative correlation between inflation & unemployment?	Phillips Curve
13	7	What is the outcome in the low inflation in Phillips Curve?	Aggregate demand low, low output, high unemployment
14		Aggregate demand low, low output, high unemployment are the outcomes of what in Phillips Curve?	Low Inflation



15	8	What is the outcome in the high inflation in Phillips Curve?	Aggregate demand high, high output, low unemployment
16		Aggregate demand high, high output, low unemployment are the outcomes of what in Phillips Curve?	High Inflation
17	9	What Phillips Curve offer to policymakers?	Menu of choices
18		Menu of choices are offered to the policymakers in what?	Phillips Curve
19	10	What people believed about the Phillips Curve?	Stable and reliable
20		What supported the Phillips curve in 1960s?	U.S. data
21	11	What argued Milton Friedman and Edmund Phelps?	Tradeoff was temporary
22		Who argued that the tradeoff was temporary in 1968?	Milton Friedman and Edmund Phelps
23	12	What refers to the claim that unemployment eventually returns to its normal or natural rate?	Natural-rate hypothesis
24		What is Natural-rate hypothesis?	Unemployment eventually returns to its natural rate
25	13	What causes faster inflation?	Faster money growth
26		What is caused by faster money growth?	Faster inflation
27	14	What is increased by fall in r ?	I
28		What increases the quantity of goods & services demanded?	fall in r
29	15	What is evidence for PC from '60s?	PC slopes downward
30		PC slopes in which direction?	Downward
31	16	How is PC in the theory of Friedman and Phelps' work?	PC is vertical



32		PC is ... in the long run?	Vertical
33	17	What refers to a measure of how much people expect the price level to change?	Expected inflation
34		What is expected inflation?	How much people expect the price level to change
35	18	How Fed can reduce u-rate below the natural u-rate?	By making inflation greater than expected
36		By making inflation greater than expected what Fed can do?	Reduce u-rate below the natural u-rate
37	19	In the long run, u-rate goes back to what?	Natural u-rate
38		In the long run, what goes back to natural u-rate whether inflation is high or low?	U-rate
39	20	What refers to an event that directly alters firms' costs and prices, shifting the AS and PC curves?	Supply shock
40		What shifts by an event that directly alters firms' costs and prices?	AS and PC curves
41	21	What is the adverse effect of Supply Shock to SRAS?	SRAS shifts left
42		What is the adverse effect of Supply Shock to PC?	PC shifts upward
43	22	What refers to a reduction in the inflation rate?	Disinflation
44		What is Disinflation?	Reduction in the inflation rate
45	23	What Fed must do to reduce inflation?	Slow rate of money growth
46		What if Fed slows the rate of money growth?	Reduces aggregate demand
47	24	What is the effect of disinflation in the short run?	output falls and unemployment rises



48		Output falls and unemployment rises is the effects of disinflation in the...	Short run
49	25	In the... output & unemployment return to their natural rates?	Long run
50		What happens to the output and unemployment in the long run?	Returns to their natural rates
51	26	What moves economy from A to B?	Contractionary monetary policy
52		Contractionary monetary policy moves economy to?	A to B
53	27	What happens to unemployment at the point C?	Natural rate of unemployment
54		What happens to inflation at the point C?	Lower inflation
55	28	What requires enduring a period of high unemployment and low output?	Disinflation
56		Disinflation requires what?	High unemployment and low output
57	29	What refers to the number of percentage points of annual output lost in the process of reducing inflation by 1 percentage point?	Sacrifice ratio
58		What is Sacrifice Ratio?	Loss in the process of reducing inflation
59	30	What is required to reducing inflation rate 1%?	Sacrifice of 5% of a year's output
60		What if sacrifice of 5% of a year's output?	Reduce 1% inflation
61	31	What refers to a theory according to which people optimally use all the information they have?	Rational expectations



62		What is Rational expectations?	a theory according to which people optimally use all the information they have
63	32	Who implied that disinflation could be much less costly?	Robert Lucas, Thomas Sargent, Robert Barro
64		What is implied by Robert Lucas, Thomas Sargent, Robert Barro for disinflation?	Less costly
65	33	What happens to inflation if Fed convinces everyone it is committed to reducing inflation?	Inflation falls
66		What happens to PC if Fed convinces everyone it is committed to reducing inflation?	PC shifts downward
67	34	What causes less unemployment than the traditional sacrifice ratio predicts?	Disinflation
68		What is caused by disinflation?	Less unemployment
69	35	When was the Fed Chairman Paul Volcker appointed?	In the late 1979
70		Who changed Fed policy to disinflation?	Paul Volcker
71	36	Which policy was expansionary?	Fiscal policy
72		Fiscal policy was expansionary, so Fed policy needed to be very contractionary to what?	Reduce inflation
73	37	Inflation fell from 10% to 4% 1981-1984, but at the cost of what?	High unemployment
74		What fell at the cost of high unemployment 1981-1984?	Inflation
75	38	When was the PC theory was no longer relevant?	During the 1990s
76		When was the inflation fell to about 1%, unemployment fell to about 4%?	During the 1990s



77	39	What Many economists believed about the Phillips curve?	Still relevant
78		What fell due to the policies of Volcker and Greenspan?	Expected inflation
79	40	What is the first favorable supply shock?	Declining commodity prices
80		Declining commodity prices including what?	Oil
81	41	What is the second favorable supply shock?	Labor-market changes
82		What reduced by Labor-market changes?	Natural rate of unemployment
83	42	What is the third favorable supply shock?	Technological advance
84		When was the information technology boom occurred?	In 1995-2000