

MODULE II

THINKING LIKE AN ECONOMIST

6) Falsifiability: Economists strive to develop theories and models that are falsifiable that is, capable of being proven false through empirical evidence. By subjecting their theories to empirical tests, economists aim to identify and refine models that best explain and predict economic phenomena.

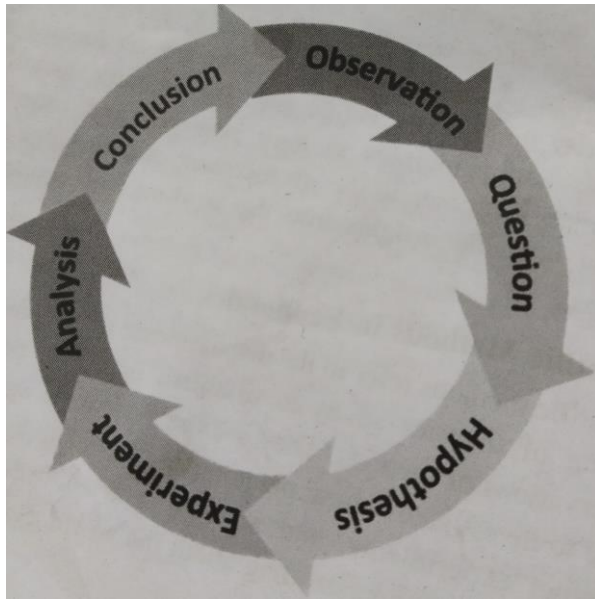
7) Openness to Revision: Like scientists, economists are open to revising their theories and models in the light of new evidences and insights.

8) Replication and Validation: Economists value replication and validation of research findings. They encourage other researchers to replicate their studies using different data sets or methodologies to verify the their findings and enhance the credibility of economic research.

Scientific Methods in Economics

Scientific methods refer to the dispassionate development and testing of theories so as to establish or refute particular observations or theories. They are the systematic approaches used to investigate natural phenomena, formulate hypotheses, conduct experiments, and analyse data in order to gain knowledge and understanding about the world.

The basic process of the scientific method of study starts with particular observations. Based on the observation, there might be the research questions for the study. On the basis of the research questions, hypotheses are being made. Data is to be collected next. Appropriate experiments and analysis have to be conducted to test the hypothesis. If the hypothesis is accepted, formal conclusions of the study have to be given. Major steps in the scientific method may be illustrated as follows:



Economics relies on scientific methods. The procedure consists of several elements such as:

- (i) observing real world behaviour and outcomes
- (ii) based on those observations, formulating a hypothesis or possible explanation of cause and effect
- (iii) testing this explanation by comparing the outcomes of specific events to the outcome predicted by the hypothesis
- (iv) accepting, rejecting, and modifying the hypothesis based on tan these comparisons, (v) continuing to test the hypothesis against her the facts.

Thus, the major concepts associated with give scientific methods include: (a) observation, (b) hypothesis, (c) theory, and (d) law.

(a). Observation: Observation is a fundamental aspect and a foundational component of the scientific methods. It is an act or instance of noticing, perceiving and noting something with specific purposes. Observations are the specific, focused, objective, systematic and quantifiable noting of something having particular aims and objectives.

Major steps in the process of observation include: (i) observe and reflect, (ii) document and gather evidence, (iii) plan and act, and finally (iv) assess.

(b). Hypothesis: Hypothesis is a tentative and yet untested explanation of an event. It is an 'if-then' statement which is usually obtained from casual observation of real world. They are the tentative statements that can be tested and verified through experimentation or observation Hypotheses provide 'ex-ante predictions about the outcomes of certain observations or experiments. These studies involve collecting data, analysing it statistically, and drawing

conclusions based on the evidence. The goal is to either confirm or reject the hypothesis based on the observed outcomes.

(c). Theory: A theory refers to a systematic explanation or framework that describes and predicts certain economic behaviour or phenomena. Theory is the successfully tested and validated hypothesis. The theory abstracts the details, simplifies, generalises and seeks to predict and explain an event.

(d). Law: Law is a theory which is always true under the same set of circumstances. They are based on proof or evidence and are universally observable. They are often based on empirical observations and theoretical reasoning. Economic laws serve as the foundational principles in economics that help economists understanding economic behaviour and guiding economic analysis and policy.

