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Institute of Management & Technology

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INTERMEDIATE MICRO ECONOMICS

COURSE- BA (ECO) **SUBJECT CODE: 202**

Q1) What is a monopoly market? What are its features and causes of monopoly?

The term Monopoly means 'alone to sell'. In a monopoly market, there is a single seller of a particular product with no strong competition from any other seller. In other words, monopoly is said to exist when one firm is the sole producer or seller of a product which has no close substitutes.

Features:

1. Single Seller of the Product

In a monopoly market, usually, there is a single firm which produces and/or supplies a particular product/ commodity. It is fair to say that such a firm constitutes the entire industry. Also, there is no distinction between the firm and the industry.

2. Strong barriers to entry

Another feature of a monopoly market is restrictions of entry. These restrictions can be of any form like economical, legal, institutional, artificial, etc.

3. No Close Substitutes

Usually, a monopolist sells a product which does not have any close substitutes. Therefore, the cross elasticity of demand for such a product is either zero or very small. Also, the price elasticity of demand for the monopolist's product is less than one. Hence, in the monopoly market, the monopolist faces a downward sloping demand curve.

4. Price Maker

Since there is only one firm selling the product, it becomes the price maker for the whole industry. The consumers have to accept the price set by the firm as there are no other sellers or close substitutes.

SOURCES AND CAUSES OF MONOPOLY:

There are a number of different factors that can cause a monopoly to arise. However, all of these factors essentially have to do with *barriers to entry*. Thus, in the following paragraphs, we will look at the three most relevant causes of monopoly markets:

1) Ownership of a Key Resource

A firm that has exclusive control or ownership of a key resource can restrict access to that resource and establish a monopoly. The limited availability of the key resource will make it impossible for new sellers to enter the market. Although this factor is important in economic theory, monopolies rarely ever arise for this reason in reality anymore .Mainly because most resources are available in various regions across the globe.

2) Government Regulation

The government can restrict market entry by law (e.g. through patents or copyright laws), which may result in a monopoly. Governments usually do this to serve the public interest, because these regulations promote innovation as well as research and development (R&D). The idea behind this is that firms can be rewarded for their R&D efforts by getting exclusive rights to sell their product.

3) Economies of Scale (i.e. Natural Monopoly)

In some industries, a single firm can supply a good or service at a lower cost than two or more firms could. We call this a natural monopoly (because it arises without government intervention). A natural monopoly can arise in industries where firms face high fixed costs but are able to realize significant economies of scale over the relevant range of output. Those circumstances result in decreasing average total costs as output increases, which makes it more difficult for new firms to enter the market. The market for electricity is a common example of a natural monopoly.

Q2) Does the demand curve under monopoly is same as the demand curve under perfect competition?

The demand curve facing an individual firm under perfect competition is a horizontal straight line as the level of prevailing price of the product. A perfectly competitive firm is a mere quantity adjuster; it has no influence over price.

But in the case of monopoly one firm constitutes the whole industry. Therefore, the entire demand of the consumers for a product faces the monopolist. Since the demand curve of the consumers for a product slopes downward, the monopolist faces a downward sloping demand curve.

Consider Fig. 26.1. DD is the demand curve facing a monopolist. At price OP the quantity demanded is OM, therefore he would be able to sell OM quantity at price OP. If he wants to sell a greater quantity ON, then price to the OL. If would he restricts his quantity to OG, fall price will rise to OH.Thus every quantity change by him entails a change in price at which the product can be sold. Thus the problem faced by a monopolist is to choose a price-quantity combination which is optimum for him, that is, which yields him maximum possible profits.

Demand curve facing the monopolist will be his average revenue curve. Thus, the average revenue curve of the monopolist slopes downward throughout its length. Since average revenue curve slopes downward, marginal revenue curve will lie below it. This follows from usual average- marginal relationship. The implication of marginal revenue curve lying below average revenue curve is that the marginal revenue will be less than the price or average revenue.

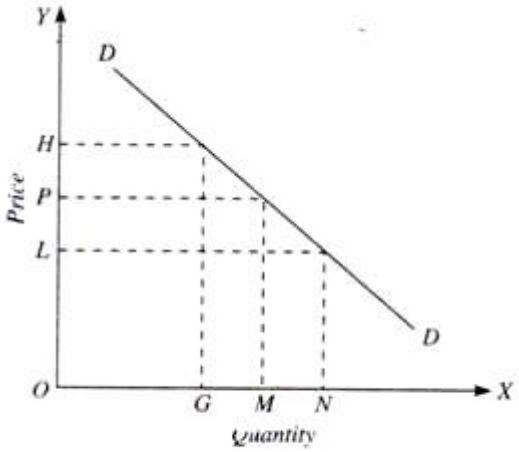


Fig. 26.1. *Demand curve of the monopolist slopes downward.*

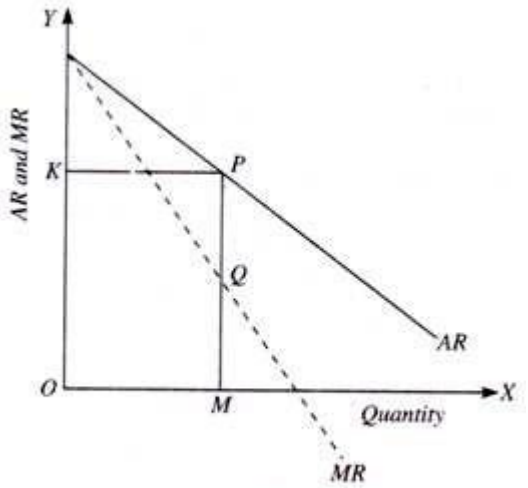


Fig. 26.2. *Average and Marginal Revenue Curves under Monopoly*

When monopolist sells more, the price of his product falls; marginal revenue therefore must be less than the price. In Fig. 26.2 AR is the average revenue curve of the monopolist and slopes downward. MR is the marginal revenue curve and lies below AR curve. At quantity OM, average revenue (or price) is MP and marginal revenue is MQ which is less than MP.

Q3) How equilibrium is established under monopoly?

Monopolist, like a perfectly competitive firm, tries to maximize his profits. Profit maximization assumption on which is based the equilibrium analysis of the perfectly competitive firm is also taken to be the most valid assumption about the behaviour of the monopolist too.The motive of monopolist is the same as the motive of the perfectly competitive firm, that is, both aims at maximizing money profits. We thus do not attribute any more sinister motive to the monopolist. If the results of monopolist' behaviour on the basis of profit maximization motive are different from that of the firm under perfect competition, it is not due to any more sinister motive of monopolist but due to the circumstances arid situation in which he is placed.

The monopolist will go on producing additional units of output so long as marginal revenue exceeds marginal cost. This is because it is profitable to produce an additional unit if it adds more to revenue than to cost.

His profits will be maximum and he will attain equilibrium at the level of output at which marginal revenue equals marginal cost. If he stops short of the level of output at which MR equals MC, he will be unnecessarily forgoing some profits which otherwise he could make.

marginal revenue is equal to marginal cost at OM level of output. The firm will be earning maximum profits and will therefore be in equilibrium when it is producing and selling OM quantity of the product. If he increases his output beyond OM, marginal revenue will be less than marginal cost, that is, additional units beyond OM will add more to cost than to revenue.

Therefore, the monopolist will be incurring loss on the additional units beyond OM and will thus be reducing his total profits by producing more than OM. Thus he is in equilibrium at OM level of output at which marginal cost equals marginal revenue (MC = MR).

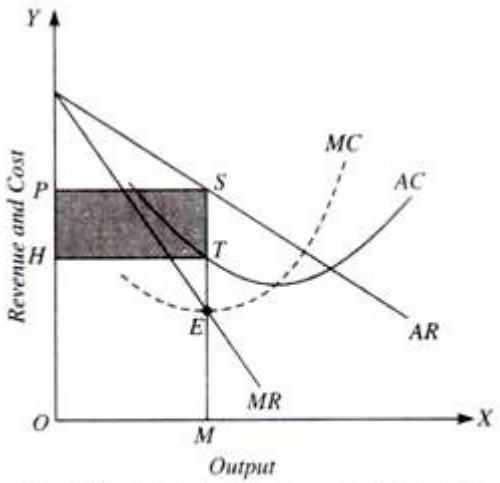


Fig. 26.3. *Firm's Equilibrium under Monopoly: Maximisation of Profits*

Q4) Explain the monopoly equilibrium with the help of price elasticity of demand.

Monopoly equilibrium will always lie where price elasticity is greater than one if marginal cost is positive. We know that at the middle point R of the straight-line demand or AR curve, elasticity is equal to one and corresponding to this unit elasticity point, marginal revenue is equal to zero.

Below the middle point R on the average revenue curve, elasticity is less than one and marginal revenue is negative. The equilibrium of the monopolist, will never lie below the middle point of the average revenue curve AR as over this range, marginal revenue becomes negative and total revenue (TR) decreases as is evident from the falling the TR curve beyond CW output in the bottom part of Fig. 26.4.

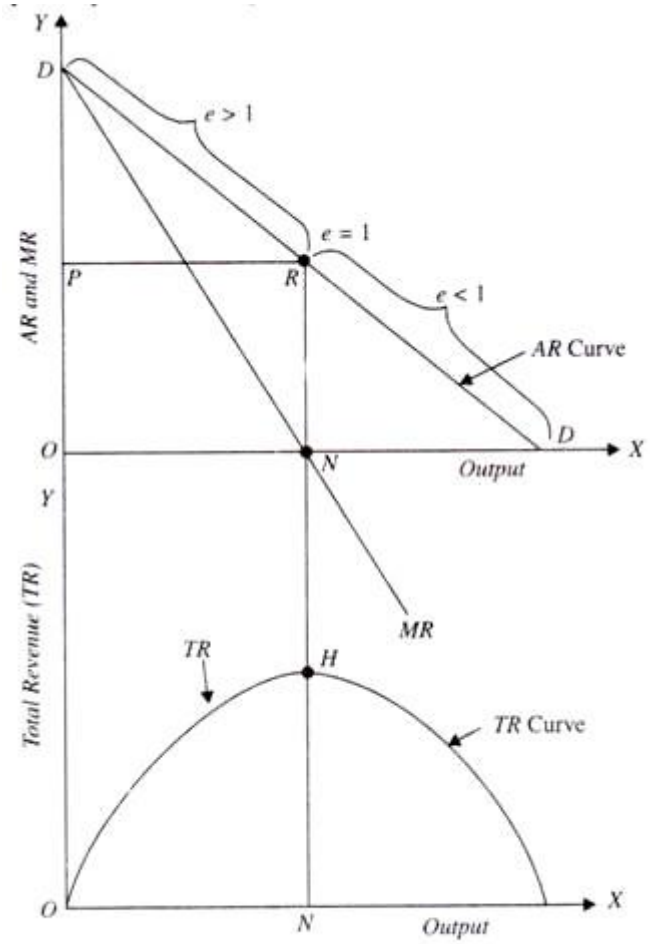


Fig. 26.4. *Monopolist cannot be in equilibrium at a level of output where elasticity of demand is less than one.*

Therefore, no sensible monopolist will produce on that portion of the demand or average revenue curve which gives him negative marginal revenue, that is, which reduces his total revenue, while the production of additional marginal units of output adds to his total cost.

Monopoly Equilibrium in Case of Zero Marginal Cost:

There are, however, some cases where marginal cost is zero, that is, it costs nothing to produce additional units of output. For instance, in case of mineral spring, cost of production of mineral water is zero. Furthermore, in the very short period when a

product is already on hand in excessive amount, it is not relevant to consider cost of production while determining the quantity of output to sell.

Q5) Explain long run equilibrium under monopoly. Also explain how monopoly equilibrium creates the welfare loss?

LONG RUN EQUILIBRIUM UNDER MONOPOLY:

In the long run, the monopolist will make adjustment in the size of his plant as shown in fig-26.5. The monopolist would choose that plant size which is most appropriate for a particular level of demand. He will be in equilibrium at the level of output where given MR curve cuts the longrun MC curve. At equilibrium, MR=LMC=SMC; SAC=LAC and P>LAC.

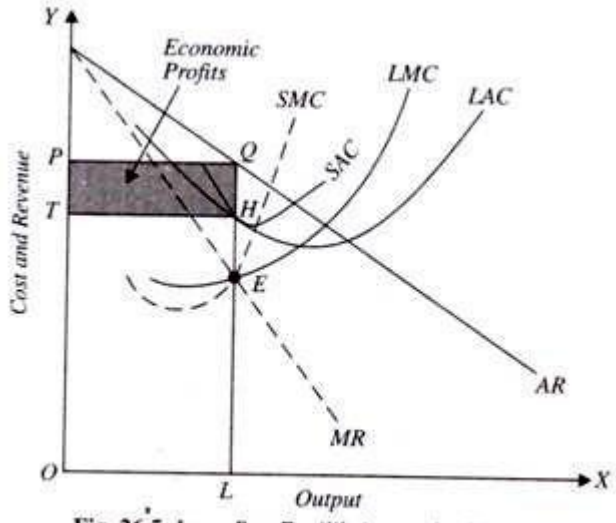


Fig. 26.5. *Long-Run Equilibrium under Monopoly*

WELFARE LOSS:

We shall now try to measure the net welfare loss due to monopoly or inefficiency of monopoly.

In Fig. 11.20, the price-output solution under perfect competition is E_c (p_c, q_c) and that under monopoly is E_m (p_m, q_m). The level of output of the perfectly competitive industry is the efficient level of output because here the willingness to pay for an extra unit of output just equals the cost of producing the extra unit (p = MC).

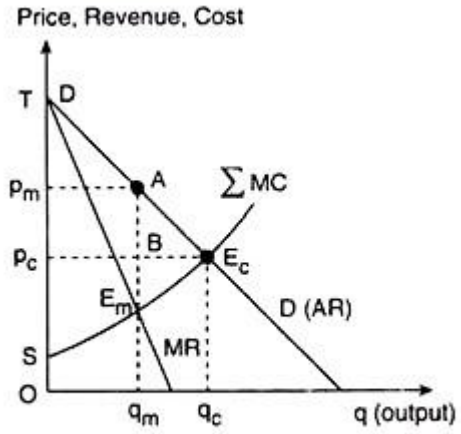


Fig. 11.20 Inefficiency of monopoly

Under monopoly, on the other hand, activity stops at a point where p is greater than MC, i.e., the willingness to pay for an extra unit is greater than the cost of producing the extra unit. That is why the monopoly output level is inefficient. It appears, therefore, that as we move from perfect competition to monopoly, the surplus equal to $\square p_c p_m AB$ is transferred from the consumers to the monopolist producer. We cannot evaluate the net gain or loss in welfare, if any, that would result from this transfer unless we are provided with some extra value judgement to overcome the problem of interpersonal comparison of utility.

Q6) How the monopolist practice price discrimination?

Price discrimination is a selling strategy that charges customers different prices for the same product or service, based on what the seller thinks they can get the customer to agree to. In pure price discrimination, the seller charges each customer the maximum price he or she will pay. In more common forms of price discrimination, the seller places customers in groups based on certain attributes and charges each group a different price.

Price discrimination is most valuable when the profit that is earned as a result of separating the markets is greater than the profit that is earned as a result of keeping the markets combined. Whether price discrimination works and for how long the various groups are willing to pay different prices for the same product depends on the relative elasticities of demand in the sub-markets. Consumers in a relatively inelastic submarket pay a higher price, while those in a relatively elastic sub-market pay a lower price.

How Price Discrimination Works?

With price discrimination, the company looking to make the sales identifies different market segments, such as domestic and industrial users, with different price elasticities. Markets must be kept separate by time, physical distance, and nature of use.

For example, Microsoft Office Schools edition is available for a lower price to educational institutions than to other users. The markets cannot overlap so that consumers who purchase at a lower price in the elastic sub-market could resell at a higher price in the inelastic sub-market. The company must also have monopoly power to make price discrimination more effective.

TYPES OF PRICE DISCRIMINATION:

First degree price discrimination, occurs when a company charges the maximum possible price for each unit consumed. Because prices vary among units, the firm captures all available consumer surplus for itself. Many industries involving client services practice first-degree price discrimination, where a company charges a different price for every good or service sold.

Second degree price discrimination occurs when a company charges a different price for different quantities consumed, such as quantity discounts on bulk purchases.

Third degree price discrimination occurs when a company charges a different price to different consumer groups. For example, a theater may divide moviegoers into seniors, adults, and children, each paying a different price when seeing the same movie. This discrimination is the most common.

Examples of Price Discrimination

One example of price discrimination can be seen in the airline industry. Consumers buying airline tickets several months in advance typically pay less than consumers purchasing at the last minute. When demand for a particular flight is high, airlines raise ticket prices in response.

By contrast, when tickets for a flight are not selling well, the airline reduces the cost of available tickets to try to generate sales. Because many passengers prefer flying home late on Sunday, those flights tend to be more expensive than flights leaving early Sunday morning. Airline passengers typically pay more for additional legroom too.

- With price discrimination, a seller charges customers a different fee for the same product or service.
- With first-degree discrimination, the company charges the maximum possible price for each unit consumed.
- Second-degree discrimination involves discounts for products or services bought in bulk, while third-degree discrimination reflects different prices for different consumer groups.

Q7) What Is Game Theory?

Game theory is a theoretical framework for conceiving social situations among competing players. In some respects, game theory is the science of strategy, or at least the optimal decision-making of independent and competing actors in a strategic setting. The key pioneers of game theory were mathematicians John von Neumann and John Nash, as well as economist Oskar Morgenstern.

The Basics of Game Theory

The focus of game theory is the game, which serves as a model of an interactive situation among rational players. The key to game theory is that one player's payoff is contingent on the strategy implemented by the other player. The game identifies the players' identities, preferences, and available strategies and how these strategies affect the outcome. Depending on the model, various other requirements or assumptions may be necessary.

Game theory has a wide range of applications, including psychology, evolutionary biology, war, politics, economics, and business. Despite its many advances, game theory is still a young and developing science.

Game Theory Definitions

Any time we have a situation with two or more players that involve known payouts or quantifiable consequences, we can use game theory to help determine the most likely outcomes. Let's start out by defining a few terms commonly used in the study of game theory:

- **Game**: Any set of circumstances that has a result dependent on the actions of two or more decision-makers (players)

- **Players**: A strategic decision-maker within the context of the game
- **Strategy**: A complete plan of action a player will take given the set of circumstances that might arise within the game
- **Payoff**: *T*he payout a player receives from arriving at a particular outcome (The payout can be in any quantifiable form, from dollars to utility.)
- **Information set**: The information available at a given point in the game (The term *information set* is most usually applied when the game has a sequential component.)
- **Equilibrium**: The point in a game where both players have made their decisions and an outcome is reached

Q8) Write short note on the following:

a) **Nash Equilibrium**
b) **Prisoner's delimma**

The Nash Equilibrium

Nash Equilibrium is an outcome reached that, once achieved, means no player can increase payoff by changing decisions unilaterally. It can also be thought of as "no regrets," in the sense that once a decision is made, the player will have no regrets concerning decisions considering the consequences.

The Nash Equilibrium is reached over time, in most cases. However, once the Nash Equilibrium is reached, it will not be deviated from. After we learn how to find the Nash Equilibrium, take a look at how a unilateral move would affect the situation. Does it make any sense? It shouldn't, and that's why the Nash Equilibrium is

described as "no regrets." Generally, there can be more than one equilibrium in a game.

However, this usually occurs in games with more complex elements than two choices by two players. In simultaneous games that are repeated over time, one of these multiple equilibrium is reached after some trial and error. This scenario of different choices overtime before reaching equilibrium is the most often played out in the business world when two firms are determining prices for highly interchangeable products, such as airfare or soft drinks.

The Prisoner's Dilemma

The Prisoner's Dilemma is the most well-known example of game theory. Consider the example of two criminals arrested for a crime. Prosecutors have no hard evidence to convict them. However, to gain a confession, officials remove the prisoners from their solitary cells and question each one in separate chambers. Neither prisoner has the means to communicate with each other. Officials present four deals, often displayed as a 2 x 2 box.

1. If both confess, they will each receive a five-year prison sentence.
2. If Prisoner 1 confesses, but Prisoner 2 does not, Prisoner 1 will get three years and Prisoner 2 will get nine years.
3. If Prisoner 2 confesses, but Prisoner 1 does not, Prisoner 1 will get 10 years, and Prisoner 2 will get two years.
4. If neither confesses, each will serve two years in prison.

The most favorable strategy is to not confess. However, neither is aware of the other's strategy and without certainty that one will not confess, both will likely confess and receive a five-year prison

sentence. The Nash equilibrium suggests that in a prisoner's dilemma, both players will make the move that is best for them individually but worse for them collectively.

The expression "tit for tat" has been determined to be the optimal strategy for optimizing a prisoner's dilemma. Tit for tat was introduced by AnatolRapoport, who developed a strategy in which each participant in an iterated prisoner's dilemma

follows a course of action consistent with his opponent's previous turn. For example, if provoked, a player subsequently responds with retaliation; if unprovoked, the player cooperates.

Q9) Briefly explain the Cournot duopoly model.

The earliest duopoly model was developed in 1838 by the French economist AugustinCournot. The model may be presented in many ways.

The original version is quite limited in that it makes the assumption that the duopolists have identical products and identical costs.

Actually Cournot illustrated his model with the example of two firms each owning a spring of mineral water, which is produced at zero costs. We will present briefly this version, and then we will generalize its presentation by using the reaction curves approach.

Cournot assumed that there are two firms each owning a mineral well, and operating with zero costs. They sell their output in a market with a straight-line demand curve. Each firm acts on the assumption that its competitor will not change its output, and decides its own output so as to maximize profit.

Assume that firm A is the first to start producing and selling mineral water. It will produce quantity A, at price P where profits are at a maximum (figure 9.1), because at this point MC — MR = 0. The elasticity of market demand at this level of output is equal to unity and the total revenue of the firm is a maximum. With zero costs, maximum R implies maximum profits, Π. Now firm B assumes that A will keep its output fixed (at 0/1), and hence considers that its own demand curve is CD'.

Clearly firm B will produce half the quantity AD', because (under the Cournot assumption of fixed output of the rival) at this level (AB) of output (and at price F) its revenue and profit is at a maximum. B produces half of the market which has not been supplied by A, that is, B's output is ¼ (= ½. ½) of the total market.

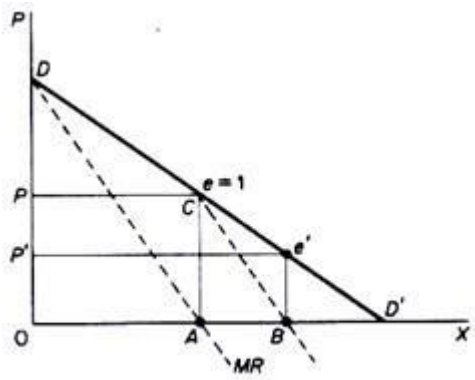


Figure 9.1

Firm A, faced with this situation, assumes that B will retain his quantity constant in the next period. So he will produce one-half of the market which is not supplied by B. Since B covers one-quarter of the market, A will, in the next period, produce ½(1 – ¼) = ½. ¾ = ⅜ of the total market.

Firm B reacts on the Cournot assumption, and will produce one-half of the unsupplied section of the market, i.e. ½ (1 – ⅜) = 5/16.

This action-reaction pattern continues, since firms have the naive behaviour of never learning from past patterns of reaction of their rival. However, eventually an equilibrium will be reached in which each firm produces one-third of the total market. Together they cover two-thirds of the total market. Each firm maximises its profit in each period, but the industry profits are not maximised.

The Cournot solution is stable. Each firm supplies 4 of the market, at a common price which is lower than the monopoly price, but above the pure competitive price (which is zero in the Cournot example of costless production).

The reaction-curves approach is a more powerful method of analysis of oligopolistic markets, because it allows the relaxation of the assumption of identical costs and identical demands. This approach is based on Stackelberg's indifference-curve analysis, which introduces the concept of isoprofit curves of competitors. We will first

establish the shape of the isoprofit curves for substitute commodities, and from these curves we will subsequently derive the reaction curves of the Cournotduopolists.

An isoprofit curve for firm A is the locus of points defined by different levels of output of A and his rival B, which yield to A the same level of profit (figure 9.2).

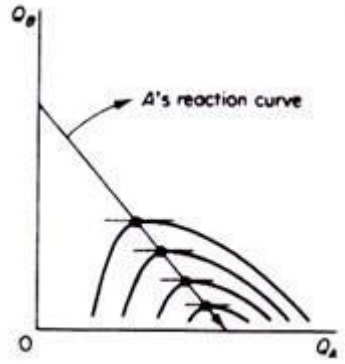


Figure 9.2 Isoprofit map of firm *A*

Similarly, an isoprofit curve for firm B is the locus of points of different levels of output of the two competitors which yield to B the same level of profit (figure 9.3)

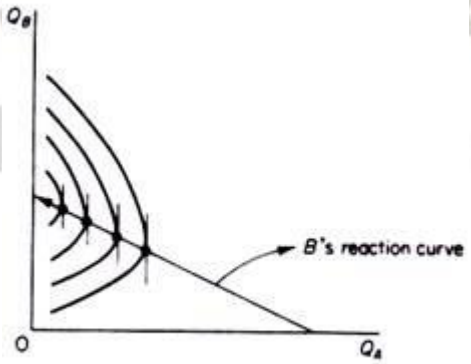


Figure 9.3 Isoprofit map of firm *B*

Cournot's equilibrium is determined by the intersection of the two reaction curves. It is a stable equilibrium, provided that A's reaction curve is steeper than B's reaction curve. (This condition is satisfied by the assumption we made that the highest points of successive isoprofit curves of A lie to the left of one another, while the highest points of B's isoprofit curves lie to the right of each other.)

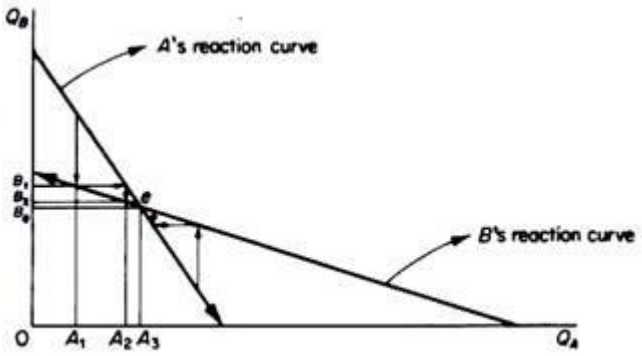


Figure 9.8

Q10) What is the difference between Cournot and Bertrand Competition?

An oligopoly is a market structure where only a few sellers serve the entire market. Because of their strong position in the market, these firms have the power to influence the price. That means, unlike in a market with perfect competition, they are no longer price takers, but price makers. In that sense, they can act somewaht similar to firms in a monopoly. However, unlike in a monopoly, sellers in an oligopoly also have to take into account the decisions and actions of their competitors when making pricing decisions.

There are two common models that describe the monopolistic competition in an oligopoly. They are called Cournot and Bertrand Competition (both named after their inventors). The main difference between the two is the firm's initial decision to set a fixed price or a fixed quantity. We'll see what exactly that means in the following paragraphs. For now, just note that the outcome of both models is based on principles of game theory (see also the prisoner's dilemma). So with that being said, let's look at the two models in more detail.

Cournot Competition

Cournot Competition describes an industry structure (i.e. an oligopoly) in which competing companies simultaneously (and independently) chose a quantity to produce. The total quantity supplied by all firms then determines the market price. According to the law of

supply and demand, a high level of output results in a relatively low price, whereas a lower level of output results in a relatively higher price. Therefore, each company has to consider the expected quantity supplied by its competitors to maximize their own profits.

For example, let's look at a candy seller called Sweet Candy Dreams (SCD). If the competitors of SCD are expected to sell only a small quantity of candy, it may be attractive for SCD to supply a large quantity because price (and thus profits) will be relatively high. Meanwhile, if the expected quantity supplied by its competitors is high, the company may decide to sell less candy, because it's less profitable due to a lower price.

Thus, we have a strategic game (see also game theory) where the quantities supplied are the strategies. This situation ultimately leads to the so-called Cournot-Equilibrium. That means, the market reaches an equilibrium where all firm's chose a quantity that is their 'best response' to their competitors' quantities. We will look at how to calculate such a Cournot-Equilibrium in a different article. For now, all you need to know is that Cournot competition leads to an inefficient equilibrium, i.e. a price above the price in perfect competition and economic profits for the firms.

Bertrand Competition

Bertrand Competition describes an industry structure (i.e. an oligopoly) in which competing companies simultaneously (and independently) chose a price at which to sell their products. The market demand at this price then determines quantity supplied. As a result, each company has to consider the expected price of their competitors' products. However, unlike in Cournot competition, in this case, the firm's won't share the market. Instead, the company that chooses the lowest price can serve the entire market.

To illustrate this, let's revisit our candy seller Sweet Candy Dreams (SCD). If we assume that there is only one other competitor (Candy Corp.) in the market, SCD has to pick a price that is equal to or lower than the price Candy Corp. chooses, if the company wants to sell anything. So if Candy Corp. is expected to set its price at USD 2.00, it would be reasonable

for SCD to set its price at USD 1.99, as this would allow the company to serve the entire market. However, Candy Corp. knows this, so it will chose a lower price.

Again, this can be seen as a strategic game, where the prices are the strategies. However, this results in entirely different outcome than before. All the firms need to do in order to increase their market share to 100% is set their price one cent lower than their competitors. They will repeat this process, until they reach a point where price equals their marginal costs. Therefore, in Bertrand competition the market ultimately reaches an efficient equilibrium, where price is equal to the price in perfect competition and the firm's don't earn economic profits.

In a Nutshell

An oligopoly is a market structure where only a few sellers serve the entire market. This gives them enough power to influence quantity and/or price of a good or service in the market. There are two common models that describe the monopolistic competition in an oligopoly: Cournot and Bertrand Competition. Cournot Competition describes an industry structure in which competing companies simultaneously (and independently) chose a quantity to produce. This sort of competition leads to an inefficient equilibrium. Meanwhile, Bertrand Competition describes an industry structure (i.e. an oligopoly) in which competing companies simultaneously (and independently) chose a price at which to sell their products. This type of competition leads to an efficient outcome.

Q11) What are the causes of market failure ?

Reasons for market failure include:

- **Positive and negative externalities**: an externality is an effect on a third party that is caused by the consumption or production of a good or service. A positive externality is a positive spillover that results from the consumption or production of a good or service. For example, although public education may only directly affect students and schools, an educated population may provide positive effects on society as a whole. A negative externality is a negative spillover effect on third parties. For example,

secondhand smoke may negatively impact the health of people, even if they do not directly engage in smoking.

- **Environmental concerns:** effects on the environment as important considerations as well as sustainable development.
- **Lack of public goods:** public goods are goods where the total cost of production does not increase with the number of consumers. As an example of a public good, a lighthouse has a fixed cost of production that is the same, whether one ship or one hundred ships use its light. Public goods can be underproduced; there is little incentive, from a private standpoint, to provide a lighthouse because one can wait for someone else to provide it, and then use its light without incurring a cost. This problem – someone benefiting from resources or goods and services without paying for the cost of the benefit – is known as the free rider problem.
- **Underproduction of merit goods:** a merit good is a private good that society believes is under consumed, often with positive externalities. For example, education, healthcare, and sports centers are considered merit goods.
- **Overprovision of demerit goods:** a demerit good is a private good that society believes is over consumed, often with negative externalities. For example, cigarettes, alcohol, and prostitution are considered demerit goods.
- **Abuse of monopoly power:** imperfect markets restrict output in an attempt to maximize profit.

