Economics for Engineers (HSS 204)

Dr. Swati Sharma

Course Design

Course Topics	*Lecture Hours*	*COs*
UNIT – I	10	CO-1
1.1: Micro and macroeconomics, Nature of Economics: Positive and normative economics. Basic economic problems.	3	
1.2: Theory of utility and consumer's choice. Theory of demand, supply and market equilibrium	7	
UNIT – II	10	CO-2
2.1: Theory of production and costs	4	
2.2: Market structures: Perfect and imperfect competition, monopoly, oligopoly.	6	
UNIT – III	10	CO-3
3.1: An overview of macroeconomics, measurement and determination of national income. Consumption, saving, and investment.	7	
3.2: Money and banking.	3	
UNIT-IV	10	CO-4, CO-5
4.1: Money, prices and inflation, Unemployment; Stabilization policies: Monetary, Fiscal	6	
4.2: International trade, balance of payments, foreign exchange rate.	4	

Evaluation Method

Evaluation Method		
Item	Weightage (%)	Associated COs
Quiz I	10	CO1
Quiz II	10	CO2
Quiz III	10	CO3
Midterm	25	CO1, CO2
Final Examination	45	CO1, CO2, CO3, CO5

Why Economics?

A good understanding of this subject will not only help us learn economics as an academic discipline but would also help us understand the world and the reality that we are in. Specifically, a study of this course will help us:

1. Appreciate events in economic history and understand how the present-day system of economics came to be.
2. Learn the ways in which economics explain the activities of man through its tools, models, principles and standards.
3. Make use of production and consumption concepts in business endeavors or simply in understanding people's economic behavior.

What is Economics?

- All economic questions arise because we want more than we can get.
- Our inability to satisfy all our wants is called scarcity.
- Because we face scarcity, we must make choices.
- The choices we make depends on the incentives we face.
- An incentive is a reward that encourages or a penalty that discourages an action.

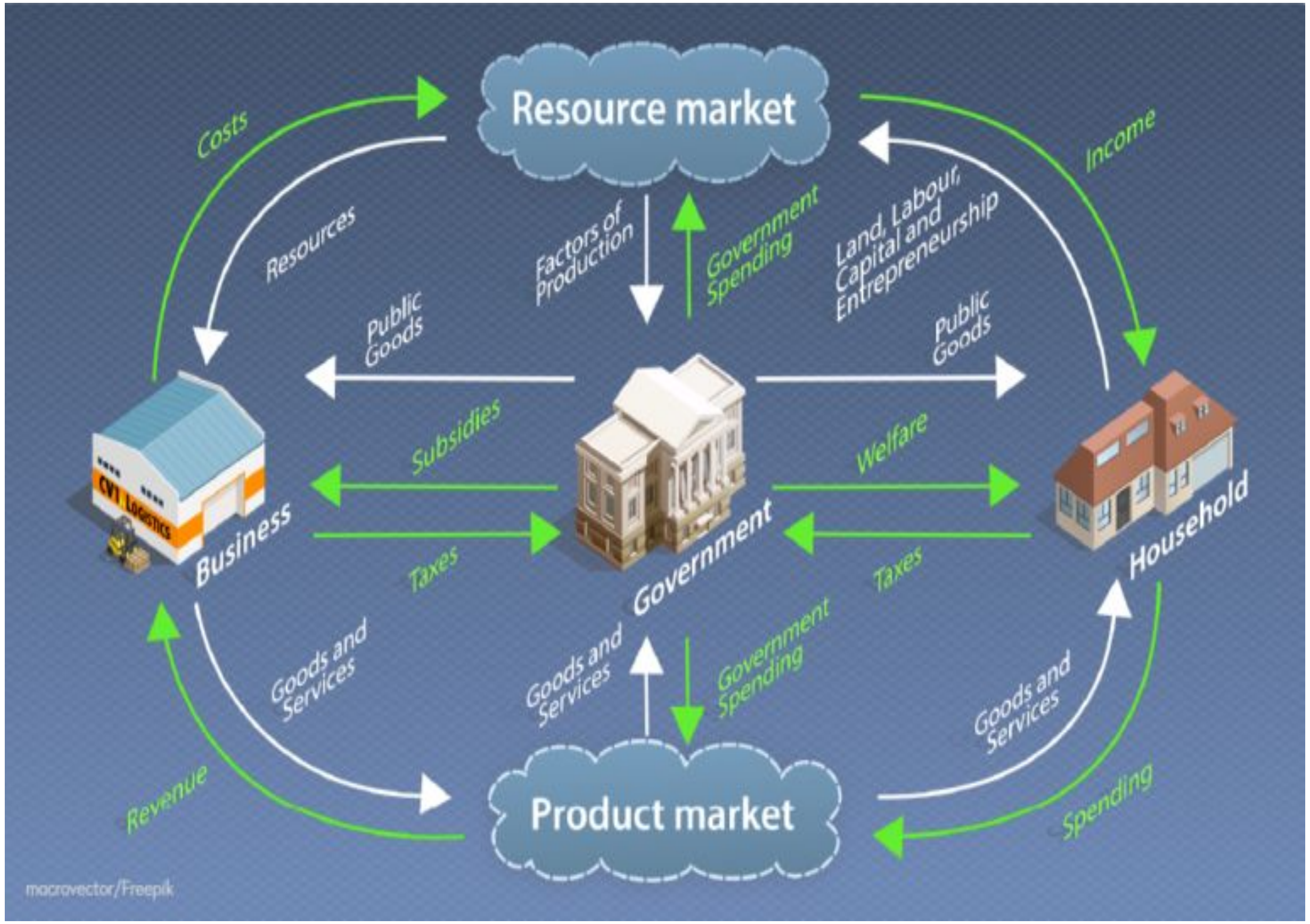
Is Economics a Dismal Science?

- Dismal science is a term coined by Scottish essayist and historian Thomas Carlyle to describe the discipline of economics.

- Dismal science is said to have been inspired by T. R. Malthus' gloomy prediction that population would always grow faster than food, dooming mankind to unending poverty and hardship.

- While economics does involve analyzing difficult trade-offs and constraints, it also offers tools and theories to improve living standards and social welfare. So, while the term "dismal science" persists, it does not accurately reflect the full scope of economics as a field of study.

What is an Economy



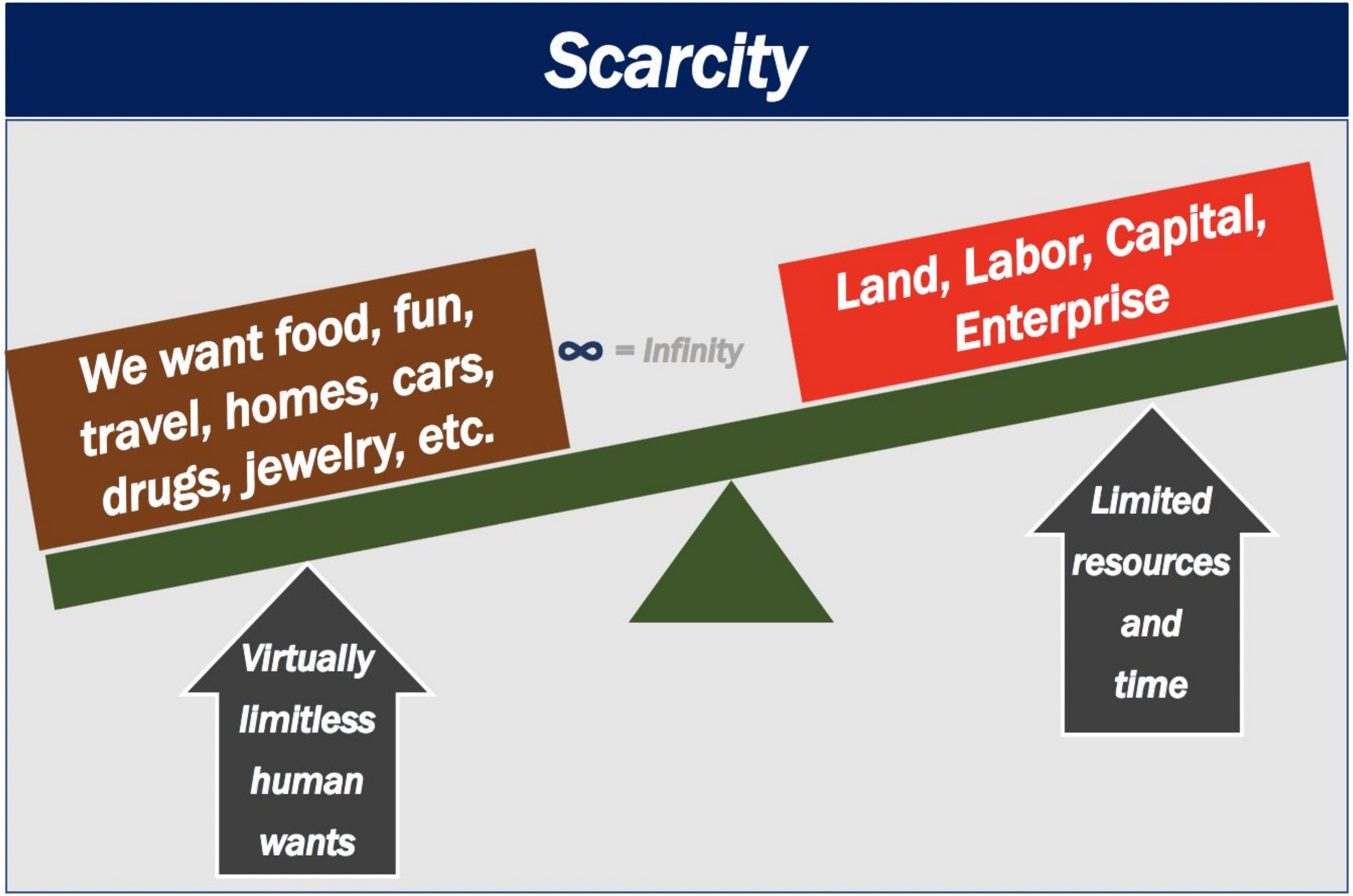
- It is a social system where people and organizations produce, consume and exchange goods and services.

- It is an organized way a nation provides for its people, wherein the production, consumption and distribution of the goods and services depends on the demand pattern of the citizens.

- The large set of inter-related production, consumption and exchange activities that aid in determining how scarce resources are allocated in a country or for a period of time.


Why study economics?

Problem of Scarcity



- Scarcity is the situation which results from the fact that we don't have the ability to satisfy all our wants.
- The problem of scarcity creates the problems of choice.
- The problem of scarcity and choice are faced not only by the individuals but also by the society and nations.

Scarcity and Choice

- Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses

✔ Human wants are unlimited

✔ Resources are limited

✔ Resources have alternative uses

Review Questions

Question: What is the primary concern addressed by economics?

a) Unlimited resources and unlimited wants
b) Scarcity and unlimited needs
c) Abundance and no needs
d) Unlimited resources and scarcity

Correct Answer: b) Scarcity and unlimited needs

Review Questions

Question: In economics, scarcity arises because:

a) Human wants and needs are limited
b) Resources are unlimited
c) Choices do not involve trade-offs
d) Opportunity cost is not a relevant concept

Answer: a) Human wants and needs are limited

Review Questions

Question: Imagine a scenario where technological advancements have made it possible to generate unlimited clean energy at almost no cost. In this situation, is scarcity still a relevant concept?

a) Yes, because other resources like land and time remain limited.
b) No, scarcity is eliminated when energy is abundant.
c) Only if demand for energy exceeds the unlimited supply.
d) Scarcity is always artificial and can be eliminated with sufficient innovation.