Role of Assumptions in Economics

Assumptions in economics refer to the foundational beliefs, ideas or conditions that are taken for granted so as to understand the behaviour of economic agents like individuals, firms, markets, and governments when analysing an economic phenomena. They are essential for building economic models and theories, which are used understand and predict various aspects of economic activities.

Economic Models

An economic model is a simplified representation of the real world. It is an 'abstraction' from the real world and a construction of 'hypothetical economic world'.

They are the 'purposeful simplifications' of an economic event or phenomena. Economic models may take the form of verbal statements, numerical tables, graphs or mathematical equations. The purpose of economic models is to create a framework for an organised and orderly method of understanding and explaining the real world.

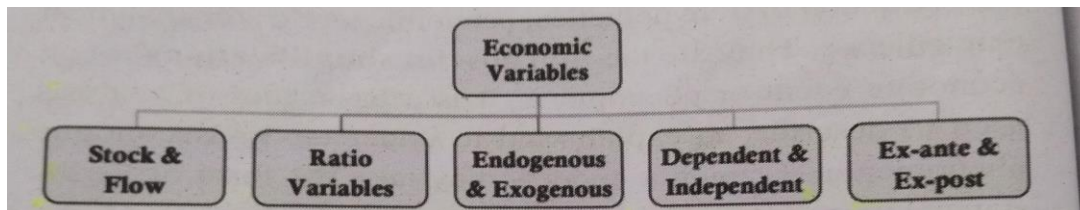
Economists use economic models to learn about the real world and to infer what is truly important for analysis. The usefulness or goodness of a model depends on its validity. The validity of a model can be judged on the basis of several criteria such as: (i) its predictive power, (ii) its consistency (iii) realism of its assumptions (iv) its explanatory power (v) its generality (vi) its simplicity.

Major concepts used in model building are:

1. Variables
2. Constants
3. Parameters
4. Functions and
5. Equations

1. Variables:

A variable is a varying magnitude. It is a quantity or magnitude whose value may change over a specified time period under consideration. Each variable is represented by a specific symbol. For example, we may express demand by 'D', supply by 'S' and price by 'P'. Economic variables may be of different types, namely:



(a). Stock & Flow Variables: A stock variable is a magnitude or quantity whose value can be measured at a 'specific point of time. Money supply is an example for stock variable.

Flow variable is a magnitude or quantity whose value can be measured in terms of a 'specific period of time.' Income is an example for flow variable where income can be expressed per week, per month or per year.

Stock variables have a 'time reference' with them while flow variables have a 'time dimension.' Stocks and flows are frequently related because a flow is a change in a stock.

(b). Ratio Variables: Ratio variables are the indices providing a measure of relationship between two variables - either two stocks or two flows or of stocks-flows at a certain point of time. $[APC = C/Y]$ is an example for ratio variable .

(c). Endogenous & Exogenous Variables:

An endogenous variable is a variable whose value can be determined within the system or model.

An exogenous variable is a variable whose value can be determined by the forces 'outside' the system or model.

Levels of income, employment and output, magnitudes of saving and investment or demand and supply etc. are the examples for endogenous variables because they are "internal" to the system. The variables like size, growth and composition of population, imports, techniques of production, inventions and innovations etc. are the examples for exogenous variables because they are "external" to the system.

(d). Dependent & Independent Variables: Dependent variables are those variables whose value varies in some unique way with the variation in the value of some other independent variables. In contrast, independent variables are those variables whose value varies without the influence of other variables. Dependent and independent variables are used for explaining the 'functional relationships' among different variables. For example, $[C = f(Y)]$ where, 'C' is the dependent variable and 'Y' is an independent variable.

(e). Ex-ante & Ex-post Variables: 'Ex-ante' and 'ex-post' are the two Latin words meaning 'before-hand' and 'after-wards' respectively. Ex-ante variables refer to the 'estimates of variables' at the beginning of a specified period whereas ex-post variables refer to the 'magnitudes of variables' at the end of a specified period. Thus, 'ex-ante' variables are the planned, intended or desired variables, whereas ex-post variables are the realised, actual or observed variables at the end of a specified period."

2. Constants:

A constant is something whose magnitude does not change. It is the opposite of a variable. When a constant is joined to a variable, it is called the 'co-efficient of that variable.'