When a market fails, the government usually intervenes depending on the reason for the failure.

Q12) Write short note on the following:

a) **Asymmetric Information**

b) **Adverse Selection**

c) **Moral Hazard**

Asymmetric Information

Asymmetric information means that one party has more or better information than the other when making decisions and transactions. The imperfect information causes an imbalance of power. For example, when you are trying to negotiate your salary, you will not know the maximum your employer is willing to pay and your employer will

not know the minimum you will be willing to accept.Accurate information is essential for sound economic decisions. When a market experiences an imbalance it can lead to market failure.

Adverse Selection

Adverse selection is a term used in economics that refers to a process in which undesired results occur when buyers and sellers have access to different/imperfect information. The uneven knowledge causes the price and quantity of goods or services in a market to shift. This results in "bad" products or services being selected. For example, if a bank set one price for all of its checking account customers it runs the risk of being adversely affected by its low-balance and high activity customers. The individual price would generate a low profit for the bank.

Moral Hazards and Market Failure

In addition to adverse selection, moral hazards are also a result of asymmetric information. A moral hazard is a situation where a party will take risks because the cost that could incur will not be felt by the party taking the risk. A moral hazard can occur when the actions of one party may change to the detriment of another after a financial transaction. In relation to asymmetric information, moral hazard may occur if one party is insulated from risk and has more information about its actions and intentions than the party paying for the negative consequences of the risk. For example, moral hazards occur in employment relationships involving employees and management. When a firm cannot observe all of the actions of employees and managers there is the chance that careless and selfish decision making will occur.

Q13) Differenciate between public good and private good.

Public goods, as the name suggests, are for the facility and welfare of the public in general for free of cost. Whereas, private products are the ones which are sold by private companies to earn profits and fulfil the needs of the buyers. This is a significant difference between these two types of goods.

However, both public goods and private goods are for the consumer's benefit; they differ drastically from each other. But, where public goods benefit the mass population, private

products are only for those who have affordability. To know these differences in detail, read below.

Difference and Comparison

BASIS	PUBLIC GOODS	PRIVATE GOODS
Meaning	Public goods are the ones which are provided by the nature or the government for free use by the public.	Private goods are the ones which are manufactured and sold by the private companies to satisfy the consumer needs and wants.
Provider	Nature or government	Manufacturers i.e. entrepreneurs
Consumer equality	Rich and poor are treated equally	Preference to rich consumers
Availability	Readily available to all	Reduces with each consumption
Opportunity Cost	No	Yes
Free riders problem	Yes	No
Quality	Remains constant	Varies with ability to buy
Objective	Overall growth and development	Profit earning
Excludability	Non-excludable	Excludable
Rivalry	Non-rival	Rival
Examples	Police service, fire brigade, national defense, public transport, roads, dams and river	Clothes, cosmetics, footwear, cars, electronic products and food

Q14) What are public goods and private goods?

Types of Goods

Before we read about the different kinds of goods available, we must clearly understand the meaning of the following two determinants of these types:

Rivalry: Rivalry can be perceived as competition in consumption i./e. If one person consumes a particular good, the other has to let go of the opportunity of using it simultaneously.

Excludability: The term excludability refers to the restriction on the usage of a product limited to the people who have paid for it.

Now, by the above two attributes, the goods are categorized into the following types of Goods:

Private Goods: The products which are rival and excludable at the same time as clothes, cosmetics and electronics are termed as private goods.

Public Goods: The goods which are non-rival and non-excludable at the same time, for instance, road, bridge and dams are called public goods.

What are Public Goods?

Public goods are the commodities or services provided by the nature of the government of a country, free of cost or by taxing the few people to offer mass benefit to the public in general.

Characteristics of Public Goods

These commodities or services develop the infrastructure and living standard of a country. To know more about public goods, let us go through its following features:

- **Non-Rival**: The public goods are non-competitive, i.e. it can serve many people at the same time without hindering the usage of one another.
- **Non-Excludable**: These goods are usually free of cost and can be used by anyone without any restriction.

- **Non-Rejectable**: The consumption of such goods cannot be dismissed or unaccepted by the public since it is available collectively to all the people.
- **Free-Riding**: The goods categorized under public goods benefit even those who have not paid for it. Such people are termed as free-riders.

What are Private Goods?

Private goods are the products or services which are manufactured or produced by the companies owned by entrepreneurs who aim at meeting customer's requirement to earn profits through the trading of such goods in the free market.

Characteristics of Private Goods

Private goods serve the personal needs of consumers. Following are the various characteristics of these goods:

- **Rival**: The private products involve rivalry or competition among the consumers for its usage since the consumption by one person will restrict its use by another.
- **Excludable**: These goods involve cost, and therefore the non-payers are excluded from the consumption.
- **Rejectable**: Private goods can be unaccepted or rejected by the consumers since they have multiple alternatives and the right to select the product according to their preference.
- **Traded in Free Market**: Such goods can be freely bought and sold in the market at a given price.
- **Opportunity Cost**: These goods have an opportunity, i.e. the consumer has to let go of the benefit from a similar product while selecting a particular private commodity.

Q15) Explain Vikrey Clark Grove Mechanism in brief.

VIKREY-CLARKE-GROVE MECHANISM

VCG mechanisms constitute an extensively studied special class of mechanisms with money. They are derived using the idea of violating one of the necessary conditions of the Gibbard-Satterthwaite theorem. VCG mechanisms assume a restricted environment called the quasilinear environment in which no social choice function can be dictatorial and moreover the mechanism can be elegantly decomposed into an

allocation rule and a payment rule. Further the ex-post efficiency property can be separated into two properties, allocative efficiency (a property of the allocation rule) and strict budget balance (a property of the payment rule). VCG mechanisms are appealing because they satisfy allocative efficiency as well as dominant strategy incentive compatibility. We discuss the quasilinear environment first followed by Groves mechanisms (which are the most general among VCG mechanisms). Then we discuss the Clarke mechanism (also called pivotal mechanism) of which the Vickrey mechanism is a special case. We provide several examples to illustrate VCG mechanisms.

Vickrey–Clarke–Groves auction is an application of VCG mechanism for welfare maximization. Here, is the set of all possible allocations of items to the agents. Each agent assigns a personal monetary value to each bundle of items, and the goal is to maximize the sum of the values of all agents.

A well-known special case is the Vickrey Auction. Here, there is only a single item, and the set contains possible outcomes: either sell the item to one of the agents, or not sell it at all. In step 3, the winner agent is paid 0 (since the total value of the others is 0) and the losers receive a payment equal to the declared value of the winner. In step 4, the winner pays the second-highest bid (the total value of the others had he not participated) and the losers pay the declared value of the winner (the total value of the others had they not participated). All in all, the winner pays the second-highest bid and the losers pay 0.

A VCG mechanism can also be used in a double auction. It is the most general form of incentive-compatible double-auction since it can handle a combinatorial auction with arbitrary value functions on bundles. Unfortunately, it is not budget-balanced: the total value paid by the buyers is smaller than the total value received by the sellers. Hence, in order to make it work, the auctioneer has to subsidize the trade.

Q16) What is an Edgeworth Box?

The EdgeworthFrancisEdgeworth (1845–1926) introduced a variety of mathematical tools, including calculus, for considering economics and political issues, and was certainly among the first to use advanced mathematics for studying ethical

problems. box considers a two-person, two-good "exchange economy." That is, two people have utility functions of two goods and endowments (initial allocations) of the two goods. The Edgeworth box is a graphical representation of the exchange problem facing these people and also permits a straightforward solution to their exchange problem.

The Edgeworth box is represented in Figure 14.1 "The Edgeworth box". Person 1 is "located" in the lower left (southwest) corner, and Person 2 in the upper right (northeast) corner. The *X* good is given on the horizontal axis, the *Y* good on the vertical. The distance between them is the total amount of the good that they have between them. A point in the box gives the allocation of the good—the distance to the lower left to Person 1, the remainder to Person 2. Thus, for the point illustrated, Person 1 obtains (x_1, y_1), and Person 2 obtains (x_2, y_2). The total amount of each good available to the two people will be fixed.

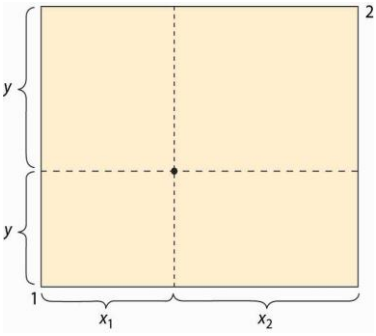


Fig 14.1: the edgeworth box

The allocation is efficient if there is no waste or slack in the system, even if it is wildly unfair. To distinguish this economic notion, it is sometimes called Pareto efficiency.

Q17) What do you understand by General Equilibrium Analysis?

General equilibrium theory, or Walrasian general equilibrium, attempts to explain the functioning of the macroeconomy as a whole, rather than as collections of individual market phenomena.

The theory was first developed by the French economist Leon Walras in the late 19th century. It stands in contrast with partial equilibrium theory, or Marshallian partial equilibrium, which only analyzes specific markets or sectors.

Understanding General Equilibrium Theory

Walras developed the general equilibrium theory to solve a much-debated problem in economics. Up to that point, most economic analyses only demonstrated partial equilibrium—that is, the price at which supply equals demand and markets clear—in individual markets. It was not yet shown that equilibrium could exist for all markets at the same time in aggregate.

General equilibrium theory tried to show how and why all free markets tend toward equilibrium in the long run. The important fact was that markets didn't necessarily reach equilibrium, only that they tended toward it. As Walras wrote in 1889, “The market is like a lake agitated by the wind, where the water is incessantly seeking its level without ever reaching it.”

General equilibrium theory builds on the coordinating processes of a free market price system, first widely popularized by Adam Smith's "The Wealth of Nations" (1776). This system says traders, in a bidding process with other traders, create transactions by buying and selling goods. Those transaction prices act as signals to other producers and consumers to realign their resources and activities along more profitable lines.

Walras, a talented mathematician, believed he proved that any individual market was necessarily in equilibrium if all other markets were also in equilibrium. This became known as Walras’s Law.

Special Considerations

There are many assumptions, realistic and unrealistic, inside the general equilibrium framework. Each economy has a finite number of goods in a finite number of agents. Each agent has a continuous and strictly concave utility function, along with possession of a single pre-existing good (the “production good”). To increase his utility, each agent must trade his production good for other goods to be consumed.

There is a specified and limited set of market prices for the goods in this theoretical economy. Each agent relies on these prices to maximize his utility, thereby creating supply and demand for various goods. Like most equilibrium models, markets lack uncertainty, imperfect knowledge, or innovation.

KEY TAKEAWAYS

- General equilibrium analyzes the economy as a whole, rather than analyzing single markets like with partial equilibrium analysis.
- General equilibrium exists when supply and demand are balanced, or equal.

Alternatives to General Equilibrium Theory

Austrian economist Ludwig von Mises developed an alternative to long-run general equilibrium with his so-called Evenly Rotating Economy (ERE). This was another imaginary construct and shared some simplifying assumptions with general equilibrium economics: no uncertainty, no monetary institutions, and no disrupting changes in resources or technology. The ERE illustrates the necessity of entrepreneurship by showing a system where none existed.

Another Austrian economist, Ludwig Lachmann, argued the economy is an ongoing, non-stable process replete with subjective knowledge and subjective expectations. He argued that equilibrium could never be mathematically proven in a general or non-partial market. Those influenced by Lachmann imagine the economy as an open-ended evolutionary process of spontaneous order.

Q18) What is an efficient point and contract curve in the edgeworth box?

We can find the Pareto-efficient points by fixing Person 1's utility and then asking what point, on the indifference isoquant of Person 1, maximizes Person 2's utility. At that point, any increase in Person 2's utility must come at the expense of Person 1, and vice versa; that is, the point is Pareto efficient. An example is illustrated in Figure 14.2 "An efficient point".

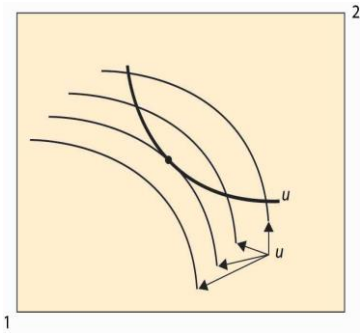


Fig 14.2: An efficient point

In Figure 14.2 "An efficient point", the isoquant of Person 1 is drawn with a dark, thick line. This utility level is fixed. It acts like the "budget constraint" for Person 2.

This process of identifying the points that are Pareto efficient can be carried out for every possible utility level for Person 1. What results is the set of Pareto-efficient points, and this set is also known as the contract curve.

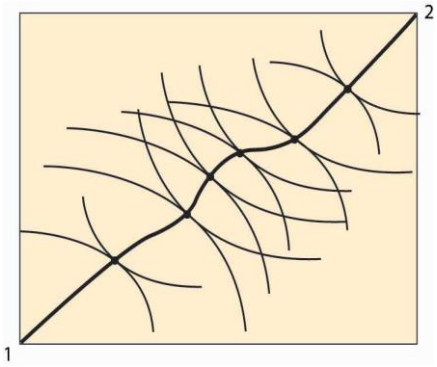


Fig 14.3: The contract curve

The contract curve need not have a simple shape, as Figure 14.3 "The contract curve" illustrates. The main properties are that it is increasing and ranges from Person 1 consuming zero of both goods to Person 2 consuming zero of both goods.

- The Edgeworth box considers a two-person, two-good "exchange economy." The Edgeworth box is a graphical representation of the exchange problem facing these people and also permits a straightforward solution to their exchange problem. A point in the Edgeworth box is the consumption of one individual, with the balance of the endowment going to the other.

- Pareto efficiency is an allocation in which making one person better off requires making someone else worse off—there are no gains from trade or reallocation.
- In the Edgeworth box, the Pareto-efficient points arise as tangents between isoquants of the individuals. The set of such points is called the contract curve. The contract curve is always increasing.

Q19) What are the first and second fundamental theorems of welfare economics?

There are two **fundamental theorems of welfare economics.** The first states that, under certain idealized conditions, any competitive equilibrium or Walrasian equilibrium leads to a Pareto efficient allocation of resources. The second states the converse, that any efficient allocation can be sustainable by a competitive equilibrium. Because of welfare economics' close ties to social choice theory, Arrow's impossibility theorem is sometimes listed as a third fundamental theorem.

The first theorem of welfare economics is based on the two assumptions:

1. In the economy, all commodities are competitive. The equilibrium in the economy is Pareto efficient.

2. There is market for all commodities. Each commodity is produced in the economy and consumption of commodity ads to utility function.

In an economy, all markets are competitive. Consumers and producers believe that their decisions have no effect on prices. In order to reduce the complexities, we have assumed simple economy with two markets and two input markets. Each market has two demanders and one supplier. In both market prices of commodities is regarded as the parameter.

Therefore no reallocation of goods or inputs can achieve a Pareto improvement. Suppose we put it differently then all gains from mutually advantageous trade is the equilibrium and the equilibrium prices have been exhausted.

Second theorem of welfare economics:

The second theorem of welfare economics has certain advantages over first theorem of welfare economics. It explains that if all consumers have convex preferences and all firms have convex production possibility sets then Pareto efficient allocation can

be achieved. The equilibrium of a complete set of competitive markets are suitable for redistribution of initial endowments.

In the second welfare theorem, Pareto efficient allocation is A*. In such A* allocation, individual h has consumption x^{h}*. Firm j produces the output y^{j}*. We know that at A* is a point where all consumers will have the same marginal rates of substitution between all pairs of commodities. Let's assume that p_i denote the consumers' marginal rate of substitution between commodity i and commodity 1.

Q20) Write short note on Natural Monopoly.

A natural monopoly is a type of monopoly that exists due to the high start-up costs or powerful economies of scale of conducting a business in a specific industry. A company with a natural monopoly might be the only provider or a product or service in an industry or geographic location. Natural monopolies can arise in industries that require unique raw materials, technology, or similar factors to operate.

Why Natural Monopolies Are Allowed

Natural monopolies are allowed when a single company can supply a product or service at a lower cost than any potential competitor, and at a volume that can service an entire market. Since natural monopolies use an industry's limited resources efficiently to offer the lowest unit price to consumers, it is advantageous in many situations to have a natural monopoly.

For example, the utility industry is a natural monopoly. The utility monopolies provide water, sewer services, electricity, and energy such as natural gas and oil to cities and towns across the country.

Regulating Natural Monopolies

Companies that have a natural monopoly may sometimes exploit the benefits by restricting the supply of a good,inflating prices, or by exerting their power in damaging ways other than though prices.

For example, a utility company might attempt to increase electricity rates to accumulate excessive profits to owners or executives. Or an internet service platform might use its monopoly power over information, online interactions, and commerce to exercise undue influence over what people can see, say, or sell online.

INTERMEDIATE MACRO ECONOMICS-204

1.Write a detailed note on Balance of payment.

Ans. The **balance of payments**, also known as **balance of international payments** and abbreviated **B.O.P.** or **BoP**, of a country is the record of all economic transactions between the residents of the country and the rest of world in a particular period of time (over a quarter of a year or more commonly over a year). The balance of payments is a summary of all monetary transactions between a country and rest of the world. These transactions are made by individuals, firms and government bodies. Thus the balance of payments includes all external visible and non-visible transactions of a country. It is an important issue to be studied, especially in international financial management field, for a few reasons.

First, the balance of payments provides detailed information concerning the demand and supply of a country's currency. For example, if Sudan imports more than it exports, then this means that the quantity supplied of Sudanese pounds by the domestic market is likely to exceed the quantity demanded in the foreign exchanging market, ceteris paribus. One can thus infer that the Sudanese pound would be under pressure to depreciate against other currencies. On the other hand, if Sudan exports more than it imports, then the Sudanese pound would be likely to appreciate.

Second, a country's balance of payments data may signal its potential as a business partner for the rest of the world. If a country is grappling with a major balance of payments difficulty, it may not be able to expand imports from the outside world. Instead, the country may be tempted to impose measures to restrict imports and discourage capital outflows in order to improve the balance of payments situation. On the other hand, a country with a significant balance-of payment surplus would be more likely to expand imports, offering marketing opportunities for foreign enterprises, and less likely to impose foreign exchange restrictions.

Third, balance of payments data can be used to evaluate the performance of the country in international economic competition. Suppose a country is experiencing trade deficits year after year. This trade data may then signal that the country's domestic industries lack international competitiveness.

Components of BOP

The BOP comprises of two accounts: Current and Capital.

Current Account

The four major components of current account are as follows:

1. **Visible trade** – This is the net of export and imports of goods (visible items). The balance of this visible trade is known as the trade balance. There is a trade deficit when imports are higher than exports and a trade surplus when exports are higher than imports.
2. **Invisible trade** – This is the net of exports and imports of services (invisible items). Transactions mainly constitute of shipping, IT, banking and insurance services.
3. **Unilateral transfers to and from abroad** – These refer to payments that are not factor payments. These are 'one-way' transactions. For examples, gifts or donations sent to the resident of a country by a non-resident relative.
4. **Income receipts and payments** – These include factor payments and receipts. These are generally rent on the property, interest on capital and profits on investments.

Capital Account

The capital account is used to finance the deficit in the current account or absorb the surplus in the current account. The three major components of capital account:

Basically, capital account of a country records changes in the assets owned by its residents in foreign countries, and assets owned by foreigners in it.

1. **Loans to and borrowings from abroad** – These consist of all loans and borrowings given to or received from abroad. It includes both private sector loans as well as the public sector loans.

2. **Investments to/from abroad** – These are investments made by nonresidents in shares in the home country or investment in real estate in any other country.
3. **Changes in foreign exchange reserves** – Foreign exchange reserves are maintained by the central bank to control the exchange rate and ultimately balance the BOP if it is not.

Current account deficit is financed by a surplus in the capital account and vice versa. This can be done by borrowing more money from abroad or lending more money to non-residents.

Balance on Current Account Vs. Balance on Capital Account:

Balance on current account and balance on capital account are interrelated.

A. A deficit in the current account must be settled by a surplus on the capital account.

B. A surplus in the current account must be matched by a deficit on the capital account

Table 5.1: The Schematic BOP

A.	**Current Account**
1.	*Merchandise Trade*
	a) Visible exports
	b) Visible imports
2.	*Invisible Trade*
	a) Invisible exports
	b) Invisible imports
3.	*Other Flows*
	a) Investment income
	b) Unrequited transfers
B.	**Capital Account**
	a) Long term capital transactions
	b) Short term capital transactions
C.	**Balancing Item**
	Net Errors and Omissions
D.	**Official Reserve Account**

Now we can summarise the BOP data:

Current account balance + Capital account balance + Reserve balance = Balance of Payments

(X – M) + (CI – CO) + FOREX = BOP

X is exports,

M is imports,

CI is capital inflows,

CO is capital outflows,

FOREX is foreign exchange reserve balance.

2. Explain autonomous and accomodating transactions.

Ans.Autonomous Transactions:

The portions of BOP account described above are collectively termed "autonomous transactions" on the assumption that they are primarily taken (i) in response to economic incentives and (ii) without reference to their likely impact on BOP position.

Since the overall BOP position is determined by autonomous transactions they are said to be placed "above the line".

Accommodating Transactions:

In contrast, the transactions recorded in the portion of Monetary Movement are termed 'accommodating transactions' on the assumption that they do not cause BOP surplus or deficit; they are the result of it.

In case of a "neutral" or "balanced" BOP, Monetary Movement account will have only blank entries. Transactions entered in Monetary Movement account are not considered in estimating the Overall Balance of Payments and are, therefore, placed "below the line". Monetary Movement account is also known as "Official Settlement Account" or "Official Reserves Account".

3.What do you understand by the Open Economy?

Ans. Even if you never leave your hometown, you are an active participant in the global economy. When you go to the grocery store, for instance, you might choose between apples grown locally and grapes grown in Chile. When you make a deposit into your local bank, the bank might lend those funds to your next-door neighbor or to a Japanese company building a factory outside

Tokyo. Because our economy is integrated with many others around the world, consumers have more goods and services from which to choose, and savers have more opportunities to invest their wealth.

In actuality, however, most economies are open: they export goods and services abroad, they import goods and services from abroad, and they borrow and lend in world financial markets.

To understand how an open economy works, we must understand the key macroeconomic variables that measure the interactions among countries. Accounting identities reveal a key insight: the flow of goods and services across national borders is always matched by an equivalent flow of funds to finance capital accumulation.

The International Flows of Capital and Goods

The key macroeconomic difference between open and closed economies is that, in an open economy, a country's spending in any given year need not equal its output of goods and services. A country can spend more than it produces by borrowing from abroad, or it can spend less than it produces and lend the difference to foreigners

The Role of Net Exports

Consider the expenditure on an economy's output of goods and services. In a closed economy, all output is sold domestically, and expenditure is divided into three components: consumption, investment, and government purchases. In an open economy, some output is sold domestically and some is exported to be sold abroad. We can divide expenditure on an open economy's output *Y* into four components:

- *Cd*, consumption of domestic goods and services,
- *I d*, investment in domestic goods and services,
- *Gd*, government purchases of domestic goods and services,
- *X*, exports of domestic goods and services.

The division of expenditure into these components is expressed in the identity

Y □□*Cd* □□*I d* □□*Gd* □□*X*.

The sum of the first three terms, *Cd* □□*I d* □□*Gd*, is domestic spending on domestic goods and services. The fourth term, *X*, is foreign spending on domestic goods and services.

A bit of manipulation can make this identity more useful. Note that domestic spending on *all* goods and services equals domestic spending on *domestic*

goods and services plus domestic spending on *foreign* goods and services. Hence, total consumption *C* equals consumption of domestic goods and services *Cd* plus consumption of foreign goods and services *Cf*; total investment *I* equals investment in domestic goods and services *I d* plus investment in foreign goods and services *I f*; and total government purchases *G* equals government purchases of domestic goods and services *Gd* plus government purchases of foreign goods and services *Gf*. Thus,

C □□*Cd* □□*Cf*,

I □□*I d* □□*I f*,

G □□*Gd* □□*G f*.

We substitute these three equations into the identity above:

Y □□(*C* □□*Cf*) □□(*I* □□*I f*) □□(*G* □□*G f*) □□*X*.

We can rearrange to obtain

Y □□*C* □□*I* □□*G* □□*X* □□(*Cf* □□*I f* □□*G f*).

The sum of domestic spending on foreign goods and services (*Cf* □□*I f* □□*G f*) is expenditure on imports (*IM*). We can thus write the national income accounts identity as

Y □□*C* □□*I* □□*G* □□*X* □□*IM*.

Because spending on imports is included in domestic spending (*C* □□*I* □□*G*), and because goods and services imported from abroad are not part of a country's output, this equation subtracts spending on imports. Defining **net exports** to be exports minus imports (*NX* □□*X* □□*IM*), the identity becomes

Y □□*C* □□*I* □□*G* □□*NX*.

This equation states that expenditure on domestic output is the sum of consumption, investment, government purchases, and net exports. This is the most common form of the national income accounts identity.

The national income accounts identity shows how domestic output, domestic spending, and net exports are related. In particular,

NX □□*Y* □□(*C* □□*I* □□*G*)

Net Exports □□Output □□Domestic Spending.

This equation shows that in an open economy, domestic spending need not equal the output of goods and services. *If output exceeds domestic spending, we export the difference: net exports are positive. If output falls short of domestic spending, we import the difference: net exports are negative.*

International Capital Flows and the Trade Balance

In an open economy, as in the closed economy, financial markets and goods markets are closely related. To see the relationship, we must rewrite the national income accounts identity in terms of saving and investment. Begin with the identity

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

Subtract C and G from both sides to obtain

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

Recall that $Y - C - G$ is national saving S, which equals the sum of private saving, $Y - T - C$, and public saving, $T - G$, where T stands for taxes. Therefore,

$S = I + NX$.

Subtracting I from both sides of the equation, we can write the national income accounts identity as

$S - I = NX$.

This form of the national income accounts identity shows that an economy's net exports must always equal the difference between its saving and its investment. Let's look more closely at each part of this identity. The easy part is the righthand side, NX, the net export of goods and services. Another name for net exports is the **trade balance,** because it tells us how our trade in goods and services departs from the benchmark of equal imports and exports.

The left-hand side of the identity is the difference between domestic saving and domestic investment, $S - I$, which we'll call **net capital outflow.** (It's sometimes called *net foreign investment.*) Net capital outflow equals the amount that domestic residents are lending abroad minus the amount that foreigners are lending to us. If net capital outflow is positive, the economy's saving exceeds its investment, and it is lending the excess to foreigners. If the net capital outflow is negative, the economy is experiencing a capital inflow: investment exceeds saving, and the economy is financing this extra investment by borrowing from abroad. Thus, net capital outflow reflects the international flow of funds to finance capital accumulation.

The national income accounts identity shows that net capital outflow always equals the trade balance. That is,

Net Capital Outflow = Trade Balance

$S - I = NX$.

If $S - I$ and NX are positive, we have a **trade surplus.** In this case, we are net

lenders in world financial markets, and we are exporting more goods than we are importing. If $S - I$ and NX are negative, we have a **trade deficit.** In this case, we are net borrowers in world financial markets, and we are importing more goods than we are exporting. If $S - I$ and NX are exactly zero, we are said to have **balanced trade** because the value of imports equals the value of exports.

The national income accounts identity shows that the international flow of funds to finance capital accumulation and the international flow of goods and services are two sides of the same coin. If domestic saving exceeds domestic investment, the surplus saving is used to make loans to foreigners. Foreigners require these loans because we are providing them with more goods and services than they are providing us. That is, we are running a trade surplus. If investment exceeds saving, the extra investment must be financed by borrowing from abroad. These foreign loans enable us to import more goods and services than we export. That is, we are running a trade deficit. Note that the international flow of capital can take many forms. It is easiest to assume—as we have done so far—that when we run a trade deficit, foreigners make loans to us. This happens, for example, when the Japanese buy the debt issued by U.S. corporations or by the U.S. government. But the flow of capital can also take the form of foreigners buying domestic assets, such as when a citizen of Germany buys stock from an American on the New York Stock Exchange.

4.Explain Mundell-Fleming model.

Ans. The basic Mundell-Fleming model — like the IS-LM model — is based on the assumption of fixed price level and shows the interaction between the goods market and the money market.

The model explains the causes of short-run fluctuations in aggregate income (or, what comes to the same thing, shifts in the ad curve) in an open economy.

The Mundell-Fleming model is based on a very restrictive assumption. It considers a small open economy with perfect capital mobility.

This means that the economy can borrow or lend freely from the international capital markets at the prevailing rate of interest since its domestic rate of interest is determined by the world

rate of interest. So, the rate of interest is not a policy variable in the small economy being studied.

This means that macroeconomic adjustment occurs only through exchange rate changes. In other words, the brunt of adjustment is borne by exchange rate movements in foreign exchange markets to maintain the officially determined exchange rate. The central bank permits the exchange rate to move up or down in response to changing economic conditions.

The basic assumption of this model is that the domestic rate of interest (r) is equal to the world rate of interest (r*) in a small open economy with perfect capital mobility. No doubt any change within the domestic economy may alter the domestic rate of interest, but the rate of interest cannot stay out of line with the world rate of interest for long.

The difference between the two, if any, is removed quickly through inflows and outflows of financial capital.

It may be recalled that **"smallness"** of a country has no relation to its size. A small country is one which cannot alter the world rate of interest through its own borrowing and lending activities. In contrast, a large economy is one which has market (bargaining) power so that it can exert influence over the world rate of interest.
For such a country, either international capital mobility is far from perfect, or the country is so large that it can exert influence on world capital markets.

The main prediction from the Mundell-Fleming model is that the behaviour of an economy depends crucially on the exchange rate system it adopts, i.e., whether it operates a floating exchange rate system or a fixed exchange rate system. We start with adjustment under a floating exchange rate system, in which case there is no central bank intervention in the foreign exchange market.

In such a situation, if the domestic interest rate goes above the world rate, foreigners will start lending to the home country. This capital inflow will create excess supply of funds and the domestic rate of interest r again will fall to r*.

The converse is also true. If, for some reason, the domestic rate of interest (r) falls below r*, there will be capital outflow from the home country and the resulting shortage of funds will push up r to the level of r*. Thus, in a world of perfect capital mobility, r will quickly get adjusted to r*.

The Open Economy IS Curve:

In the Mundell-Fleming model, the market for goods and services is expressed by the following equation:

$Y = C(Y - T) + I(r^*) + G + NX(e) \ldots (1)$

where all the terms have their usual meanings. Here investment depends on the world rate of interest r* since r = r* and NX depends on the exchange rate e which is the price of a foreign currency in terms of domestic currency.