Answer: a) Yes, because other resources like land and time remain limited.

Ten Principles of Economics

1. People face trade-offs
2. The cost of something is what you give up to get it
3. Rational people think at the margin
4. People respond to incentives
5. Trade can make everyone better off
6. Markets are usually a good way to organize economic activity
7. Government can sometimes improve market outcomes
8. A country's standard of living depends on county's production
9. Price rise when government prints too much money
10. Society faces a short-run trade-off between inflation and unemployment

What are Economic Agents?

Economic agents are participants in the economy that engages in economic activities (specialization, production, distribution and consumption) .

There are two main economic agents:

1. Producers
2. Consumers

Government is also considered as an economic agents.

Economic vs Non-Economic Activities

Basic	Economic	Non -Economic
Purpose/Notice Examples	Those activities whose Objective is to earn money and to create wealth. - People working in factories - A teacher teaching in a school	Those activities whose aim is not to earn money, but to satisfy social, psychological and emotional needs. - A house wife cooking food for her family - A teacher training his / Daughter at home.

Concept of Economics

Economics relates to:

- **Economic Activities :** Production, Consumption and Distribution
- **Economic Systems :** Command, Market or Mixed Economy
- **Economic Policies:** Monetary, Fiscal and Trade Policies

Review Question

Which of the following is an example of a non-economic activity?

A) Buying groceries at the supermarket
B) Volunteering at a local charity
C) Starting a small business
D) Working at a part-time job

Answer: B) Volunteering at a local charity

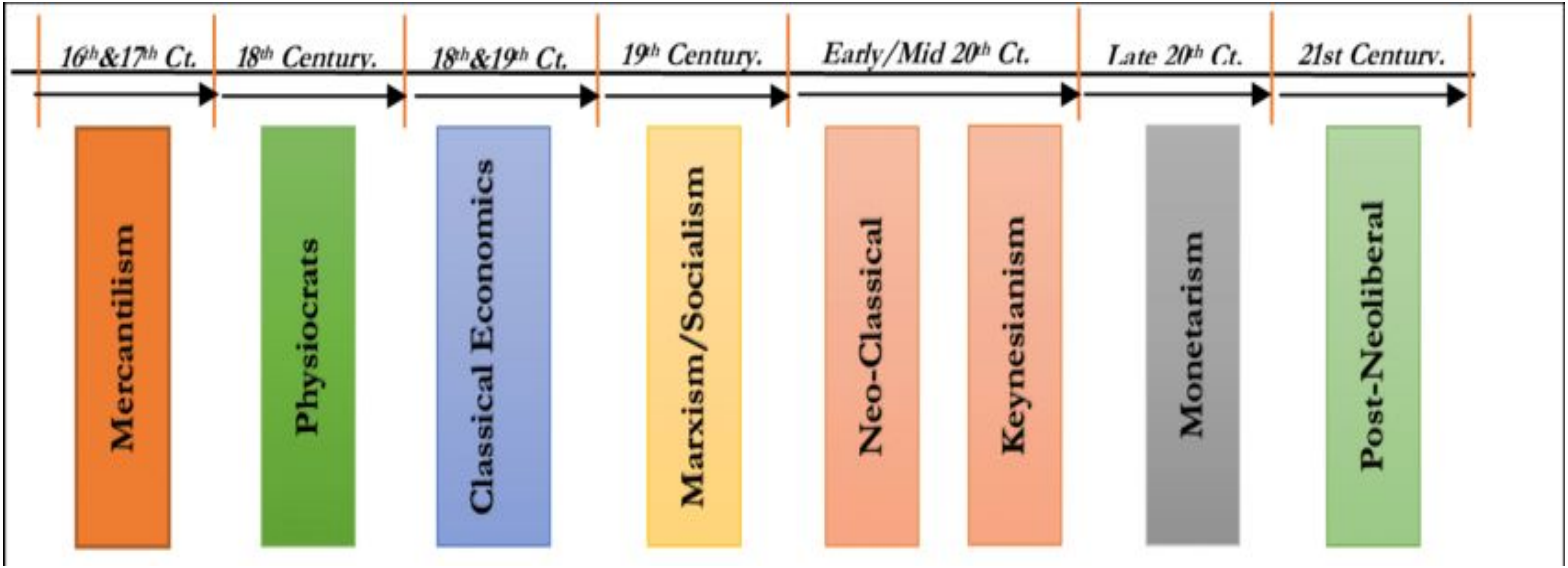
Review Question

Question: Identify the economic activity from the following options:

A) Going for a morning jog in the park
B) Selling handmade crafts at a local market
C) Reading a book at the library
D) Gardening in your backyard

Answer: B) Selling handmade crafts at a local market

Evolution of Economics



Adam Smith: Father of Economics

- Laid the conceptual foundation for measuring nation's wealth.

- He wanted to Examine:

❑ *Why some countries are richer and some poorer?*

❑ *What are the basic economic factors that increase the wealth of an economy?*

- Production (value of the total output), not gold or silver, is the measure of nation's wealth.

The Invisible Hand

- Smith’s invisible hand is probably the most well known of his arguments.
- His argument was that when individuals were allowed to pursue their self interest, society will automatically benefit.
- Therefore, government should intervene as little as possible in the economy, and should allow free markets and free trade as much as possible.

Labor Theory of Value

- In the labor theory of value, the amount of labor that goes into producing an economic good is the source of that good's value.

Division of Labor

- The essential starting point for growth and productivity is the division of labor.

- Dividing up the production process into different stages.

  Skill specialization (dexterity, tacit knowledge and judgement)

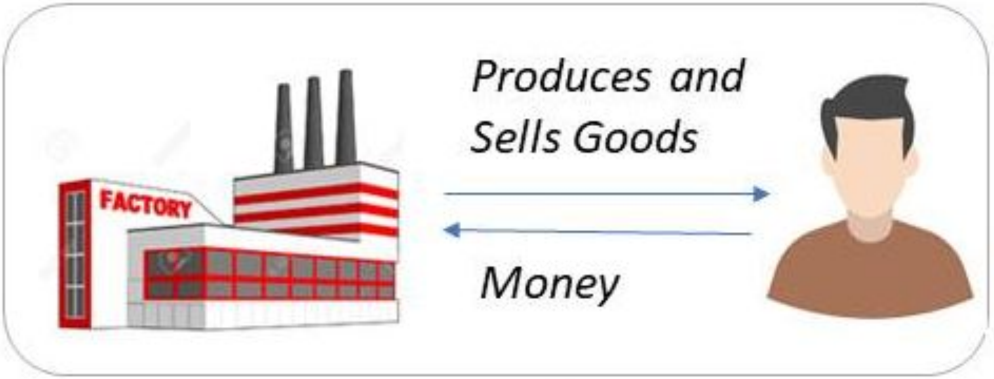
- Skill specialization lead to a diversified economy.

  Mutually dependent labourers co-operating freely in a process of exchange.

Microeconomics vs Macroeconomics

- *Microeconomics* is the branch which deals with the economic decision making of individual economic agents such as the producers, consumers, etc.
- It takes into account small components of the whole economy.

- *Macroeconomics* is the branch of the economics which deals with aggregates and averages of the entire economy. Example: aggregate output, national income, aggregate savings and aggregate investment.
- It takes into consideration the economy of any country as a whole.

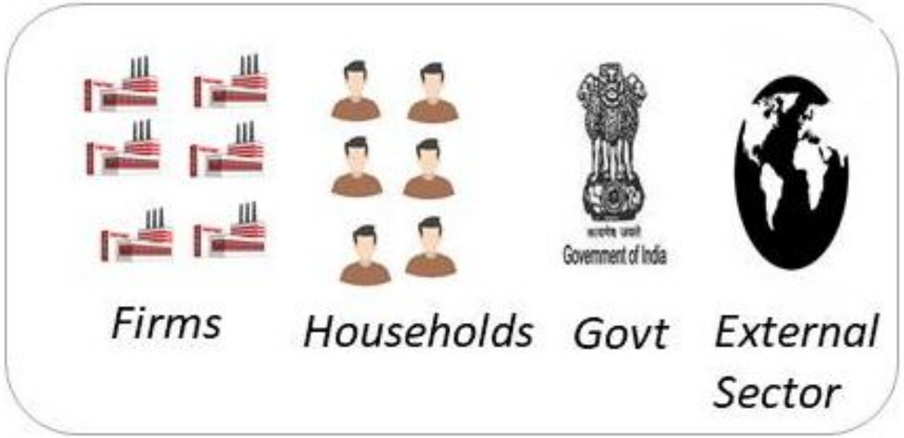


Microeconomics

Studies Behavior of
Individual Producer
and
Individual Consumer

It covers issues like

- Individual Demand and Individual Supply
- Regulate Price of Commodity
- Studies Effect of Individual Market Decision of a Customer or business



Macroeconomics

It Studies Behavior of
Overall aggregates of economy
Example-All sectors of an economy like
Firms, Households, Govt and External Sector

It covers issues like

- Market Demand and Market Supply
- Regulate Inflation in Economy
- Studies effect of decision taken by Government and RBI

Review Question

If a country experiences a high overall price level, rising unemployment, and a decrease in consumer spending, which branch of economics would primarily focus on analyzing and addressing these issues?

A. Microeconomics

B. Behavioral Economics

C. Macroeconomics

D. Environmental Economics

Answer:

C. Macroeconomics

Review Questions

If the government decides to impose taxes on cigarettes to reduce smoking rates and improve public health, which branch of economics would primarily examine the impact on individual consumer behavior and market transactions?