3. Parameters:

A parameter is a symbol which is constant for the purpose of any particular problem but, may assume different values to different problems. That is why it is called 'parametric constant' or 'constant variable'. Parameters are normally represented by such symbols α , β , γ etc.

4. Functions:

Functions or functional relationships among two or more variables implies that there exists some unique relationship between their magnitudes such that a change in the magnitude of one variable is associated in some regular and definite way with the changes in the other variable. For example, $[Q_d = f(P)]$ where, 'Q_d' is the dependent variable and 'P' is the independent variable.

5. Equations:

In economic models, generally three types of equations are used, namely:

- (i) behavioural equations,
- (ii) definitional equations
- (iii) the equilibrium condition.

Behavioural equations specify how a variable behaves in response to the changes in other variables.

Definitional equations specify the relationship between 2 alternate expressions having the same meaning.

The equation that explains the attainment of equilibrium is called the equilibrium condition. For example, the equilibrium condition for the market model is $[Q_d = Q_s]$.

Major Uses of Economic Models

An economic model is a simplified representation of reality that allows us to observe, understand, and make predictions about economic behavior.

Economic principles and models are highly useful in analysing economic behaviour and understanding how the economy operates. They are the tools for ascertaining cause and effect (action and outcome) relationships within the economic system

The major uses of economic models may be summarised as follows:

1. Models are the simplification of reality.
2. Models are very much useful to create a framework for an organized and orderly understanding and explaining of the real world.
3. Models prove helpful in understanding and explaining the complex real life situations.
4. Models serve as a powerful means for understanding the nature of economic relationships.
5. Models are helpful to provide a 'cause and effect relationship.
6. Models can be used to isolate the determinants of important economic variables.
7. Models are useful in predicting the consequence of certain events.
8. Models with valid expressions and accurate predictions can be used for the purpose of control.
9. Models enable systematic thinking about the problem we are trying to solve.

10. Models are useful in policy making.

The Circular Flow Model

The circular flow model is a basic concept in economics that describes how money, goods, and services move through an economy. It shows the interconnection between different sectors,

An economy can be defined as an integrated system of production, exchange and consumption. In carrying out these economic activities, people are involved in making transactions. Economic transactions generate two kinds of flows a real flow (flow of goods and services) and a money flow.

The circular flow of income and expenditure, or simply the circular flow, is a schematic representation of the organisation of an economy. It is a simple economic model showing the relationship between money income and spending for the economy as a whole. The various components of national income and expenditure such as saving, investment, taxation, government expenditure, exports and imports flow from one sector to another.

There are some 'leakages' from and 'injections' to the circular flows of income and expenditure. The 'leakages' are the 'withdrawals' from and injections are the 'additions' to the circular flow. If injections exceed leakages, the circular flow grows, that is, there is economic prosperity. If injections are less than leakages, the circular flow shrinks, that is, there is a recession in the economy.

To analyse the circular flows, the economy may be divided into four sectors as:

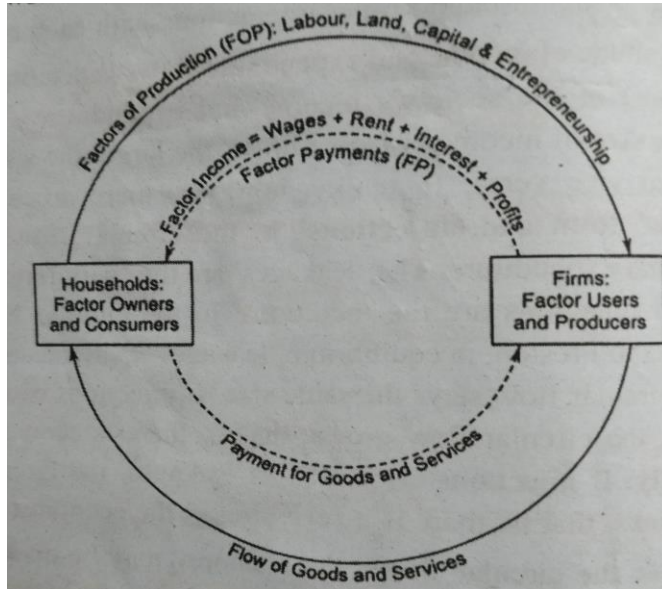
- (i) the household sector,
- (ii) the business sector or firms
- (iii) the government sector
- (iv) the foreign sector.

