BECC-132

PRINCIPLES OF MICROECONOMICS-II

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December, 2019

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ISBN : 978-93-89200-04-1

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Further information on Indira Gandhi National Open University courses may be obtained from the University's office at Maidan Garhi, New Delhi-110 068 or visit University's Website http://www.ignou.ac.in.

Printed and published on behalf of the Indira Gandhi National Open University, New Delhi by Registrar, MPDD, IGNOU.

Lasertypesetted at Graphic Printers, 204, Pankaj Tower, Mayur Vihar, Phase-I, Delhi-110091.

Printed at : A-One Offset Printers, 5/34, Kirti Nagar Industrial Area, New Delhi - 110015

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INTRODUCTION TO PRINCIPLES OF MICROECONOMICS-II

Economics is a live subject and helps the economic agents in their decision making like: Which commodities to produce? How to produce? Which techniques to use? Which factors or resources to use, in which combinations to produce and What quantity of a commodity? How consumers make purchasing decisions and how their choices are affected by changing prices and incomes? How firms decide how many workers to hire and how do workers decide where to work and how much work to do? In other words, economics has moved away from financing the activities of state to helping the common man in the street to make many a crucial decisions impinging on their day-to-day life.

We, today incorporate a wide spectrum of activities in the domain of economics. These activities include: (a) consumer's behaviour or choice process; (b) producers' behaviour or how is the production organised and carried on, what is the special role of cost functions? (c) What are the different forms of market organisations; (d) how different individuals co-operate in the process of production to contribute factors owned by them. (e) What are the various types of efficiencies? (f) Under what situations markets fail and how the state can play its role in such situations? Issues pertaining to (a) and (b) have been covered in the course on Principles of Microeconomics - I. The present course on principles of Micro Economics - II aims to expose the learners to the issues pertaining to (c) to (f). The course is divided into four blocks.

Block 1 throws light on the various forms of market i.e. perfect competition, monopoly, monopolistic competition, and oligopoly. This block comprises 4 units. **Unit 1** on **Perfect Competition: Firm and Industry Equilibrium** provides the characteristics of perfectly competitive market and exposes the learners to equilibrium of Firm and Industry under perfect competition. **Unit 2** on **Monopoly: Price and Output Decision** deals with pricing and output decisions and price discrimination under monopoly condition. The concept of deadweight loss under monopoly has also be discussed in this unit. The equilibrium conditions of monopolistic competition in short-run and long-run period, theory of excess capacity, the comparison of the various market forms have been provided in **Unit 3**. Price and Output determination under oligopoly have been covered in **Unit 4.**

Block 2 discuses the Pricing of the factors of production. It comprises three units. Introducing the Marginal Productivity theory of distribution, **Unit 5** provides an overview of how rent and wages are determined. It also provides a bird's eye view on the theories of interest and profit. **Unit 6** acquaints the learners of the role of demand and supply mechanisms in determinations of wages under perfectly competitive labour markets and imperfectly competitive labour markets. It also provides the role of labour unions and explanation of wage differentials. **Unit 7** throws light on features of land as a peculiar factor of production and the various theories of rent.

Block 3 covers the Welfare Market failure and the role of state. This block comprises two units. **Unit 8** exposes the learners to the various forms of efficiencies under perfectly competitive market economy and the outcome of departures from the assumptions of perfectly competitive market conditions. **Unit 9** highlights the various situations where markets fail and hence the role of state comes into picture.

Block 4 deals with the issues related to international trade. This block comprises two units. **Unit 10** gives an overview of the various theories of International trade. **Unit 11** touches upon the various issues related to trade policy and World Trade Organisation.

BLOCK 2 FACTOR MARKET

BLOCK 2 FACTOR MARKET

In Block 1 we have focused on output market i.e. markets for goods and services that firms sell and consumers purchase. Although the demand for factors of production is derived in nature and hence the forces that shape the supply and demand in output markets also affect factor markets. Yet, due to some peculiar features of factors of production particularly that of land and labour, the pricing of factors of production need separate treatment. Hence the pricing of factors of production is being discussed separately in this block. This block comprises three units.

Unit 5 provides an overview of how rent and wages are determined. It also provides a bird's eye view on the theories of interest and profit. **Unit 6** acquaints the learners of the role of demand and supply mechanisms in determinations of wages under perfectly competitive labour markets and imperfectly competitive labour markets. It also provides the role of labour unions and explanation of wage differentials. **Unit 7** throws light on features of land as a peculiar factor of production and the various theories of rent.