A. Microeconomics

B. Macroeconomics

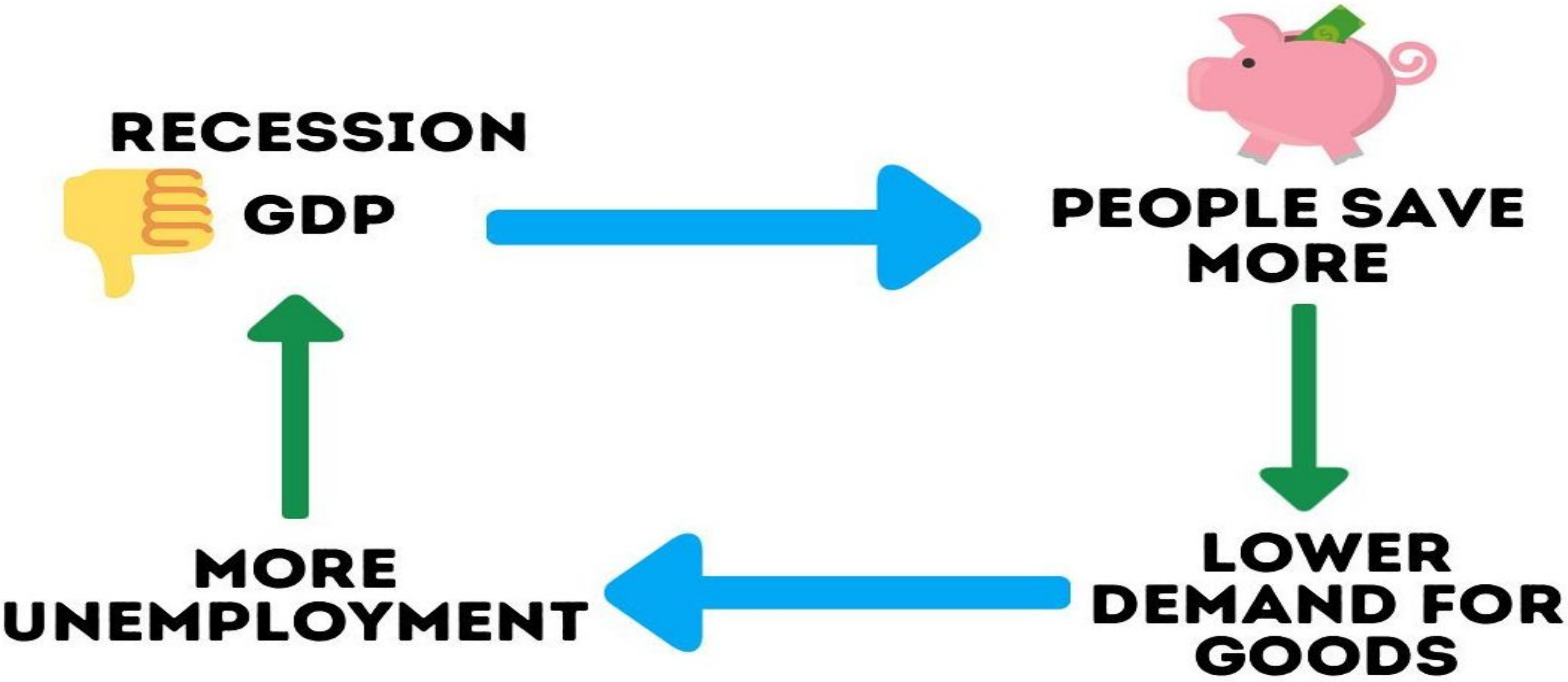
C. Development Economics

D. Public Economics

Answer:

A. Microeconomics

Paradox of Thrift



Common Fallacies in Economic Logic

Economists use analyses and theories to understand economic life. Because economic relationships are complex, involving many different variables, there may be some fallacies in economic reasoning, Including:

1- The post hoc fallacy

2- Failure to hold other things constant

3- The fallacy of composition

The Post hoc fallacy

It occurs when we assume that, because one event occurred before another event, the first event caused the second event.

Example: I wore my lucky socks to the exam, and I did well. Therefore, wearing lucky socks must have been the reason for my success

Failure to hold other things constant

It means failure to hold other things constant when thinking about an issue.

Example: Lowering tax rates in the country may not be the reason for the increase in government revenues, because other factor that is the growth in people's incomes may have caused this increase in government revenues.

The fallacy of composition

It occurs when we assume that what is true for the part of a system also holds true for the whole.

Example: If one farmer has a bumper crop, this farmer will have a higher income, if all farmers produce a record crop, farm incomes will fall.

If someone receives a great deal of money, that person will be better off, but if everyone receives a great deal more money, the society is likely to be worse off.

Positive Economics vs Normative Economics

Review Question

Question: In economics, the distinction between positive and normative statements is best described as:

a) Positive statements focus on how things should be, while normative statements describe how they are.

b) Positive statements are based on facts and observations, while normative statements involve value judgments and opinions.

c) Positive statements are prescriptive in nature, while normative statements are descriptive.

d) Positive statements provide subjective opinions, while normative statements rely on objective observations.

Correct Answer: b) Positive statements are based on facts and observations, while normative statements involve value judgments and opinions.

Review Question

Question:

Identify the statement that represents normative economics:

a) "The unemployment rate is 5% in the current fiscal year."

b) "Government policies should prioritize environmental sustainability over economic growth."

c) "A decrease in interest rates is likely to boost consumer spending."

d) "The GDP growth rate for the last quarter was 3.2%."

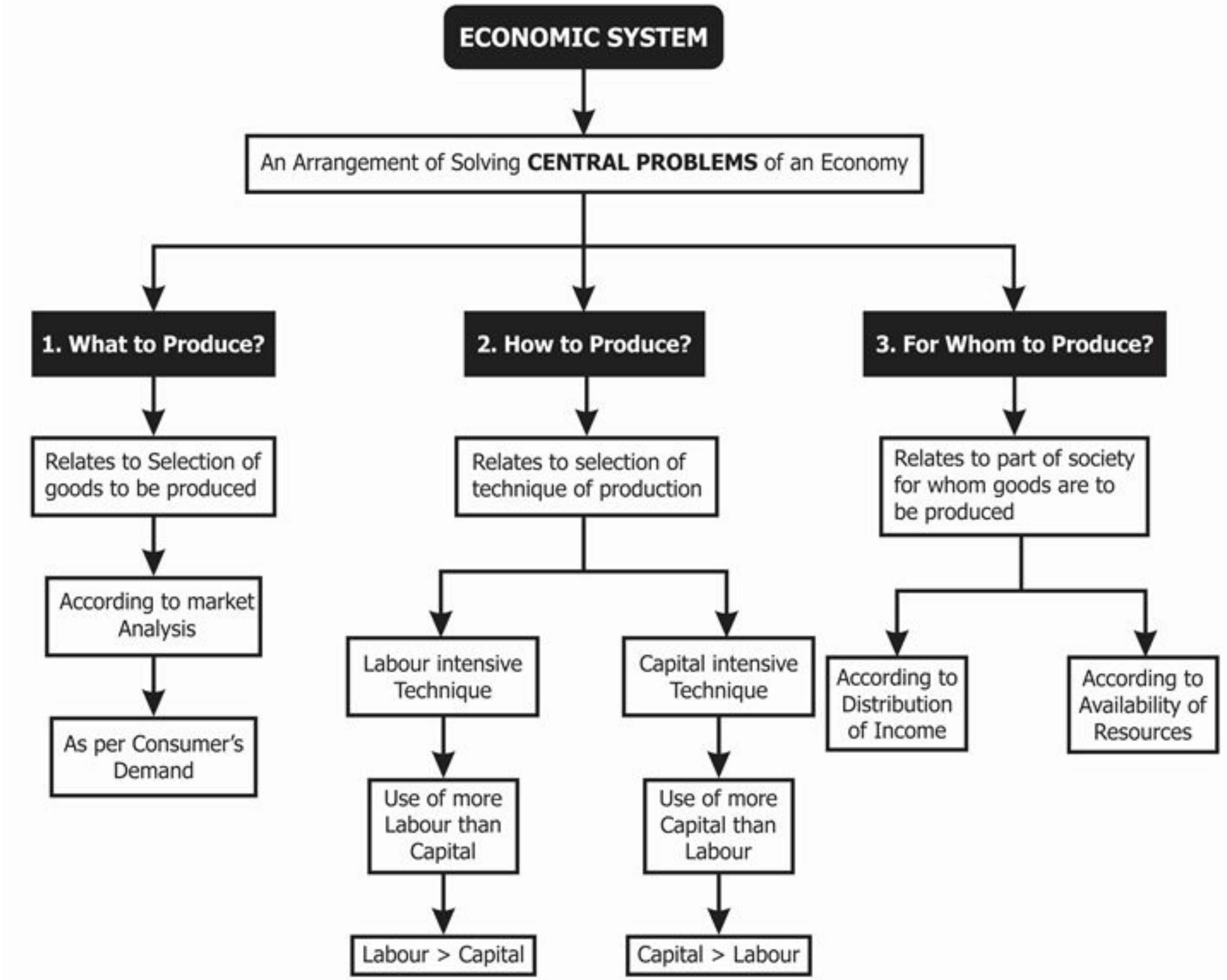
Answer: b) "Government policies should prioritize environmental sustainability over economic growth."

Three Centrals Problems of an Economy

What → To produce? 

How → To produce? 

Whom → To produce? 


ECONOMIC SYSTEM
An Arrangement of Solving **CENTRAL PROBLEMS** of an Economy
1. What to Produce?
2. How to Produce?
3. For Whom to Produce?
Relates to Selection of goods to be produced
According to market Analysis
As per Consumer's Demand
Relates to selection of technique of production
Labour intensive Technique
Capital intensive Technique
Use of more Labour than Capital
Use of more Capital than Labour
Labour > Capital
Capital > Labour
Relates to part of society for whom goods are to be produced
According to Distribution of Income
According to Availability of Resources

What to produce?

- An economy has an infinite number of wants and finite number of resources that can be put to other alternative uses.

- The economy is unable to produce all types of goods, such as consumer and capital goods.

- Therefore, the economy must decide what types of goods and services will be produced and in what quantities.

How to produce?

It is a problem of deciding on a production technique. There are two main types of production technique: Labour intensive and Capital intensive

- *Labour-intensive*

The production process involving more labour and less capital per unit of output is called labour intensive technology/process.

- *Capital-intensive*

The production process involving more capital and less labour per unit of output is called capital intensive technology/process.

For whom to produce?

- This problem deals with determining the final consumers of the goods produced. As resources are scarce in the economy, it becomes difficult to cater to all sections of the society.

- It leads to the problem of choice in the economy, as a good which may be in demand among one section, may not be in demand for another section of the society.

- Such a situation arises due to the difference in income, preferences, and attitude, which affects the buying pattern of the individuals.

Review Question

The "For whom to produce?" problem in economics refers to:

a) Determining the optimal production levels

b) Allocating resources efficiently

c) Deciding which goods and services to produce

d) Distributing and allocating the output to consumers

Answer: d) Distributing and allocating the output to consumers

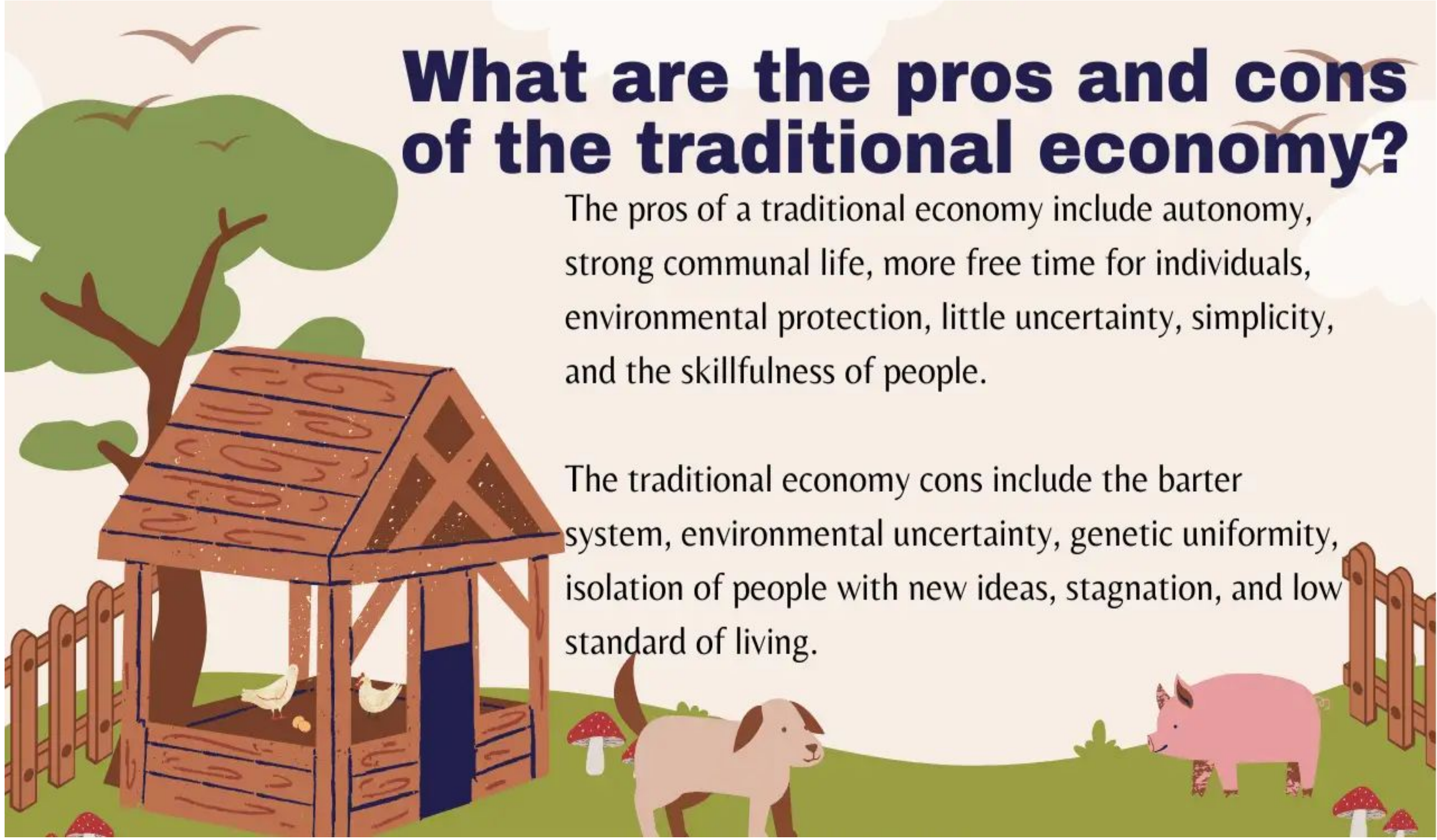
Types of Economic System

1. Traditional Economic System
2. Centrally-Planned/ Socialistic Economy
3. Capitalist Economy/ Market Economy
4. Mixed Economy

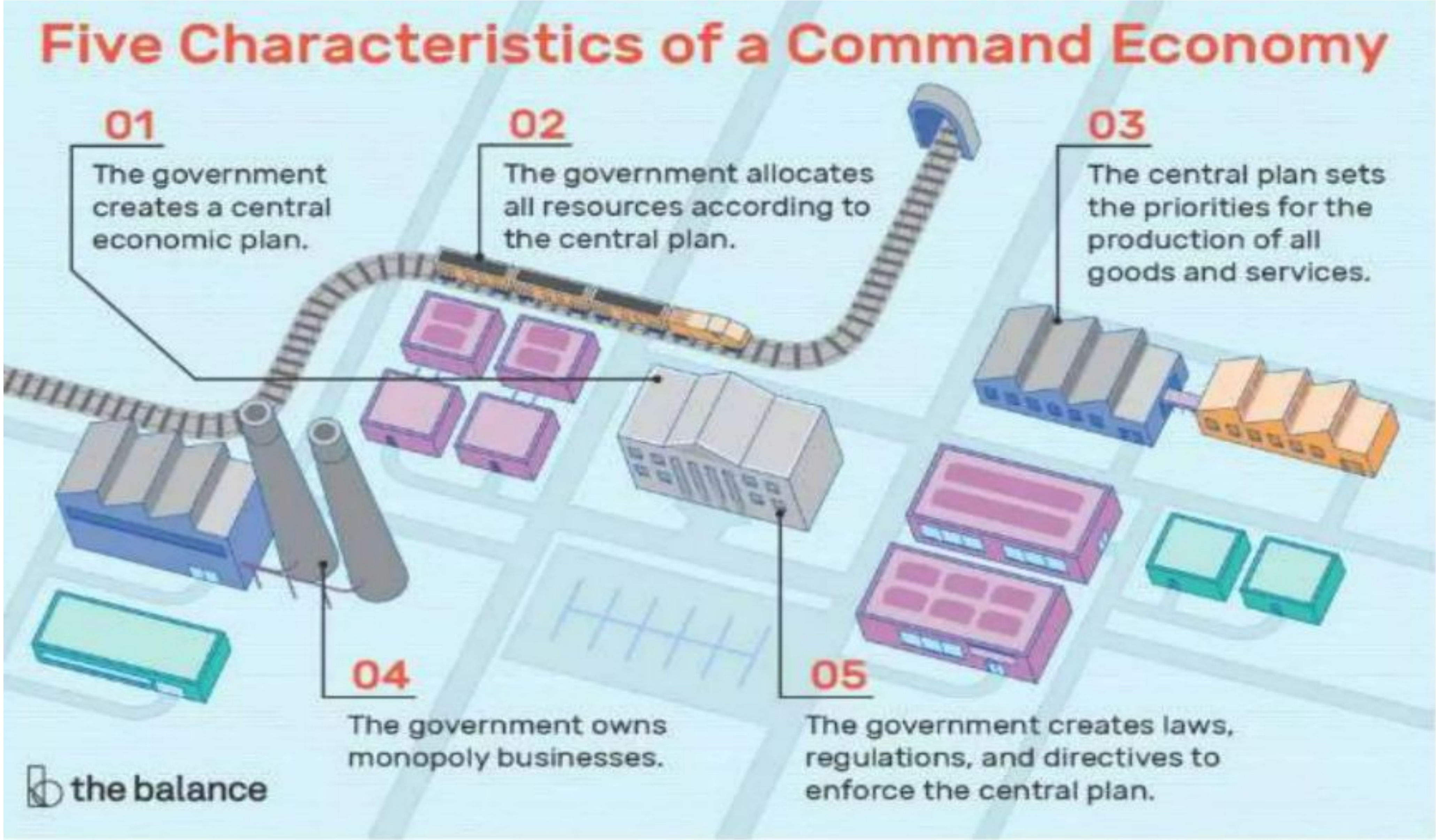
Traditional Economic System

- A traditional economy is primarily based on customs, beliefs and traditions that guide the production, distribution and consumption of goods and services.

- It often relies on subsistence farming or hunting and gathering, where families produce goods and services for their own use and exchange is done via barter system.



Socialistic/Command Economy

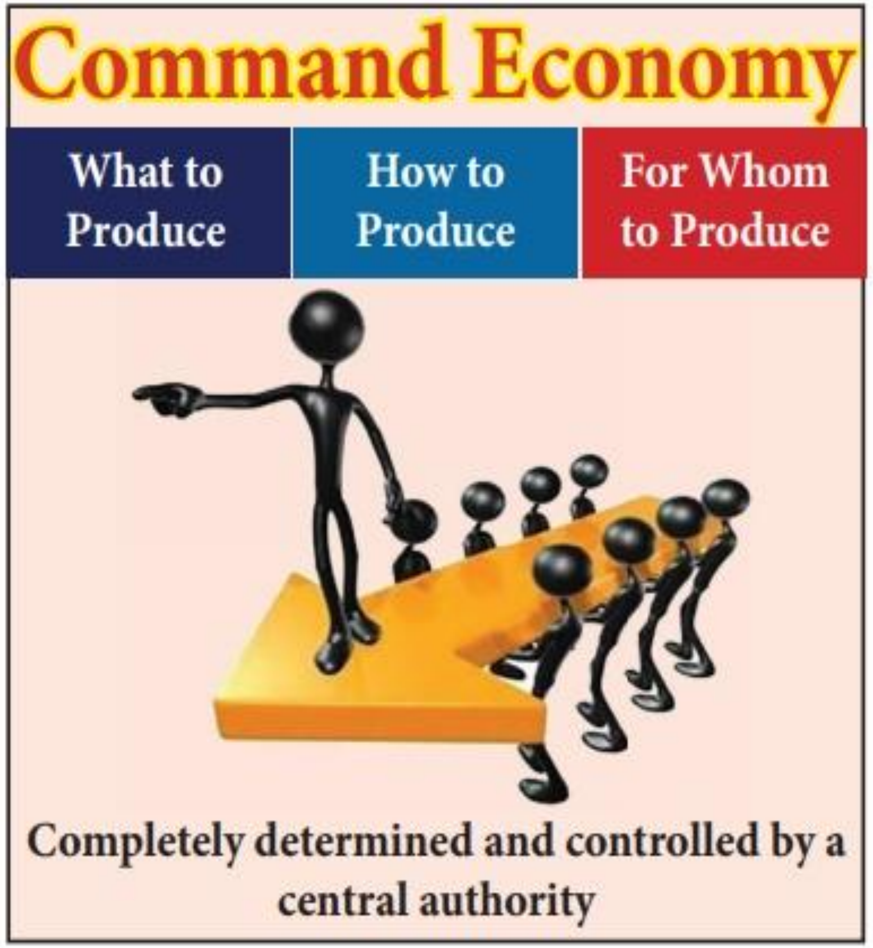


Pros (Strengths)

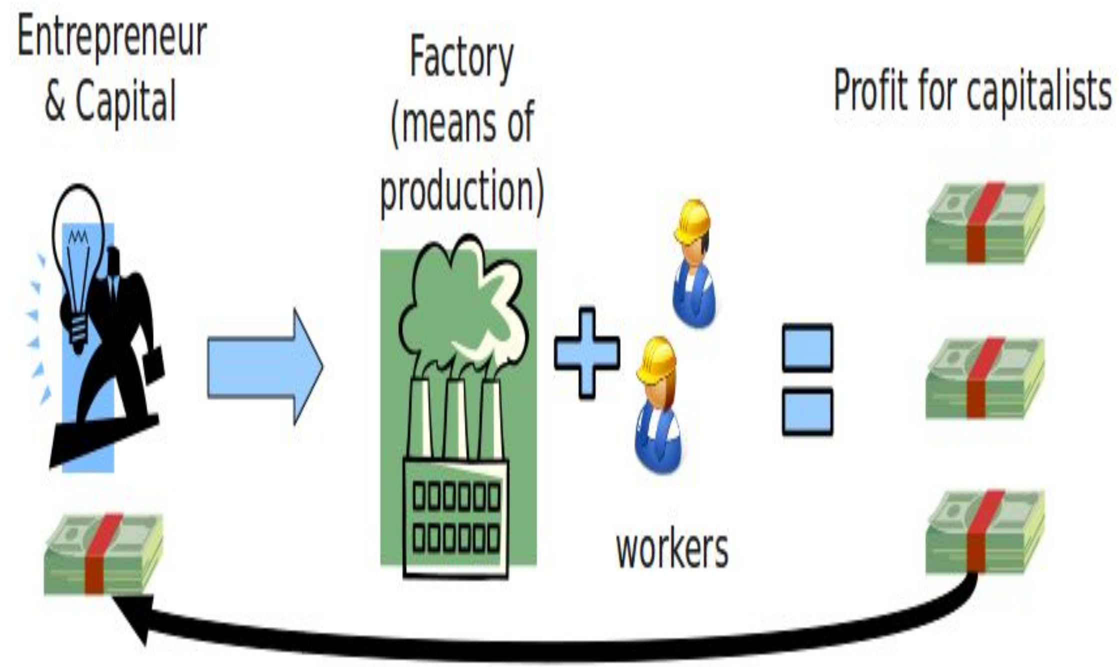
- ✔ Curtails economic inequality
- ✔ Distributes resources to the needy
- ✔ Prevents private monopolization of capital

Cons (Weaknesses)

- ✔ Limits economic freedom
- ✔ Leads to economic inefficiency
- ✔ Doesn't leverage the ingenuity of the entreprene



Capitalistic/Market Economy



It is an economic system that is based around the private ownership of the capital. It is also usually associated with free enterprise.