By considering these four sectors, we have three models of circular flows:

- The 2-sector model including the household sector and the business sector
- The 3-sector model including the household sector, the business sector and the government sector, and
- The 4-sector model including the household sector, the business sector, the government sector and the foreign sector.

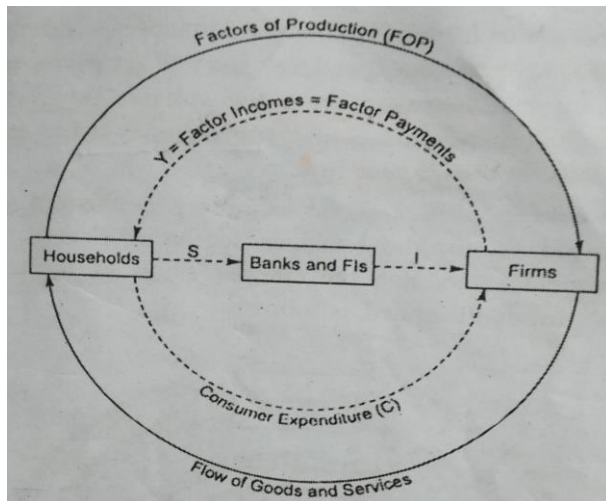
◆ **The 2-sector Model:**

The working of a 2-sector economy consisting of the household sector and the business sector or firms and the circular flow of income and expenditure is illustrated as follows :



The state of equilibrium is defined as a situation in which **levels of income (Y), expenditure (E) and output (O) is equal**. That is, $[Y=E=O]$. This means that the expenditure of buyers (households) becomes income for sellers (firms). The firms then spend this income on factors of production such as labour, capital and raw materials, 'transferring their income to the factor owners. The factor owners spend this income on goods which leads to a circular flow of income.

In the real economy, when we are incorporating the financial sector or the role of banks and other financial institutions and 'savings' is leakages and 'investments' as the 'injections' to the 2-sector circular flow model, then the model may be illustrated as follows:



◆The 3-sector Model:

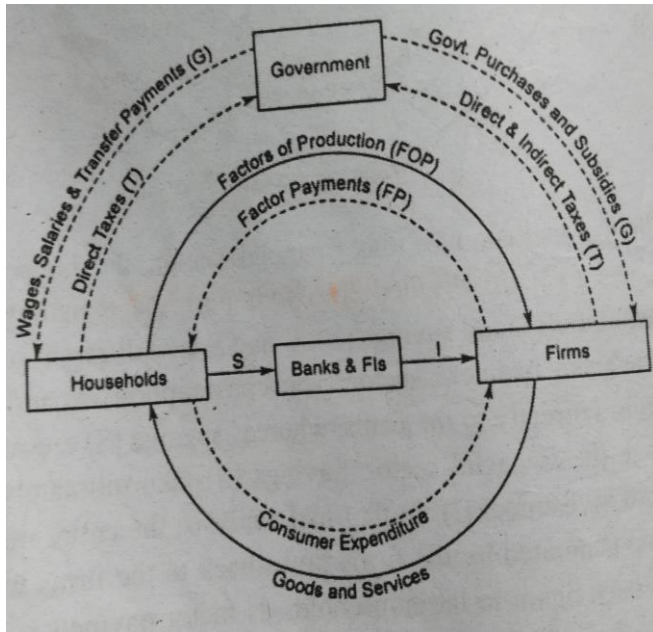
The 3-sector model is formed by adding the government sector to the 2-sector model. It provides a more realistic picture of the economy because it includes the role of government in the economic spheres. The inclusion of the government sector into the model requires adding and analyzing the 'fiscal operations' of the government.

Three important fiscal variables

- taxes (T)
- government expenditure (G)
- transfer payments (T).

Taxes are the 'leakages' from the circular flow whereas government expenditure and transfer payments are the 'injections' to the circular flow.