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UNIT 5 FACTOR MARKET AND PRICING DECISIONS

Structure

5.0 Objectives

5.1 Introduction

5.2 Meaning of Factor Markets

5.3 Concepts of Demand and Supply of a Factor

5.3.1 Demand for Factor

5.3.2 Supply of Factor

5.4 Factor Pricing by Marginal Productivity Theory

5.5 Determination of Returns to a Factor

5.5.1 Rent

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5.5.4 Profits

5.6 Role of Factor Prices in Pricing Decision of the Firm

5.7 Let Us Sum Up

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5.9 Answers or Hints to Check Your Progress Exercises

5.0 OBJECTIVES

After learning about the different market structures viz. Perfect Competition Monopoly, monopolistic competition and oligopoly in Unit 1 to 4 which explain the different equilibrium conditions of price and output in the product market, this unit introduces the concept of factor market i.e. the market for factors of production in an economy. This unit will develop your understanding about how factor markets operate distinctly from product markets, how pricing decisions take place in factor markets and how returns to factors of production are determined.

After going through this unit, you will be able to:

- state the concept of a factor market;
- explain the demand and supply mechanisms in factor markets;
- discuss marginal productivity theory of factor pricing;
- articulate pricing decisions for a factor and; and
- determine returns to factors of production viz. Wages, interest, rent and profit.

Dr. Nausheen Nizami, Assistant Professor of Economics, Pt. Deen Dayal Upadhyay Petrolium University, Ahmedabad.

5.1 INTRODUCTION

Any platform that facilitates sale and purchase of a good or service is known as a market. In order to produce goods and services, factors of production are required. Just like product and service markets, factors of production of an economy also have their markets. Markets are required to determine their demand, supply and market prices. The primary four factors of production are land, labour, capital and entrepreneurship. This unit explains briefly the essence, importance and operations of land, labour and capital market and the last two units of this block provide detailed explanation on labour and land markets.

To begin with, it is important to understand why there is a need for factor markets. For understanding this, there is a need to understand the importance of factors of production in an economy. As the name suggests, 'factors' of production are important entities in the process of production without which production cannot take place. It is not possible to produce a computer without a machine (capital), not possible to produce software without an IT professional (labour) and not possible to produce anything without some space for production (land) where capital and labour are engaged through an IT employer (entrepreneur). All four factors of production are required in an economy for production to take place irrespective of the fact whether what is getting produced is a product or a service. However the ratios in which factors of production are used can differ as per production requirements and advancement of technology. In the era of artificial intelligence, virtual markets and robots, production process using the above technologies are likely to become more capital intensive (and less labour intensive).

Having understood the importance and dynamics of factor markets in an economy, the following sub-sections will throw light on the meaning of factor markets and theories of factor market pricing.

5.2 MEANING OF FACTOR MARKETS

Factor markets are the markets where sale and purchase of factors of production like land, labour and capital takes place. These factors of production, along with entrepreneur, interact to produce goods and services in an economy. The broad characteristics and meaning of these factors of production has been outlined below:

i) **Land:** It is a physical/tangible factor of production and is a stock concept. It consists of the total physical resources that are available. Land not just includes ground, but also includes the forests, water resources, soil, minerals, mines, etc.

ii) **Labour:** It is an intangible factor of production as labour services are endowed with a labourer and cannot be separated from him. The effort used by households for production purposes, whether manual or intellectual, is known as labour. Labour is a flow concept.

iii) **Capital:** It is a tangible factor of production and refers to all forms of machinery, buildings, transport services, etc. that are used in the production process.

iv) **Entrepreneurship:** This refers to the intangible abilities of an entrepreneur to conduct and organise the production process for producing goods and services.

Generally, households own or control these factors of production and sell them to producers. Households provide their services as labour and earn wages in return. They also mobilise their savings for buying physical capital and also own land. Some households also have members with entrepreneurial skills and act as entrepreneurs. Households earn by selling these factors of production in the factor markets and thus contribute positively to the production process. This interaction can be shown through a circular flow of income and spending between households and firms in Fig. 5.1 given below.