- Private Ownership of the Means of Production
- Market-driven allocation of resources
- Profit Motive and Incentives
- Competition
- Limited Government Intervention

Pros (Strengths)

- ✔ Incentive to be rich and encourages innovation.
- ✔ Firms have incentive to be efficient .
- ✔ Consumers are free to choose the products that they desire.

Cons (Weaknesses)

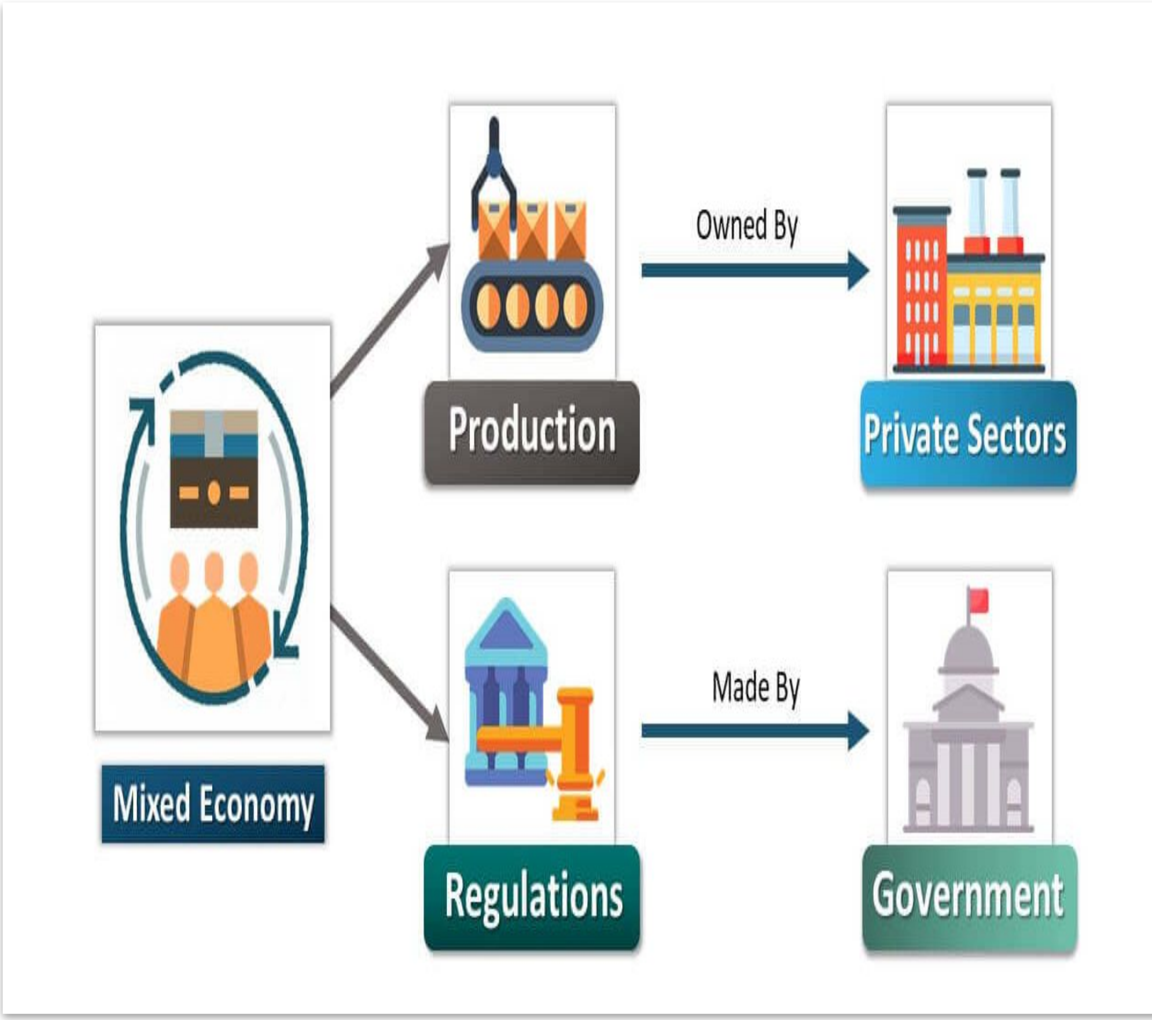
- ✔ Firms can gain monopoly and exploit consumers.
- ✔ Firms with monopsony power can pay low wages.
- ✔ Externalities can damage the environment.
- ✔ Can lead to high inequality
- ✔ Misallocation of resources

Mixed Economy

- It is an economic system in which both the state and the private sector direct the economy, reflecting characteristics of both market and planned economies.

- Allocation of resources done through the wants of the consumers with some government intervention to provide goods and services to those in need

- This economy works best as it relies on what the consumers want, however prevents failure with the help of government intervention.



Is Mixed economy the best?

Pros (Strengths)

- ✔ Government may intervene to correct serious market failures.
- ✔ Wide variety of choice for the consumers
- ✔ Competition enables better quality of goods and better prices

Cons (Weaknesses)

- ✔ Taxes may be high, reducing incentive in workers, leading to less money for the consumers to contribute to the economy.
- ✔ Public sector provision may be inefficient , poor quality goods may be produced
- ✔ Government spending may be politically motivated instead of concentrating on the consumers

Review Questions

Question:

Which of the following best characterizes a command economy?

A. Extensive private ownership of means of production.

B. Decentralized decision-making by individuals and firms.

C. Centralized planning and control by the government.

D. Minimal government intervention in economic affairs.

Answer:

C. Centralized planning and control by the government.

Review Questions

Question

In the context of economic systems, what does a mixed economy primarily refer to?

A. An economy where all production decisions are made by the government.

B. An economy with no government intervention in economic activities.

C. An economy where the government and the market both play a role in resource allocation.

D. An economy solely based on traditional customs and beliefs.

Answer:

C. An economy where the government and the market both play a role in resource allocation.

Production Possibility Curve (PPC)

- It is the graphical representation of all possible combination of two goods that can be produced in an economy, with given resources and technology.

- The points on the curve show how much of each good will be produced when resources shift, thus impacting more production of one good and less of the other.

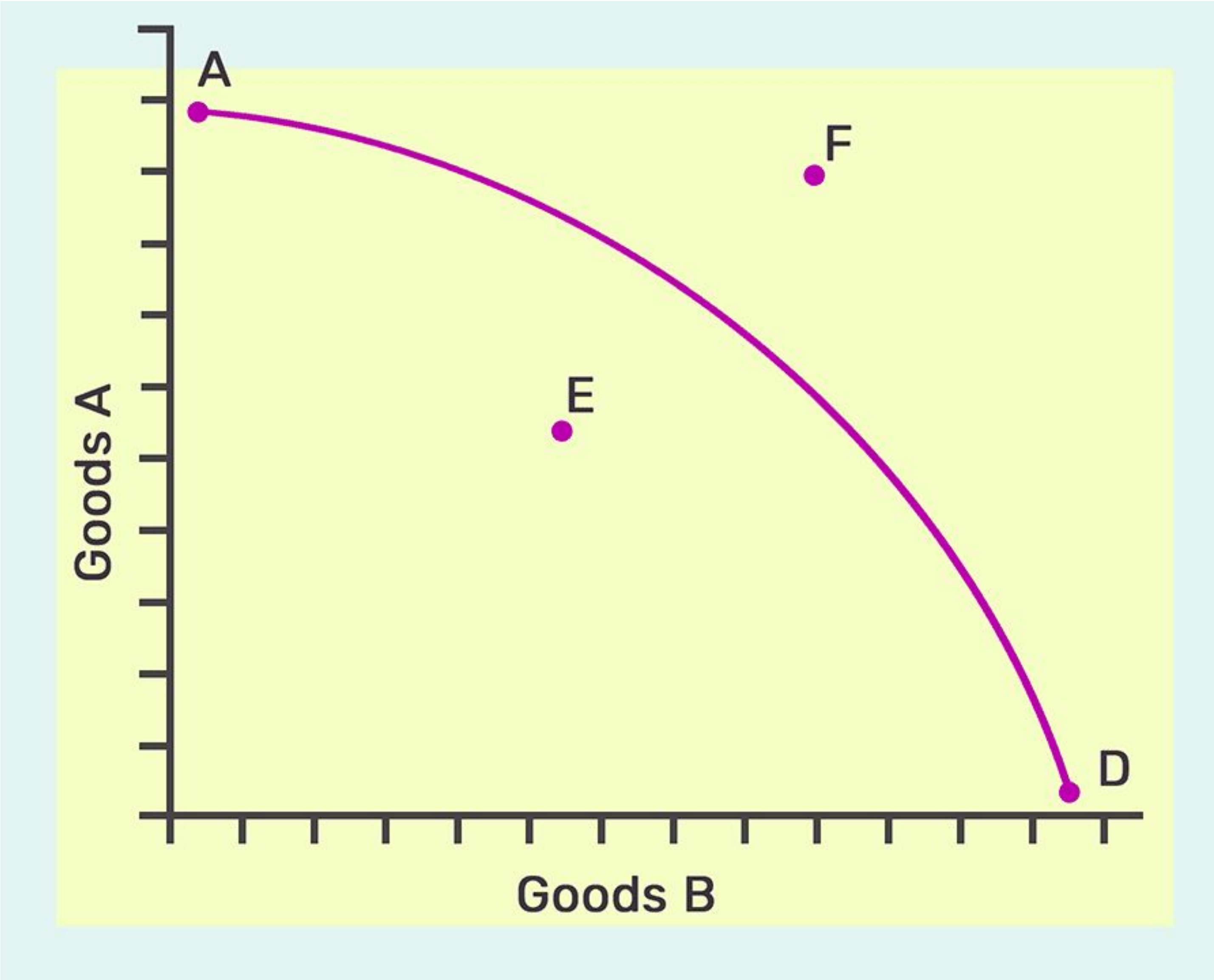
- It does not indicate how much of each good should be produced, but the production sacrifices needed to make more of the other good.

- It demonstrates the concept of opportunity cost.

Assumptions of PPC Curve

- Resources are fixed
- The economy is producing only two goods
- Technology remains unchanged
- Income is constant
- Resources are efficiently employed
- The resources are not uniformly efficient and competent in the production of all the goods.
- Applicable in short-run
- Ceteris paribus

Graphical Representation



E: All resources are not being used.

F: Any point outside the PPF curve is impossible; more of both goods cannot be produced with current resources.

A: More of goods A are being produced and none of goods B are being produced.

D: None of goods A are being produced and more of goods B are being produced.

Properties of PPC

- It is downward sloping curve from left to right, as increase in the production of one good leads to decrease in the production of the other good.

- The shape of the Production Possibility Curve (PPC) is concave to the origin. It is so because the Marginal Opportunity Cost (MOC) tends to rise.

- If there is an increase in any of the factor of production, then the curve can shift.