In the Mundell-Fleming model, it is assumed that the price levels at home and abroad remain fixed. So, there is no difference between real exchange rate and nominal exchange rate. We now illustrate the equation of the goods market equilibrium in Fig. 12.1

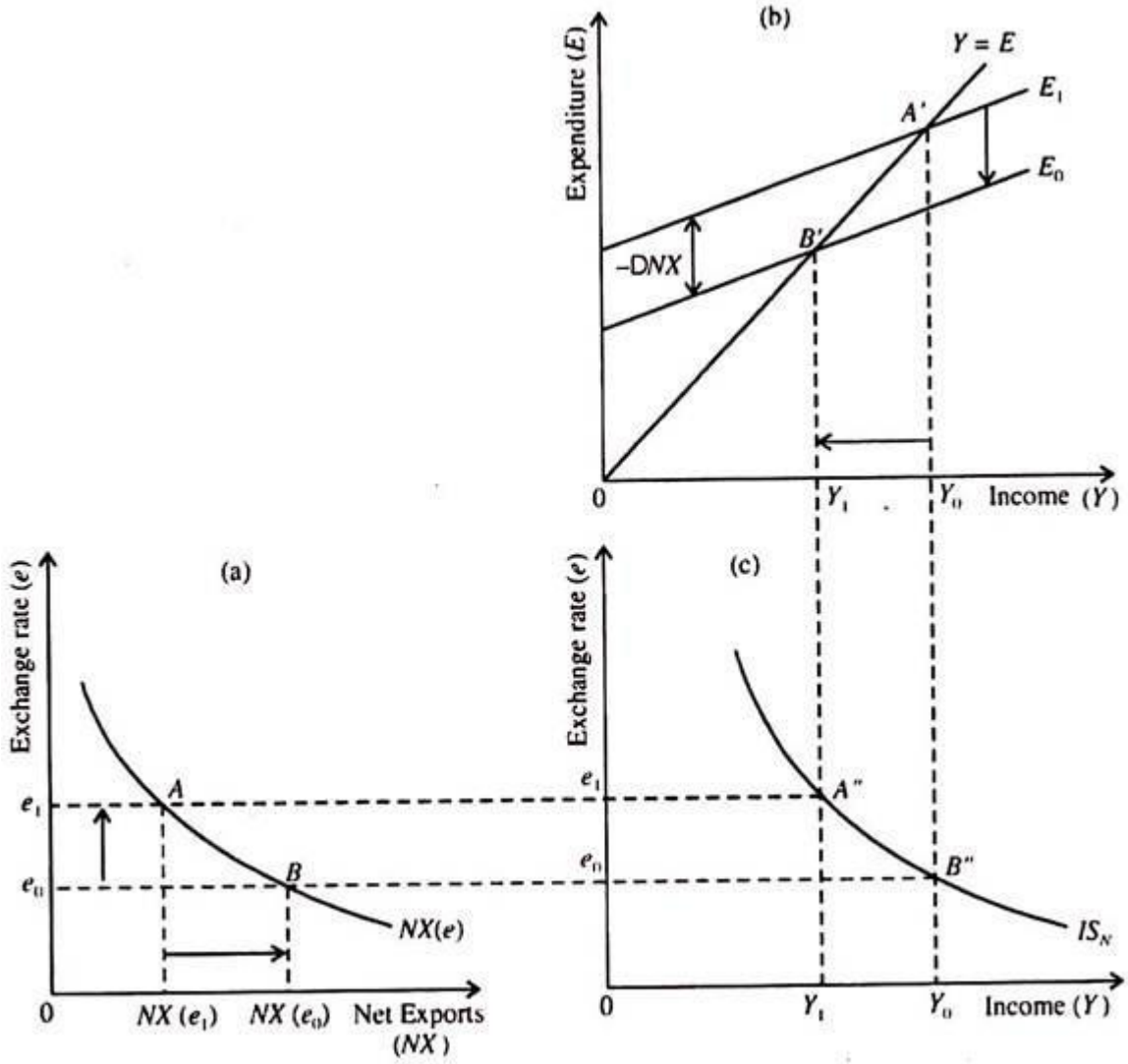


Fig. 12.1 The New IS Curve

In part (a), an increase in the rate from e_0 to e_1, lowers net exports from $NX(e_0)$ to $NX(e_1)$. As a result, the planned expenditure line E_1 shifts downward to E_0. Consequently, income falls from Y_1 to Y_0. In part (c), we show the new IS curve, which is the locus of points, indicating alternative combinations of e and Y which ensure equilibrium in the goods market.

The new IS curve is derived by following this sequence:

e rises → NX falls → Y falls

The Open Economy LM Curve:

The equilibrium condition of the money market in the Mundell-Fleming model is:

$M = L(r^*, Y)$ … (2)

since $r = r^*$.

Here the supply of money equals its demand and demand for money varies inversely with r* and the positively with Y. In this model, M remains exogenously fixed by the central bank.

The new LM curve, as shown in Fig. 12.2(b), is vertical — since the equation (2) has no relation to the exchange rate. This equation determines only Y, whether e is high or low. In Fig. 12.2(a), we draw the closed economy LM curve as also a horizontal line showing parity between r and r*.

The intersection of the two curves at the point A determines the equilibrium level of income Y_0, which has no relation to e, shown on the vertical axis of Fig. 12.2(b). This is why the new (open economy) LM curve is vertical. The LM_N curve of Fig. 12.2(b) is derived from r* and the closed economy LM curve, shown in Fig. 12.2(a).

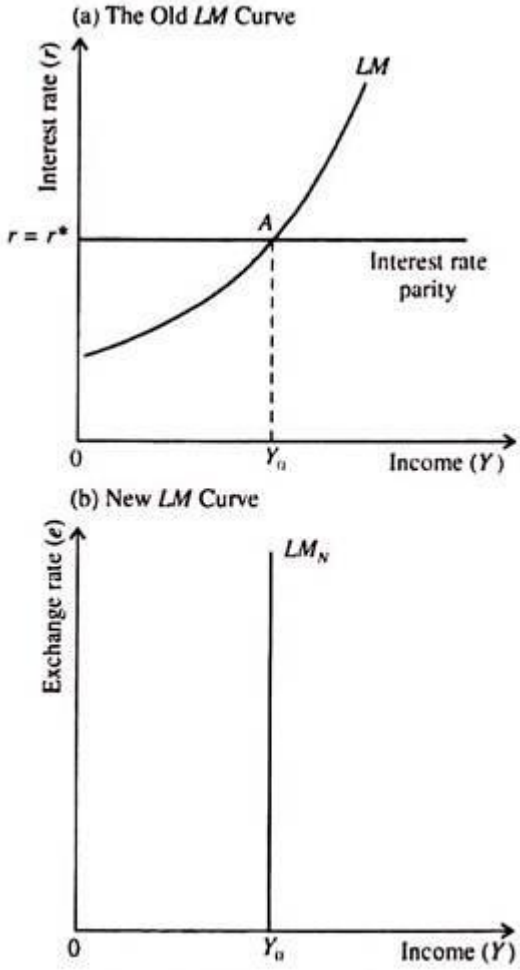


Fig. 12.2 The New LM Curve

General Equilibrium:

In the Fig. 12.3, we show the general equilibrium of goods market and the money market. The equilibrium income (Y_0) and exchange rate (e_0) are determined simultaneously at point A where the IS and LM curves intersect.

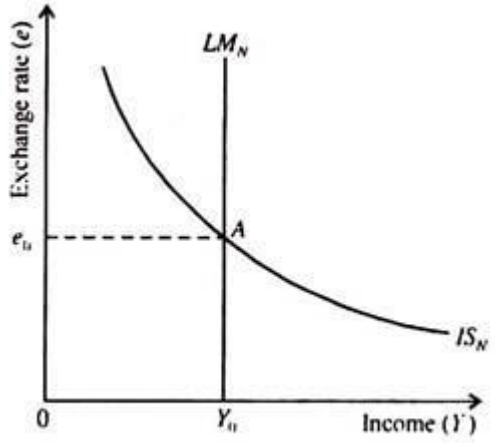


Fig. 12.3 General Equilibrium in MF Model

Main Message of Mundell-Flemming Model:

The main message of the Mundell-Fleming model is that the effect of any economic policy (fiscal, monetary or trade) depends on the exchange rate system of the country under consideration, i.e., whether the country is following a fixed or a floating exchange rate system. Table 12.1 summarises the effects of three different policies in the Mundell-Fleming model.

	Exchange Rate System					
	Floating			Fixed		
	Impact on					
Policy	*Y*	*e*	*NX*	*Y*	*e*	*NX*
Fiscal (*G* rises, *T* falls)	—	↑	↓	↑	—	—
Monetary (*M* rises)	↑	↓	↑	—	—	—
Trade (Imports fall)	—	↑	—	↑	—	↑

Note : The sign — implies no effect; ↑ implies a rise and ↓ implies a fall

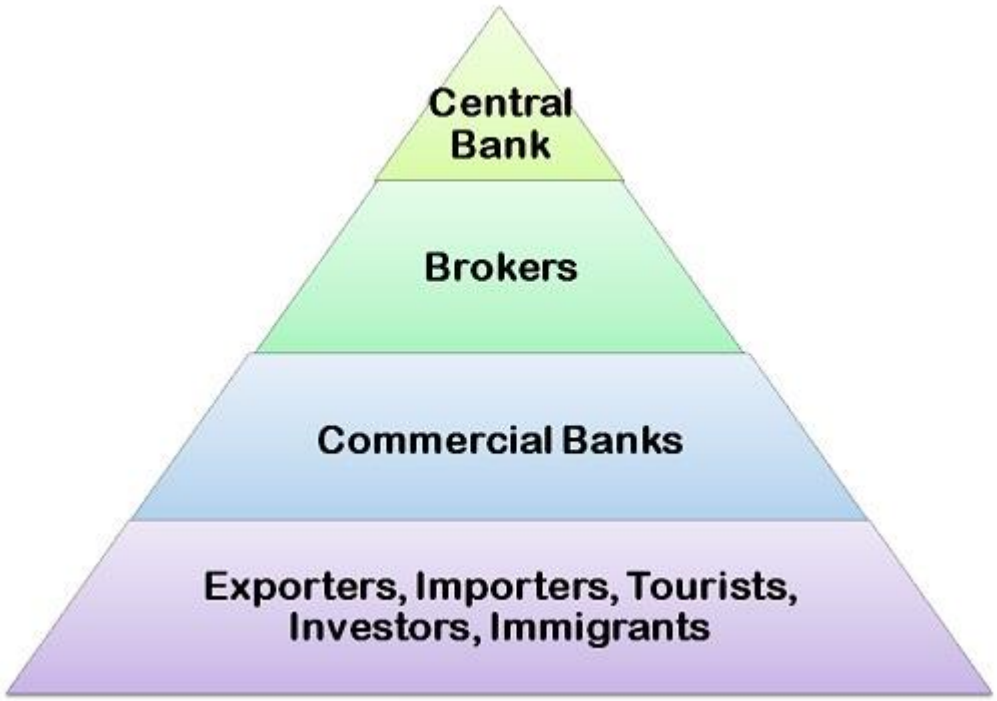
The Mundell-Fleming model shows how to make appropriate use of monetary, fiscal and trade policies to achieve any desired macroeconomic objective. The influence of these policies depends on the exchange rate system. Under floating exchange rate system, only monetary policy can alter national income.

The effect of expansionary fiscal policy is totally neutralised by currency appreciation. Under fixed exchange rate system, only fiscal policy can alter Y. The central bank loses control over money supply since it has to be adjusted upward or downward for maintaining the exchange rate at a predetermined level.

5. Explain Foreign Exchange Market.

Definition: The **Foreign Exchange Market** is a market where the buyers and sellers are involved in the sale and purchase of foreign currencies. In other words, a market where the currencies of different countries are bought and sold is called a foreign exchange market.

The structure of the foreign exchange market constitutes central banks, commercial banks, brokers, exporters and importers, immigrants, investors, tourists. These are the main players of the foreign market, their position and place are shown in the figure below.



At the bottom of a pyramid are the actual buyers and sellers of the foreign currencies- exporters, importers, tourist, investors, and immigrants. They are actual users of the currencies and approach **commercial banks** to buy it.

The ***commercial banks*** are the second most important organ of the foreign exchange market. The banks dealing in foreign exchange play a role of **"market makers",** in the sense that they quote on a daily basis the foreign exchange rates for buying and selling of the foreign currencies. Also, they function as **clearing houses**, thereby helping in wiping out the difference between the demand for and the supply of currencies. These banks buy the currencies from the **brokers** and sell it to the buyers.

The third layer of a pyramid constitutes the ***foreign exchange brokers***. These brokers function as a link between the central bank and the commercial banks and also between the actual buyers and commercial banks. They are the major source of market information. These are the persons who do not themselves buy the foreign currency, but rather strike a deal between the buyer and the seller on a commission basis.

The ***central bank*** of any country is the apex body in the organization of the exchange market. They work as the **lender of the last resort**and the **custodian of foreign exchange of the country**. The central bank has the power to regulate and control the foreign exchange market so as to assure that it works in the orderly fashion. One of the major functions of the central

bank is to prevent the aggressive fluctuations in the foreign exchange market, if necessary, by direct intervention. Intervention in the form of selling the currency when it is overvalued and buying it when it tends to be undervalued.

Functions of foreign Exchange Market

The foreign exchange market is a market in which foreign exchange transactions take place.

Transfer of Purchasing Power

The Primary function of a foreign exchange market is the transfer of purchasing power from one country to another and from one currency to another. The international clearing function performed by foreign exchange markets plays a very important role in facilitating international trade and capital movement. **Provision of credit**

The credit function performed by foreign exchange markets also plays a very important role in the growth of foreign trade, for international trade depends to a great extent on credit facilities. Exporters may get pre shipment and post shipment credit. Credit facilities are available also for importers. The Euro dollar market has emerged as a major international credit market.

Provision of Heding Facilities

The other important of the foreign exchange market is to provide hedging facilities. Heding refers to covering of foreign trade risks, and it provides a mechanism to exporters and importers to guard themselves against losses arising from fluctuations in exchange rates.

Factors Determining Spot Exchange Rates

1. **Balance of Payments**: Balance of Payments represents the demand for and supply of foreign exchange which ultimately determine the value of the currency. Exports, both visible and invisible, represent the supply side for foreign exchange. Imports, visible and invisible, create demand for foreign exchange. Put differently, export from the country creates demand for the currency of the country in the foreign exchange market. The exporters would offer to the market the foreign currencies they have acquired and demand in exchange the local currency. Conversely, imports into the country will increase the supply of the currency of the country in the foreign exchange market. When the balance of payments of a country is continuously at deficit, it implies that the demand for the currency of the country is lesser than its supply. Therefore, its value in the market declines. If the balance of payments is surplus continuously it shows that the demand for the currency in the exchange market is higher than its supply therefore the currency gains in value.

2. **Inflation**: Inflation in the country would increase the domestic prices of the commodities. With increase in prices exports may dwindle because the price may not be competitive. With the decrease in exports the demand for the currency would also decline; this in turn would result in the decline of external value of the currency. It may be noted that unit is the relative rate of inflation in the two countries that cause changes in exchange rates. If, for instance, both India and the USA experience 10% inflation, the exchange rate between rupee and dollar will remain the same. If inflation in India is 15% and in the USA it is 10%, the increase in prices would be higher in India than it is in the USA. Therefore, the rupee will depreciate in value relative to US dollar.
3. **Interest rate**: The interest rate has a great influence on the short – term movement of capital. When the interest rate at a centre rises, it attracts short term funds from other centers. This would increase the demand for the currency at the centre and hence its value. Rising of interest rate may be adopted by a country due to tight money conditions or as a deliberate attempt to attract foreign investment. Whatever be the intention, the effect of an increase in interest rate is to strengthen the currency of the country through larger inflow of investment and reduction in the outflow of investments by the residents of the country.
4. **National Income**: An increase in national income reflects increase in the income of the residents of the country. This increase in the income increases the demand for goods in the country. If there is underutilized production capacity in the country, this will lead to increase in production. There is a chance for growth in exports too. But more often it takes time for the production to adjust to the increased income. Where the production does not increase in sympathy with income rise, it leads to increased imports and increased supply of the currency of the country in the foreign exchange market. The result is similar to that of inflation, viz., and decline in the value of the currency. Thus an increase in national income will lead to an increase in investment or in consumption, and accordingly, its effect on the exchange rate will change. Here again it is the relative increase in national incomes of the countries concerned that is to be considered and not the absolute increase
5. **Political factors** Political stability induced confidence in the investors and encourages capital inflow into the country. This has the effect of strengthening the currency of the country. On the other hand, where the political situation in the country is unstable, it makes the investors withdraw their investments. The outflow of capital from the country would weaken the currency. Any news about change in the government or

political leadership or about the policies of the government would also have the effect of temporarily throwing out of gear the smooth functioning of exchange rate mechanism.

Transactions in the foreign Exchange Market

A very brief account of certain important types of transactions conducted in the foreign exchange market is given below: Spot and Forward Exchanges

Spot Market The term spot exchange refers to the class of foreign exchange transaction which requires the immediate delivery or exchange of currencies on the spot. In practice the settlement takes place within two days in most markets. The rate of exchange effective for the spot transaction is known as the spot rate and the market for such transactions is known as the spot market.

Forward Market The forward transactions is an agreement between two parties, requiring the delivery at some specified future date of a specified amount of foreign currency by one of the parties, against payment in domestic currency be the other party, at the price agreed upon in the contract. The rate of exchange applicable to the forward contract is called the forward exchange rate and the market for forward transactions is known as the forward market. The foreign exchange regulations of various countries generally regulate the forward exchange transactions with a view to curbing speculation in the foreign exchanges market. In India, for example, commercial banks are permitted to offer forward cover only with respect to genuine export and import transactions. Forward exchange facilities, obviously, are of immense help to exporters and importers as they can cover the risks arising out of exchange rate fluctuations be entering into an appropriate forward exchange contract. With reference to its relationship with spot rate, the forward rate may be at **par, discount or premium**.

Unit -2

1. Explain Exchange rate system.

Ans. An exchange rate measures the value of one currency in units of another currency.As economic conditions of a country change, exchange rates can change substantially.

Exchange Rate Systems

Over the ages, currencies have been defined in terms of gold and other items of value, and the international monetary system has been subject to a variety of international agreements. A brief history of these systems provides useful perspective against which to compare today‘s system and to evaluate weaknesses and proposed changes in the present system. In the following sections various monetary standards that were in practice since 19th century were briefly explained. The international monetary system has evolved historically from the gold standard (1876-1913) of fixed exchange rates, to the interwar years and World War II (1914-1944) with floating exchange rates, to fixed exchange rates (1945-1973) under the Bretton Woods Agreement, to the present eclectic currency arrangement (1973- present) of fixed, floating, and managed exchange rates. In the following sections.

an attempt has been made to explain them briefly for understanding of their significance in international monetary environment.

The Gold Standard (1876 – 1913): A system of setting currency values whereby the participating countries commit to fix the prices of their domestic currencies in terms of a specified amount of gold. The gold standard as an international monetary system gained acceptance in Western Europe in the 1870s. The United States was something of a latecomer to the system, not officially adopting the standard until 1879. The ―rules of the game‖ under the gold standard were clear and simple. Each country set the rate at which its currency (paper or coin) could be converted to a weight of gold. The United States, for example, declared the dollar to be convertible to gold at a rate of $20.67/ounce of gold (a rate in effect until the beginning of World War 1). Because the government of each country on the gold standard agreed to buy or sell gold on demand to anyone at its own fixed parity rate, the value of each individual currency in terms of gold, and therefore the fixed parities between currencies, was set. Under this system it was very important for a country to maintain adequate reserves of gold to back its currency‘s value. The system also had the effect of implicitly limiting the rate at which any individual country could expand its money supply. The growth in money was limited to the rate at which additional gold could be acquired by official authorities. The gold standard worked adequately until the outbreak of World War 1 interrupted trade flows and the free movement of gold. This caused the main trading nations to suspend the operation of the gold standard.

Advantages of Gold Standard:

Several advantages are claimed for the gold standard, especially when it is adopted simultaneously by a number of countries, i.e., international gold standard.

(i) It is an objective system and is not subject to the changing policies of the government or the whims of the currency authority.

(ii) Gold standard enables the country to maintain the purchasing power of its currency over long periods. This is so because the currency and credit structure is ultimately based on gold in possession of the currency authority.

(iii) Another important advantage claimed for gold standard is that it preserves and maintains the external value of the currency (rate of exchange) within narrow limits. As a matter of fact, within the gold standard system, it provides fixed exchanges, which is a great boon to traders and investors. International division of labour is greatly facilitated.

(iv) It is further claimed that gold standard helps to adjust the balance of payments between countries automatically. How this happens may be illustrated by a simple example. Suppose England and America are both on gold standard and only trade with each other, and that a balance of payments is due from England to America. Gold will be exported from England to America. The Bank of England will lose gold. This will contract currency in England and bring about a fall in the British price level. Price level in America will rise due to larger reserves and the expansion of currency and credit. England will become a good market to buy from and a bad market to sell in. Conversely, America will become a good market to sell in and a bad market to buy from. British exports will be encouraged and imports discouraged. American exports will be discouraged and imports encouraged. The balance of payments will tend to move in favour of Britain until equilibrium is reached. It is in this way, that movement of gold, by affecting prices and trade, keeps equilibrium among gold standard countries.

Disadvantages of Gold Standard:

(i) Gold standard is costly and the cost is unnecessary. We only want a medium of exchange, why should it be made of gold? It is a luxury. ―The yellow metal could tickle the fancy of savages only.‖

(ii) Even the value of gold has not been found to be absolutely stable over long periods.

(iii) Under the gold standard, currency cannot be expanded in response to the requirements of trade. The supply of currency depends on the supply of gold. But the supply of gold depends on the success of the

mining operations, which may have nothing to do with the factors affecting the growth of trade and industry in the country.

(iv) Gold standard has also been charged with sacrificing internal stability to external (exchange) stability. It is the international aspect of the gold standard which has been paid more attention to.

(v) Another disadvantage is that, under gold standard gold movements lead to changes in interest rates, so that investment is stimulated or checked solely in order to expand or reduce money income.

(vi) A country on a gold standard cannot follow an independent policy. In order to maintain the gold standard or to restore it (as in England after World War I), it may have to deflate its currency against its will. Deflation spells ruin to the economy of a country. It brings, in its wake, large-scale unemployment, closing of works and untold suffering attendant on depression.

Causes of the Break-down of the Gold Standard

The gold standard broke down in country after country soon after its rehabilitation during the post-1914-18 war decade. There were several reasons for this development:

(1) Gold was very unevenly distributed among the countries in the inter-war period. While the U.S.A. and France came to possess the bulk of it, other countries did not have enough to maintain a monetary system based in gold.

(2) Owing to general political unsettlement, a habit arose on the part of certain Continental countries to keep their funds for short periods in foreign central banks, especially in Great Britain. These funds were liable to be withdrawn at the earliest danger signal. Withdrawal of such funds from Britain on the part of France led to gold standard being suspended in 1931 in the former country. The Bank of England could not afford to lose its gold resources in large quantities at such a short notice.

(3) International trade was not free. Some countries often imposed stringent restrictions on imports, which created serious balance of payments problems for other countries. Not having enough gold to cover the gap, they threw the gold standard overboard. This specially happened during the Great Depression of early thirties.

(4) International obligation in the form of reparations and war debts arose out of World War I. Since the creditor countries refused to accept payments in the form of goods and also refused to continue lending to the debtors countries, the debts had to be cleared through gold movements. This led to concentration of 34 per cent of the world‘s gold in the U.S.A. and

France, the two chief creditor countries. The gold left with the other countries was not enough to enable them to maintain gold standard successfully.

(5) The gold-receiving countries did not ―play the game of the gold standard‖. They (especially the U.S.A.) did not allow this gold to have any effect on their price levels. The gold was ―sterilised‖ or made ineffective. Had prices risen in these countries, imports would have been encouraged and exports discouraged and an unfavourable balance of trade would have led to movement of gold in the reverse direction. Since this was not allowed to happen, the gold standard failed to work automatically.

(6) Gold standard failed also because the economic structure of the countries concerned had become less and less elastic after the World War of 1914-18. This was due to several reasons: The enormous growth in the indebtedness of governments and local authorities resulted in a mass of interest payments fixed by contract over a long period of years. The huge expenditure in the form of payment to social services could not be easily reduced. The trade unions were now able to offer a much stronger resistance to wage cuts than before 1914. The prices of raw materials and finished goods were becoming more and more fixed by partial monopolies, cartel agreements, etc. The result was that prices no longer moved in the directions warranted by gold movements and equilibrium failed to be restored as of old.

(7) Another weakness that was discovered in the gold standard in practice was that it was always liable to collapse in a crisis. It has often been called a _fair weather standard‘ only. (8) Another objection that was frequently urged against the system was that gold movements caused inconvenient changes in interest rates. Deflation, for instance, may be made necessary at a time of crisis to prevent suspension of the standard. But deflation, which involves falling wages and prices, may prove a cause of serious trouble. Wage cuts are resisted by trade unions, and falling prices increase the burden of fixed payments which the government or the people may have to make. Moreover, falling prices discourage enterprise and create unemployment.

A large volume of short-term capital was moving for safely from one financial centre to another. Big flows of this hot money necessitated large gold movements, which the slender gold reserves of the countries could not maintain. Hence, gold standard was given up. Thus, it was that country after country abandoned the Gold Standard in the inter-war period (1914-1944).

Bretton Woods (1944):

In 1944, as World War II drew toward a close, the Allied Powers met at Bretton Woods, New Hampshire, in order to create a new post-war international monetary system. The

Bretton Woods Agreement, implemented in 1946, whereby each member government pledged to maintain a fixed, or pegged, exchange rate for its currency vis-à-vis the dollar or gold. These fixed exchange rates were supposed to reduce the riskiness of international transactions, thus promoting growth in world trade. The Bretton Woods Agreement established a US dollar-based international monetary system and provide for two new institutions, The IMF and the World Bank. The IMF aids countries with balance of payments and exchange rate problems. The International Bank for Reconstruction and Development (World Bank) helped post-war reconstruction and since then has supported general economic development.

The IMF was the key institution in the new international monetary system, and it has remained so to the present. The IMF was established to render temporary assistance to member countries trying to defend their currencies against cyclical, seasonal, or random occurrences. It also assists countries having structural trade problems if they take adequate steps to correct their problems. However, if persistence deficits occur, the IMF cannot save a country from eventual devaluation. In recent years it has attempted to help countries facing financial crises. It has provided massive loans as well as advice to Russia and other former Russian republics, Brazil, Indonesia, and South Korea, to name but a few. Under the original provisions of the Bretton Woods Agreement, all countries fixed the value of their currencies for gold. Only the dollar remained convertible into gold (at $35 per ounce). Therefore, each country decided what it wished its exchange rate to be vis-à-vis the dollar and then calculated the gold per value of its currency to create the desired dollar exchange rate. Participating countries agreed to try to maintain the value of their currencies within 1% (later expanded to 2 ¼ %) of par by buying or selling foreign exchange or gold as needed. Devaluation was not to be used as a competitive trade policy, but if a currency became too weak to defend, a devaluation of up to 10% was allowed without formal approval by the IMF. Larger devaluations required IMF approval.

Fixed Vs Floating Exchange Rate Systems:

Fixed Exchange Rates, 1945-1973

The currency arrangement negotiated at Bretton Woods and monitored by the IMF worked fairly well during the post-World War II period of reconstruction and rapid growth in world trade. However, widely diverging national monetary and fiscal policies, differential rates of inflation, and various unexpected external shocks eventually resulted in the system‘s demise. The U.S. dollar was the main reserve currency held by central banks and was the key to the web of exchange rate values. Unfortunately, the United States ran persistent and growing

deficits on its balance of payments. A heavy capital outflow of dollars was required to finance these deficits and to meet the growing demand for dollars from investors and businesses. Eventually, the heavy overhang of dollars held abroad resulted in a lack of confidence in the ability of the United States to meet its commitment to convert dollars to gold. On August 15, 1971, President Richard Nixon was forced to suspend official purchases or sales of gold by the U.S. Treasury after the United States suffered outflows of roughly one-third of its official gold reserves in the first seven months of the year. Exchange rates of most of the leading trading countries were allowed to float in relation to the dollar and thus indirectly in relation to gold. By the end of 1971 most of the major trading currencies had appreciated vis-à-vis the dollar. This change was – in effect – a devaluation of the dollar. In early 1973, the U.S. dollar came under attack once again, thereby forcing a second devaluation on February 12, 1973, this time by 10% to $42.22 per ounce. By late February 1973, a fixed –rate system no longer appeared feasible given the speculative flows of currencies. The major foreign exchange makets were actually closed for several weeks in March 1973. When they reopened, most currencies were allowed to float to levels determined by market forces. Par values were left unchanged. The dollar had floated downward an average of 10% by June 1973.

Floating Rate System: In a floating-rate system, it is the market forces that determine the exchange rate between two currencies. The advocates of the floating rate system put forth two major arguments. One is that the exchange rate varies automatically according to the changes in the macroeconomic variables. As a result, there is no gap between the real exchange rate and the nominal exchange rate. The country does not need any adjustment, which is often required in a fixed rate regime and so it does not have to bear the cost of adjustment. The other argument is that this system possesses insulation properties, meaning that the currency remains isolated from the shocks emanating from other counties. It also means that the government can adopt an independent economic policy without impinging upon the external sector performance.

In case of Managed Floating with no preannounced path for the exchange rate, the monetary authority influences the movements of the exchange rate through active intervention in the foreign exchange market without specifying, or precommiting to, a pre-announced path for the exchange rate. In case of Independent Floating, the exchange rate is market-determined, with any foreign exchange intervention aimed at moderating the rate of change and preventing undue fluctuations in the exchange rate, rather than at establishing a level for it.

2.How exchange Rate Determine?

Ans. There are two methods of foreign exchange rate determination. One method falls under the classical gold standard mechanism and another method falls under the classical paper currency system. Today, gold standard mechanism does not operate since no standard monetary unit is now exchanged for gold.

All countries now have paper currencies not convertible to gold. Under inconvertible paper currency system, there are two methods of exchange rate determination. The first is known as the purchasing power parity theory and the second is known as the demand-supply theory or balance of payments theory. Since today there is no believer of purchasing power parity theory, we consider only demand-supply approach to foreign exchange rate determination.

1. Demand-Supply Approach of Foreign Exchange, Or BOP Theory of Foreign Exchange:

Since the foreign exchange rate is a price, economists apply supply-demand conditions of price theory in the foreign exchange market. A simple explanation is that the rate of foreign exchange equals its supply. For simplicity, we assume that there are two countries: India and the USA. Let the domestic currency be rupee. US dollar stands for foreign exchange and the value of rupee in terms of dollar (or conversely value of dollar in terms of rupee) stands for foreign exchange rate. Now the value of one currency in terms of another currency depends upon demand for and supply of foreign exchange.

(i) Demand for foreign exchange:

When Indian people and business firms want to make payments to the US nationals for buying US goods and services or to make gifts to the US citizens or to buy assets there, the demand for foreign exchange (here dollar) is generated. In other words, Indians demand or buy dollars by paying rupee in the foreign exchange market.

A country releases its foreign currency for buying imports. Thus, what appears in the debit side of the BOP account is the sources of demand for foreign exchange. The larger the volume of imports the greater is the demand for foreign exchange.

The demand curve for foreign exchange is negative sloping. A fall in the price of foreign exchange or a fall in the price of dollar in terms of rupee (i.e., dollar depreciates) means that foreign goods are now more cheaper.

Thus, an Indian could buy more American goods at a low price. Consequently, imports from the USA would increase resulting in an increase in the demand for foreign exchange, i.e., dollar. Conversely, if the price of foreign exchange or price of dollar rises (i.e., dollar appreciates) then foreign goods will be expensive leading to a fall in import demand and, hence, fall in the demand for foreign exchange.