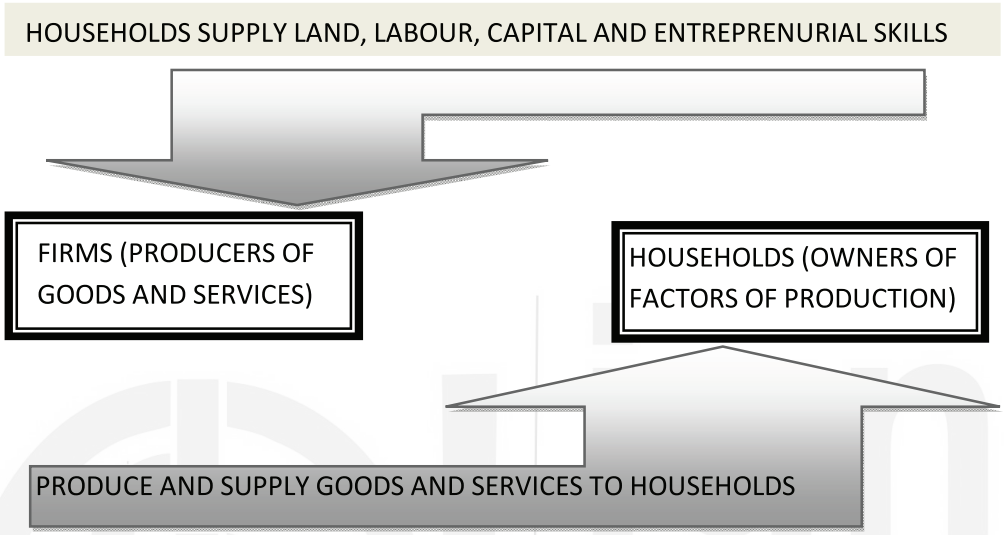

Fig. 5.1: Circular flow of factors of production and goods & services between households and firms in a simple two-sector economy

5.3 CONCEPT OF DEMAND AND SUPPLY OF A FACTOR

As a student of microeconomics, you may already be well-versed with the concepts of demand and supply. The concepts and the laws of demand and supply that you have previously studied apply largely to the goods market. In order to understand the demand and supply of a factor, it is important to understand the inter-relationship between the goods market and factor markets.

Derived Demand

Let us consider the demand for office space by a data analytics firm. A data analytics company generally requires a rented office space for its analysts, programmers, managers and other workers. Similarly a bakery owner requires space for producing and selling bakery products. In each geographical area, there would be a downward sloping demand curve for office space whose rental is linked to the quantity of office space demanded by firms i.e. the lower the rental price, the higher is the demand of firms for office space. An important distinction between demand for goods and demand for factors is with regards to utility. While on one hand, consumers demand goods as they derive utility from its consumption, on the other hand firms do not demand factors of production for satisfaction of utility but for the purpose of conducting production operations using the four factors of production. The purpose is to maximise revenue and gains from production using factors of production. Moreover the demand for factors of production is dependent on the demand for goods and services from the consumers. Higher is the demand for goods,

higher would be the demand for factors of production and vice-versa. Economists therefore regard demand for factors of production shown in Fig. 5.2 given below as a derived demand.