Importance of PPC

Marginal rate of transformation (MRT)/ Marginal Opportunity Cost (MOC)

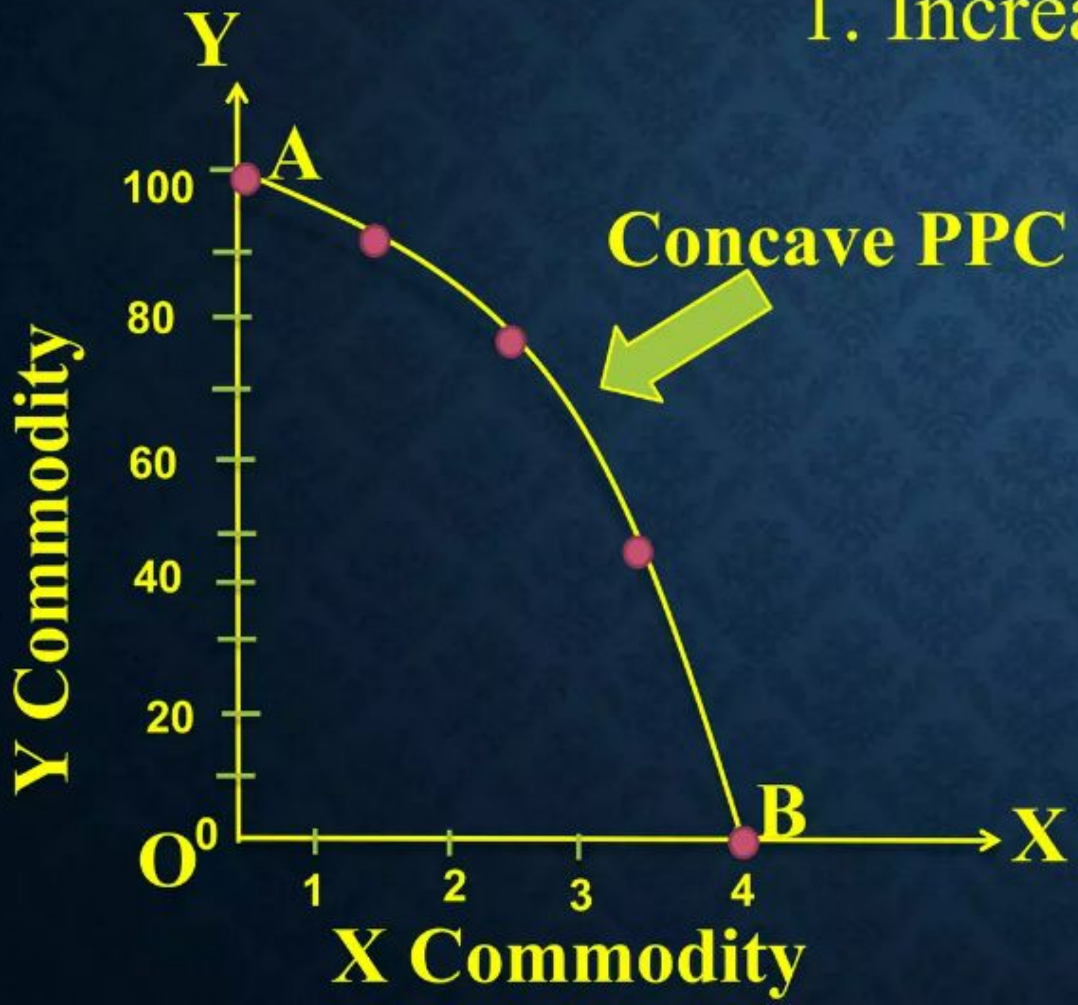
- ✔ It is the economic concept that helps to measure the opportunity cost.
- ✔ It shows number of units of product that one needs to sacrifice to make one unit of another product.
- ✔ MRT is the slope of the PPC
- ✔ Every point on the PPC has different marginal rate of transformation

$$MRT = \frac{\Delta Y}{\Delta X} = \frac{\text{Loss of output of Y}}{\text{Gain of output of X}}$$

$$\left[\begin{array}{l}\text{when some resources} \\ \text{are shifted from Y to X}\end{array}\right]$$

Types of MOC

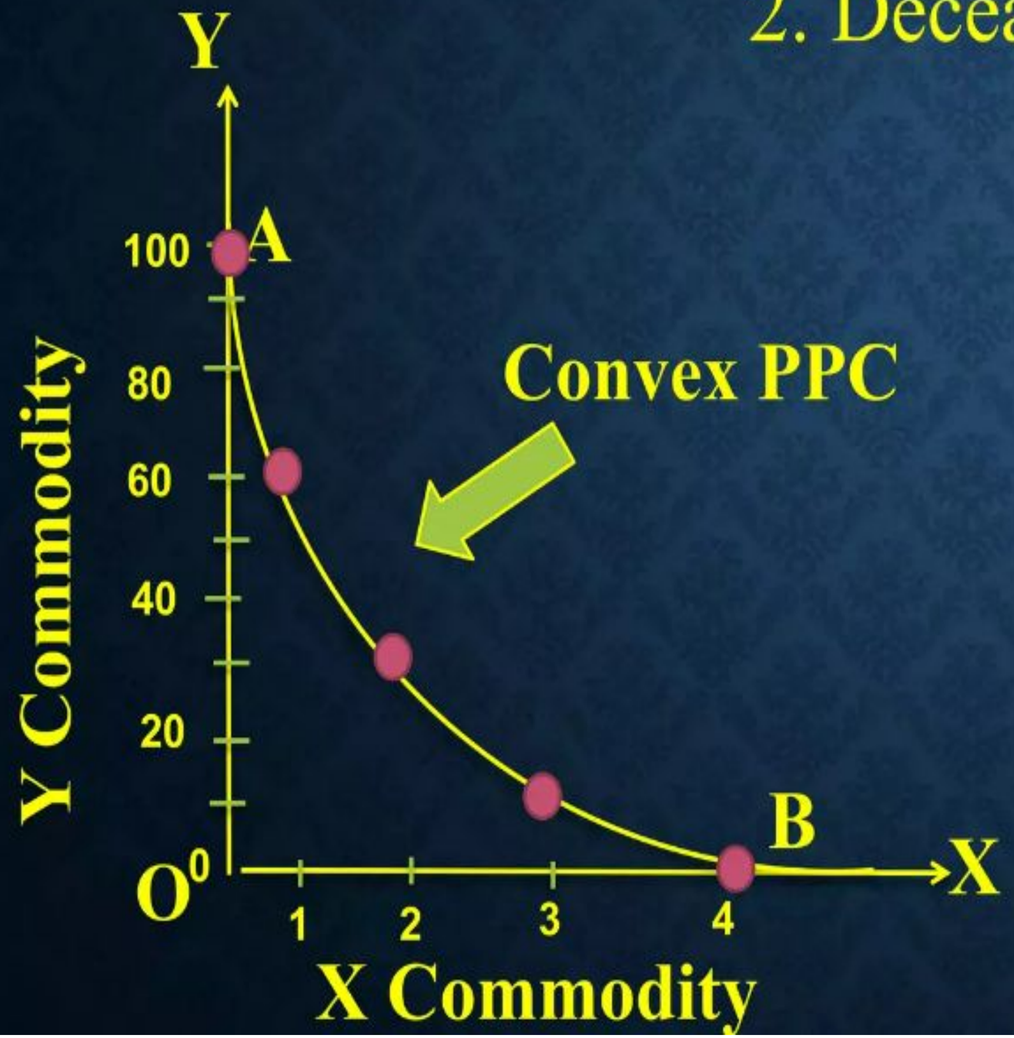
1. Increasing MOC



Combinations	X Commodity	Y Commodity	MOC = ΔY/ΔX
A	0	100	-
B	1	90	10÷1=10
C	2	70	20÷1=20
D	3	40	30÷1=30
E	4	0	40÷1=40

Types of MOC

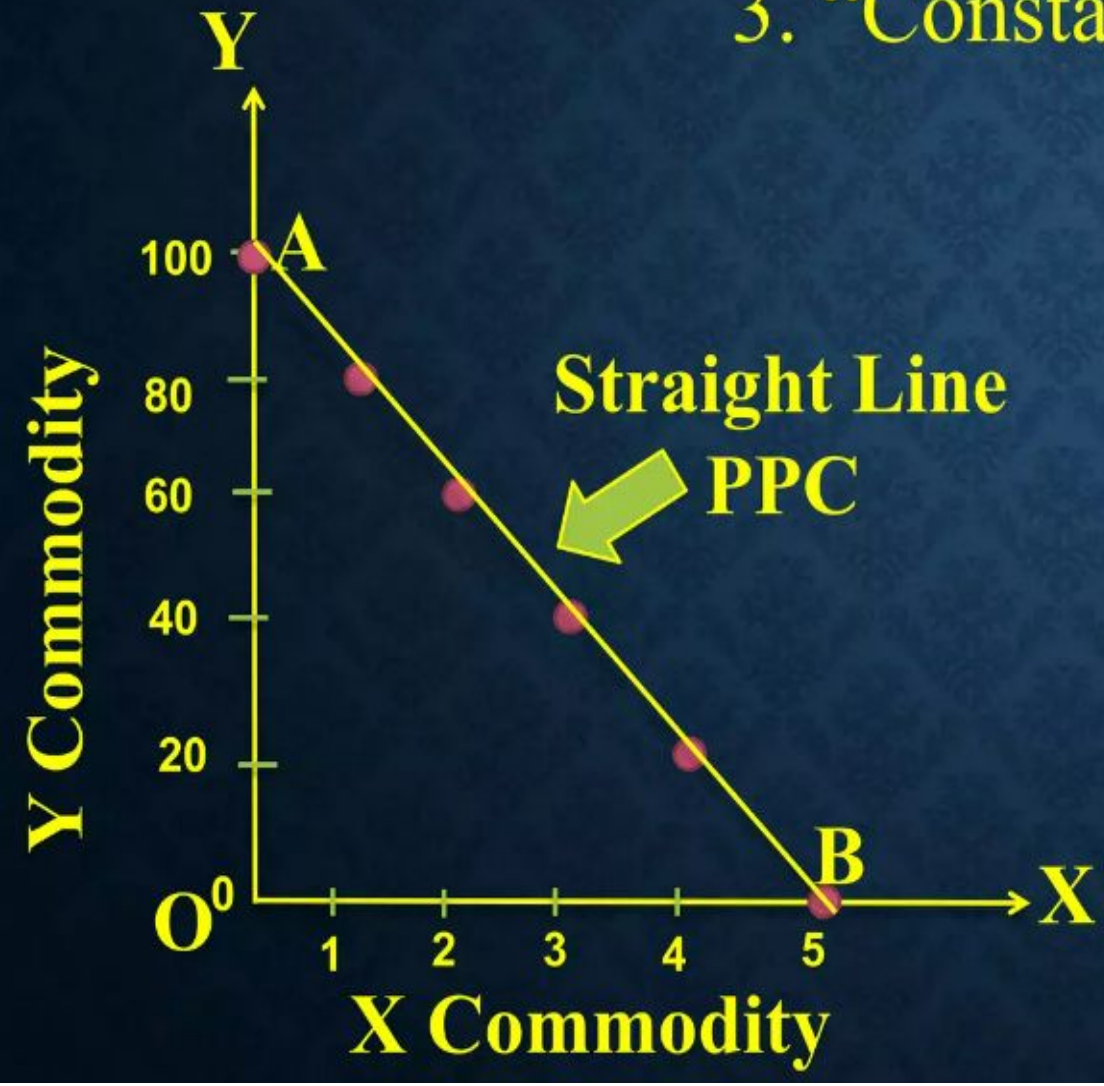
2. Deceasing MOC



Combinations	X Commodity	Y Commodity	MOC = $\Delta Y / \Delta X$
A	0	100	-
B	1	60	40÷1=40
C	2	30	30÷1=30
D	3	10	20÷1=20
E	4	0	10÷1=10