Since price of foreign exchange and demand for foreign exchange move in opposite direction, the importing country's demand curve for foreign exchange is downward sloping from left to right.

In Fig. 5.4, DD_1 is the demand curve for foreign exchange. In this figure, we measure exchange rate expressed in terms of domestic currency that costs 1 unit of foreign currency (i.e., dollar per rupee) on the vertical axis. This makes demand curve for foreign exchange negative sloping.

If exchange rate is expressed in terms of foreign currency that could be purchased with 1 unit of domestic currency (i.e., dollar per rupee), the demand curve would then exhibit positive slope. Here we have chosen the former one.

(b) Supply of foreign exchange:

In a similar fashion, we can determine supply of foreign exchange. Supply of foreign currency comes from its receipts for its exports. If the foreign nationals and firms intend to purchase Indian goods or buy Indian assets or give grants to the Government of India, the supply of foreign exchange is generated.

In other words, what the Indian exports (both goods and invisibles) to the rest of the world is the source of foreign exchange. To be more specific, all the transactions that appear on the credit side of the BOP account are the sources of supply of foreign exchange.

A rise in the rupee-per-dollar exchange rate means that Indian goods are cheaper to foreigners in terms of dollars. This will induce India to export more. Foreigners will also find that investment is now more profitable. Thus, a high price or exchange rate ensures larger supply of foreign exchange. Conversely, a low exchange rate causes exchange rate to fall. Thus, the supply curve of foreign exchange, SS_1, is positive sloping.

Now we can bring both demand and supply curves together to determine foreign exchange rate. The equilibrium exchange rate is determined at that point where demand for foreign exchange equals supply of foreign exchange. In Fig. 5.4, DD_1 and SS_1 curves intersect at

point E. The foreign exchange rate thus determined is OP. At this rate, quantities of foreign exchange demanded (OM) equals quantity supplied (OM). The market is cleared and there is no incentive on the part of the players to change the rate determined.

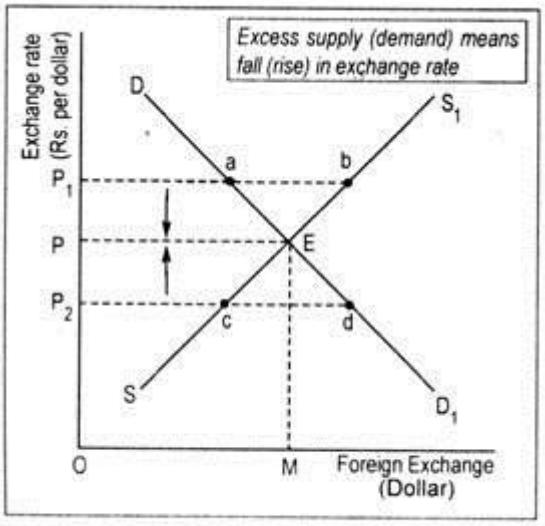


Fig. 5.4: Equilibrium Exchange Rate

Suppose that at the rate OP, Rs. 50 = $1, demand for foreign exchange is matched by the supply of foreign exchange. If the current exchange rate OP_1 exceeds the equilibrium rate of exchange (OP) there occurs an excess supply of dollar by the amount 'ab'. Now the bank and other institutions dealing with foreign exchange—wishing to make money by exchanging currency—would lower the exchange rate to reduce excess supply.

Thus, exchange rate will tend to fall until OP is reached. Similarly, an excess demand for foreign exchange by the amount 'cd' arises if the exchange rate falls below OP, i.e., OP_2. Thus, banks would experience a shortage of dollars to meet the demand. Rate of foreign exchange will rise till demand equals supply.

The exchange rate that we have determined is called a floating or flexible exchange rate. (Under this exchange rate system, the government does not intervene in the foreign exchange market.) A floating exchange rate, by definition, results in an equilibrium rate of exchange that will move up and down according to a change in demand and supply forces. The process by which currencies float up and down following a change in demand or change in supply forces is, thus, illustrated in Fig. 5.5.

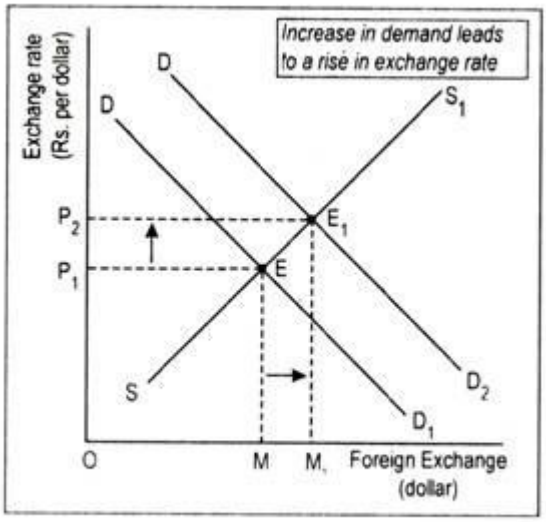


Fig. 5.5: Equilibrium Exchange Rate

Let us assume that national income rises. This results in an increase in the demand for imports of goods and services and, hence, demand for dollar rises. This results in a shift in the demand curve from DD_1 to DD_2. Consequently, exchange rate rises as from OP_1 to OP_2 determined by the intersection of new demand curve and supply curve. Note that dollar appreciates from Rs. 50 = $1 to Rs. 53 = $1, while rupee depreciates from $1 = Rs. 50 to $1 = Rs. 53.

Similarly, if supply curve shifts from SS_1 to SS_2, as shown in Fig. 5.6, new exchange rate thus determined would be OP_2. If Indian goods are exported more, following an increase in national income of the USA, the supply curve would then shift rightward. Consequently, dollar depreciates and rupee appreciates. New exchange rate is settled at that point where the new supply curve (SS_2) intersects the demand curve at E_2.

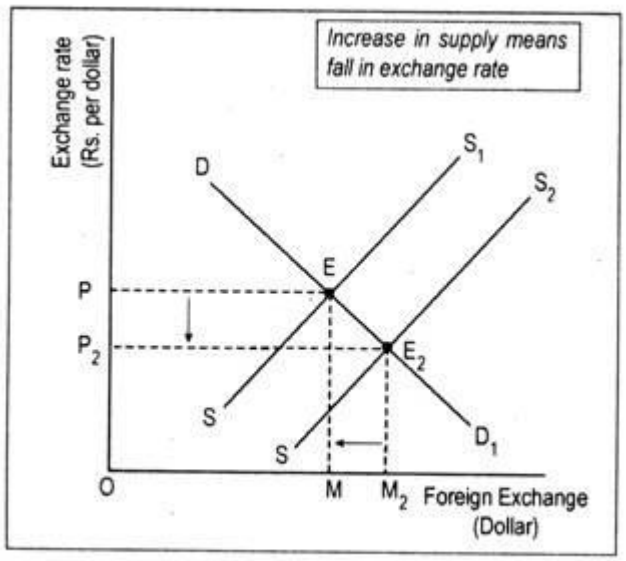


Fig. 5.6 : Equilibrium Exchange Rate

This is the balance of payments theory of exchange rate determination. Wherever government does not intervene in the market, a floating or a flexible exchange rate prevails. Such system may not necessarily be ideal since frequent changes in demand and supply forces cause frequent as well as violent changes in exchange rate. Consequently, an air of uncertainty in trade and business would prevail.

Such uncertainty may be damaging for the smooth flow of trade. To prevent this situation, government intervenes in the foreign exchange rate. It may keep the exchange rate fixed. This exchange rate is called a fixed exchange rate system where both demand and supply forces are manipulated or calibrated by the central bank in such a way that the exchange rate is kept pegged at the old level.

Often managed exchange rate is suggested. Under this system, exchange rate, as usual, is determined by demand for and supply of foreign exchange. But the central bank intervenes in the foreign exchange market when the situation demands to stabilise or influence the rate of foreign exchange. If rupee depreciates in terms of dollar, the RBI would then sell dollars and buy rupee in order to reduce the downward pressure in the exchange rate.

3.Mechanism of the Monetary Approach to the Balance of Payments Adjustment!

Ans. The monetary approach to the balance of payments is an explanation of the overall balance of payments. It explains changes in balance of payments in terms of the demand for and supply of money.

According to this approach, "a balance of payments deficit is always and everywhere a monetary phenomenon." Therefore, it can only be corrected by monetary measures.

Its Assumptions:

This approach is based on the following assumptions:

1. The 'law of one price' holds for identical goods sold in different countries, after allowing for transport costs.

2. There is perfect substitution in consumption in both the product and capital markets which ensures one price for each commodity and a single interest rate across countries.

3. The level of output of a country is assumed exogenously.

4. All countries are assumed to be fully employed where wage price flexibility fixes output at full employment.

5. It is assumed that under fixed exchange rates the sterilisation of currency flows is not possible on account of the law of one price globally.

6. The demand for money is a stock demand and is a stable function of income, prices, wealth and interest rate.

7. The supply of money is a multiple of monetary base which includes domestic credit and the country's foreign exchange reserves.

8. The demand for nominal money balances is a positive function of nominal income.

The Theory:

Given these assumptions, the monetary approach can be expressed in the form of the following relationship between the demand for and supply of money:

The demand for money (M_D) is a stable function of income (Y), prices (P) and rate of interest (i)

$M_D=f(Y, P, i)$ …(1)

The money supply (M_s) is a multiple of monetary base (m) which consists of domestic money (credit) (D) and country's foreign exchange reserves (R). Ignoring m for simplicity which is a constant,

$M_S = D + R$ … (2)

Since in equilibrium the demand for money equals the money supply,

$M_D = M_s$ .. (3)

or $M_D = D + R$ [$M_S = D + R$] …(4)

A balance of payments deficit or surplus is represented by changes in the country's foreign exchange reserves. Thus

$\Delta R = \Delta M_D - \Delta D$ … (5)

Or $\Delta R = B$ … (6)

Where B represents balance of payments which is equal to the difference between change in the demand for money (ΔM_D) and change in domestic credit (ΔD).

A balance of payments deficit means a negative B which reduces R and the money supply. On the other hand, a surplus means a positive B which increases R and the money supply. When B = O, it means bop equilibrium or no disequilibrium of BOP.

The automatic adjustment mechanism in the monetary approaches is explained under both the fixed and flexible exchange rate systems.

Under the fixed exchange rate system, assume that $M_D = M_S$ so that BOP (or B) is zero. Now suppose the monetary authority increases domestic money supply, with no change in the demand for money. As a result, $M_S > M_D$ and there is a BOP deficit.

People who have larger cash balances increase their purchases to buy more foreign goods and securities. This tends to raise their prices and increase imports of goods and foreign assets. This leads to increase in expenditure on both current and capital accounts in BOP, thereby creating a BOP deficit.

To maintain a fixed exchange rate, the monetary authority will have to sell foreign exchange reserves and buy domestic currency. Thus the outflow of foreign exchange reserves means a fall in R and in domestic money supply. This process will continue until $M_S = M_D$ and there will again be BOP equilibrium.

On the other hand, if $M_S < M_D$ at the given exchange rate, there will be a BOP surplus. Consequently, people acquire the domestic currency by selling goods and securities to foreigners. They will also seek to acquire additional money balances by restricting their expenditure relatively to their income.

The monetary authority on its part, will buy excess foreign currency in exchange for domestic currency. There will be inflow of foreign exchange reserves and increase in domestic money supply. This process will continue until $M_S = M_D$ and BOP equilibrium will again be restored. Thus a BOP deficit or surplus is a temporary phenomenon and is self-correcting (or automatic) in the long-run.

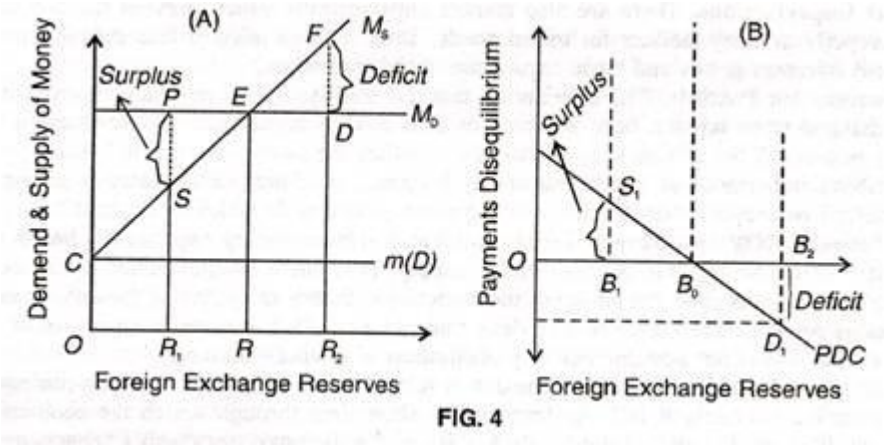


FIG. 4

This is explained in Fig. 4 In Panel (A) of the figure, M_D is the stable money demand curve and M_S is the money supply curve. The horizontal line m (D) represents the monetary base which is a multiple of domestic credit, D which is also constant. This is the domestic component of money supply that is why the M_S curve starts from point C.

M_S and M_D curves intersect at point E where the country's balance of payments is in equilibrium and its foreign exchange reserves are OR. In Panel (B) of the figure, PDC is the payments disequilibrium curve which is drawn as the vertical difference between M_s and $M_D$curves of Panel (A). As such, point B_0 in Panel (B) corresponds to point E in Panel (A) where there is no disequilibrium of balance of payments.

If $M_S < M_D$ there is BOP surplus of SP in Panel (A). It leads to the inflow of foreign exchange reserves which rise from OR_1 to OR and increase the money supply so as to bring BOP equilibrium at point E. On the other hand, if $M_S > M_D$, there is deficit in BOP equal to DF.

There is outflow of foreign exchange reserves which decline from OR_2 to OR and reduce the money supply so as to reestablish BOP equilibrium at point E. The same process is illustrated in Panel (B) of the figure where BOP disequilibrium is self-correcting or automatic when B_1S_1 surplus and B_2D_1 deficit are equal.

Under a system of flexible (or floating) exchange rates, when B = O, there is no change in foreign exchange reserves (R). But when there is a BOP deficit or surplus, changes in the demand for money and exchange rate play a major role in the adjustment process without any inflow or outflow of foreign exchange reserves.

Suppose the monetary authority increases the money supply ($M_S > M_D$) and there is a BOP deficit. People having additional cash balances buy more goods thereby raising prices of domestic and imported goods. There is depreciation of the domestic currency and a rise in the exchange rate.

The rise in prices, in turn, increases the demand for money thereby bringing the equality of M_D and M_S without any outflow of foreign exchange reserves. The opposite will happen when $M_D > M_S$, there is fall in prices and appreciation of the domestic currency which automatically eliminates the excess demand for money. The exchange rate falls until $M_D = M_S$ and BOP is in equilibrium without any inflow of foreign exchange reserves.

4.The Portfolio Balance Approach explained in detailed.

Ans. The portfolio balance approach is an extension of the monetary exchange rate models focusing on the impact of bonds. According to this approach, any change in the economic conditions of a country will have a direct impact on the demand and supply for the domestic and the foreign bond. This shift in the demand/supply for bonds will in turn influence the exchange rate between the domestic and foreign economies.

The key advantage of the portfolio approach when compared to traditional approaches is that the financial assets tend to adjust considerably faster to news economic conditions than tradeable goods. Nevertheless, based on empirical evidence, the portfolio balance approach is not an accurate predictor of exchange rates.

The Assumptions of Portfolio Balance Approach

The portfolio balance approach is based on several assumptions:

1. The purchasing power parity (PPP) does not hold

2. The uncovered interest parity does not hold

3. The exchange rate is expected unchanged

4. Only three (3) assets are available for investment for each household: money, domestic bonds, and foreign bonds

5. Bonds are not perfect substitutes

6. Assumes perfect capital mobility without capital controls and similar barriers to investment

7. Assumes narrow transaction costs and high completion in the money markets

Portfolio Balance Approach Key Points

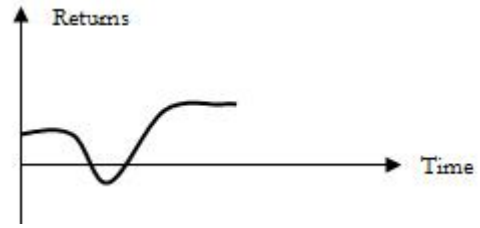
Emphasizes on the importance of global financial markets (especially as concerns the bond markets)

Assumes the existence of arbitrage between two economies

Offers a realistic and simplistic analysis framework

The portfolio balance approach, based on empirical evidence, hasn't proven an accurate predictor of exchange rates

5. What is J-Curve Effect?



The J-curve effect is often seen in a country's balance of trade and equity fund returns.

A country's trade balance experiences the J-curve effect if its currency becomes devalued. At first, the country's total value of imports (goods purchased from abroad) exceeds its total value of exports (goods sold abroad), resulting in a trade deficit. But eventually, the currency devaluation reduces the price of its exports. Consequently, the country's level of exports gradually recovers, and the country moves back to a trade surplus.

Equity fund returns typically experience the J-curve effect in the first years following their formation. Initially, equity funds yield negative annual returns resulting from start-up costs and high management fees. However, once a fund stabilizes, its value gradually rises into positive territory and beyond its initial value.

WHY IT MATTERS:

Economic analysts and policymakers may factor the J-curve effect into their analyses and decisions as a way to gauge both short- and long-term effects of a variable change (for example, a decline in exchange rates) or new policy.

Assumption 1:	

That is to say, the position of the Investment Saving (IS) curve is determined by the volume of injections into the flow of income and by the competitiveness of Home country output measured by the real exchange rate.

The first assumption is essentially saying that the IS curve (demand for goods) position is in some way dependent on the real effective exchange rate Q.

That is, [IS = C + I + G +Nx(Q)]. In this case, net exports is dependent on Q (as Q goes up, foreign countries' goods are relatively more expensive, and home countries' goods are cheaper, therefore there are higher net exports).

Assumption 2:	Financial Markets are able to adjust to shocks instantaneously, and investors are risk neutral.

If financial markets can adjust instantaneously and investors are risk neutral, it can be said the uncovered interest rate parity (UIP) holds at all times. That is, the equation $r = r^* + \Delta se$ holds at all times (explanation of this formula is below).

It is clear, then, that an expected depreciation/appreciation offsets any current difference in the exchange rate. If $r > r^*$, the exchange rate (domestic price of one unit of foreign currency) is expected to increase. That is, the domestic currency depreciates relative to the foreign currency.

Assumption	In the short run, goods prices are 'sticky'. That is, aggregate supply is

3:	horizontal in the short run, though it is positively sloped in the long run.

In the long run, the exchange rate(s) will equal the long run equilibrium exchange rate,(ŝ).

Unit -3

Economic Growth

1.Explain The Accumulation of Capital.

Ans. The Solow growth model is designed to show how growth in the capital stock, growth in the labor force, and advances in technology interact in an economy as well as how they affect a nation's total output of goods and services. We will build this model in a series of steps. Our first step is to examine how the supply and demand for goods determine the accumulation of capital. In this first step, we assume that the labor force and technology are fixed. We then relax these assumptions by introducing changes in the labor force.

The Supply and Demand for Goods

The supply and demand for goods played a central role in our static model of the closed economy in Chapter 3. The same is true for the Solow model. By considering the supply and demand for goods, we can see what determines how much output is produced at any given time and how this output is allocated among alternative uses.

The Supply of Goods and the Production Function The supply of goods in the Solow model is based on the production function, which states that output depends on the capital stock and the labor force:

$Y = F(K, L)$.

The Solow growth model assumes that the production function has constant returns to scale. This assumption is often considered realistic, and, as we will see shortly, it helps simplify the analysis. Recall that a production function has constant

returns to scale if

$zY = F(zK, zL)$

for any positive number z. That is, if both capital and labor are multiplied by z, the amount of output is also multiplied by z.

Production functions with constant returns to scale allow us to analyze all quantities in the economy relative to the size of the labor force. To see that this is true, set $z = 1/L$ in the preceding equation to obtain

$Y/L = F(K/L, 1)$.

This equation shows that the amount of output per worker Y/L is a function of the amount of capital per worker K/L. (The number 1 is constant and thus can be ignored.) The assumption of constant returns to scale implies that the size of the economy—as measured by the number of workers—does not affect the relationship between output per worker and capital per worker.

Because the size of the economy does not matter, it will prove convenient to denote all quantities in per worker terms. We designate quantities per worker with lowercase letters, so $y = Y/L$ is output per worker, and $k = K/L$ is capital per worker. We can then write the production function as

$y = f(k)$,

where we define $f(k) = F(k, 1)$. Figure 7-1 illustrates this production function.

The slope of this production function shows how much extra output a worker produces when given an extra unit of capital. This amount is the marginal product of capital *MPK*. Mathematically, we write

$MPK = f(k + 1) - f(k)$.

Note that in Figure 7-1, as the amount of capital increases, the production function becomes flatter, indicating that the production function exhibits diminishing marginal product of capital. When k is low, the average worker has only a little capital to work with, so an extra unit of capital is very useful and produces a lot of additional output. When k is high, the average worker has a lot of capital already, so an extra unit increases production only slightly.

The Demand for Goods and the Consumption Function The demand for goods in the Solow model comes from consumption and investment. In other words, output per worker y is divided between consumption per worker c and investment per worker i:

$y = c + i.$

This equation is the per-worker version of the national income accounts identity for an economy. Notice that it omits government purchases (which for present purposes we can ignore) and net exports (because we are assuming a closed economy).

The Solow model assumes that each year people save a fraction s of their income and consume a fraction $(1 – s)$. We can express this idea with the following consumption function:

$c = (1 - s)y,$

where s, the saving rate, is a number between zero and one. Keep in mind that various government policies can potentially influence a nation's saving rate, so one of our goals is to find what saving rate is desirable. For now, however, we just take the saving rate s as given.

To see what this consumption function implies for investment, substitute $(1 – s)y$ for c in the national income accounts identity:

$y = (1 - s)y + i.$

Rearrange the terms to obtain

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$y = (1 - s)y + i.$

Rearrange the terms to obtain

$i = sy$.

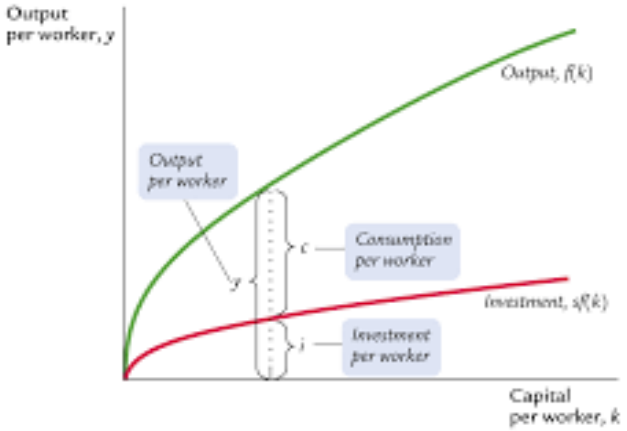
This equation shows that investment equals saving, as we first saw in Chapter 3. Thus, the rate of saving s is also the fraction of output devoted to investment. We have now introduced the two main ingredients of the Solow model—the production function and the consumption function—which describe the economy at any moment in time. For any given capital stock k, the production function $y = f(k)$ determines how much output the economy produces, and the saving rate s determines the allocation of that output between consumption and investment.

Growth in the Capital Stock and the Steady State

At any moment, the capital stock is a key determinant of the economy's output, but the capital stock can change over time, and those changes can lead to economic growth. In particular, two forces influence the capital stock: investment and depreciation. *Investment* is expenditure on new plant and equipment, and it causes the capital stock to rise. *Depreciation* is the wearing out of old capital, and it causes the capital stock to fall. Let's consider each of these forces in turn.

As we have already noted, investment per worker i equals sy. By substituting the production function for y, we can express investment per worker as a function of the capital stock per worker:

$i = sf(k)$.



This equation relates the existing stock of capital k to the accumulation of new capital i. Figure 7-2 shows this relationship. This figure illustrates how, for any

value of *k*, the amount of output is determined by the production function *f*(*k*), and the allocation of that output between consumption and saving is determined by the saving rate *s*.

To incorporate depreciation into the model, we assume that a certain fraction d of the capital stock wears out each year. Here d (the lowercase Greek letter delta) is called the *depreciation rate*. For example, if capital lasts an average of 25 years, then the depreciation rate is 4 percent per year (d □□0.04). The amount of capital that depreciates each year is d*k*. Figure 7-3 shows how the amount of depreciation depends on the capital stock.

We can express the impact of investment and depreciation on the capital stock with this equation:

Change in Capital Stock □□Investment □□Depreciation

D*k* □□*i* □□d*k*,

where D*k* is the change in the capital stock between one year and the next. Because investment *i* equals *sf*(*k*), we can write this as

D*k* □□*sf* (*k*) □□d*k*.

Figure 7-4 graphs the terms of this equation—investment and depreciation—for different levels of the capital stock *k*. The higher the capital stock, the greater the amounts of output and investment. Yet the higher the capital stock, the greater also the amount of depreciation.

As Figure 7-4 shows, there is a single capital stock *k** at which the amount of investment equals the amount of depreciation. If the economy finds itself at this level of the capital stock, the capital stock will not change because the two forces acting on it—investment and depreciation—just balance. That is, at *k**, D*k* □□0, so the capital stock *k* and output *f*(*k*) are steady over time (rather than growing or shrinking). We therefore call *k** the **steady-state** level of capital.

The steady state is significant for two reasons. As we have just seen, an economy at the steady state will stay there. In addition, and just as important, an economy *not* at the steady state will go there. That is, regardless of the level of capital with which the economy begins, it ends up with the steady-state level of capital. In this sense, *the steady state represents the long-run equilibrium of the economy.*

To see why an economy always ends up at the steady state, suppose that the economy starts with less than the steady-state level of capital, such as level *k*1 in

Figure 7-4. In this case, the level of investment exceeds the amount of depreciation. Over time, the capital stock will rise and will continue to rise—along with output $f(k)$—until it approaches the steady state k^*.

Similarly, suppose that the economy starts with more than the steady-state level of capital, such as level $k2$. In this case, investment is less than depreciation: capital is wearing out faster than it is being replaced. The capital stock will fall, again approaching the steady-state level. Once the capital stock reaches the steady state, investment equals depreciation, and there is no pressure for the capital stock to either increase or decrease.

2. Explain The Golden Rule Level of Capital.

So far, we have used the Solow model to examine how an economy's rate of saving and investment determines its steady-state levels of capital and income. This analysis might lead you to think that higher saving is always a good thing because it always leads to greater income. Yet suppose a nation had a saving rate of 100 percent. That would lead to the largest possible capital stock and the largest possible income. But if all of this income is saved and none is ever consumed, what good is it?

This section uses the Solow model to discuss the optimal amount of capital accumulation from the standpoint of economic well-being. In the next chapter, we discuss how government policies influence a nation's saving rate. But first, in this section, we present the theory behind these policy decisions

Comparing Steady States

To keep our analysis simple, let's assume that a policymaker can set the economy's saving rate at any level. By setting the saving rate, the policymaker determines the economy's steady state. What steady state should the policymaker choose?

The policymaker's goal is to maximize the well-being of the individuals who make up the society. Individuals themselves do not care about the amount of capital in the economy, or even the amount of output. They care about the amount of goods and services they can consume. Thus, a benevolent policymaker would want to choose the steady state with the highest level of consumption.

The steady-state value of k that maximizes consumption is called the **Golden Rule level of capital** and is denoted k^*gold.2

How can we tell whether an economy is at the Golden Rule level? To answer this question, we must first determine steady-state consumption per worker. Then we can see which steady state provides the most consumption.

To find steady-state consumption per worker, we begin with the national income accounts identity

$y = c + i$

and rearrange it as

$c = y - i.$

Consumption is output minus investment. Because we want to find steady-state consumption, we substitute steady-state values for output and investment. Steady-state output per worker is $f(k^*)$, where k^* is the steady-state capital stock per worker. Furthermore, because the capital stock is not changing in the steady state, investment equals depreciation δk^*. Substituting $f(k^*)$ for y and δk^* for i, we can write steady-state consumption per worker as

$c^* = f(k^*) - \delta k^*.$

According to this equation, steady-state consumption is what's left of steady-state output after paying for steady-state depreciation. This equation shows that an increase in steady-state capital has two opposing effects on steady-state consumption. On the one hand, more capital means more output. On the other hand, more capital also means that more output must be used to replace capital that is wearing out.

Figure 7-7 graphs steady-state output and steady-state depreciation as a function of the steady-state capital stock. Steady-state consumption is the gap between output and depreciation. This figure shows that there is one level of the capital stock—the Golden Rule level k^*_{gold}—that maximizes consumption.

When comparing steady states, we must keep in mind that higher levels of capital affect both output and depreciation. If the capital stock is below the Golden Rule level, an increase in the capital stock raises output more than depreciation, so consumption rises. In this case, the production function is steeper than the δk^* line, so the gap between these two curves—which equals consumption—grows as k^* rises. By contrast, if the capital stock is above the Golden Rule level, an increase in the capital stock reduces consumption, because the increase in output is smaller than the increase in depreciation. In this case, the production function is flatter than the δk^* line, so the gap between the curves—consumption—shrinks as k^* rises. At the Golden Rule level of capital,

the production function and the d*k** line have the same slope, and consumption is at its greatest level.

We can now derive a simple condition that characterizes the Golden Rule level of capital. Recall that the slope of the production function is the marginal product of capital *MPK*. The slope of the d*k** line is d. Because these two slopes are equal at *k**gold, the Golden Rule is described by the equation

MPK □□d.

At the Golden Rule level of capital, the marginal product of capital equals the depreciation rate.

To make the point somewhat differently, suppose that the economy starts at some steady-state capital stock *k** and that the policymaker is considering increasing the capital stock to *k** □□1. The amount of extra output from this increase in capital would be *f*(*k** □□1) – *f*(*k**), the marginal product of capital *MPK*. The amount of extra depreciation from having 1 more unit of capital is the depreciation rate d. Thus, the net effect of this extra unit of capital on consumption is *MPK* – d. If *MPK* – d □□0, then increases in capital increase consumption, so *k** must be below the Golden Rule level. If *MPK* – d □□0, then increases in capital decrease consumption, so *k** must be above the Golden Rule level. Therefore, the following condition describes the Golden Rule:

MPK □□d □□0.

At the Golden Rule level of capital, the marginal product of capital net of depreciation (*MPK* – d) equals zero. As we will see, a policymaker can use this condition to find the Golden Rule capital stock for an economy.3

Keep in mind that the economy does not automatically gravitate toward the Golden Rule steady state. If we want any particular steady-state capital stock, such as the Golden Rule, we need a particular saving rate to support it. Figure 7-8 shows the steady state if the saving rate is set to produce the Golden Rule level of capital. If the saving rate is higher than the one used in this figure, the steady-state capital stock will be too high. If the saving rate is lower, the steadystate capital stock will be too low. In either case, steady-state consumption will be lower than it is at the Golden Rule steady state.

3.Explain Population Growth.

Ans.The basic Solow model shows that capital accumulation, by itself, cannot explain sustained economic growth: high rates of saving lead to high growth temporarily,

but the economy eventually approaches a steady state in which capital and output are constant. To explain the sustained economic growth that we observe in most parts of the world, we must expand the Solow model to incorporate the other two sources of economic growth—population growth and technological progress. In this section we add population growth to the model.