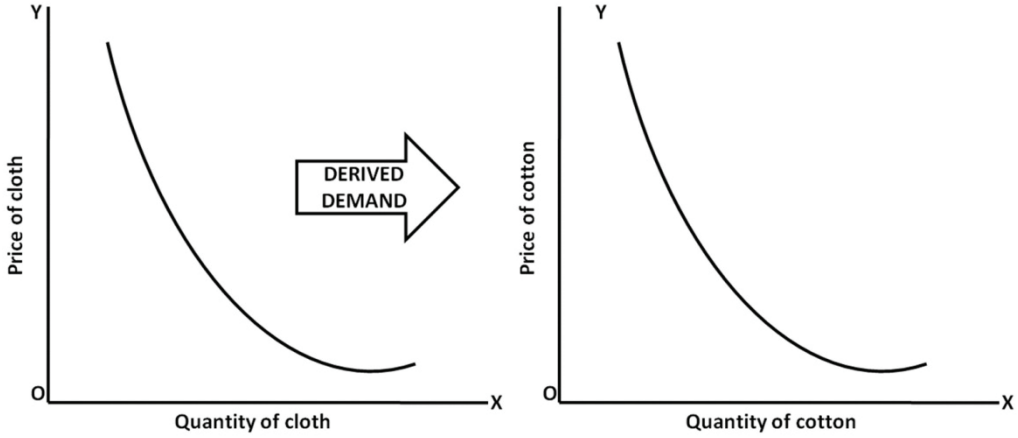

Fig. 5.2

Interdependent demand

As explained earlier, you may recall that production cannot take place using a single factor of production. It takes place through an interaction of different factors of production. Imagine a producer who wants to produce gold jewellery. This producer would require services of designers (labour), office space for conducting production process (land) and some machinery for moulding and heating metals (capital). It is to be noted that interdependence in production leads to interdependence in productivities of factors of production. Thus productivity of labour would get directly affected if the casting or rolling machine used in making gold jewellery gets jammed for two days. In effect, it is the interdependence of productivities of land, labour and capital that makes distribution of factor incomes a complex task. In order to estimate the contributions of the different factors of production in the process of production, the concept of marginal productivity is used wherein the marginal productivity of each factor of production is calculated and used for determination of returns to them.

Marginal Physical Product (MPP), Value of Marginal Product (VMP) and Marginal Revenue Product (MRP)

The marginal physical product (MPP) of a factor of production (like labour) is the additional output produced when an extra unit of that factor of production (worker) is added, other factors of production remaining constant.

MPP = Change in Total product / Change in number of units of factor of production

The concept of value of marginal product also known as marginal value product refers to the value of output as estimated using information on market prices. Thus when price of a product is multiplied with the marginal physical product of a factor of production, one can derive value of marginal product.

VMP = Price of output × Marginal Physical Product of factor

Marginal revenue product is the additional revenue due to highering of an additional of worker.

MRP = Change in Total revenue / change in number of units of a factor of production

OR

MRP = Marginal revenue × Marginal physical product

These concepts can be easily understood using an illustration of a firm making decisions on how many workers to hire. The Table 5.1 shows the hypothetical case of a bread manufacturer with given factors of production. Information on workers who are variable factors of production is given. In order to calculate value of marginal product, information on market price of bread is given as Rs.10.

Table 5.1

Units of Workers	Total Product (TP)	Marginal Product (MPP)	Market Price of Bread	Value of Marginal Product (VMP)	Total Revenue (TR)	Marginal Revenue (MR)	Marginal Revenue Product (MRP)
0	0	---------	10	-------	------	-----	-------
1	20	20	10	200	200	10	200
2	30	10	10	100	300	10	100
3	35	5	10	50	350	10	50
4	38	3	10	30	380	10	30
5	39	1	10	10	390	10	10

As you can see in the above table, the entries in the VMP column are identical to the entries in the MRP column. However this is taking place due to the assumption of perfect competition where price is equal to marginal revenue. The entries would change in case of imperfectly competitive markets.

Demand for Factors of Production

Demand curve of factors of production can differ depending upon the type of market structure we are discussing. We have discussed examples of perfectly competitive market structure so far and observed that in such a market VMP is equal to MRP. Here VMP gives information about the maximum number of factors that may be hired. As VMP refers to the value addition of each worker in the production process, it can be inferred that in perfectly competitive markets, it is the VMP (as well as MRP) curve which reflects the demand curve of a perfectly competitive firm. Thus VMP as well as MRP curve becomes the demand curve for a factor of production. This also implies that factors which affect the MRP of a firm would also affect the demand curve for the factor. Factors which may affect MRP of a firm are substitutability of a factor by other factors, change in demand for finished product as well as the total cost incurred on a factor of production.

Does VMP as well as MRP curve give the market demand of a factor? A single MRP curve would not give the market demand for a factor as it reflects demand only for a single firm. Thus aggregation of the MRP curves of all the firms of the industry would give industry wide market demand for a factor. In addition to this, if the market demand for a factor for all the industries is added, then one can derive the aggregate market demand curve for a factor of production.