Types of MOC

3. “Constant MOC”



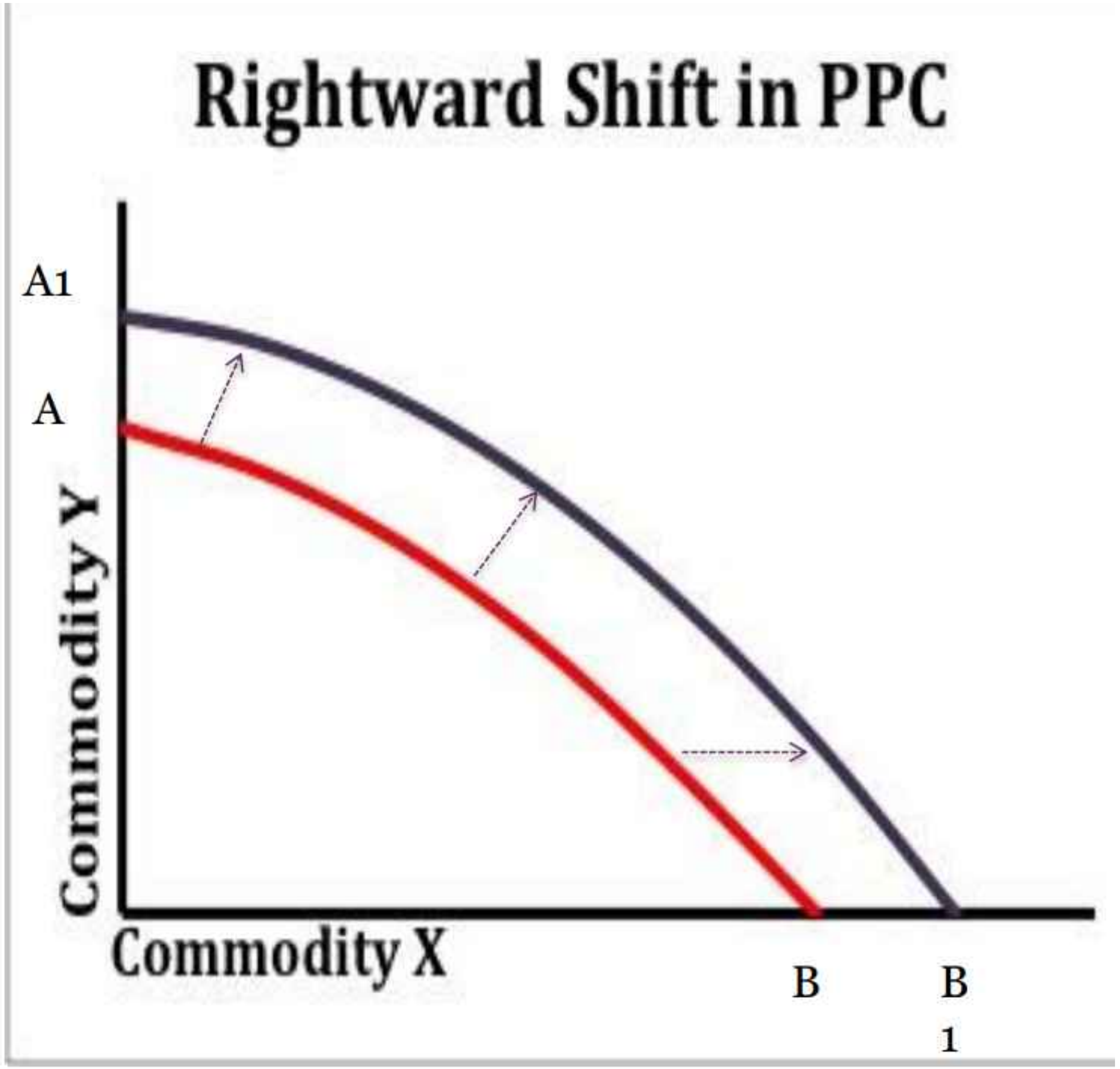
Combinations	X Commodity	Y Commodity	MOC = ΔY/ΔX
A	0	100	-
B	1	80	20÷1=20
C	2	60	20÷1=20
D	3	40	20÷1=20
E	4	20	20÷1=20
F	5	0	20÷1=20

Explanation

PPC	MOC
Concave	↑
Convex	↓
Straight Line	→

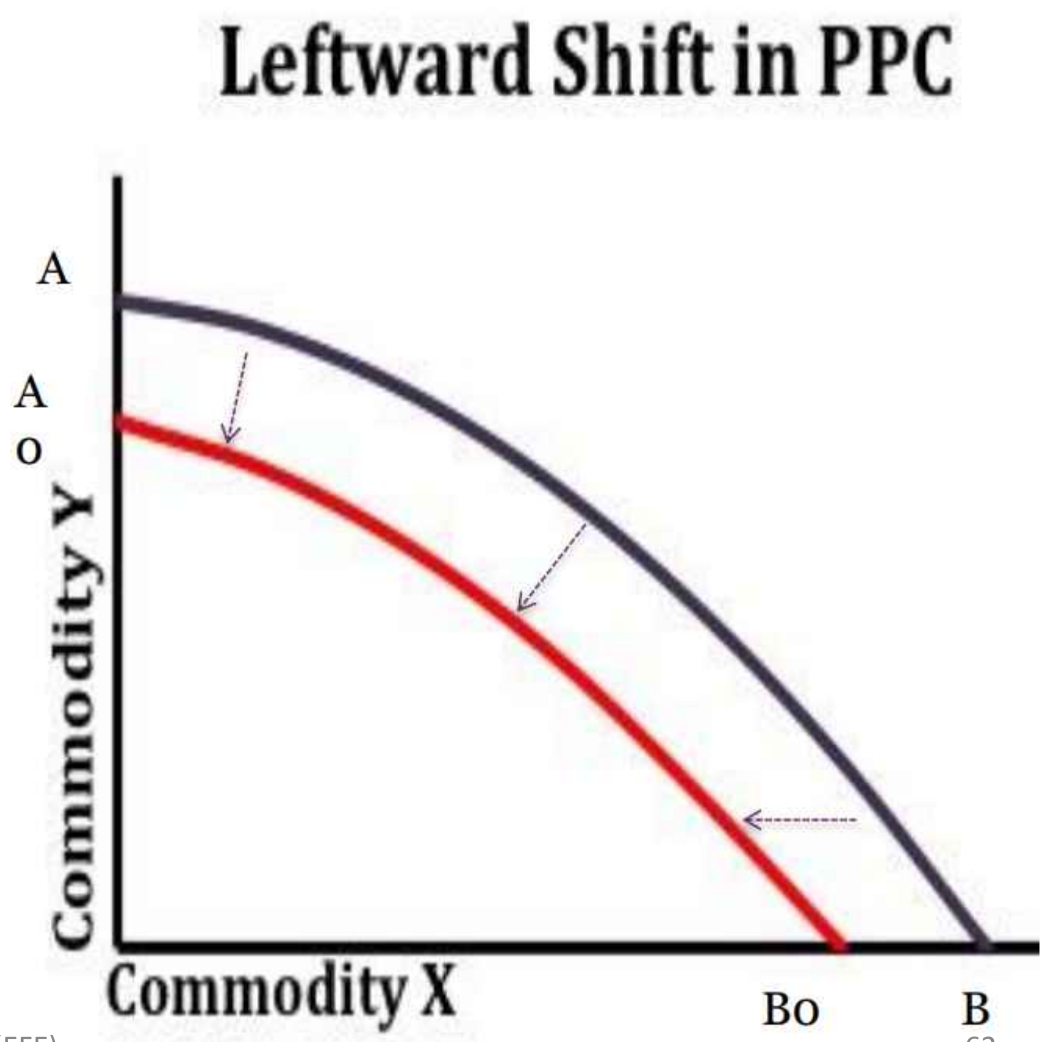
Shift in PPC Curve

Rightward shift in PPC from AB to A_1B_1 due to increase in availability of resources or improvement in technology



Shift in PPC Curve

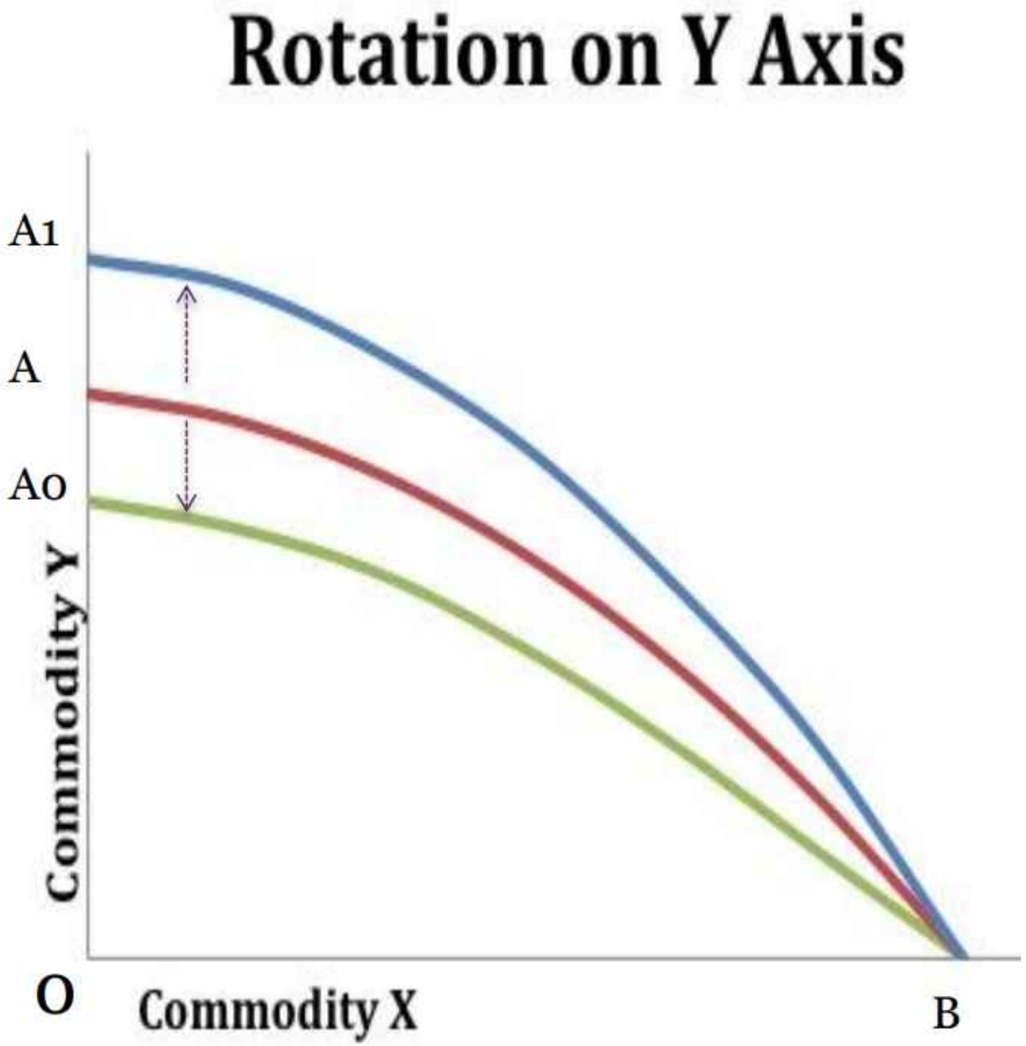
Leftward Shift in PPC from AB to $A_o B_0$ due to decrease in availability of resources or degradation in technology



Rotation in PPC Curve

PPC rotate upward from AB to A_1B due to growth of resources or technological improvement for Commodity Y.