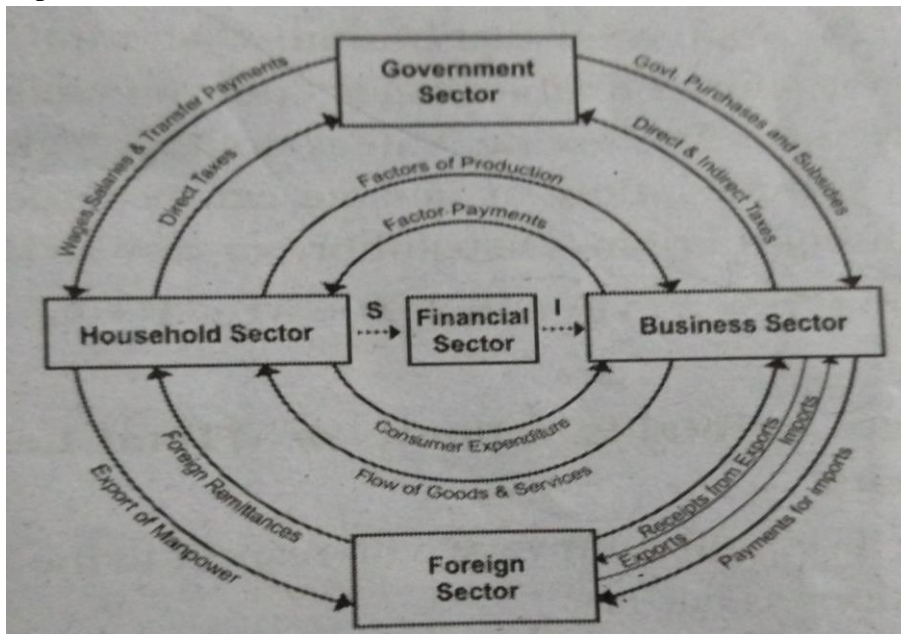
The working of a 3-sector economy consisting of the household sector, the business sector or firms and the government sector and the circular flows of income and expenditure is illustrated as follows:



◆ **The 4-sector Model:**

The 4-sector model is formed by adding the foreign sector to the 3-sector model. When the economy is open for international transactions, it becomes an 'open economy' and provides the complete picture of the economy. The foreign sector consists of two types of transactions as export and import of goods and services and the inflow and outflow of capital.

The working of a 4-sector economy consisting of the household sector, the business sector or firms, the government sector and the foreign sector and the circular flows of income and expenditure is illustrated as follows:



- The foreign sector transforms the model from a closed economy to an open economy.
- The main leakage from this sector are imports (M), which represent spending by residents into the rest of the goods world.
- The main injection provided by this sector is the exports of goods and services which generate income for the exporters from overseas residents.

In terms of the 4-sector circular flow of income model, the state of equilibrium occurs when the total leakages are equal to the total injections that occur in the economy. This can be shown as below:

- $[Savings + Taxes + Imports] = [Investment + Government Spending + Exports]$

or

- $[S+T+M=I+G+X]$

- Therefore, since the leakages are equal to the injections, the economy is in a stable state of equilibrium.
- This state can be contrasted to the state of disequilibrium where unlike that of equilibrium, the sum of total leakages does not equal the sum of total injections.

Disequilibrium can be shown as:

- $[S+T+M>I+G+X]$ or $[S+T+M<I+G+X]$ That is,

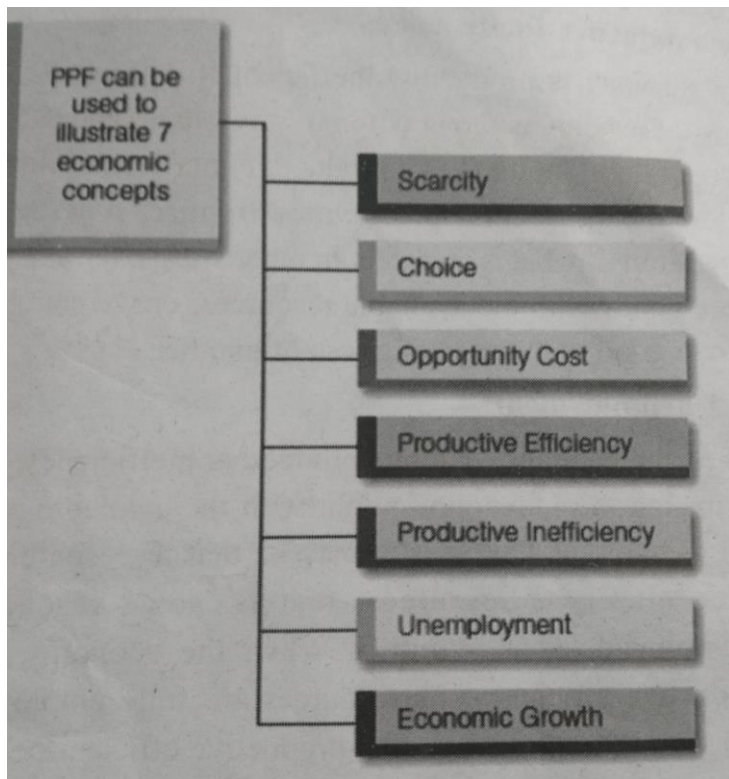
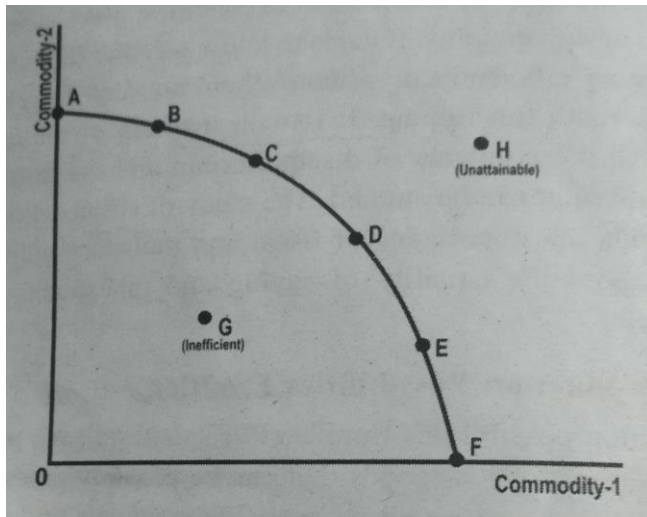
$[Total\ leakages > Total\ injections]$ or $[Total\ Leakages < Total\ injections]$

- If $[S+T+M > I+G+X]$, then, the levels of income, output, expenditure and employment will fall causing a recession or contraction in the overall economic activity.
- If $[S+T+M<I+G+X]$, then, the levels of income, output, expenditure and employment will rise causing a boom or expansion in economic activity.

The Production Possibilities Frontier

Production possibilities frontier (PPF) shows all the possible combinations of two goods that can be possibly produced in an economy by using all its available resources and a given state of technology in a particular period of time. It is the boundary between production levels we 'can attain' and 'cannot attain.' the PPF which separates the production possibilities of an economy into two regions, namely: (i) an attainable region and (ii) an unattainable region. Suppose, the available resources in the economy are used for the production of two commodities, for example commodity- 1 and commodity-2. Then an increase in the production of commodity-1 will lead to

a decrease in the production of commodity-2 and vice versa. Graphically, the PPF is given below:



1. Scarcity:

Scarcity is the condition where the wants for goods are greater than the resources available to satisfy them. The finiteness of resources is graphically portrayed by the PPF. It separates the production possibilities of an economy into two regions:

(i) an attainable region, which consists of the points on the PPF itself and all points below it,

(ii) an unattainable region, which consists of the points above and beyond the PPF. Point A on the PPF is attainable, as is point G; point H is not.

2. Choice:

Choice is also shown with the help of the PPF. Within the attainable region, individuals must make a choice. They must choose the combination of the two goods they want to produce. Whenever they choose alternative combinations, they must have some opportunity costs.

3. Opportunity Cost:

Because people are constrained to choose alternative combinations within the attainable region of the frontier, they must have some opportunity costs. Opportunity costs are the costs of the next best alternative forgone. It is illustrated by the movement from one point to another on the PPF.

4. Productive Efficiency:

An economy is productive efficient if it is producing the maximum output with the given resources and technology. In the exhibit, points A, B, C, D, E and F are productive efficient points. All these points lie on the production possibilities frontier.