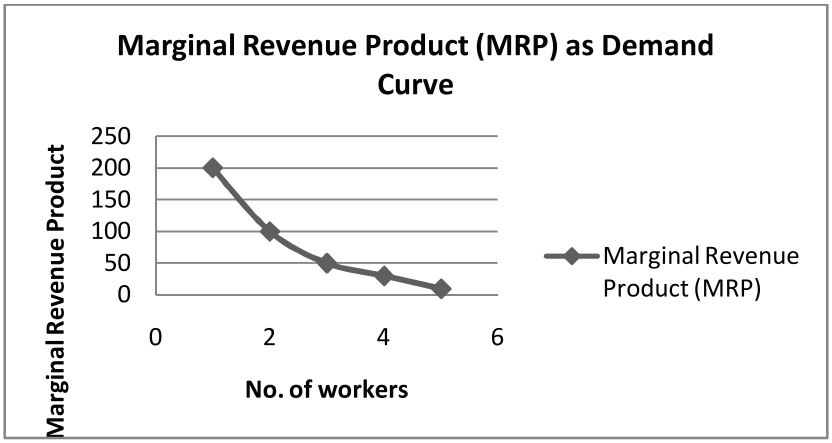

Fig. 5.3

Supply of Factors of Production

Most factors of production are privately owned in a free market economy. Moreover decisions on supply of factors of production like labour, capital and land are governed by a number of economic and noneconomic factors. The important determinants of labour supply are the price of labour and demographic factors such as age, gender, education and family structure. Factors that affect the supply of land are mostly the one that affects the quality such as conservation and change in settlement patterns. Factors that affect the supply of capital are past investments made by businesses, households and governments.

The supply curve for all inputs may slope positively or be vertical. In some cases, it may have even a negative slope. To begin with as the supply of land is fixed, the supply curve of land has a vertical shape. As the supply of capital is directly affected by a change in its returns, higher the returns, higher would be the supply of capital. Thus the supply curve of capital is positively sloped.

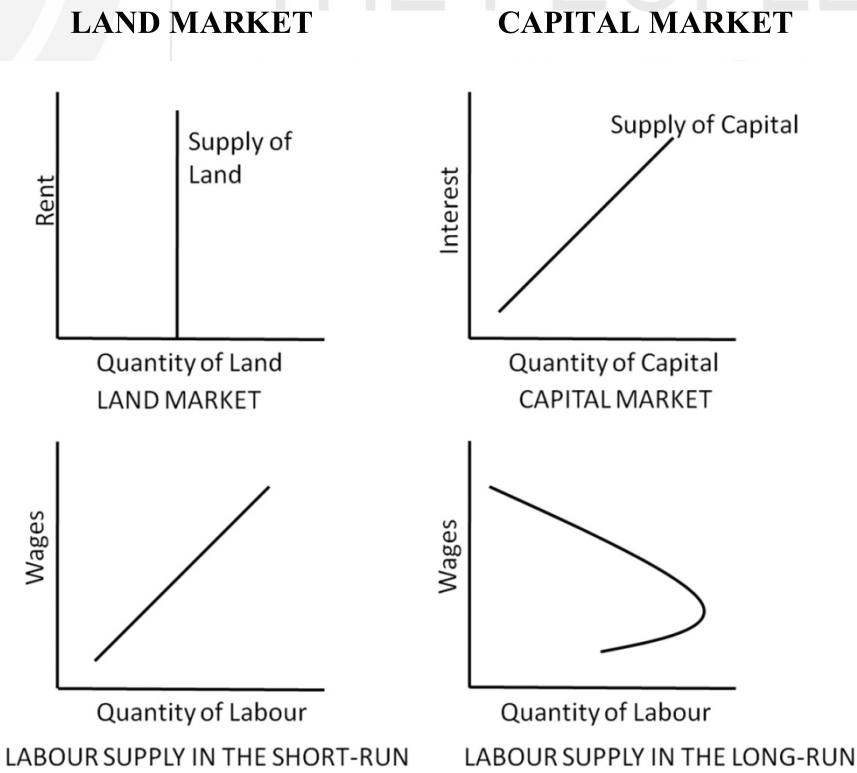

Fig. 5.4

LABOUR MARKET

On the other hand, the supply curve of labour is either positively sloped in the short-run or backward-bending in the short-run. Reasons for the backward bending shape of the labour supply curve have been discussed in detail in the next unit. The interaction of the demand curves of factors of production and the supply curves of factors determines their equilibrium price level.

Check Your Progress 1

1) What do you understand by the term factor pricing? What are factor markets?

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2) Is demand for capital a derived demand? Explain the concept of interdependent demand also.

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3) How is the equilibrium determined in factor markets?