The Steady State With Population Growth

How does population growth affect the steady state? To answer this question, we must discuss how population growth, along with investment and depreciation, influences the accumulation of capital per worker. As we noted before, investment raises the capital stock, and depreciation reduces it. But now there is a third force acting to change the amount of capital per worker: the growth in the number of workers causes capital per worker to fall.

We continue to let lowercase letters stand for quantities per worker. Thus, $k = K/L$ is capital per worker, and $y = Y/L$ is output per worker. Keep in mind, however, that the number of workers is growing over time.

The change in the capital stock per worker is

$$\Delta k = i - (\delta + n)k.$$

This equation shows how investment, depreciation, and population growth influence the per-worker capital stock. Investment increases k, whereas depreciation and population growth decrease k. We saw this equation earlier in this chapter for the special case of a constant population ($n = 0$).

We can think of the term $(\delta + n)k$ as defining *break-even investment*—the amount of investment necessary to keep the capital stock per worker constant. Break-even investment includes the depreciation of existing capital, which equals δk. It also includes the amount of investment necessary to provide new workers with capital. The amount of investment necessary for this purpose is nk, because there are n new workers for each existing worker and because k is the amount of capital for each worker. The equation shows that population growth reduces the accumulation of capital per worker much the way depreciation does. Depreciation reduces k by wearing out the capital stock, whereas population growth reduces k by spreading the capital stock more thinly among a larger population of workers.5

Our analysis with population growth now proceeds much as it did previously. First, we substitute $sf(k)$ for i. The equation can then be written as

D*k* □□*sf* (*k*) □□(d □□*n*)*k.*

To see what determines the steady-state level of capital per worker, we use Figure 7-11, which extends the analysis of Figure 7-4 to include the effects of population growth. An economy is in a steady state if capital per worker *k* is unchanging. As before, we designate the steady-state value of *k* as *k**. If *k* is less than *k**, investment is greater than break-even investment, so *k* rises. If *k* is greater than *k**, investment is less than break-even investment, so *k* falls.

In the steady state, the positive effect of investment on the capital stock per worker exactly balances the negative effects of depreciation and population growth. That is, at *k**,D*k* □□0 and *i** □□d*k** □□*nk**. Once the economy is in the steady state, investment has two purposes. Some of it (d*k**) replaces the depreciated capital, and the rest (*nk**) provides the new workers with the steady-state amount of capital.

The Effects of Population Growth

Population growth alters the basic Solow model in three ways. First, it brings us closer to explaining sustained economic growth. In the steady state with population growth, capital per worker and output per worker are constant. Because the number of workers is growing at rate *n*, however, *total* capital and *total* output must also be growing at rate *n.* Hence, although population growth cannot explain sustained growth in the standard of living (because output per worker is constant in the steady state), it can help explain sustained growth in total output.

Second, population growth gives us another explanation for why some countries are rich and others are poor. Consider the effects of an increase in population growth. Figure 7-12 shows that an increase in the rate of population growth from *n*1 to *n*2 reduces the steady-state level of capital per worker from *k**1 to *k**2. Because *k** is lower and because *y** □□*f*(*k**), the level of output per worker *y** is also lower. Thus, the Solow model predicts that countries with higher population growth will have lower levels of GDP per person. Notice that a change in the population growth rate, like a change in the saving rate, has a level effect on income per person but does not affect the steady-state growth rate of income per person.

Finally, population growth affects our criterion for determining the Golden Rule (consumption-maximizing) level of capital. To see how this criterion changes, note that consumption per worker is

c □□*y* – *i.*

Because steady-state output is $f(k^*)$ and steady-state investment is $(\delta + n)k^*$, we can express steady-state consumption as

$c^* = f(k^*) - (\delta + n)k^*$.

Using an argument largely the same as before, we conclude that the level of k^* that maximizes consumption is the one at which

$MPK = \delta + n$,

or equivalently,

$MPK - \delta = n$.

In the Golden Rule steady state, the marginal product of capital net of depreciation equals the rate of population growth.

4.Explain Technological Progress in the Solow Model

Ans. The Efficiency of Labor

To incorporate technological progress, we must return to the production function that relates total capital K and total labor L to total output Y. Thus far, the production function has been

$Y = F(K, L)$.

We now write the production function as

$Y = F(K, L \times E)$,

where E is a new (and somewhat abstract) variable called the **efficiency of labor.** The efficiency of labor is meant to reflect society's knowledge about production methods: as the available technology improves, the efficiency of labor rises, and each hour of work contributes more to the production of goods and services. For instance, the efficiency of labor rose when assembly-line production transformed manufacturing in the early twentieth century, and it rose again when computerization was introduced in the late twentieth century. The efficiency of labor also rises when there are improvements in the health, education, or skills of the labor force.

The term $L \times E$ can be interpreted as measuring the *effective number of workers.* It takes into account the number of actual workers L and the efficiency of each worker E. In other words, L measures the number of workers in the labor force, whereas $L \times E$ measures both the workers and the technology with which the typical worker comes equipped. This new production function states that total output Y depends on the inputs of capital K and effective workers $L \times E$.

The essence of this approach to modeling technological progress is that increases in the efficiency of labor E are analogous to increases in the labor force L. Suppose, for example, that an advance in production methods makes
the efficiency of labor E double between 1980 and 2010. This means that a single worker in 2010 is, *in effect,* as productive as two workers were in 1980. That is, even if the actual number of workers (L) stays the same from 1980 to 2010, the effective number of workers ($L \times E$) doubles, and the economy benefits from the increased production of goods and services.

The simplest assumption about technological progress is that it causes the efficiency of labor E to grow at some constant rate g. For example, if $g = 0.02$, then each unit of labor becomes 2 percent more efficient each year: output increases as if the labor force had increased by 2 percent more than it really did. This form of technological progress is called *labor augmenting,* and g is called the rate of **labor-augmenting technological progress.** Because the labor force L is growing at rate n, and the efficiency of each unit of labor E is growing at rate g, the effective number of workers $L \times E$ is growing at rate $n + g$.

The Steady State With Technological Progress

Because technological progress is modeled here as labor augmenting, it fits into the model in much the same way as population growth. Technological progress does not cause the actual number of workers to increase, but because each worker in effect comes with more units of labor over time, technological progress causes the effective number of workers to increase. Thus, the analytic tools we used in Chapter 7 to study the Solow model with population growth are easily adapted to studying the Solow model with labor-augmenting technological progress.

We begin by reconsidering our notation. Previously, when there was no technological progress, we analyzed the economy in terms of quantities per worker; now we can generalize that approach by analyzing the economy in terms of quantities per effective worker. We now let $k = K/(L \times E)$ stand for capital per effective worker and $y = Y/(L \times E)$ stand for output per effective worker. With these definitions, we can again write $y = f(k)$.

Our analysis of the economy proceeds just as it did when we examined population growth. The equation showing the evolution of k over time becomes

$\Delta k = sf(k) - (\delta + n + g)k$.

As before, the change in the capital stock D*k* equals investment *sf*(*k*) minus breakeven investment (d □□*n* □□*g*)*k.* Now, however, because *k* □□*K*/(*L* □□*E)*, break-even investment includes three terms: to keep *k* constant, d*k* is needed to replace depreciating capital, *nk* is needed to provide capital for new workers, and *gk* is needed to provide capital for the new "effective workers" created by technological progress.

As shown in Figure 8-1, the inclusion of technological progress does not substantially alter our analysis of the steady state. There is one level of *k,* denoted *k**, at which capital per effective worker and output per effective worker are constant. As before, this steady state represents the long-run equilibrium of the economy.

The Effects of Technological Progress

Table 8-1 shows how four key variables behave in the steady state with technological progress. As we have just seen, capital per effective worker *k* is constant in the steady state. Because *y* □□*f*(*k*), output per effective worker is also constant. It is these quantities per effective worker that are steady in the steady state.

From this information, we can also infer what is happening to variables that are not expressed in units per effective worker. For instance, consider output per actual worker *Y*/*L* □□*y* □□*E.* Because *y* is constant in the steady state and *E* is growing at rate *g,* output per worker must also be growing at rate *g* in the steady state. Similarly, the economy's total output is *Y* □□*y* □□(*E* □□*L*). Because *y* is constant in the steady state, *E* is growing at rate *g,* and *L* is growing at rate *n,* total output grows at rate *n* □□*g* in the steady state.

With the addition of technological progress, our model can finally explain the sustained increases in standards of living that we observe. That is, we have shown that technological progress can lead to sustained growth in output per worker. By contrast, a high rate of saving leads to a high rate of growth only until the steady state is reached. Once the economy is in steady state, the rate of growth of output per worker depends only on the rate of technological progress. *According to* the Solow model, only technological progress can explain sustained growth and persistently rising living standards. The introduction of technological progress also modifies the criterion for the Golden Rule. The Golden Rule level of capital is now defined as the steady state

that maximizes consumption per effective worker. Following the same arguments that we have used before, we can show that steady-state consumption per effective

worker is

$c^* = f(k^*) - (\delta + n + g)k^*$.

Steady-state consumption is maximized if

$MPK = \delta + n + g$,

or

$MPK = \delta + n + g$.

That is, at the Golden Rule level of capital, the net marginal product of capital, $MPK - \delta$, equals the rate of growth of total output, $n + g$. Because actual economies experience both population growth and technological progress, we must use this criterion to evaluate whether they have more or less capital than they would at the Golden Rule steady state.

5. Growth Theory to Growth Empirics.

Ans. Balanced Growth

According to the Solow model, technological progress causes the values of many variables to rise together in the steady state. This property, called *balanced growth*, does a good job of describing the long-run data for the U.S. economy. Consider first output per worker Y/L and the capital stock per worker K/L.

According to the Solow model, in the steady state, both of these variables grow at g, the rate of technological progress. U.S. data for the past half century show that output per worker and the capital stock per worker have in fact grown at approximately the same rate—about 2 percent per year. To put it another way, the capital–output ratio has remained approximately constant over time.

Technological progress also affects factor prices. Problem 3(d) at the end of the chapter asks you to show that, in the steady state, the real wage grows at the rate of technological progress. The real rental price of capital, however, is constant over time. Again, these predictions hold true for the United States. Over the past 50 years, the real wage has increased about 2 percent per year; it has increased at about the same rate as real GDP per worker. Yet the real rental price of capital (measured as real capital income divided by the capital stock) has remained about the same.

The Solow model's prediction about factor prices—and the success of this prediction—is especially noteworthy when contrasted with Karl Marx's theory of the development of capitalist economies. Marx predicted that the return to capital would decline over time and that this would lead to economic and political crisis. Economic history has not supported Marx's prediction, which partly

explains why we now study Solow's theory of growth rather than Marx's.

Convergence

If you travel around the world, you will see tremendous variation in living standards. The world's poor countries have average levels of income per person that are less than one-tenth the average levels in the world's rich countries. These differences in income are reflected in almost every measure of the quality of life—from the number of televisions and telephones per household to the infant mortality rate and life expectancy.

Much research has been devoted to the question of whether economies converge over time to one another. In particular, do economies that start off poor subsequently grow faster than economies that start off rich? If they do, then the world's poor economies will tend to catch up with the world's rich economies. This property of catch-up is called *convergence.* If convergence does not occur, then countries that start off behind are likely to remain poor.

The Solow model makes clear predictions about when convergence should occur. According to the model, whether two economies will converge depends on why they differ in the first place. On the one hand, suppose two economies happen by historical accident to start off with different capital stocks, but they have the same steady state, as determined by their saving rates, population growth rates, and efficiency of labor. In this case, we should expect the two economies to converge; the poorer economy with the smaller capital stock will naturally grow more quickly to reach the steady state. (In a case study in Chapter 7, we applied this logic to explain rapid growth in Germany and Japan after World War II.) On the other hand, if two economies have different steady states, perhaps because the economies have different rates of saving, then we should not expect convergence. Instead, each economy will approach its own steady state. Experience is consistent with this analysis. In samples of economies with similar cultures and policies, studies find that economies converge to one another at a rate of about 2 percent per year. That is, the gap between rich and poor economies closes by about 2 percent each year. An example is the economies of individual American states. For historical reasons, such as the Civil War of the 1860s, income levels varied greatly among states at the end of the nineteenth century. Yet these differences have slowly disappeared over time.

In international data, a more complex picture emerges. When researchers

examine only data on income per person, they find little evidence of convergence: countries that start off poor do not grow faster on average than countries that start off rich. This finding suggests that different countries have different steady states. If statistical techniques are used to control for some of the determinants of the steady state, such as saving rates, population growth rates, and accumulation of human capital (education), then once again the data show convergence at a rate of about 2 percent per year. In other words, the economies of the world exhibit *conditional convergence:* they appear to be converging to their own steady states, which in turn are determined by such variables as saving, population growth, and human capital.

Unit -4

1. Explain Irving Fisher and Intertemporal Choice.Ans. The consumption function introduced by Keynes relates current consumptionto current income. This relationship, however, is incomplete at best. When people decide how much to consume and how much to save, they consider both thepresent and the future. The more consumption they enjoy today, the less they will be able to enjoy tomorrow. In making this tradeoff, households must look aheadto the income they expect to receive in the future and to the consumption ofgoods and services they hope to be able to afford.The economist Irving Fisher developed the model with which economists analyze how rational, forward-looking consumers make intertemporal choices—that is, choices involving different periods of time. Fisher's model illuminates theconstraints consumers face, the preferences they have, and how these constraintsand preferences together determine their choices about consumption and saving.Most people would prefer to increase the quantity or quality of the goods andservices they consume—to wear nicer clothes, eat at better restaurants, or seemore movies. The reason people consume less than they desire is that their con-sumption is constrained by their income. In other words, consumers face a limiton how much they can spend, called a budget constraint. When they are decidinghow much to consume today versus how much to save for the future, they facean intertemporal budget constraint, which measures the total resourcesavailable for consumption today and in the future. Our first step in developingFisher's model is to examine this constraint in some detail.To keep things simple, we examine the decision facing a consumer who lives

for two periods. Period one represents the consumer's youth, and period tworepresents the consumer's old age. The consumer earns income Y1 and consumesC1 in period one, and earns income Y2 and consumes C2 in period two. (Allvariables are real—that is, adjusted for inflation.) Because the consumer has theopportunity to borrow and save, consumption in any single period can be eithergreater or less than income in that period.Consider how the consumer's income in the two periods constrains con-sumption in the two periods. In the first period, saving equals income minus consumption.

That is,$S = Y1 - C$

where S is saving. In the second period, consumption equals the accumulatedsaving, including the interest earned on that saving, plus second-period income.

That is,$C2 = (1 + r)S + Y2$,where r is the real interest rate. For example, if the real interest rate is 5 percent,then for every $1 of saving in period one, the consumer enjoys an extra $1.05 ofconsumption in period two. Because there is no third period, the consumer doesnot save in the second period.Note that the variable S can represent either saving or borrowing and thatthese equations hold in both cases. If first-period consumption is less thanfirst-period income, the consumer is saving, and S is greater than zero. Iffirst-period consumption exceeds first-period income, the consumer is borrow-ing, and S is less than zero. For simplicity, we assume that the interest rate forborrowing is the same as the interest rate for saving.To derive the consumer's budget constraint, combine the two preceding equa-tions. Substitute the first equation for S into the second equation to obtain$C2 = (1 + r)(Y1 - C1) + Y2$.To make the equation easier to interpret, we must rearrange terms. To place allthe consumption terms together, bring $(1 + r)C1$ from the right-hand side to the

left-hand side of the equation to obtain$(1 + r)C1 + C2 = (1 + r)Y1 + Y2$.This equation relates consumption in the two periods to income in the two peri-ods. It is the standard way of expressing the consumer's intertemporal budgetconstraint.The consumer's budget constraint is easily interpreted. If the interest rate iszero, the budget constraint shows that total consumption in the two periodsequals total income in the two periods. In the usual case in which the interestrate is greater than zero, future consumption and future income are discountedby a factor $1 + r$.This discounting arises from the interest earned on savings. Inessence, because the consumer earns interest on current income that is saved,future income is worth less than current income. Similarly, because future con-sumption is paid for out of savings that have earned interest, future consumptioncosts less than current consumption. The factor $1/(1 + r)$ is the price of sec-ond-period consumption measured in terms of first-period consumption: it isthe amount of first-period consumption that the consumer must forgo to obtain1 unit of second-period consumption.

2.Explain Robert Hall and the Random-Walk HypothesisAns. The permanent-income hypothesis is based on Fisher's model of intertemporalchoice. It builds on the idea that forward-looking consumers base their con-sumption decisions not only on their current income but also on the income

they expect to receive in the future. Thus, the permanent-income hypothesishighlights that consumption depends on people's expectations.Recent research on consumption has combined this view of the consumerwith the assumption of rational expectations. The rational-expectations assump-tion states that people use all available information to make optimal forecastsabout the future.

The HypothesisThe economist Robert Hall was the first to derive the implications of rationalexpectations for consumption. He showed that if the permanent-incomehypothesis is correct, and if consumers have rational expectations, then changesin consumption over time should be unpredictable. When changes in a variableare unpredictable, the variable is said to follow a random walk. According toHall, the combination of the permanent-income hypothesis and rational expec-tations implies that consumption follows a random walk.Hall reasoned as follows. According to the permanent-income hypothesis,consumers face fluctuating income and try their best to smooth their consump-tion over time. At any moment, consumers choose consumption based on theircurrent expectations of their lifetime incomes. Over time, they change their con-sumption because they receive news that causes them to revise their expecta-tions. For example, a person getting an unexpected promotion increasesconsumption, whereas a person getting an unexpected demotion decreases con-

sumption. In other words, changes in consumption reflect "surprises" about life-time income. If consumers are optimally using all available information, thenthey should be surprised only by events that were entirely unpredictable. There-fore, changes in their consumption should be unpredictable as well.The rational-expectations approach to consumption has implications not onlyfor forecasting but also for the analysis of economic policies. If consumers obey thepermanent-income hypothesis and have rational expectations, then only unexpected policychanges influence consumption. These policy changes take effect when they change expec-tations. For example, suppose that today Congress passes a tax increase to beeffective next year. In this case, consumers receive the news about their lifetimeincomes when Congress passes the law (or even earlier if the law's passage waspredictable). The arrival of this news causes consumers to revise their expecta-tions and reduce their consumption. The following year, when the tax hike goesinto effect, consumption is unchanged because no news has arrived.economy not only through their actions but also through the public's

expectationof their actions. Expectations, however, cannot be observed directly. Therefore, it isoften hard to know how and when changes in fiscal policy alter aggregate demand.

3.Write detailed note on Business Fixed Investment.Ans. The largest piece of investment spending, accounting for about three-quarters ofthe total, is business fixed investment. The term "business" means that theseinvestment goods are bought by firms for use in future production. The termfixed" means that this spending is for capital that will stay put for a while, as

opposed to inventory investment, which will be used or sold within a short time.Business fixed investment includes everything from office furniture to factories,computers to company cars.The standard model of business fixed investment is called the neoclassicalmodel of investment. The neoclassical model examines the benefits and coststo firms of owning capital goods. The model shows how the level of invest-ment—the addition to the stock of capital—is related to the marginal product ofcapital, the interest rate, and the tax rules affecting firms.To develop the model, imagine that there are two kinds of firms in the econ-omy. Production firms produce goods and services using capital that they rent.Rental firms make all the investments in the economy; they buy capital and rentit out to the production firms. Most firms in the real world perform both func-tions: they produce goods and services, and they invest in capital for future pro-duction. We can simplify our analysis and clarify our thinking, however, if weseparate these two activities by imagining that they take place in different firms.The Rental Price of CapitalLet's first consider the typical production firm, thisfirm decides how much capital to rent by comparing the cost and benefit of eachunit of capital. The firm rents capital at a rental rate R and sells its output at a priceP; the real cost of a unit of capital to the production firm is R/P. The real benefit

of a unit of capital is the marginal product of capital MPK—the extra output pro-duced with one more unit of capital. The marginal product of capital declines as theamount of capital rises: the more capital the firm has, the less an additional unit ofcapital will add to its output. , to maximize profit, the firmrents capital until the marginal product of capital falls to equal the real rental price.the marginal product of capital determines the demandcurve. The demand curve slopes downward because the marginal product of cap-ital is low when the level of capital is high. At any point in time, the amount ofcapital in the economy is fixed, so the supply curve is vertical. The real rentalprice of capital adjusts to equilibrate supply and demand.To see what variables influence the equilibrium rental price, let's consider a

particular production function. many economists con-sider the Cobb–Douglas production function a good approximation of how the actual economy turns capital and labor into goods and services. ThevCobb–Douglas production function isY = AKaL1−a,where Y is output, K is capital, L is labor, A is a parameter measuring the levelof technology, and a is a parameter between zero and one that measures capital'sshare of output. The marginal product of capital for the Cobb–Douglas proDuction function.

Because the real rental price R/P equals the marginal product of capital in equilibrium, we can writeR/P = aA(L/K)This expression identifies the variables that determine the real rental price. Itshows the following:■ The lower the stock of capital, the higher the real rental price of capital.■ The greater the amount of labor employed, the higher the real rentalprice of capital.■ The better the technology, the higher the real rental price of capital.Events that reduce the capital stock (an earthquake), or raise employment (anexpansion in aggregate demand), or improve the technology (a scientific discov-ery) raise the equilibrium real rental price of capital.The Cost of CapitalNext consider the rental firms. These firms, like car-rental companies, merelybuy capital goods and rent them out. Because our goal is to explain the invest-ments made by the rental firms, we begin by considering the benefit and cost ofowning capital.The benefit of owning capital is the revenue earned by renting it to the pro-duction firms. The rental firm receives the real rental price of capital R/P for

The cost of owning capital is more complex. For each period of time that itrents out a unit of capital, the rental firm bears three costs:1. When a rental firm borrows to buy a unit of capital, it must pay interest onthe loan. If PK is the purchase price of a unit of capital and i is the nominalinterest rate, then iPK is the interest cost. Notice that this interest costwould be the same even if the rental firm did not have to borrow: if therental firm buys a unit of capital using cash on hand, it loses out on the

interest it could have earned by depositing this cash in the bank. In eithercase, the interest cost equals iPK.2. While the rental firm is renting out the capital, the price of capital canchange. If the price of capital falls, the firm loses, because the firm's asset hasfallen in value. If the price of capital rises, the firm gains, because the firm'sasset has risen in value. The cost of this loss or gain is −DPK. (The minus sign is here because we are measuring costs, not benefits.)3. While the capital is rented out, it suffers wear and tear, called depreciation.If d is the rate of depreciation—the fraction of capital's value lost perperiod because of wear and tear—then the dollar cost of depreciationis dThe total cost of renting out a unit of capital for one period is thereforeCost of Capital = iPK − DPK + dPK= PK(i − DPK/PK + dThe cost of capital depends on the price of capital, the interest rate, the rate atwhich capital prices are changing, and the depreciation rate.For example, consider the cost

of capital to a car-rental company. The com-pany buys cars for $10,000 each and rents them out to other businesses. Thecompany faces an interest rate i of 10 percent per year, so the interest cost iPK is$1,000 per year for each car the company owns. Car prices are rising at 6 per-cent per year, so, excluding wear and tear, the firm gets a capital gain DPK of $600per year. Cars depreciate at 20 percent per year, so the loss due to wear and tearPK is $2,000 per year. Therefore, the company's cost of capital isCost of Capital = $1,000 − $600 + $2,000= $2,400.The cost to the car-rental company of keeping a car in its capital stock is $2,400per year.To make the expression for the cost of capital simpler and easier to interpret,we assume that the price of capital goods rises with the prices of other goods. Inthis case, DPK/PK equals the overall rate of inflation p. Because i − p equals the real interest rate r, we can write the cost of capital asCost of Capital = PK(r + d)This equation states that the cost of capital depends on the price of capital, thereal interest rate, and the depreciation rate.Finally, we want to express the cost of capital relative to other goods in theeconomy. The real cost of capital—the cost of buying and renting out a unitof capital measured in units of the economy's output—isReal Cost of Capital = (PK/P)(r + d).This equation states that the real cost of capital depends on the relative price ofa capital good PK/P, the real interest rate r, and the depreciation rate dThe Determinants of InvestmentNow consider a rental firm's decision about whether to increase or decrease itscapital stock. For each unit of capital, the firm earns real revenue R/P and bears

the real cost (PK/P)(r + d)

The real profit per unit of capital is

Profit Rate = Revenue − Cost

= R/P − (PK/P)(r + d).Because the real rental price in equilibrium equals the marginal product of capital, we can write the profit rate as

Profit Rate = MPK − (PK/P)(r + d)The rental firm makes a profit if the marginal product of capital is greater thanthe cost of capital. It incurs a loss if the marginal product is less than the costof capital.We can now see the economic incentives that lie behind the rental firm'sinvestment decision. The firm's decision regarding its capital stock—that is,whether to add to it or to let it depreciate—depends on whether owning andrenting out capital is profitable. The change in the capital stock, called netinvestment, depends on the difference between the marginal product of capi-tal and the cost of capital. If the marginal product of capital exceeds the cost of capital,firms find it profitable to add to their capital stock. If the marginal product of capital fallsshort of the cost of capital, they let their capital stock shrink.We can also now see that the separation of economic activity between pro-duction and rental firms, although useful for clarifying our thinking, is not nec-essary for our conclusion

regarding how firms choose how much to invest. Fora firm that both uses and owns capital, the benefit of an extra unit of capital isthe marginal product of capital, and the cost is the cost of capital. Like a firm thatowns and rents out capital, this firm adds to its capital stock if the marginal prod-uct exceeds the cost of capital. Thus, we can writeDK = In [MPK − (PK/P)(r + d)]where In( ) is the function showing how much net investment responds to the
incentive to invest.

4.Explain Tobin's q theory. Ans. Many economists see a link between fluctuations in investment and fluctuationsin the stock market. The term stock refers to shares in the ownership of corpo-rations, and the stock market is the market in which these shares are traded.Stock prices tend to be high when firms have many opportunities for profitableinvestment, because these profit opportunities mean higher future income for theshareholders. Thus, stock prices reflect the incentives to invest.The Nobel Prize–winning economist James Tobin proposed that firms basetheir investment decisions on the following ratio, which is now called Tobin's q:q = . – – – –
Market Value of Installed CapitalReplacement Cost of Installed Capital
The numerator of Tobin's q is the value of the economy's capital as determinedby the stock market. The denominator is the price of that capital if it were pur-chased today.
Tobin reasoned that net investment should depend on whether q is greater orless than 1. If q is greater than 1, then the stock market values installed capital atmore than its replacement cost. In this case, managers can raise the market valueof their firms' stock by buying more capital. Conversely, if q is less than 1, thestock market values capital at less than its replacement cost. In this case, managerswill not replace capital as it wears out.At first the q theory of investment may appear very different from the neo-classical model developed previously, but the two theories are closely related. Tosee the relationship, note that Tobin's q depends on current and future expectedprofits from installed capital. If the marginal product of capital exceeds the costof capital, then firms are earning profits on their installed capital. These profitsmake the firms more desirable to own, which raises the market value of thesefirms' stock, implying a high value of q. Similarly, if the marginal product of cap-ital falls short of the cost of capital, then firms are incurring losses on theirinstalled capital, implying a low market value and a low value of q.The advantage of Tobin's q as a measure of the incentive to invest is that it reflects
the expected future profitability of capital as well as the current profitability. Forexample, suppose that Congress legislates a reduction in the corporate income taxbeginning next year. This expected fall in the corporate tax means greater profits forthe owners of capital. These

higher expected profits raise the value of stock today,raise Tobin's q, and therefore encourage investment today. Thus, Tobin's q theory ofinvestment emphasizes that investment decisions depend not only on current eco-nomic policies but also on policies expected to prevail in the future.

5.Explain Residential Investment.Ans. In this section we consider the determinants of residential investment. We beginby presenting a simple model of the housing market. Residential investmentincludes the purchase of new housing both by people who plan to live in itthemselves and by landlords who plan to rent it to others. To keep things sim-ple, however, it is useful to imagine that all housing is owner-occupied.The Stock Equilibrium and the Flow SupplyThere are two parts to the model. First, the market for the existing stock ofhouses determines the equilibrium housing price. Second, the housing pricedetermines the flow of residential investmen the relative price of housing PH/P is deter- mined by the supply and demand for the existing stock of houses. At any pointin time, the supply of houses is fixed. We represent this stock with a vertical sup-ply curve. The demand curve for houses slopes downward, because high pricescause people to live in smaller houses, to share residences, or sometimes even tobecome homeless. The price of housing adjusts to equilibrate supply and demand.

the relative price of housing determines

the supply of new houses. Construction firms buy materials and hire labor tobuild houses and then sell the houses at the market price. Their costs depend onthe overall price level P (which reflects the cost of wood, bricks, plaster, etc.), andtheir revenue depends on the price of houses PH. The higher the relative priceof housing, the greater the incentive to build houses and the more houses arebuilt. The flow of new houses—residential investment—therefore depends onthe equilibrium price set in the market for existing houses.This model of residential investment is similar to the q theory of business fixedinvestment. According to the q theory, business fixed investment depends on themarket price of installed capital relative to its replacement cost; this relative price,in turn, depends on the expected profits from owning installed capital. Accordingto this model of the housing market, residential investment depends on the rela-tive price of housing. The relative price of housing, in turn, depends on thedemand for housing, which depends on the imputed rent that individuals expectto receive from their housing. Hence, the relative price of housing plays much thesame role for residential investment as Tobin's q does for business fixed investment.Changes in Housing DemandWhen the demand for housing shifts, the equilibrium price of housing changes,and

this change in turn affects residential investment. The demand curve forhousing can shift for various reasons. An economic boom raises national incomeand therefore the demand for housing. A large increase in the population, per-haps because of immigration, also raises the demand for housing. an expansionary shift in demand raises the equilibrium.

INTRO. TO DEVELOPMENT ECONOMICS

SUBJECT CODE: 206

Q.1 What do you mean by inequality? Examine the policy implications of wide spreadpoverty and inequality in the Indian economy.

Ans: Inequality are:

- Economic inequality
- Income inequality metrics
- International inequality
- Social inequality
- Educational inequality
- Gender inequality
- Participation inequality
- Racial inequality
- Social stratification

Poverty is a significant issue in India, despite having one of the fastest-growing economies in the world, clocked at a growth rate of 7.6% in 2015, and a sizable consumer economy. The World Bank reviewed and proposed revisions in May 2014, to its poverty calculation methodology and purchasing power parity basis for measuring poverty worldwide, including India. According to this revised methodology, the world had 872.3 million people below the new poverty line, of which 179.6 million people lived in India. In other words, India with 17.5% of total world's population, had 20.6% share of worlds poorest in 2011. As of 2014, 58% of the total population were living on less than $3.10 per day. According to the Modified Mixed Reference Period (MMRP) concept proposed by World Bank in 2015, India's poverty rate for period 2011-12 stood at 12.4% of the total population, or about 172 million people; taking the revised poverty line as $1.90. The World Bank has been revising its definition and benchmarks to measure up poverty since 1990, with a $2 per day income on purchasing power parity basis as the definition in use from 2005 to 2013. Some semi-economic and non-

economic indices have also been proposed to measure poverty in India; for example, the Multi-dimensional Poverty Index placed 33% weight on number of years spent in school and education and 6.25% weight on financial condition of a person, in order to determine if that a person is poor.