PPC rotate downward from AB to A_oB due to decrease in resources or degradation of technology for Commodity X.

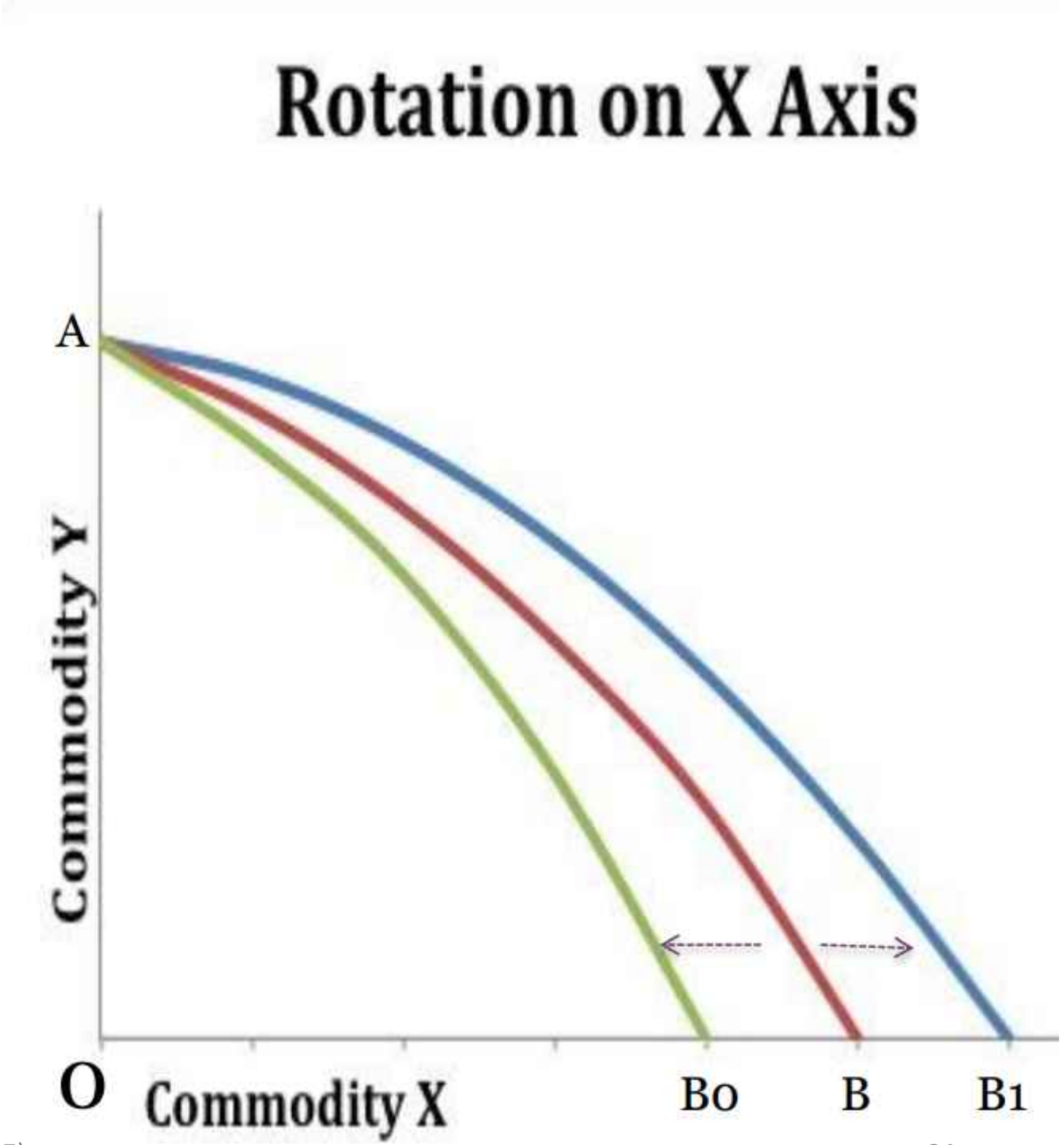


Rotation in PPC Curve

- PPC rotate rightward from AB to AB_1 due to growth of resources or technological improvement for Commodity X.

PPC rotate leftward from AB to AB_o

Due to decrease in resources or degradation of technology for Commodity X.



Review Questions

Question:

Which of the following best describes the Marginal Rate of Transformation (MRT) on a Production Possibility Curve (PPC)?

A. The total quantity of goods an economy can produce.

B. The opportunity cost of producing one more unit of a good in terms of the other.

C. The point where the economy is fully utilizing its resources.

D. The maximum combination of goods attainable with current resources.

Answer:

B. The opportunity cost of producing one more unit of a good in terms of the other.

Review Questions

Question

In an economy, the Marginal Rate of Transformation (MRT) between two goods is found to be increasing. What does this imply?

A. The opportunity cost of producing one more unit of the first good is decreasing.

B. The opportunity cost of producing one more unit of the first good is increasing.

C. The economy is operating at full efficiency.

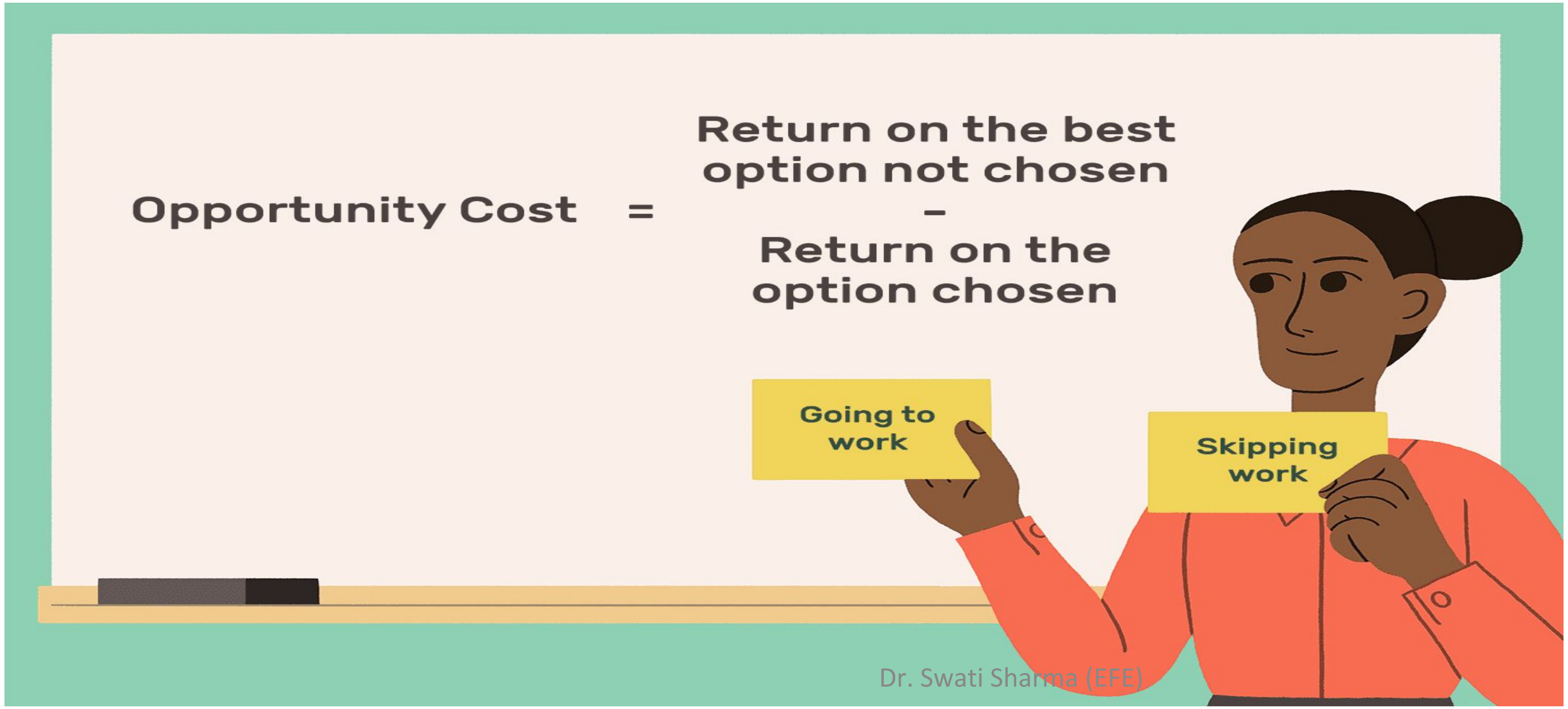
D. The Production Possibility Curve is linear.

Answer:

B. The opportunity cost of producing one more unit of the first good is increasing.

Opportunity Cost

Opportunity cost is the cost of giving up one opportunity in order to take another one. 'The next best alternative' that must be given up comes with a cost



Example:

Suppose you have $10,000 that you can either invest in Stock A or use to start a small business. Let's assume the following scenarios:

1. **Stock A:**
   1. You decide to invest the $10,000 in Stock A, which has an expected annual return of 8%.
   2. After one year, your investment in Stock A has grown to $10,800 (initial investment + 8% return).
2. **Small Business:**
   1. Alternatively, you could have used the $10,000 to start a small business. Let's assume that the business has a return on investment of 15%.
   2. After one year, the business has generated a profit of $1,500 (initial investment * 15%).

In this example, the opportunity cost of choosing to invest in Stock A instead of starting the small business is $700. This means that by choosing to invest in Stock A, you gave up the opportunity to earn an additional $700 in return that the small business could have provided.

1. It takes you half an hour to do a math assignment and two hours to do a micro assignment. What is the opportunity cost of you doing two math assignments?

a. 1/2 micro assignments.

b. 1 micro assignment.

c. 2 micro assignments.

d. 4 micro assignments.

2. Jenn won a free ride to four years of college. During these four years Jenn could also do any number of things, including:

I. Travel the world.

II. Work to gather savings and career experience.

III. Become an expert oboist.

Which of the following is the opportunity cost of Jenn attending college? *

a. Zero.

b. II only.

c. The sum of I, II, III, and any other opportunities she passed up.

d. Whichever of I, II, III or any other opportunities she passed up is most valuable to her.

3. Daniel has $50 left over this week and he wants to contribute to a charitable cause. With $5, Daniel can feed one homeless person one meal. With $10, he can provide shelter for one homeless person one night. What is the opportunity cost of Daniel using all his money to shelter homeless people? *

a. Zero.

b. Depends on which option is most valuable to Daniel.

c. Depends on which option is most valuable to the homeless people in question.

d. 10 homeless meals.