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5.4 FACTOR PRICING BY MARGINAL PRODUCTIVITY THEORY

So far you have studied that households provide the different factors of production used in the production process and how their demand and supplies are determined. You may be curious to understand that how owners of factors of production get paid for the factors they provide. For understanding this process, it is important to understand marginal productivity theory of income distribution.

The theory of marginal productivity of income distribution analyses the way the national income gets distributed among the different factors. The theory says that returns to a factor are directly determined by their marginal product of that factor. This occurs due to the competition among numerous landowners, labourers and capital-owners. Another fundamental point about the distribution theory is that the demands for various factors of production are derived from the revenues that each factor yields on its marginal product. The profit maximising firms would choose factor combinations according to their marginal revenue products.

5.5 DETERMINATION OF RETURNS TO A FACTOR

A) RENT

Land is such a factor of production whose total supply is fixed. The demand for land is also a derived demand. Suppose a particular piece of land is being used

to grow soyabean. If the demand for soyabean increases in the market, the demand for land for growing soyabeans would also increase. However as supply of land is fixed, an increase in the demand for land would increase the rental rate of land.

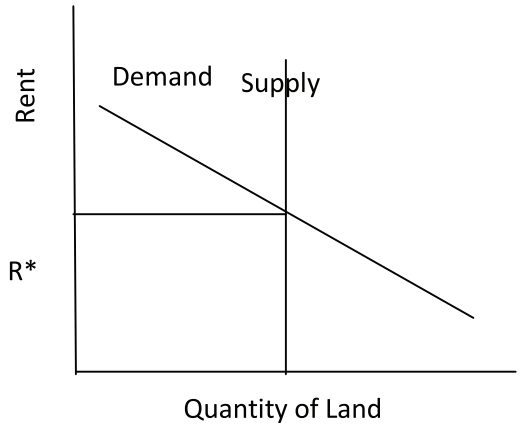

Fig. 5.5: Equilibrium in Land market

As per the Fig. 5.5, R* is the equilibrium rental rate of land which has been determined by the interactions between demand and supply of land. The various theories of rent have been provided in Unit 7.

B) WAGES

Wages are the price of labour supplied. In competitive markets wages are equal to the marginal product of labour. Wages are in equilibrium when the downward sloping labour demand curve crosses the upward sloping labour supply curve. When due to an external shock, there is lower demand for the product of the industry, then there is a fall in the price of product. Due to this, the value of marginal product of labour (VMP) would also fall resulting into lower wages for the labour. Conversely, a surge in the demand for product of an industry would raise the prices. This, in turn, would increase the value of marginal product of labour leading to a rise in wages. This mechanism has been explained in the Fig. 5.6.

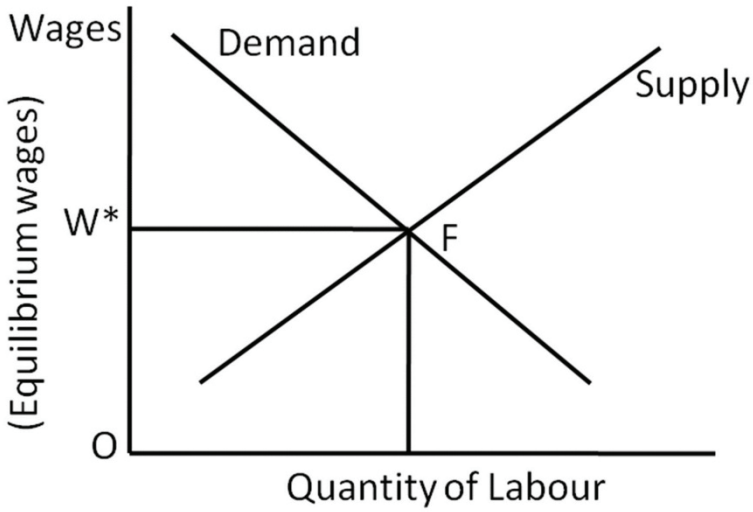

Fig. 5.6: Equilibrium in Labour Market

The determination of wage rates is however different in case of perfectly competitive and imperfectly competitive markets as you would see in Unit 6.