The different definitions and different underlying small sample surveys used to determine poverty in India, have resulted in widely different estimates of poverty from 1950s to 2010s. In 2012, the Indian government stated 22% of its population is below its official poverty limit. The World Bank, in 2011 based on 2005's PPPs International Comparison Program, estimated 23.6% of Indian population, or about 276 million people, lived below $1.25 per day on purchasing power parity. According to United Nation's Millennium Development Goals (MDG) programme 270 millions or 21.9% people out of 1.2 billion of Indians lived below poverty line of $1.25 in 2011-2012.

From late 19th century through early 20th century, under British colonial rule, poverty in India intensified, peaking in 1920s. Famines and diseases killed millions each time. After India gained its independence in 1947, mass deaths from famines were prevented. Rapid economic growth since 1991, has led to sharp reductions in extreme poverties in India. However, those above poverty line live a fragile economic life.

As per the methodology of the Suresh Tendulkar Committee report, that the population below the poverty line in India in 2009-2010 was 354 million (29.6% of the population) and that in 2011-2012 was 269 million (21.9% of the population). The Rangarajan Committee said in 2014 that the population below the poverty line in 2009-2010 was 454 million (38.2% of the population) and that in 2011-2012 was 363 million (29.5% of the population). Deutsche Bank Research estimated that there are nearly 300 million people who are middle class. If former trends continue, India's share of world GDP will significantly increase from 7.3% in 2016 to 8.5% by 2020. In 2015, around 170 million people, or 12.4%, lived in poverty (defined as $1.90 (Rs 123.5)), a reduction from 29.8% in 2009.

The Asian Development Bank estimates India's population to be at 1.28 billion with an average growth rate, from 2010-2015, at 1.3%. In 2014, 49.9% of the population aged 15 years and above were employed.

However, there are still 21.9% of the population who live below the national poverty line. The World Poverty Clock shows real-time poverty trends in India, which are based on the latest data, of the World Bank, among others.

Q.2 Distinguish between 'economic growth' and economic development. What policy initiatives would you suggest to make India emerge as the fastest growing emerging economy in the world?

The fundamental differences between economic growth and development are explained in the points given below:

1. Economic growth is the positive change in the real output of the country in a particular span of time economy. Economic Development involves a rise in the level of production in an economy along with the advancement of technology, improvement in living standards and so on.
2. Economic growth is one of the features of economic development.
3. Economic growth is an automatic process. Unlike economic development, which is the outcome of planned and result-oriented activities.
4. Economic growth enables an increase in the indicators like GDP, per capita income, etc. On the other hand, economic development enables improvement in the life expectancy rate, infant mortality rate, literacy rate and poverty rates.
5. Economic growth can be measured when there is a positive change in the national income,whereas economic development can be seen when there is an increase in real national income.
6. Economic growth is a short-term process which takes into account yearly growth of the economy.But if we talk about economic development it is a long-term process.
7. Economic Growth applies to developed economies to gauge the quality of life, but as it is anessential condition for the development, it applies to developing countries also. In contrast to,economic development applies to developing countries to measure progress.
8. Economic Growth results in quantitative changes, but economic development brings bothquantitative and qualitative changes.
9. Economic growth can be measured in a particular period. As opposed to economic developmentis a continuous process so that it can be seen in the long run.

A country's general economic health can be measured by looking at that country's economic growth and development.

Let's take a separate look at what indicators comprise economic growth versus economic development. Let's first examine economic growth. A country's economic growth is usually indicated by an increase in that country's gross domestic product, or GDP. Generally speaking, gross domestic product is an economic model that reflects the value of a country's

output. In other words, a country's GDP is the total monetary value of the goods and services produced by that country over a specific period of time.

For example, let's say that a special berry grows naturally only in the country of Utopia. Natives to Utopia have used this berry for many years, but recently, a wealthy German traveller discovered the berry and brought samples back to Germany. His German friends also loved the berry, so the traveller funded a large berry exporting business in Utopia. The new berry exporting business hired hundreds of Utopians to farm, harvest, wash, and box and ship the berries to grocers in Germany. In one calendar year, the berry exporting business added over one million dollars to Utopia's GDP because that's the total value of the goods and services produced by the new berry exporting business. Since Utopia's GDP increased, this means that Utopia experienced economic growth.

In the United States, our periods of large economic growth are mostly associated with new technology. The Industrial Revolution and the development of the Internet are two examples. When new developments bring an increase in output capacity, economic growth usually follows.

Q.3 Bring out the major points of contrast between the Balanced and Unbalanced growth strategies. Which one of these, do you think, is more relevant for an economy like India?

Ans.: A major development debate from the 1940s to the 1960s concerned balanced growth versus unbalanced growth. Some of the debate was semantic, as the meaning of balance can vary from the abrupt requirement that all sectors grow simultaneously and at the same rate to the more simple plea that same attention be given to all major sectors—industry, agriculture and services.

In contrast, A. O. Hirschman develops the idea of unbalanced investment to complement existing imbalances. A broad choice of development strategy is between Ragnar Nurkse's theory of balanced growth (BG) and A. O. Hirschman's theory of unbalanced growth (UG). The doctrine of BG is based on the economic rationale for a 'big push'.

By contrast, UG is based on the hypothesis that a 'big push' or a 'critical minimum effort' is not feasible. So the best way to stimulate development in LDCs is to deliberately create an imbalance. The issue is yet to be resolved. So, there are two opposite issues on development strategy.

Having critically examined the comparative analysis of balanced and unbalanced growth strategies, a logical question arises: which of these two strategies provide greater stimulus of economic growth?

It is strictly based on empirical evidence and political motivation. While Paul Streeten contends that it is possible to reformulate the choice between balanced and unbalanced growth.

Both the theories are based on the theory of Big Push which advocates investment to break the vicious circle of poverty. The balanced growth aims at the development of all sectors simultaneously but unbalanced growth recommends that the investment should be made only in leading sectors of the economy.

Underdeveloped countries have insufficient resources in men, material and money for simultaneous investment in number of complementary industries. The investment made in selected sectors leads to new investment opportunities. The aim is to keep alive rather than to eliminate the disequilibrium by maintaining tensions and disproportions.

Balanced growth aims at harmony, consistency and equilibrium whereas unbalanced growth suggests the creation of disharmony, inconsistency and disequilibrium. The implementation of balanced growth requires huge amount of capital.

On the other hand, unbalanced growth requires less amount of capital, making investment in only leading sectors. Balanced growth is long term strategy because the development of all the sectors of economy is possible only in long run period. But the unbalanced growth is a short term strategy as the development of few leading sectors is possible in short span of period.

The doctrine of balanced growth and unbalanced growth have two common problems on relating to role of state and the role of supply limitations and supply inelasticity's. The private enterprise is only incapable of taking investment decisions in underdeveloped countries.

Therefore, balanced growth presupposes planning. In unbalanced growth strategy, the states play a pioneer role in encouraging SOC investments, thereby creating disequilibrium.

If the development starts via Investment in DPA, political pressures force the state to undertake investment in SOC. The theory of balanced growth is mainly concerned with the lack of demand and neglects the role of supply limitations.

This is not true as underdeveloped country lacks in supply of capital, skills, infrastructures and other resources which are- inelastic in supply. Similarly, unbalanced growth doctrine also neglects the role of supply limitations and supply in elasticity's. Under such situations, a judicious compromise has to be made between the benefits from balanced growth and unbalanced growth.

Q.4 Explain Marx's theory of declining rate of profit in a capitalist economy.

Ans.: Marx defined the rate of profit as the ratio of profit to investment. A long-term feature of capitalism has been the tendency for this rate of profit to fall - for booms to get shorter, and slumps deeper and longer.

This was not a phenomenon noted only by Marx. Early pro-capitalist economists such as David Ricardo had attempted to explain a declining profit rate by comparing the economy to agricultural fields reaching the limits of their fertility. But there is no obvious reason why this should apply to the manufacturing of commodities. Marx saw the answer in the nature of capitalist accumulation.

Marx described capitalists as a "band of warring brothers". He said they are locked in a continual battle to undercut each other to make commodities more cheaply than their rivals. They plough capital back into production but this leads to investment largely in machines - what Marx called "dead labour".

He divided investment in production into two categories. Raw materials, machines and other goods used to produce commodities have inflexible value. These were the "constant capital" invested by capitalists.

The second investment is in labour. It is here that a capitalist can be flexible as workers' wages can be driven down - the labour which a capitalist buys is therefore his "variable capital".

Capitalists can increase output by investing in more of the same variable and constant capital - by employing more workers with more of the same machines. But a better alternative would be to make the factory more efficient by using new technology that reduces the time needed to produce the commodities.

For example, a capitalist manufacturing TVs could put £2,000 into employing workers (variable capital), £2,000 in machines (constant capital) and out of this receive £2,000 profit. If the workforce produces 40 TVs a day each TV will embody £50 variable and £50 constant capital, and £50 surplus value.

A capitalist might choose to invest in more expensive machinery which can produce more TVs in one day. For example, if the new machinery costs £4,000 in constant capital but can now produce 100 TVs a day, each TV now embodies only £20 variable capital as the workforce is the same, and £40 constant capital.

So it seems that in the second case both the constant and variable capital have decreased. But at the same time the ratio of variable to constant capital has changed. There is more constant capital relative to variable capital. In effect this means workers are harnessed to more machinery.

Marx called the ratio of the value of investment in machinery compared to labour the "organic composition of capital". Under capitalism it has a tendency to rise. The first capitalist who invests in new machinery can make large amounts of profit because initially they undercut other capitalists.

But as every capitalist starts to buy the new machines the first capitalist loses this advantage.

On the face of it this can seem very beneficial - it was after all the advance to mass production that brought TV prices down to the point where they are now available to most people.

But commodities don't only embody constant and variable capital. They also embody the surplus value that the capitalist can only extract from workers.

As we saw with the TV example, investment in the workforce stays the same. Because profit can only come from human labour, as more and more capitalists invest in the new machinery the average labour time required to produce each commodity falls. This is what makes the rate of profit fall, as the ratio of surplus value to investment falls across the whole system.

But this is only a tendency rather than an iron law. There are things that capitalists can do to counteract falling rates of profit, including attacks on workers' conditions.

Increasing the hours of the labour force, without increasing pay directly gives the capitalist more surplus, while taking away tea breaks and putting in supervisors also allows capitalists

not only to gain surplus through efficiency but allows them to make the most of machines before they go out of date.

Finally capitalists can resort to wage cutting or holding wages below increases in profit. Marx maintained that none of these were absolute laws, but ways used by capitalists to counteract falling profit rates. All these things could be resisted by workers.

The great contradiction in capitalist production is that the more a capitalist accumulates, the greater the problem for the capitalist system as a whole - and yet the logic of accumulation is central to the system. Capitalism not only destroys the environment and lives of those forced to work under it, but dooms itself to greater and greater crisis.

Q.5 Explain the Harris-Todaro model and examine its relevance.Critically analyse the role of savings and investment in the growth process as expounded by Harrod.

Ans.: The Harris-Todaro (1970) model's key contribution to the field of development economics is by making the migration process a rational choice based on expected earnings. The Harris-Todaro (H-T) model takes most of Lewis models' assumptions as given, such as the rural sector being characterized by subsistence agriculture, and the urban sector being characterized by modernized industries. The Harris-Todaro model takes a standard two sector model and imposes a higher wage in the urban sector which is higher than equilibrium clearing,

while wage in agriculture is flexible. Equilibrium clearing is simply when wage across both sectors equalize, minus movement costs or natural advantages (such as better living environment) in 1 or the other sector. By imposing this higher wage in the urban sector, we no longer have market clearing wage which gives the workers in the rural sector an incentive to migrate to the urban sector. These migrant workers are not guaranteed to find a job in the urban sector. There is a probability that they will end being unemployed or in the informal sector.

For modelling simplicity, it is usually assumed that only 1 of these two sectors are in the model. It fits the situation in LDC's better to assume that an informal sector exists in the urban sector than unemployment. LDC's are unlikely to have good social safety nets such as welfare benefits, unemployment benefits, and old age security. Without these benefits, workers in urban sector must do some work to keep themselves alive. If they were unable to find a job in the urban formal sector, which is the modern industrial sector, they would be forced to work in the informal sector to keep themselves alive. The informal sector is very

primitive; work in this sector is labour intensive with little or no capital endowment. The equilibrium condition of the Harris-Todaro model can be described as the wage in agriculture must be equal to the expected wage in the urban sector. The model in its most basic form ignores disutility from not being at home farm, or cost of mobility, but these omissions do not change the essence of the model, the only implication of this is a downward shift of the urban sector's expected returns. This equilibrium can be defined as,

$$w_a = \left(\frac{L_f}{L_f + L_i}\right) w_f + \left(\frac{L_i}{L_f + L_i}\right) w_i$$

Where wa denote the wage in rural (agricultural) sector wf denote the wage in urban formal (industry) sector wi denote the wage in urban informal sector Lf denote the number of workers in the urban formal sector Li denote the number of workers in the urban informal sector The left hand side of the equation is simply the agricultural wage. The right hand side, $Lf + Li$ which is formal sector labour force plus informal sector labour force; combining these results in the entire labour force in the urban sector. $\left(\frac{L_f}{L_f + L_i}\right)$ then is simply the ratio of urban workers in the formal sector, in the Harris-Todaro model, this is what the potential migrant sees as the probability of finding a job in the formal sector. Similarly, $\left(\frac{L_i}{L_f + L_i}\right)$ is what the potential migrant sees as the probability of ending up in the informal sector. The probabilities of each sector is then multiplied by that sector's respective wage, adding the results together yields the right hand side of the Harris-Todaro equilibrium, which is the expected wage from moving to the urban sector.

The Harris-Todaro in essence is an extension of the Lewis model. It simply endogenizes migration decision along with the introduction of a second urban sector. It does not change from the Lewis model in that the fundamental driving force of growth is still technological growth.

Q.6 Evaluate briefly the contribution of Malthus to the theory of economic development.

Ans.: We generally remember Robert Malthus as the propounder of his famous Theory of Population. But it is well to remember that Malthus had also some important things to say about economic development and it is refreshing to note that in several ways he anticipated

the later economists like Keynes and Kaleeki. Also, the Malthusian version of economic growth represents in several respects a refinement of the general classical theory.

He recognised, more than did the other classical economists, the importance of a distinct and systematic theory of economic development. Book II of his "Principles of Political Economy" deals with the "Progress of Wealth" where he says- "There is scarcely any inquiry more curious or, from its importance more worthy of our attention, than that which traces the causes which practically check the progress of wealth in different countries."

The problem of development, according to Malthus, lies in explaining why the actual gross national product (actual riches) should differ from the potential gross national product (power of producing riches). He thus points out the way in which the potentialities of economic development in a country should be realised. This can be done by larger production and fairer distribution.

Malthus contends that the process of economic development is not automatic. Rather conscious, deliberate efforts are needed to bring it about. For instance, Malthus explains that mere increase in population cannot by itself lead to economic development unless there is increase in effective demand. (This is anticipation of the Keynesian doctrine). He says – "A man whose only possession is his labour has, or has not, an effective demand for produce according as he is, or is not, in demand by those who have the disposal of the produce." He rejects Say's Law which says "supply creates its own demand" and that savings are automatically invested and constitutes a demand for capital goods.

Malthus's important contribution is in showing that savings in the sense of not consuming is a mere negative act and instead of creating more demand it will lead to a decline in effective demand. Only savings which are furnished by increased gains and are invested create an effective demand. Thus, according to him, "abstinence on the part of capitalists, far from accelerating economic growth, will in itself retard it." Hence, Malthus brings out an important fact that in advanced economy consumption, saving and investment all should expand simultaneously.

Role of Capital:

Malthus attaches great importance to the accumulation of capital for economic development. He regards capital as indispensable to development. According to him, "no permanent and continued increase of wealth can take place without a continued increase of capital." Besides, Malthus underlined the importance of foreign trade for speeding up economic development.

Foreign trade provides incentives for investing, since it leads to the extension of the market for the goods produced and for greater division of labour resulting in increased output.

There is another important fact brought out by Malthusian analysis of economic growth, namely, the structured change that takes place in the process of economic development i.e., a decline in the relative importance of agriculture as the economy moves forward. We know that economic development in developing countries is regarded as synonymous with the development of industries. Naturally, agriculture is eclipsed by the speedier development of industries. As a means for expanding agricultural output, Malthus suggested land reforms.

Of far greater importance than what has been pointed out above, is the anticipation by Malthus of the theory of 'dualism' as applied to underdeveloped economies. He envisaged the economy as consisting of the two major sectors, viz., the agricultural sector and the industrial sector. His analysis of the interrelation between these two sectors is quite interesting and enlightening. The law of increasing returns operated in the industrial sector, whereas the agricultural sector was subject to the law of diminishing returns, the rate of technological progress being responsible for this difference.

Malthus brings out an important truth that when one of these sectors lags behind, it retards the development of the other sector. We know how in India the failure on the agricultural front was responsible for the slow rate of growth. "The development of the industrial sector of underdeveloped countries is limited by the poverty of the agricultural sector." This is due to the fact that the lack of purchasing power in the rural masses reduces effective demand in the economy and retards its growth.

Assessment of Malthus's Contributions:

There is no doubt that Malthus made a valuable contribution to the theory of economic development. His repudiation of Say's Law and emphasising the importance of effective demand and its relation to saving and investment are indeed noteworthy for their modern touch. A great deal of what he wrote on the subject is applicable to an underdeveloped economy, especially relating to the theory of dualism.

It has been pointed out by the critics of Malthus's theory of economic development; he concentrates on explaining the factors which hinder growth rather than the factors that promote economic progress. However, some elements of his theory make positive contribution to the growth process. For example, he considers production and distribution as the two grand elements of economic growth. The distribution of production is as important as

production itself or sustained economic development. He also gives importance to capital accumulation in bringing about economic development.

At the same time he emphasises that the capital accumulation will choke off if it is not possible for the additional goods to find consumers. That is, he points to the significance of effective demand for sustained accumulation of capital. Increase in effective demand, according to him, is as important as increase in production. Therefore, unlike Adam Smith, he thinks that excessive parsimony will reduce aggregate demand leading to widespread depression and unemployment. He recommends a more egalitarian system of distribution in order to increase effective demand. He also recognizes the importance of non-economic factors in economic development.

Though Malthus is more well-known for his theory of population than his contribution to growth economics, his emphasis on fair distribution of production and effective demand makes his theory of development distinct from that of other classical economists, such as Adam Smith and David Ricardo. According to his population theory, population increases so rapidly as to outstrip the food supply due to the operation of law of diminishing returns which has largely been falsified owing to the rapid increase in agricultural productivity yet it is very helpful in probing the problem facing the labour-surplus developing countries of today.

Relevance of Malthus's Theory to Developing Countries:

Malthus's theory of development is negative in the sense that he concentrates his attention on the causes which hinder growth rather than the causes which promote economic progress. However, some elements making positive contribution to growth process are discernible in his Principles of Political Economy. Malthus considers production and distribution as the two grand elements of economic progress.

The distribution of production is as important as production itself for the furtherance of economic progress. He also fully realises the significance of capital accumulation in economic growth. At the same time he makes the important point that the accumulation of capital will choke off if it is not possible for the additional goods to find consumers. Herein are contained the seeds of the significance of effective demand.

Increase in effective demand, according to Malthus, is as important as the increase in production. Excessive parsimony decreases the effective demand leading to widespread depression and unemployment. He recommends a more egalitarian system of distribution in order to increase effective demand. Malthus also duly recognizes the importance of non-

economic factors. Above all, Malthus is better known for his theory of population than his contribution to growth economics. He held the view that population increases so rapidly as to outstrip the food supply due to the operation of the law of diminishing returns.

Malthus's contribution to economic growth contains several elements that are relevant to the developing economies. His emphasis on both production and distribution, capital accumulation and the creation of congenial non-economic factors is as valid today as was in his time. Though his theory of population has largely been falsified owing to the rapid increase in agricultural productivity, yet it is very helpful in probing the problems facing the overpopulated developing countries of today.

Q.7 Explain the method of calculation of Human Development Index (HDI). How does India rank in the above index?

Ans.: The Human Development Index (HDI) is a composite statistics of life expectancy, education, and income indices to rank countries into four tiers of human development. It was created by economist Mahbub-ul-Haq, followed by economist Amartya Sen in 1990, and published by the United Nations Development Programme (UNDP).

In its 2010 Human Development Report, the UNDP began using a new method of calculating the HDI. The following three indices are used:

1. Life Expectancy Index

2. Education Index: It includes

a. Mean Years of Schooling Index

b. Expected Years of Schooling Index

3. Income Index

Finally, the HDI is the geometric mean of the above three normalized indices

1. Among 187 countries ranked in the Human Development Report, India comes in at a dismal 135th (2014) in the main composite index.
2. HDR 2011 makes the important point that environmental degradation and climate change will exacerbate inequalities, a trend already evident.
3. The report said India's Human Development Index (HDI) value for 2011 was 0.547 — positioning the country in the 'medium human development category'.

4. Neighbouring Pakistan was ranked at 145 (0.504) and Bangladesh at 146 (0.500).
5. It said between 1980 and 2011, India's HDI value increased from 0.344 to 0.547, an increase of 59 per cent or an average annual increase of about 1.5 per cent.

Computing the HDI:

To construct the Index, fixed minimum and maximum values have been established for each of the indicators:

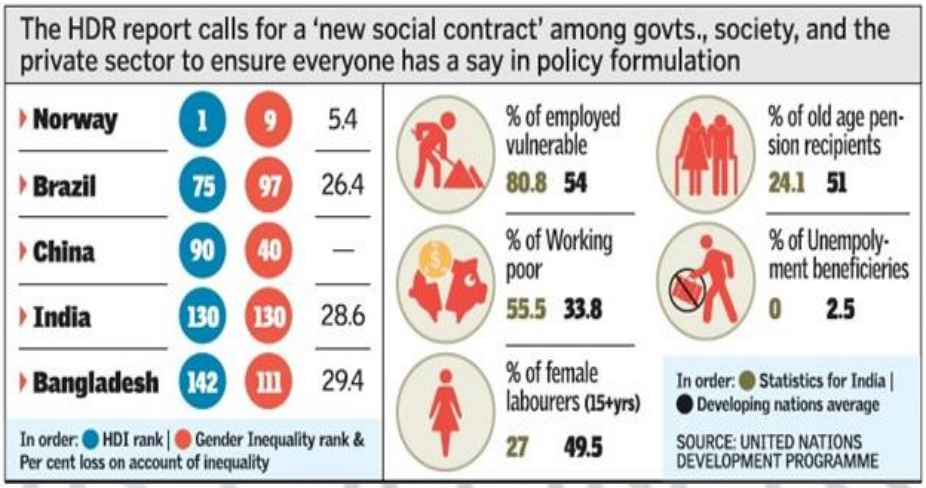
i. Life expectancy at birth: 25 years and 85 years.

ii. General literacy rate: 0 per cent and 100 per cent.

iii. Real GDP per capita (PPP$); PPP$ 100 and PPP$ 40,000.

Individual indices are computed first on the basis of a given formula. HDI is a simple average of these three indices and is derived by dividing the sum of these three indices by 3.

With normalization of the values of the variables that make up the HDI, its value ranges from 0 to 1. The HDI value for a country or a region shows the distance that it has to travel to reach the maximum possible value of 1 and also allows inter-country comparisons.



Inequality-adjusted HDI:

The 2010 Human Development Report was the first to calculate an Inequality-adjusted Human Development Index (IHDI). The HDI represents a national average of human development achievements in the three basic dimensions making up the HDI: Health, education and income. Like all averages, it conceals disparities in human development across the population within the same country. Two countries with different distributions of achievements can have the same average HDI value. The HDI takes into account not only the

average achievements of a country on health, education and income, but also how those achievements are distributed among its citizens by "discounting" each dimension's average value according to its level of inequality.

Q.8 Explain the concept of economic development. Discuss various factors that influence economic development.

Ans.: The earliest concept of development was interpreted in terms of growth of output over time and later in terms of per capita output. The terms growth and development were used interchangeably.

During 1950 and 1960s many developing countries realized their economic growth targets but standard of living of the people did not change. In fact existence of mass poverty, illiteracy and ill health continued to plague the developing countries. This implied that there was something wrong with this definition of economic development. Most of the economists clamoured for dethronement of GNP and define development in terms of removal of poverty, illiteracy, disease and changes in the composition of input and output, increase in per capita output of material goods. Increase in output of goods and services and in income does not imply an improvement in the standard of living of the people because GDP is a narrow indicator of economic development that does not include non-economic indicators such as leisure time, access to health, education, environment, freedom or social justice.

Economic development is thus a multivariate concept; hence there is no single satisfactory definition of it. Economic development is a process where 49 low income national economies are transformed into modern industrial economies. It involves qualitative and quantitative improvements in a country's economy. Political and social transformations are also included in the concept of economic development in addition to economic changes.

Literally, economic development can be defined as "passage from lower to higher stage which implies change". Charles P. Kindleberger and Bruce Herrick (1958) point out: "Economic development is generally defined to include improvements in material welfare especially for persons with the lowest incomes, the eradication of mass poverty with its correlates of illiteracy, disease and early death, changes in the composition of inputs and output that generally include shifts in the underlying structure of production away from agricultural towards industrial activities, the organization of the economy in such a way that productive employment is general among working age population rather than the situation of a privileged minority, and the correspondingly greater participation of broad based groups in

making decision about the direction, economic and otherwise, in which they should move their welfare".

Kindleberger while making a distinction between economic growth and economic development argues that: "Economic development implies both more output and changes in the technical and institutional arrangement by which it is produced and distributed". Economic development in the classical era meant: "an increase in the absolute size of annual production regardless of the size of the population, or an increase in the economy's real income over a long period of time".

Consequently in the words of Meier (1964), "Economic development is a process whereby an economy's real national income increases over a long period of time". This definition fails to take into account the changes in the growth of population. If a rise in real income is accompanied by faster growth in population there will be no economic development but retardation. Thus, some economists define economic development in terms of an increase in per capita income. Drewnewski (1966) defines development in terms of economic and social welfare, "In the standard of living of people economic development is supportive and it involves increased per capita income and creation of new opportunities in education, healthcare, employment sectors. Development is of limited significance if it does not lead to economic welfare. Economic development implies increased per capita income and reduced income inequalities and satisfaction of the people as a whole".

In 1970's redistribution from growth became a common slogan. Dudley Seers (1972) raised the basic question about the meaning of development succinctly when he asserted questions about a country's development, such as "what has been happening to poverty? What has been happening to unemployment? What has been happening to inequality? If all three of these have declined from high levels, then beyond this constitutes period of development for the country concerned. If one or two of these central problems have been growing worse, especially if all three have, it would be strange to call the result development even if per capita income doubled".

Further, for understanding the meaning of development Goulet (1971) considers three core values as an important basis and guideline:

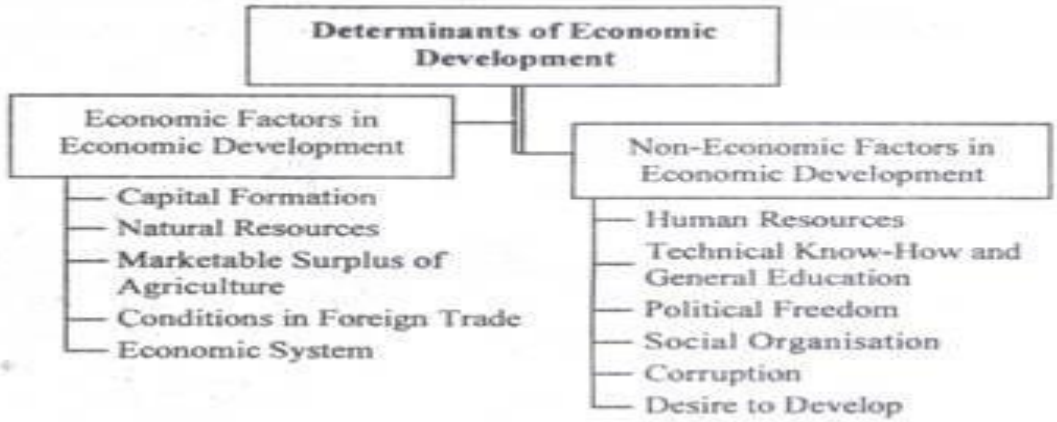
1. **Life Sustenance:** The ability to meet basic needs: There are some basic needs (food, shelter, etc.) that are essential for improvement in the quality of life. So the basic function of economic activity is to overcome people from misery arising from shortage of food, shelter.

2. **Self-esteem:** A second universal component of the good life is self-esteem. Self-esteem refers to self-respect and independence and for development of a country it is an essential condition. Developing countries need development for self-esteem to eliminate the feeling of dominance.

3. Freedom: A third universal value is the concept of freedom. Freedom here is understood as a fundamental sense of release from freedom, freedom from misery, institutions and dogmatic beliefs. It refers to freedom from three evils of want, ignorance and squalor.

Types of Determinants (Factors) Which Influence the Economic Development of a Country are as follows:

There are mainly two types of determinants (factors) which influence the economic development of a country.



A) Economic Factors in Economic Development:

In a country's economic development the role of economic factors is decisive. The stock of capital and the rate of capital accumulation in most cases settle the question whether at a juven point of time a country will grow or not. There are a few other economic factors which also have some bearing on development but their importance is hardly comparable to that of capital formation. The surplus of food grains output available to support urban population, foreign trade conditions and the nature of economic system are some such factors whose role in economic development has to be analysed:

1) Capital Formation:

The strategic role of capital in raising the level of production has traditionally been acknowledged in economics. It is now universally admitted that a country which wants to

accelerate the pace of growth, has m choice but to save a high ratio-of its income, with the objective of raising the level of investment. Great reliance on foreign aid is highly risky, and thus has to be avoided. Economists rightly assert that lack of capital is the principal obstacle to growth and no developmental plan will succeed unless adequate supply of capital is forthcoming.

Whatever be the economic system, a country cannot hope to achieve economic progress unless a certain minimum rate of capital accumulation is realized. However, if some country wishes to make spectacular strides, it will have to raise its rate of capital formation still higher.

2) Natural Resources:

The principal factor affecting the development of an economy is the natural resources. Among the natural resources, the land area and the quality of the soil, forest wealth, good river system, minerals and oil-resources, good and bracing climate, etc., are included. For economic growth, the existence of natural resources in abundance is essential. A country deficient in natural resources may not be in a position to develop rapidly. In fact, natural resources are a necessary condition for economic growth but not a sufficient one. Japan and India are the two contradictory examples.

According to Lewis, "Other things being equal man can make better use of rich resources than they can of poor". In less developed countries, natural resources are unutilized, under-utilized or mis- utilized. This is one of the reasons of their backwardness. This is due to economic backwardness and lack of technological factors.

According to Professor Lewis, "A country which is considered to be poor in resources may be considered very rich in resources some later time, not merely because unknown resources are discovered, but equally because new methods are discovered for the known resources". Japan is one such country which is deficient in natural resources but it is one of the advanced countries of the world because it has been able to discover new use for limited resources.

3) Marketable Surplus of Agriculture:

Increase in agricultural production accompanied by a rise in productivity is important from the point of view of the development of a country. But what is more important is that the marketable surplus of agriculture increases. The term 'marketable surplus' refers to the excess of output in the agricultural sector over and above what is required to allow the rural population to subsist.