5. Productive Inefficiency:

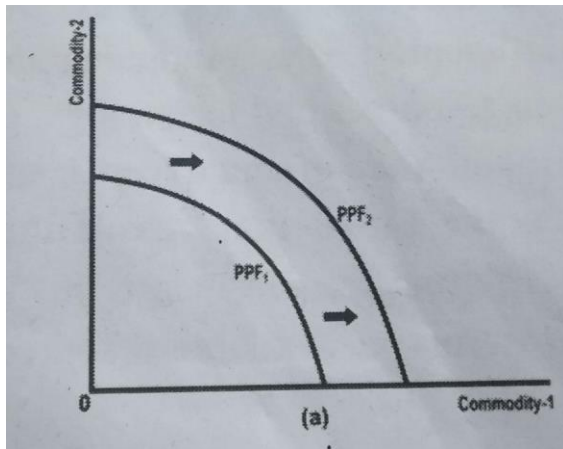
An economy is productive inefficient if it is producing less than the maximum output with given resources and technology. In the exhibit, point G is a productive inefficient point. It lies below the production possibilities frontier, it is below the outer limit of what is possible.

6. Unemployment:

When the economy exhibits productive inefficiency, it is not producing the maximum output with the available resources and technology. One reason may be that the economy is not using all of its resources; that is, some resources are unemployed, as at point G. When the economy exhibits productive efficiency, its resources are fully employed, and none are unemployed. At the productive efficient points A to F, no resources are unemployed.

7. Economic Growth:

Economic growth refers to the increased productive capabilities of an economy. It is illustrated by a shift outward in the production possibilities frontier. Two major factors that affect economic growth are: (i) an increase in the quantity of resources, and (ii) an advance in technology.



Microeconomics and Macroeconomics

Microeconomics and macroeconomics are the two fundamental approaches to economic problems and analysis. Both of these terms were coined by Ragnar Frisch, a Norwegian economist in 1933. The prefixes 'micro' and 'macro' have been derived from two Greek words 'mikros' and 'makros' meaning 'small' and 'large' respectively. Thus, microeconomics is concerned with the study and analysis of individual or small components of the whole economy whereas macroeconomics is concerned with the study and analysis of 'aggregates' covering the entire economy and concerns the overall dimensions of economic life.

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Why the Economists' Advice is not Always Followed?

Economists play a crucial role in shaping economic policy and understanding the dynamics of the economy. Major limitations of economists or the major reasons why they are not always followed are listed below:

- 1. Assumptions:** Economic theories often rely on simplifying assumptions that may not accurately reflect the real-world complexities.
- 2. Data Limitations:** Economic analysis relies heavily on data, but data can be incomplete, outdated, or subject to interpretation.
- 3. Complexity of Issues:** Economic problems are often multifaceted and interconnected, making it difficult to implement straightforward solutions. Economic systems are complex and dynamic, with countless variables interacting in unpredictable ways.

4. Time Lags: Economic policies often take time to produce measurable effects, and the outcomes may not be immediate or visible.

5. Predictive Ability: Economists face challenges in accurately predicting future economic trends and events.

6. Behavioural Factors: Traditional economic models assume rational behaviour, but humans often behave irrationally.

7. Political Considerations: Economic policies often intersect with political ideologies and priorities.

8. Interest Groups: Various interest groups prevailing in the society may lobby for the economic policies that benefit their members or constituents, even if they are not economically optimal.

9. Public Opinion: Economic policies may not always align with public sentiment or perception. Politicians may prioritise policies that are popular among voters, even if they contradict economists' recommendations.

10. Policy Implementation: Even if economist providing sound policy recommendations, implementing these policies effectively can be challenging.

11. Ethical Considerations: Economic analysis often focuses on maximising efficiency and economic growth, but it may neglect important ethical considerations such as equity, justice, and sustainability.

Why Economists Disagree?

Different economists may have different interpretations of the same evidence, leading to disagreements. The economy is actually a complex system with many interconnected parts. Predicting how changes in one part will affect the overall economy is very challenging. Disagreements rather than purely economic reasoning. Thus, economists disagree for several reasons and the prominent among them are listed below:

1. Economists often have incomplete information about the economy.

2. Economic analysis often relies on simplifying assumptions about human behaviour, markets, and government actions, Disagreements can arise over the validity of these assumptions and their implications for economic outcomes.

3. Economists use different methodologies or models to analyse economic problems which may lead to different conclusions.

4. Economists often rely on empirical data to support their theories and arguments. However, interpreting this data can lead to differing conclusions.

5. Economists may have different normative views about what policies are desirable or what outcomes are optimal. These differences in values and objectives can lead to disagreements about the best course of action.