The importance of the marketable surplus in a developing economy emanates from the fact that the urban industrial population subsists on it. With the development of an economy, the ratio of the urban population increases and increasing demands are made on agriculture for food grains. These demands must be met adequately; otherwise the consequent scarcity of food in urban areas will arrest growth.

In case a country fails to produce a sufficient marketable surplus, it will be left with no choice except to import food grains which may cause a balance of payments problem. Until 1976-77, India was faced with this problem precisely. In most of the years during the earlier planning period, market arrivals of food grains were not adequate to support the urban population.

If some country wants to step-up the tempo of industrialization, it must not allow its agriculture to lag behind. The supply of the farm products particularly food grains, must increase, as the setting-up of industries in cities attracts a steady flow of population from the countryside.

4) Conditions in Foreign Trade:

The classical theory of trade has been used by economists for a long time to argue that trade between nations is always beneficial to them. In the existing context, the theory suggests that the presently less developed countries should specialize in production of primary products as they have comparative cost advantage in their production. The developed countries, on the contrary, have a comparative cost advantage in manufactures including machines and equipment and should accordingly specialize in them.

In the recent years, a powerful school has emerged under the leadership of Raul Prebisch which questions the merits of unrestricted trade between developed and under-developed countries on both theoretical and empirical grounds.

Foreign trade has proved to be beneficial to countries which have been able to set-up industries in a relatively short period. These countries sooner or later captured international markets for their industrial products. Therefore, a developing country should not only try to become self-reliant in capital equipment as well as other industrial products as early as possible, but it should also attempt to push the development of its industries to such a high level that in course of time manufactured goods replace the primary products as the country's principal exports.

In countries like India the macro-economic interconnections are crucial and the solutions of the problems of these economies cannot be found merely through the foreign trade sector or simple recipes associated with it.

5) Economic System:

The economic system and the historical setting of a country also decide the development prospects to a great extent. There was a time when a country could have a laissez faire economy and yet face no difficulty in making economic progress. In today's entirely different world situation, a country would find it difficult to grow along the England's path of development.

The Third World countries of the present times will have to find their own path of development. They cannot hope to make much progress by adopting a laissez faire economy. Further, these countries cannot raise necessary resources required for development either through colonial exploitation or by foreign trade. They now have only two choices before them:

i) They can follow a capitalist path of development which will require an efficient market system supported by a rational interventionist role of the State.

ii) The other course open to them is that of economic planning.

The latest experiments in economic planning in China have shown impressive results. Therefore, from the failure of economic planning in the former Soviet Union and the erstwhile East European socialist countries it would be wrong to conclude that a planned economy has built-in inefficiencies which are bound to arrest economic growth.

B) Non-Economic Factors in Economic Development:

From the available historical evidence, it is now obvious that non- economic factors are as much important in development as economic factors. Here we attempt to explain how they exercise influence on the process of economic development:

1) Human Resources:

Human resources are an important factor in economic development. Man provides labour power for production and if in a country labour is efficient and skilled, its capacity to contribute to growth will decidedly be high. The productivity of illiterate, unskilled, disease ridden and superstitious people is generally low and they do not provide any hope to developmental work in a country. But in case human resources remain either unutilized or the

manpower management remains defective, the same people who could have made a positive contribution to growth activity prove to be a burden on the economy.

2) Technical Know-How and General Education:

It has never been, doubted that the level of technical know-how has a direct bearing on the pace of development. As the scientific and technological knowledge advances, man discovers more and more sophisticated techniques of production which steadily raise the productivity levels.

Schumpeter was deeply impressed by the innovations done by the entrepreneurs, and he attributed much of the capitalist development to this role of the entrepreneurial class. Since technology has now become highly sophisticated, still greater attention has to be given to Research and Development for further advancement. Under assumptions of a linear homogeneous production function and a neutral technical change which does not affect the rate of substitution between capital and labour, Robert M. Solow has observed that the contribution of education to the increase in output per man hour in the United States between 1909 and 1949 was more than that of any other factor.

3) Political Freedom:

Looking to the world history of modern times one learns that the processes of development and underdevelopment are interlinked and it is wrong to view them in isolation. We all know that the under-development of India, Pakistan, Bangladesh, Sri Lanka, Malaysia, Kenya and a few other countries, which were in the past British colonies, was linked with the development of England. England recklessly exploited them and appropriated a large portion of their economic surplus.

Dadabhai Naoroji has also candidly explained in his classic work 'Poverty and Un-British Rule in India' that the drain of wealth from India under the British was the major cause of the increase in poverty in India during that period, which in turn arrested the economic development of the country.

4) Social Organisation:

Mass participation in development programs is a pre-condition for accelerating the growth process. However, people show interest in the development activity only when they feel that the fruits of growth will be fairly distributed. Experiences from a number of countries suggest

that whenever the defective social organisation allows some elite groups to appropriate the benefits of growth, the general mass of people develop apathy towards State's development programs. Under the circumstances, it is futile to hope that masses will participate in the development projects undertaken by the State.

India's experience during the whole period of development planning is a case in point. Growth of monopolies in industries and concentration of economic power in the modern sector is now an undisputed fact. Furthermore, the new agricultural strategy has given rise to a class of rich peasantry creating widespread disparities in the countryside.

5) Corruption:

Corruption is rampant in developing countries at various levels and it operates as a negative factor in their growth process. Until and unless these countries root-out corruption in their administrative system, it is most natural that the capitalists, traders and other powerful economic classes will continue to exploit national resources in their personal interests.

The regulatory system is also often misused and the licenses are not always granted on merit. The art of tax evasion has been perfected in the less developed countries by certain sections of the society and often taxes are evaded with the connivance of the government officials.

6) Desire to Develop:

Development activity is not a mechanical process. The pace of economic growth in any country depends to a great extent on people's desire to develop. If in some country level of consciousness is low and the general mass of people has accepted poverty as its fate, then there will be little hope for development. According to Richard T. Gill, "The point is that economic development is not a mechanical process; it is not a simple adding- up of assorted factors. Ultimately, it is a human enterprise. And like all human enterprises, its outcome will depend finally on the skill, quality and attitudes of the men who undertake".

Q.9 (a) Explain, what do you understand by the term "GDP". What is the difference between Real GDP and nominal GDP?

(b) Do you think GDP is a good measure of economic welfare?

Ans. (a) Gross Domestic Product (GDP) is the total market value of all of the goods and services provided from within the borders of a country during a set time period. GDP is most often used to measure the economic growth, purchasing power, and overall economic health of a nation. There are two primary ways of measuring GDP: nominal gross domestic product

and real gross domestic product. The advantages of real versus. nominal GDP vary depending on how you're using the final measure and whether you'd like to account for inflation.

Nominal GDP, or nominal gross domestic product, is a measure of the value of all final goods and services produced within a country's borders at current market prices. Also known as a "current dollar GDP" or "chained dollar GDP," nominal GDP takes price changes, money supply, inflation, and changing interest rates into account when calculating a country's gross domestic product.

How Is Nominal GDP Calculated?

GDP measures the market value of all goods and services produced by a country. The US Bureau of Economic Analysis calculates this by multiplying price by quantity.

- In calculating nominal GDP, we only use current quantities at current year prices. This is achieved by using a consumer price index of the country's basket of goods. Nominal GDP takes into account all the goods and services that are produced within a country's borders at these current prices.
- If, for instance, the United States produced only three products—coffee, tea, and cannoli, let's say—nominal GDP would be calculated by first multiplying the quantity of each product produced by its current market price, and then adding the three results together. In order to calculate it, we first need to know the quantity of each product produced and the up-to-date average price for that product.
- Therefore, (coffee quantity x coffee's current market price) + (tea quantity x tea's current market price) + (cannoli quantity x cannoli's current market price) = Nominal GDP
- For instance, the U.S. could have produced 1 million pounds of coffee, which currently sells for $4/lb; 2 million pounds of tea, which currently sells at $2/lb; and 1 million cannoli, which sell for $1/pastry. With this information, we can now calculate this country's nominal GDP by plugging it into the formula above.
- It can then be further reduced to the nominal GDP per capita by dividing the nominal GDP by the country's population.

Real gross domestic product, or real GDP, is a measure of a country's output in terms of the value of its goods and services, its investments, its government spending, and its exports. Real GDP takes nominal GDP and adjusts for inflation or deflation by comparing

and converting prices to a base year's prices. By adjusting for price changes, the final number won't reflect false increases or decreases in GDP due to fluctuation in prices, and it is a more accurate representation of a country's economic activity.

How to Calculate Real GDP?

To calculate real GDP, you must first calculate nominal GDP for the deflator, which is a price index used to measure inflation against a base year.

The US Bureau of Economic Analysis calculates the GDP deflator for the US every year. It uses the year 2000 as the standard base year for prices and exchange rates, but the BEA also includes several other base years for a quick look at the rise in inflation as far back as 1937.

Once you have both nominal GDP and the deflator, the formula for calculating real GDP is as follows: GDP = Nominal GDP / Deflator

Nominal GDP Compare to Real GDP?

While nominal GDP by definition reflects inflation, real GDP uses a GDP deflator to adjust for inflation, thus reflecting only changes in real output. Since inflation is generally a positive number, a country's nominal GDP is generally higher than its real GDP.

- Economists typically use nominal GDP when comparing different quarters of output within the same year.
- But when comparing GDP across more than one year, economists use real GDP because, by removing inflation from the equation, the comparison only shows the change in output volume between the years. That means that real GDP growth reflects a country's increased output and is not influenced by inflation increasing price level.

(b) GDP measures both the economy's total income and the economy's total expenditure on goods and services. Thus, GDP per person tells us the income and expenditure of the average person in the economy. Because most people would prefer to receive higher income and enjoy higher expenditure, GDP per person seems a natural measure of the economic well-being of the average individual.

Yet some people dispute the validity of GDP as a measure of well-being. When Senator Robert Kennedy was running for president in 1968, he gave a moving critique of such economic measures:

[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.

Much of what Robert Kennedy said is correct. Why, then, do we care about GDP?

The answer is that a large GDP does in fact help us to lead good lives. GDP does not measure the health of our children, but nations with larger GDP can afford better healthcare for their children. GDP does not measure the quality of their education, but nations with larger GDP can afford better educational systems. GDP does not measure the beauty of our poetry, but nations with larger GDP can afford to teach more of their citizens to read and enjoy poetry. GDP does not take account of our intelligence, integrity, courage, wisdom, or devotion to country, but all of these laudable attributes are easier to foster when people are less concerned about being able to afford the material necessities of life. In short, GDP does not directly measure those things that make life worthwhile, but it does measure our ability to obtain many of the inputs into a worthwhile life.

GDP is not, however, a perfect measure of well-being. Some things that contribute to a good life are left out of GDP. One is leisure. Suppose, for instance, that everyone in the economy suddenly started working every day of the week, rather than enjoying leisure on weekends. More goods and services would be produced, and GDP would rise. Yet despite the increase in GDP, we should not conclude that everyone would be better off. The loss from reduced leisure would offset the gain from producing and consuming a greater quantity of goods and services.

Because GDP uses market prices to value goods and services, it excludes the value of almost all activity that takes place outside markets. In particular, GDP omits the value of goods and services produced at home. When a chef prepares a delicious meal and sells it at her restaurant, the value of that meal is part of GDP. But if the chef prepares the same meal for her family, the value she has added to the raw ingredients is left out of GDP. Similarly, child care provided in day-care centers is part of GDP, whereas child care by parents at home is not. Volunteer work also contributes to the well-being of those in society, but GDP does not reflect these contributions.

Another thing that GDP excludes is the quality of the environment. Imagine that the government eliminated all environmental regulations. Firms could then produce goods and services without considering the pollution they create, and GDP might rise. Yet well-being would most likely fall. The deterioration in the quality of air and water would more than offset the gains from greater production.

GDP also says nothing about the distribution of income. A society in which 100 people have annual incomes of $50,000 has GDP of $5 million and, not surprisingly, GDP per person of $50,000. So does a society in which 10 people earn $500,000 and 90 suffer with nothing at all. Few people would look at those two situations and call them equivalent. GDP per person tells us what happens to the average person, but behind the average lies a large variety of personal experiences.

In the end, we can conclude that GDP is a good measure of economic wellbeing for most — but not all — purposes. It is important to keep in mind what GDP includes and what it leaves out.

Q.10 What role does foreign aid play in the growth process of an underdeveloped economy? Discuss the relative merits and demerits of foreign aid and private foreign capital in the context of India's development?

Ans.: Foreign aid is a broad term. In a wide sense, it can be defined as "financial or technical help given by one country's government to another country to assist social and economic development or to respond to a disaster in a receiving country."Foreign aid can save the lives of millions of people living in poverty around the world. It addresses issues such as health, education, infrastructure and humanitarian emergencies.

There are numerous reasons why foreign aid is important to help impoverished countries:

1. **Infrastructure**: roads, bridges, institutions and sewer systems get built, giving people the ability to be mobile and have access to basic necessities such as electricity and running water.
2. **Agricultural technology improvements:** improvements enter the infrastructure within the agricultural businesses within recipient countries.
3. **Education:** classrooms get built, teachers receive training and children gain basic educational needs.

4. **Health:** vaccinations, mosquito nets, safe drinking water, access to hygiene education and basic sanitation are all brought in.
5. **Humanitarian issues and natural disaster emergencies:** life-saving support comes to those affected and possibly displaced due to natural disasters, emergency shelters are built for people affected by violence, and counselling services are made available.
6. **National security:** recipient countries can combat terrorism with the help of foreign aid as it decreases poverty, weak institutions and corruption and can help strengthen good governance, transparency and the economy.

Another reason why foreign aid is important is how it fosters a conducive diplomatic relationship between the donor and the recipient.

Impoverished nations receiving aid can eventually become independent and move towards democratic fundamentals with the help of donor countries.

The relative merits and demerits of foreign aid and private foreign capital are:

1. Save Lives.

At the onset, foreign aid is there to save lives particularly during calamities and disasters, like in the case of natural disasters.

2. Rebuild Livelihoods.

Foreign aid helps rebuild lives by providing livelihoods and housing right after a disaster so that victims can start over.

3. Provide Medicines.

Medical missions are there to offer free medical and healthcare products and services where they are needed the most.

4. Aids Agriculture.

Foreign support directed towards agriculture helps farmers and increase food production, which leads to better quality of life and higher quantity of food.

5. Encourage Development.

Industrial development projects supported by foreign aid create more jobs, improve infrastructure and overall development of the local community.

6. Tap Natural Resources.

Some less developed countries do not have the ability to maximize their otherwise rich natural resources, but with foreign support, this is possible.

7. Promote Sanitation.

Less privileged communities benefit from foreign aid aimed at providing clean water and sanitation facilities, which reduces risk of contracting infections and diseases.

List of Disadvantages of Foreign Aid

1. Increase Dependency.

Less economically developed countries (LEDCs) may become increasingly dependent on donor countries, and become heavily indebted.

2. Risk of Corruption.

There is likelihood that foreign financial support do not reach their rightful recipients, but go to the hands of corrupt political officials.

3. Economic/Political Pressure.

A donor country may place economic and political pressure on the receiving country, forcing them to return the favour.

4. Overlook Small Farmers.

Foreign support may only benefit large-scale agricultural projects, and not the less privileged, small farmers who need help the most.

5. Benefit Employers.

Most development may only benefit large corporations and already-wealthy employers, and not the people who do not have jobs or proper livelihoods.

6. Hidden Agenda of Foreign-Owned Corporations.

Foreign aid is sometimes given to a country or recipient to benefit foreign-owned corporations and entities. So the help is not actually directed to the less fortunate, but to its own people.

7. More Expensive Commodities.

When there is development and progress, there is inflation, which causes prices of commodities to increase, making the poor people more deprived.

Giving help to LECDs is a noble thing, but nations must properly monitor and manage the flow of foreign aid so that they reach the people who need it, and not go right into the pockets of corrupt and greedy entities.

Q.11 "Poverty must be seen as the deprivation of basic capabilities rather than merely as insufficient incomes." Discuss.

Ans.: There is no consensus on how best to conceptualise, quantify and even respond to poverty. How poverty is defined and measured depends mainly on who is asking the question, how the question is understood, and ultimately, who responds to the question

Poverty (on account of its depriving, dehumanising and excluding characteristics) has to be fought. Fighting poverty has to be a central objective in any worthwhile development policy locally, nationally and globally.

There are various ways that have been used over time to conceptualise and quantify the reality of poverty. Each framework used to conceptualise and quantify poverty identifies different persons as being poor, with either positive or negative implications on any attempts to a response.

There are a myriad ways designed to fight poverty either through poverty reduction, poverty alleviation, or poverty eradication (Downs 2008:39-53; Graig & Porter 2002:53-69; Hussain & Hanjra 2004:1-15). The challenge that confronts each design is the question of what poverty is. A conceptualisation of poverty is crucial to its quantification and subsequent response(s).

There are various attempts made towards identification and quantification of poverty. However, each attempt immediately has to deal with some *issues*. It is discerned in Laderchi, Saith and Stewart (2006) that:

There are a number of issues involved in defining and measuring poverty. Is it confined to *material* aspects of life, or does it also include *social, cultural* and *political* aspects? Is it about what may be achieved, given the resources available and the prevailing environment, or what is *actually* achieved? Should definitions and measurement methods be applied in the same way in all countries and used for comparisons? Are there 'objective' methods, or are

value judgments involved? What is the rationale for defining a poverty line? Should it be *absolute* as in the Millennium Development Goals and in most developing countries, or *relative* as in the rich OECD countries? … Should poverty be defined and measured at the individual, household or geographic area level; and for what respective purpose? The *multidimensionality* issue - considering that individual well-being/poverty manifests itself in multiple dimensions, should an aggregate index be developed, and how? Finally, the *time* horizon over which poverty is identified needs to be specified - many people move in and out of poverty over seasons and years, hence the longer the time perspective the less poverty will appear.

This demonstrates the kind of challenges that any attempt aimed at responding to poverty has to confront. Four approaches to conceptualisation and quantification of poverty that identify different people as being poor follow.

A monetary approach (MA) to poverty

This approach conceptualises poverty in terms of a shortfall on consumption or income on the basis of a poverty line. Imputation of monetary value is placed on subsistence production and social services and other public goods based on market prices.

A relative poverty line is obtained by a political consensus, while an absolute poverty line is determined on the basis of an identification of behavioural breaks between those who are poor and those who are not - on account of nutritional needs for survival. There are merits to this approach. It has been discerned by Laderchi et al. (2006) that:

'Economic' measures of well-being are popular with policy makers because they are useful when they need to make quick, rough-and-ready, short-run, aggregate inferences in order to make an assessment. Such measures are more responsive, changing much faster than 'non-economic' social data, which suffer a time lag. They are more likely to be … available than 'non-economic' measures, and are also cheaper and less complex to collect than are 'non-economic' poverty data. A monetary approach has the appearance of a rigorous, simple, direct, measurable and seemingly unambiguous slant. Needless to say that this approach is based on tangible phenomena, that accommodate quantification such as income or expenditure and are seemingly more objective (in the sense that it can apply to all) than subjective (i.e. health and education may differ from person to person).

Conceptualisation of poverty from a monetary perspective continues to have a preferred status compared to non-monetary perspectives, not only for technical reasons but also

because of its supposed objectivity on account of assumptions about its tangible, quantifiable and universal nature. Limitations to this approach are noted in Laderchi et al. (2006) that:

There are problems about nutritionally based poverty lines. Differing metabolic rates, activities, size, gender and age among people mean that what is adequate varies among them. … Moreover, poverty lines are often drawn up at the level of the household, disregarding how the intra-household distribution affects individual nutrition levels.

Sakiko Fakuda-Parr (2010:16) observes that the limitations of the monetary approach to understanding and measuring poverty are stirringly evident. She notes that, poverty is in itself very complex and amorphous, as such; the perspective seems to neglect and/or ignore other factors that contribute to explaining, shaping, and driving poverty trends. It fails to factor in lived experiences and non-income, social and political aspects of poverty. Some non-monetary indicators for well-being that may play a role in poverty situations as reflected in the Millennium Development Goals (2008:1-2), include: *education* (i.e. enrolment rates, literacy rates, and survival to the final grade of primary or secondary school, or completion of primary or secondary school), *health and nutrition* (i.e. malnutrition rates, mortality and morbidity rates, life expectancy, infection rates, health service usage, e.g. skilled personnel at birth, contraceptive prevalence rate and immunisation rates), and *environment* (i.e. access to safe and healthy water sources, access to adequate sanitation and household infrastructure, e.g. permanent material used for walls of home, electricity supply, etc.).

Even with no consensus on how to define and measure poverty, Fakuda-Parr (2010:18) rightly observes that there is a broad recognition that the income perspective is too narrow to capture the complexity of poverty as a life experience of people.

A monetary approach to poverty identifies those who live below the poverty line as poor.

A social exclusion (SE) approach to poverty

Social exclusion implies marginalisation and relegation away from the main social arrangements within a given community, including its entitlements and opportunities, ordinarily as a consequence of poverty or on account of being an insignificant other.

The effectiveness of social exclusion as a concept is the support that it lends to the importance of social relationships, especially in resource distribution, control and usage. The concept suggests exclusion of sorts from decision-making, social services, including community and family support (Adato, Carter & May 2006:229). A social exclusion

approach to poverty, according to Laderchi et al. (2006; see also Runciman 1966; Townsend 1971) therefore:

Lends itself to the study of structural characteristics of society and the situation of marginalised groups … leads to a focus on distributional issues - the situation of those deprived relative to the norm generally cannot improve without some redistribution of opportunities and outcomes.

A social exclusion approach to poverty sheds light to marginalisation and multiple faces of deprivation. It allows for an analysis on the dynamics and processes that breed and sustain deprivation. Social exclusion implies the exclusion to the rights of citizenship. It is directly interconnected with the existence of discriminatory forces, such as racism, and the outcome of market failures and unenforced rights.

The approach allows for a study of 'structural characteristics' of a society, including conditions of marginalised peoples, such as the landless and ethnic minorities. As such, attention is directed to 'distributional issues'. Distribution of opportunities and outcomes becomes crucial on account of awareness that the poor and deprived people may not be able to improve their circumstances in and of themselves. In situations of exclusion, there are 'excluders' and the 'excludees'. The approach attempts to identify these role players (Laderchi et al. 2006:11).

A social exclusion approach to poverty has its weaknesses. It is further acknowledged in Laderchi, Saith and Stewart (2003), that it is difficult:

To identify appropriate norms to provide the benchmarks of exclusion, since exclusion from formal sector employment or social insurance coverage tends to apply to the majority of the population. … To the extent that the normal may not be desirable, what is 'normal' may not be satisfactory in defining the benchmarks of exclusion. Consequently, there is a serious problem in deciding what would be appropriate [*social exclusion*] characteristics. A further complication is that exclusion, as with the caste system, is part of the social system in some societies.

Some people in a community who appear 'included' may in other ways feel excluded. Certainly, failure to possess what the community values or appears to value (even for the wrong reasons) is still a form of exclusion.

Shame is used (by various marketing companies) to sell commodities, that is, from mobile phones to fashion labels. A sense of shame does function to persuade a target people to prioritise the opinions of others over their own:

Autonomous appreciation of usefulness, beauty, pleasure, sufficiency or desire, and thus to censor those needs which, by their singularity - or, for that matter, their conviviality - do not correspond to commodified products. (Bowring 2000:315)

Advertising companies can purposely, shrewdly and suggestively market products by infusing a sense of pride, honour and glory to those who purchase or consume their products, and impress a sense of shame and humiliation on those who do not. So, those who choose not to purchase or consume those products are 'ordered' (socially excluded). Even teenagers, whose parents may not allow them to own some products, because they may have wanted those products for the wrong reasons, may see themselves as socially excluded among their peers, and develop a sense of humiliation, shame and embarrassment.

An apparent weakness to the SE approach is the lack of a clear distinction between induced social exclusion (i.e. through marketing, purchase and consumption of some products) and other forms of social exclusion so fare referred to.

A social exclusion approach to poverty distinguishes those who are marginalised and powerless (socially excluded) as living in poverty.

Q.12 ExplainHarrod-Domar Model of Growth and its Limitations.

Ans.: The Harrod Domar Model suggests that the rate of economic growth depends on two things:

1. **Level of Savings** (higher savings enable higher investment)
2. **Capital-Output Ratio**. A lower capital-output ratio means investment is more efficient and the growth rate will be higher.

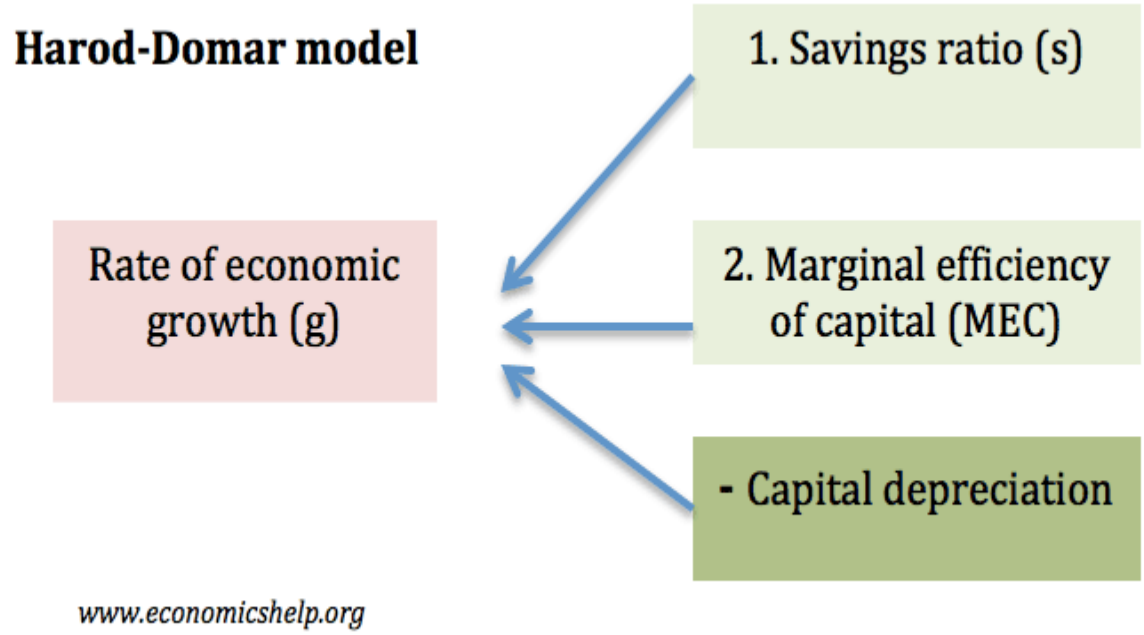
A simplified model of Harrod-Domar:

$$\text{Rate of economic growth } (g) = \frac{\text{Level of savings } (s)}{\text{Capital ouptut ratio } (k)}$$

Harrod-Domar in more detail

- Level of savings (s) = Average propensity to save (APS) – which is the ratio of national savings to national income.
- The capital-output ratio = 1/marginal product of capital.
    - The capital-output ratio is the amount of capital needed to increase output.
    - A high capital-output ratio means investment is inefficient.
    - The capital-output ratio also needs to take into account the depreciation of existing capital

Main factors affecting economic growth



- **Level of savings**. Higher savings enable greater investment in capital stock
- **The marginal efficiency of capital**. This refers to the productivity of investment, e.g. if machines costing £30 million increase output by £10 million. The capital-output ratio is 3
- **Depreciation** – old capital wearing out.

Warranted Growth Rate

Roy Harrod introduced a concept known as the warranted growth rate.

- This is the growth rate at which all saving is absorbed into investment. (e.g. £80bn of saving = £80bn of investment.
- Let us assume, the saving rate is 10% and the capital-output ratio is 4. In other words, £10bn of investment increases output by £2.5bn.
- In this case, the economy's warranted growth rate is 2.5 percent (ten divided by four).
- This is the growth rate at which the ratio of capital to output would stay constant at four.

The Natural Growth Rate

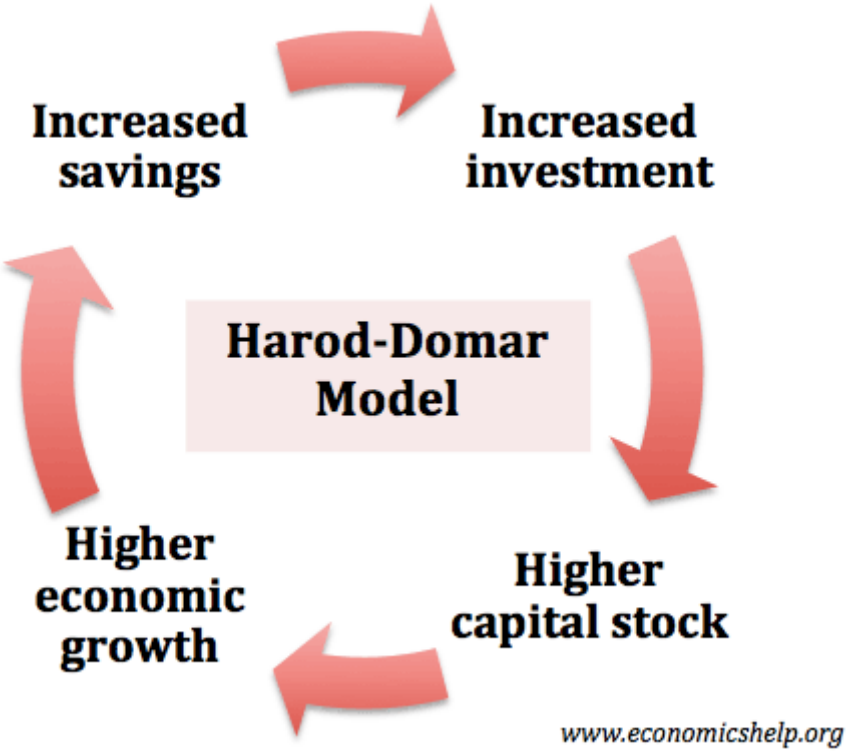
- The natural growth rate is the rate of economic growth required to maintain full employment.
- If the labour force grows at 3 percent per year, then to maintain full employment, the economy's annual growth rate must be 3 percent.
- This assumes no change in labour productivity which is unrealistic.

Importance of Harrod-Domar

It is argued that in developing countries low rates of economic growth and development are linked to low saving rates.

This creates a vicious cycle of low investment, low output and low savings. To boost economic growth rates, it is necessary to increase savings either domestically or from abroad. Higher savings create a virtuous circle of self-sustaining economic growth.

Impact of increasing capital



The transfer of capital to developing economies should enable higher growth, which in turn will lead to higher savings and growth will become more self-sustaining.

Criticisms of Harrod-Domar Model

- Developing countries find it difficult to increase saving. Increasing savings ratios may be inappropriate when you are struggling to get enough food to eat.
- Harrod based his model on looking at industrialised countries post-depression years. He later came to repudiate his model because he felt it did not provide a model for long-term growth rates.
- The model ignores factors such as labour productivity, technological innovation and levels of corruption. The Harrod-Domar is at best an oversimplification of complex factors which go into economic growth.
- There are examples of countries who have experienced rapid growth rates despite a lack of savings, such as Thailand.
- It assumes the existences of a reliable finance and transport system. Often the problem for developing countries is a lack of investment in these areas.

- Increasing capital stock can lead to diminishing returns. Domar was writing during the aftermath of the Great Depression where he could assume there would always be surplus labour willing to use the machines, but, in practice, this is not the case.
- The Model explains boom and bust cycles through the importance of capital, however, in practice businesses are influenced by many things other than capital such as expectations.
- Harrod assumed there was no reason for the actual growth to equal natural growth and that an economy had no tendency to full employment. However, this was based on the assumption of wages being fixed.
- The difficulty of influencing saving levels. In developing economies it can be difficult to increase savings ratios – because of widespread poverty.
- The effectiveness of foreign capital flows can vary. In the 1970s and 80s many developing economies borrowed from abroad, this led to an inflow of foreign capital however, there was a lack of skilled labour to make effective use of capital. This led to very high capital-output ratios (poor productivity) and growth rates didn't increase significantly. However, developing economies were left with high debt repayments and when interest rates rose, a large proportion of national savings was diverted to paying debt repayments.

Q.13 From the diverse growth experiences across countries, illustrate that economic convergence need not necessarily entail convergence in institutions.

Ans. If the growth of an economy depended only on the deepening of human capital and physical capital, then the growth rate of that economy would be expected to slow down over the long run because of diminishing marginal returns. However, there is another crucial factor in the aggregate production function: technology.

The development of new technology can provide a way for an economy to sidestep the diminishing marginal returns of capital deepening. Figure 1 shows how. The horizontal axis of the figure measures the amount of capital deepening, which on this figure is an overall measure that includes deepening of both physical and human capital. The amount of human and physical capital per worker increases as you move from left to right, from C_1 to C_2 to C_3. The vertical axis of the diagram measures per capita output. Start by considering the lowest line in this diagram, labeled Technology 1. Along this aggregate production function, the level of technology is being held constant, so the line shows only the relationship between

capital deepening and output. As capital deepens from C_1 to C_2 to C_3 and the economy moves from R to U to W, per capita output does increase—but the way in which the line starts out steeper on the left but then flattens as it moves to the right shows the diminishing marginal returns, as additional marginal amounts of capital deepening increase output by ever-smaller amounts. The shape of the aggregate production line (Technology 1) shows that the ability of capital deepening, by itself, to generate sustained economic growth is limited, since diminishing returns will eventually set in.

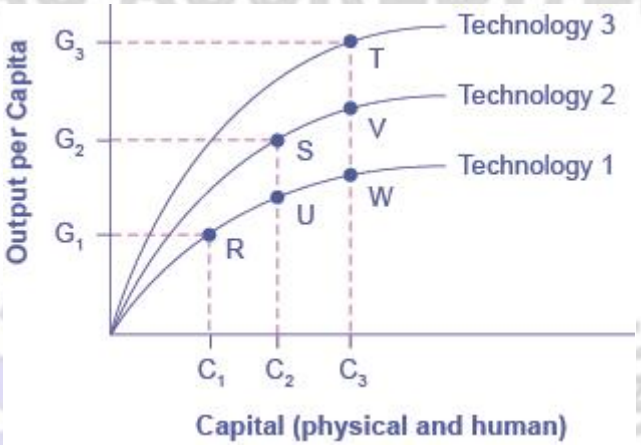


Figure 1.

Capital Deepening and New Technology. Imagine that the economy starts at point R, with the level of physical and human capital C_1 and the output per capita at G_1. If the economy relies only on capital deepening, while remaining at the technology level shown by the Technology 1 line, then it would face diminishing marginal returns as it moved from point R to point U to point W. However, now imagine that capital deepening is combined with improvements in technology. Then, as capital deepens from C_1 to C_2, technology improves from Technology 1 to Technology 2, and the economy moves from R to S. Similarly, as capital deepens from C_2 to C_3, technology increases from Technology 2 to Technology 3, and the economy moves from S to T. With improvements in technology, there is no longer any reason that economic growth must necessarily slow down.

Now, bring improvements in technology into the picture. Improved technology means that with a given set of inputs, more output is possible. The production function labeled Technology 1 in the figure is based on one level of technology, but Technology 2 is based on an improved level of technology, so for every level of capital deepening on the horizontal axis, it produces a higher level of output on the vertical axis. In turn, production function Technology 3 represents a still higher level of technology, so that for every level of inputs on

the horizontal axis, it produces a higher level of output on the vertical axis than either of the other two aggregate production functions.

Most healthy, growing economies are deepening their human and physical capital and increasing technology at the same time. As a result, the economy can move from a choice like point R on the Technology 1 aggregate production line to a point like S on Technology 2 and a point like T on the still higher aggregate production line (Technology 3). With the combination of technology and capital deepening, the rise in GDP per capita in high-income countries does not need to fade away because of diminishing returns. The gains from technology can offset the diminishing returns involved with capital deepening.

Will technological improvements themselves run into diminishing returns over time? That is, will it become continually harder and more costly to discover new technological improvements? Perhaps someday, but, at least over the last two centuries since the Industrial Revolution, improvements in technology have not run into diminishing marginal returns. Modern inventions, like the Internet or discoveries in genetics or materials science, do not seem to provide smaller gains to output than earlier inventions like the steam engine or the railroad. One reason that technological ideas do not seem to run into diminishing returns is that the ideas of new technology can often be widely applied at a marginal cost that is very low or even zero. A specific additional machine, or an additional year of education, must be used by a specific worker or group of workers. A new technology or invention can be used by many workers across the economy at very low marginal cost.

The argument that it is easier for a low-income country to copy and adapt existing technology than it is for a high-income country to invent new technology is not necessarily true, either. When it comes to adapting and using new technology, a society's performance is not necessarily guaranteed, but is the result of whether the economic, educational, and public policy institutions of the country are supportive. In theory, perhaps, low-income countries have many opportunities to copy and adapt technology, but if they lack the appropriate supportive economic infrastructure and institutions, the theoretical possibility that backwardness might have certain advantages is of little practical relevance.

THE SLOWNESS OF CONVERGENCE

Although economic convergence between the high-income countries and the rest of the world seems possible and even likely, it will proceed slowly. Consider, for example, a country that starts off with a GDP per capita of $40,000, which would roughly represent a typical high-income country today, and another country that starts out at $4,000, which is roughly the

level in low-income but not impoverished countries like Indonesia, Guatemala, or Egypt. Say that the rich country chugs along at a 2% annual growth rate of GDP per capita, while the poorer country grows at the aggressive rate of 7% per year. After 30 years, GDP per capita in the rich country will be $72,450 (that is, $40,000 $(1 + 0.02)^{30}$) while in the poor country it will be $30,450 (that is, $4,000 $(1 + 0.07)^{30}$). Convergence has occurred; the rich country used to be 10 times as wealthy as the poor one, and now it is only about 2.4 times as wealthy. Even after 30 consecutive years of very rapid growth, however, people in the low-income country are still likely to feel quite poor compared to people in the rich country. Moreover, as the poor country catches up, its opportunities for catch-up growth are reduced, and its growth rate may slow down somewhat.

The slowness of convergence illustrates again that small differences in annual rates of economic growth become huge differences over time. The high-income countries have been building up their advantage in standard of living over decades—more than a century in some cases. Even in an optimistic scenario, it will take decades for the low-income countries of the world to catch up significantly.

Q.14 Discuss the causes of Poverty in India.

Ans.: **Main Causes of Poverty in India**

(i) Heavy pressure of population:

Population has been rising in India at a rapid speed. This rise is mainly due to fall in death rate and more birth rate.

India's population was 84.63 crores in 1991 and became 102.87 crores in 2001. This pressure of population proves hindrance in the way of economic development.

(ii) Unemployment and under employment:

Due to continuous rise in population, there is chronic unemployment and under employment in India. There is educated unemployment and disguised unemployment. Poverty is just the reflection of unemployment.

(iii) Capital Deficiency:

Capital is needed for setting up industry, transport and other projects. Shortage of capital creates hurdles in development.

(iv) Under-developed economy:

The Indian economy is under developed due to low rate of growth. It is the main cause of poverty.

(v) Increase in Price:

The steep rise in prices has affected the poor badly. They have become more poor.

(vi) Net National Income:

The net national income is quite low as compared to size of population. Low per capita income proves its poverty. The per capita income in 2003-04 was Rs. 20989 which proves India is one of the poorest nations.

(vii) Rural Economy:

Indian economy is rural economy. Indian agriculture is backward. It has great pressure of population. Income in agriculture is low and disguised unemployment is more in agriculture.

(viii) Lack of Skilled Labour:

In India, unskilled labour is in abundant supply but skilled labour is less due to insufficient industrial education and training.

(ix) Deficiency of efficient Entrepreneurs:

For industrial development, able and efficient entrepreneurs are needed. In India, there is shortage of efficient entrepreneurs. Less industrial development is a major cause of poverty.

(x) Lack of proper Industrialisation:

Industrially, India is a backward state. 3% of total working population is engaged in industry. So industrial backwardness is major cause of poverty.

(xi) Low rate of growth:

The growth rate of the economy has been 3.7% and growth rate of population has been 1.8%. So compared to population, per capita growth rate of economy has been very low. It is the main cause of poverty.

(xii) Outdated Social institutions:

The social structure of our country is full of outdated traditions and customs like caste system, laws of inheritance and succession. These hamper the growth of economy.

(xiii) Improper use of Natural Resources:

India has large natural resources like iron, coal, manganese, mica etc. It has perennial flowing rivers that can generate hydroelectricity. Man power is abundant. But these sources are not put in proper use.

(xiv) Lack of Infrastructure:

The means of transport and communication have not been properly developed. The road transport is inadequate and railway is quite less. Due to lack of proper development of road and rail transport, agricultural marketing is defective. Industries do not get power supply and raw materials in time and finished goods are not properly marketed.

Q.15 Explain Kuznet's characteristics of Economic Development.

Ans.: P**rofessor Simon Kuznets Nobel prize winner in 1971 in** economics for his pioneering work in the measurement and analysis of economic growth has given six characteristics of modern economic growth. These are, High rates of growth of PC and population High rates of increase in TFP High rates of structural transformation High rates of social and ideological transformation International economic outreach Limited spread of economic growth Kuznets's six characteristics of modern economic growth

In case of both per capita output and population growth all developed countries have experienced large multiples of their previous rates from around 1770 to the present. For the now industrialized countries annual growth rates over this period averaged almost 2% per capita output and 1% for population or 3% for total output (real GNP).These rates imply a doubling time of roughly 35 years for pc output,70 years for population and 23 years for real GNP. For the last two centuries the growth rate of per capita out put is about 10 times ,population growth 4 to 5 times and the GNP growth rate have been 40 or 50 times. High Rates of Per Capita Output and population growth

The second aggregate economic characteristic of modern growth is relatively high rate of rise in TFP,the output per unit of all inputs. TFP shows the efficiency with which all inputs are used in a production. Kuznets found substantial rise in TFP in modern era. William Easterly has found that the growth of countries is not due to factor accumulation but due to TFP. Historical facts suggests that the rate of increase in TFP account for about 50 to 75%

per capita output in developed countries, this due to technological progress. High Rates of Total Factor Productivity Increase

The third important characteristic of historical growth is a high rate of structural and sectoral change. This structural change include the gradual shift from agriculture to non-agriculture and more recently towards services, a significant change in the scale or average size of productive units (from personnel and family enterprises to impersonal of national and international MNC's),and also share of labor in non-agriculture activities. For example in US labor engaged in agriculture was 53% in 1870 and now about 2%. High Rates of Economic Structural Transformation.

Changes in attitudes, institutions and ideologies are also an integral part of economic development. According to Myrdal these include Rationality Economic planning Social and economic equalization Improved institutions and attitudes High Rates of Social and Ideological Transformation

Another important characteristic of modern economic growth of countries relates to the historical and ongoing propensity to reach to the rest of the world for primary products and raw material, cheap labor and lucrative markets for their manufactured products. With increase in transport and communication globalization has occurred. International Economic Outreach

In spite of the enormous increased in world output over the past two centuries, the spread of sustained modern economic growth is still largely limited to less than one third of world population(about 15%). Unequal international power relationships between developed and underdeveloped countries may have a tendency to exacerbate the gap between rich and poor. Limited International Spread of Economic Growth

Q.16 Discuss how natural resources contribute to climate change.

Ans: Climate change affects many natural resources when:

- lakes freeze and thaw
- trees bud in the spring

- changing temperatures and precipitation cause extreme events that affect water resources (e.g., floods, droughts)

Change in natural resources will lead to impact the following natural resources:

Plants and animals

As the climate changes, some species will adapt by:

- migrating to new locations
- changing their breeding seasons
- seeking new food sources

Less adaptable species may even disappear from their current habitats.

Biodiversity

- the way certain species interact with one another and their environment may change
- the geographic range of plants and wildlife is predicted to move north as the temperature increases. Moose, gray jays, and polar bear populations are expected to shift north
- changes in water and air temperature may make conditions more favourable for diseases and invasive species, which puts pressure on native species

Forests

- there may be more insect and disease outbreaks
- increased tree stress may affect forest growth
- drier forests will lead to more intense and frequent forest fires
- local tree species will be less suited to local conditions. Climate conditions may change faster than local trees can migrate, which may case cause them to die off in some areas

Water

- milder, shorter winters lead to:
    - earlier snowmelt

    - less ice cover on lakes
    - changing rainfall patterns
    - changes in water's movement between air, soil, plants and bodies of water
- there may be less water available for renewable energy production and waterways
- increasing water temperatures may result in lower water quality as more micro-organisms are found in lakes
- warm-water species may spread into new northern habitats
- more extreme weather may result in more frequent flooding, erosion, shoreline damage, infrastructure failures and decreased water quality due to increased runoff and debris

Aquatic Species

- most aquatic species's growth and reproduction are strongly influenced by water temperatures
- higher temperatures in the Great Lakes and inland lakes could result in fewer cold water species (e.g., lake trout, yellow perch, largemouth bass)
- changes to water quality, water levels and ice cover may affect the type and number of fish in lakes and rivers

Wildlife

- some wildlife species will be forced to move further north to a more favourable habitat
- species in southern areas will live in a smaller area due to increased parasites and competition
- hybridization between different animal species (e.g., northern and southern flying squirrels) is already being observed due to climate change
- while some animals will adapt, species that require a narrow range of temperature and precipitation conditions are most likely to decline or die out completely
- climate change may affect:
    - wildlife reproduction

- relationships between predators and prey
- survival
- rates of disease in wildlife species
- the availability of food and habitat

For example, if migratory songbirds arrive at their breeding grounds earlier, the food they need for successful reproduction may be unavailable.

Wetlands

- wetlands help reduce the effects of climate change by capturing and storing carbon
- climate change alters wetlands and the native species living there
- changes in precipitation and temperature may change wetland water systems, causing flooding and droughts
- when there is a decrease in precipitation and increased evaporation due to warmer air, wetlands may dry up or disappear
- it is likely that as wetlands dry up, plants living in the area will shift and marshes may become more swamp-like as woody plants move into marsh areas

Parks and protected areas

- protected areas are established to conserve representative features, ecosystems and species
- as ecosystems move and change in response to climate change, the fixed boundaries of protected areas may no longer conserve the features they were created to protect
- patterns of recreational use may change:
  - summer activities such as camping and swimming may be affected by poor water quality and heat events
  - spring and fall recreational use may become more popular
  - as the winter season shortens and snow cover becomes less reliable, opportunities for winter activities may decline

Q.17 What are the five stages of economic development according to Rostow?

One of the key thinkers in 20th-century Development Studies was W.W. Rostow, an American economist and government official. Prior to Rostow, approaches to development had been based on the assumption that "modernization" was characterized by the Western world (wealthier, more powerful countries at the time), which were able to advance from the initial stages of underdevelopment. Accordingly, other countries should model themselves after the West, aspiring to a "modern" state of capitalism and liberal democracy. Using these ideas, Rostow penned his classic "Stages of Economic Growth" in 1960, which presented five steps through which all countries must pass to become developed:

1) Traditional society, 2) preconditions to take-off, 3) take-off, 4) drive to maturity and 5) age of high mass consumption.

The model asserted that all countries exist somewhere on this linear spectrum, and climb upward through each stage in the development process:

Traditional Society: This stage is characterized by a subsistent, agricultural-based economy with intensive labor and low levels of trading, and a population that does not have a scientific perspective on the world and technology.

Preconditions to Take-off: Here, a society begins to develop manufacturing and a more national/international—as opposed to regional—outlook.

Take-off: Rostow describes this stage as a short period of intensive growth, in which industrialization begins to occur, and workers and institutions become concentrated around a new industry.

Drive to Maturity: This stage takes place over a long period of time, as standards of living rise, the use of technology increases, and the national economy grows and diversifies.

Age of High Mass Consumption: At the time of writing, Rostow believed that Western countries, most notably the United States, occupied this last "developed" stage. Here, a country's economy flourishes in a capitalist system, characterized by mass production and consumerism.

Rostow's Model in Context

Rostow's Stages of Growth model is one of the most influential development theories of the 20th century. It was, however, also grounded in the historical and political context in which he wrote. "Stages of Economic Growth" was published in 1960, at the height of the Cold War, and with the subtitle "A Non-Communist Manifesto," it was overtly political. Rostow

was fiercely anti-communist and right-wing; he modelled his theory after western capitalist countries, which had industrialized and urbanized. As a staff member in President John F. Kennedy's administration, Rostow promoted his development model as part of U.S. foreign policy. Rostow's model illustrates a desire not only to assist lower-income countries in the development process but also to assert the United States' influence over that of communist Russia.

Criticisms of Rostow's Model

As the Singapore case shows, Rostow's model still sheds light on a successful path to economic development for some countries. However, there are many criticisms of his model. While Rostow illustrates faith in a capitalist system, scholars have criticized his bias towards a western model as the only path towards development. Rostow lays out five succinct steps towards development and critics have cited that all countries do not develop in such a linear fashion; some skip steps or take different paths. Rostow's theory can be classified as "top-down," or one that emphasizes a trickle-down modernization effect from urban industry and western influence to develop a country as a whole. Later theorists have challenged this approach, emphasizing a "bottom-up" development paradigm, in which countries become self-sufficient through local efforts, and urban industry is not necessary. Rostow also assumes that all countries have a desire to develop in the same way, with the end goal of high mass consumption, disregarding the diversity of priorities that each society holds and different measures of development. For example, while Singapore is one of the most economically prosperous countries, it also has one of the highest income disparities in the world. Finally, Rostow disregards one of the most fundamental geographical principals: site and situation. Rostow assumes that all countries have an equal chance to develop, without regard to population size, natural resources, or location. Singapore, for instance, has one of the world's busiest trading ports, but this would not be possible without its advantageous geography as an island nation between Indonesia and Malaysia.

In spite of the many critiques of Rostow's model, it is still one of the most widely cited development theories and is a primary example of the intersection of geography, economics, and politics.

Q.18 Compare the features of developed and underdeveloped economics. Explain the characteristics of underdevelopment with reference to India’s experience.

Ans.: Developed and underdeveloped economics can be compared on the following basis:

- The first characteristics of underdeveloped countries worth speaking about is a low human capital, providing the labor force to have poor skills, which leads to poor labor productivity. While for developed countries typical are high levels of human capital, providing the labor force to be significantly educated and skilled. This makes it easier to engrain new technology continuously, causing high labor productivity.
- Another important aspect which influences the economy a lot is a social infrastructure, roads, bridges, etc. Bad infrastructure in the underdeveloped countries can cease goods and services production, limit the market's growth on selling these products, causing low labor mobility and productivity. While the developed countries' infrastructure is advanced and can both significantly simplify productivity as well as provide a rapid market growth.
- The next point is a financial infrastructure, which is badly developed with a primitive banking sector in the underdeveloped countries. But it is modern and well established with all the modern, effective banking means in the developed countries. Therefore, the developed countries present rapid financial transactions, which reduces the unit trade cost accordingly.
- The other point is an educational sector, presented by educational institutions, labor training institutions and others, which are not in a sufficient amount for underdeveloped countries. That is why people there do not have an opportunity to learn the modern economic techniques of goods and services production and distribution.
- The political systems, as well as the general political, social, cultural and economic situation, are not stable in the underdeveloped countries. All these prevent the successful growth and development of the economy in such countries. While in well-developed countries the political systems alongside the political, social, cultural and economic environment are stable providing the well-established democracies.
- Here let's compare how modern technology is researched and developed. In most underdeveloped countries there can be some researches and practices committed at a low level, but nothing more. However, the developed countries technology sector is shown to be significantly emphasized and invested in for a prosperous future.
- Export in these two economies is also greatly different. While undeveloped countries export their primary agricultural goods and other raw materials for a high weight to price ratio with earning a very little money for it, the developed countries export high technology goods, such as planes, or others advanced electronic goods for a low weight to price ratio with earning a lot of money.

- Therefore, all these reduce the capability of underdeveloped countries to import new goods and services, making it impossible to come out of the vicious poverty circle. But everything is slightly different within the developed countries. They can import fresh goods and services, and it makes them stay afloat within the economic prosperity of their country.

❖ **Characteristics of Indian economy:**

1. **Low per capita income:** In India, the national income and per capita income is very low. As per the estimates of the Central Statistics Office (CSO), the per capita net national income of the country at current prices for the year 2015-16 is estimated to attain the level of Rs. 93231/-. The per capita net national income at constant prices (2011-12) for the year 2015-16 is estimated to attain the level of Rs. 77, 431
2. **Agriculture Based Economy:** Agriculture and allied sectors provide around 14.2% of Indian GDP while 53% of total Indian population is based on the agriculture sector.
3. **Over population:** In every decade Indian population get increased by about 20% . During the 2001-11 population increased by 17.6%. Currently India is adding the total population of Australia every year. India is the possessor of around 17.5% population of the whole world.
4. **Income Disparities:** a report released by Credit Suisse revealed that the richest 1% Indians owned 53% of the country's wealth, while the share of the top 10% was 76.30%. To put it differently, in a manner that conveys the political economy of this stunning statistic, 90% of India owns less than a quarter of the country's wealth.
5. **Lack of Capital Formation:** Rate of capital formation is low because of lower level of income. Gross domestic capital formation was 23.3% in 1993-94 increased upto the level os 38.1% in 2007-08 but declined upto 34.8% in 2012-13.
6. **Backwardness of Infrastructural Development:** As per an recent study, 25% of Indian families don't have reach of electricity and 97 million peoples don't have reach of safe drinking water and 840 million people in India don't have sanitation services. India needs 100 million dollar for infrastructural development upto 2025.
7. **Market Imperfections:** Indian economy doesn't have good mobility from one place to other which hinders the optimum utilization of resources. These market imperfections create the fluctuations in the price of commodities every year.
8. **Economy is Trapped in the Vicious Circle of Poverty:** Prof. Ragner Nurkes says that 'a country is poor because it is poor'. It means poor countries are trapped in the vicious circle of poverty.

9. **Use of Outdated Technology:** It is very clear that Indian production technique is more labour oriented in nature. So it increases the cost of production of the products made in these countries.
10. **Traditional Set Up of Society:** Indian societies are trapped in the menace like casteism, communalist, male dominated society, superstitions, lack of entrepreneurship, and 'chalta hai attitude' of the peoples. These all factors hindered the growth of the country as a whole.

Q.19 Distinguish between relative and absolute poverty. Discuss Tendulkar report on methodology for estimation of poverty line in India.

Ans.: Poverty is an economic state where people are experiencing it lacks certain commodities that are considered essential for the lives of human beings.

Certain regions around the world are considered experiencing poverty at significantly higher levels as compared to other regions.

Relative and absolute are some of the methods used for measuring poverty levels. There are significant differences between relative and absolute poverty that individuals need to understand.

Absolute Poverty:

The term absolute poverty is used to refer to the poverty conditions where an individual cannot meet the most basic commodities to sustain life and other normal activities. This means that any person who is struggling to find food, shelter, and clothing is in absolute poverty.

Relative Poverty:

Relative poverty is defined to the standard of living as compared to the economic standards of living for other people within the surrounding. This means that an individual is considered power concerning the environment or the living conditions of the people he or she is living with.

Difference between Relative and Absolute Poverty:

1) Biological Needs in Relative and Absolute Poverty

The primary differences between absolute and relative poverty are that absolute poverty focuses more on the biological needs while relative poverty has nothing to do with biological

needs. On the other hand, relative poverty does not classify biological needs in its definition but focuses on the comparison between other people within the environment. It is important to highlight that one can be meeting his or her biological needs but still be considered as poor under relative poverty measurement.

2) Income Levels in Relative and Absolute Poverty

The second difference is that the income level is highly considered in absolute poverty, but it is not considered under the relative poverty measurement.

3) Country Dependency in Relative and Absolute Poverty

Relative poverty varies between developed and developing countries while absolute poverty does not vary.

4) Changes in Relative and Absolute Poverty

The other difference is that absolute poverty can change while relative poverty cannot change.

5) Poverty Alleviation Programs for Relative and Absolute Poverty

Different international bodies and government of various countries have developed policies and measures to ensure that absolute poverty is eradicated around the world, while there are no measures and policies implemented to alleviate relative poverty.

6) Quality of Life in Relative and Absolute Poverty

People living in absolute poverty have poor quality lives while those living in relative poverty have quality lives. Besides, people living under extreme poverty levels cannot access basic commodities in their lives like food and shelter, which makes them highly vulnerable to diseases.

Summary of Relative vs. Absolute Poverty

Differentiating between absolute poverty and relative poverty is important for individuals so that they can understand what they are experiencing.

Poverty alleviating bodies should also understand the difference between absolute and relative poverty so that they can develop suitable programs to deal with the challenge.

Lastly, poverty is a severe condition that is not acceptable due to its severe impacts on the life of human beings. All individuals should strive to eradicate poverty in the communities.

Tendulkar Committee:

The current methodology for poverty estimation is based on the recommendations of an Expert Group to Review the Methodology for Estimation of Poverty (Tendulkar Committee) established in 2005. The Committee calculated poverty levels for the year 2004- 05. Poverty levels for subsequent years were calculated on the basis of the same methodology, after adjusting for the difference in prices due to inflation. Table 1 shows national poverty levels for the last twenty years, using methodology suggested by the Tendulkar Committee. According to these estimates, poverty declined at an average rate of 0.74 percentage points per year between 1993-94 and 2004-05, and at 2.18 percentage points per year between 2004-05 and 2011-12. **Table 1: National poverty estimates (% below poverty line) (1993 - 2012)**

Year	Rural	Urban	Total
1993 – 94	50.1	31.8	45.3
2004 – 05	41.8	25.7	37.2
2009 – 10	33.8	20.9	29.8
2011 – 12	25.7	13.7	21.9

Q.20 Explain the Role of State in Economic Development?

Ans.: Today the state has emerged as an active participant in the process of economic development in many ways. The doctrine of laissez-faire is dead.

Now the government has started participating increasingly in the productive activities and through its monetary and fiscal policies are guiding the direction of economic activities. It also determines the distribution of goods and services in the economy.

The process of development in case of developed countries was spread over a long period but under-developed countries today have no time to wait and it is essential for them to cut short the period do development. In this case the government has an important role in the process of development.

These countries have remained stagnant and a positive government intervention is necessary to put them on the path of the growth. In order to reduce the various rigidities inherent in an under-developed country, the state must play the strategic role.

Thus the state has to shoulder heavy responsibilities in order to ensure rapid economic development in under-developed countries. This task can be performed by two types of measures i.e. (A) Direct and (B) Indirect.

Types of Measures:

(A) Direct Measures:

For the economic development of under-developed countries state has involved itself directly and performs certain vital functions which are enumerated below:

1. Organizational Changes:

The organizational changes play an important role in the process of economic development. It includes the expansion of the size of market and the organization of labour market. The state can develop the means of transport and communications for expanding the size of market because private enterprise cannot be capable of undertaking such schemes.

Moreover, the state can help the growth of agriculture and industries. The organization of the labour market also falls under the functions of government.

It increases the productivity of labour. The government helps in organizing labour by recognizing labour unions. It fixes working hours, payment of wages, establishes machinery for the settlement of labour disputes, provides for social securities measures etc.

This establishes relation between the employers and employees which increases efficiency of labour which in turn increases the production and reduces the cost.

2. Social and Economic Overheads:

The main obstacle in the way of economic development of under-developed countries is the lack of economic overheads such as means of communications and transportations, ports, electricity irrigation etc. In industrially advanced countries, these facilities are provided by private enterprises.

But in under-developed countries the private enterprises are not interested to invest because the return is not fruitful and, moreover, such huge investments are beyond the capacity of private sector.

3. Education:

Education plays an important role in the process of economic development.To start on a national development programme, while leaving the population largely illiterate seems to be

futile. The educational facilities provided in under-developed countries increase their geographic and occupational mobility, raising their productivity and facilitating innovations. The quality of labour is very important for economic growth.

4. Public Health and Family Planning:

The development and maintenance of public health services are important functions to be performed by the government. It is necessary that the health of people should be maintained to increase the efficiency and productivity of labour.

Public health measures generally include the improvement of environmental sanitation in both rural and urban areas, removal of Stagnant and polluted water, better disposal of sewage, control of communicable diseases, provision for medical and health services particularly in the field of maternity and child welfare, health and family planning education and the training of health and medical personnel and all this requires planned efforts on the part of public authorities.

5. Changes in Institutional Frame Work:

Economic development cannot take place in static institutional frame work. The rigid institutional frame work is a positive hindrance in the path of development in UDC. Prof. Paul Streeten has rightly observed that, "The difference between economic growth in advanced countries… and development in so called developing countries is that in the former attitudes and institutions are by and large, adopted to a change and the society has innovations and progress built into the system, while into the latter attitudes and institutions and even policies are stubborn obstacles to development."

6. Stepping up Rate of Investment:

The process of development is accelerated by increasing the rate of investment. The rate of savings in UDC is highly inadequate as compared to their investment requirements. Thus, it becomes essential for government to accelerate the rate of capital formation in these countries and the government can achieve this through taxation or inflation.

The socialist economies have also been able to save and invest a very high percentage of their national income because of their government's active role in the field of capital formation.

7. Agricultural Development:

In UDC majority of people depend upon agriculture for their livelihood. Lack of irrigation and credit facilities are main hurdles in the way of economic development. If the agriculture

remains backward, the other sectors of the economy cannot develop because agriculture is the basic industry and the other industries depends upon it for raw material.

8. Industrial Development:

In LDC, the natural resources are under- developed or less developed. This is due to the fact that these countries remained under the colonial rule for a long period and their natural resources were mercilessly exploited for their selfish ends. After attaining their freedom there was no logic to leave the development of these resources in the hands of foreign dominating countries.

Furthermore, these poor countries lack in basic and key industries like iron, steel, cement, heavy engineering etc. The fact is that these industries required heavy capital investment, technical knowledge. These basic amenities are beyond the reach of private investors in these countries. In addition to this, private entrepreneur is totally reluctant to enter in these areas of production.

Therefore, it becomes the prime duty to start basic and key industries to boost the economic development of the country. Again these big industries need long gestation period. On the other hand no doubt these countries have some basic consumer's goods industries are primitive and superstitious.

The other direct measures are as follows:

- Influencing the Use of Resources
- Removal of Inequalities
- Optimum Allocation of Resources
- Maintenance of Peace and Security
- Balanced Growth
- Self-Reliance

(B) Indirect Measures:

In an indirect manner, the government can perform a vital function in providing the ever increasing needs of people.

1. Monetary Policy
2. Fiscal Policy
3. Price Policy
4. Increase in Foreign Trade

5. Strengthening of Public Sector
6. Economic Planning
7. Public Debt