C) INTEREST

Capital is a factor of production made by human beings. The cost of using capital services is known as the rental rate for capital and the returns to the owners of capital is known as interest. Interest is a reward for the services of capital. Rental rate of capital is the opportunity cost of holding capital. Unlike labour, capital goods can be bought and sold and have an asset price. Buying a car for Rs.10 lakh entitles one to use it for a number of transport services in future directly or by renting it to someone. The price of an asset is the sum for which the capital asset can be purchased outright. The required rental rate of capital depend on three things: the price of capital good, the real interest rate and the depreciation rate. The price of capital good depends on the interactions between demand and supply of capital goods. In general, the price of capital assets and services is higher when the anticipated rental stream is higher or the interest rate is lower. Both of these raise the present value of the future rental streams of capital. The real interest rate depends on the prevailing rate of inflation and the nominal interest rate. The difference between the nominal rate of interest and the rate of inflation is known as real interest rate. Depreciation depends largely on technology and also on how fast the machine wears out with usage and time.

Theories of Interest

There are a number of theories, which seek to determine the rate of interest. These theories try to explain the phenomenon of interest in terms of different set of variables.

i) Loanable Funds Theory

This theory relies on demand for borrowings and supply of loanable funds to determine the rate at which transaction will take place. It assumes that at any moment of time there will be some people who would spend less then their current income (savers) and others who plan to spend more than their income. The former will constitute the supplies of loanable funds while the latter constitutes the group which demands such funds. The rate at which demand for funds equals supply of funds will be the rate of interest. Such a situation is depicted in Fig 5.7.

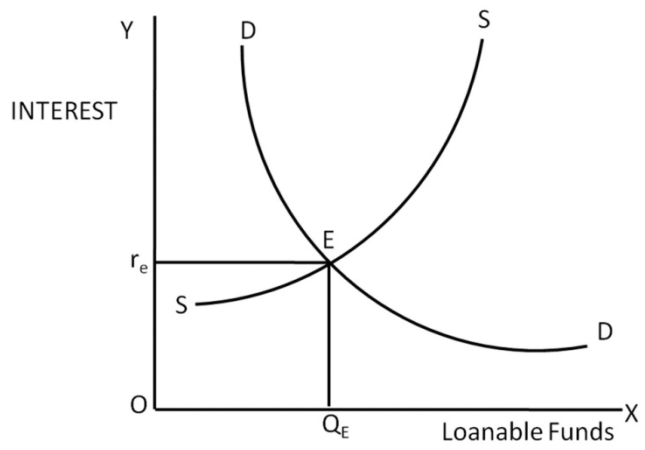

Fig. 5.7

Fig. 5.7 Presents a simple demand and supply curve diagram you are so familiar by now. The curve DD is demand curve for the funds. This shows

amounts the borrowers would like to borrow at different rates of interest. Likewise, the amounts all the savers in the society are willing to save and lend are shown by supply curve marked SS. The intersection of these two at point E gives us equilibrium rate of interest r_e and the quantity Q_E that will be borrowed and lent at that rate.

At r_e rate of interest, Q_E quantity of funds is borrowed (and lent). Note that demand for funds may arise on account of any three of the following:

a) Investment demand, b) consumption demand and c) financial demand. It is more likely to be a composite of all the three demands.

Similarly, we can say that supply of funds may arise from net savings, de-hoarding of past savings and also from new creation of money.

ii) **Liquidity-Preference Theory**

Keynes had developed this approach and he related demand for money and rate of interest to aggregate level of income in the society. In his formulation demand for liquid money would depend on transaction, precaution or speculation, given the level of income. But supply of money was policy determined variable. The rate of interest was thus determined by interaction of a demand function with a given supply of money. However, in his approach, the rate of interest has nothing to do with determination of rate of remuneration of factor of production.

iii) **Time Preference Approach**

Irving Fisher developed this approach. His idea was that consumer tries to compare present consumption and future consumption. The rate at which future consumption can substitute for present consumption (and vice-versa) will be marginal rate of substitution between present and future consumption. This is called the rate of time preference. It shall be equal to slope of indifference curve between present and future consumption.

D) PROFITS

We regard entrepreneurship to be the fourth economic factor of production. Recall that an entrepreneur brings together land, labour and capital and thus facilitates production. Her role in production is clear. If other factors of production are not brought together, there may not be any production at all. In capitalist system, the possibility of profit becomes key determinant of whether an activity will be undertaken or not. Even under various non-capitalistic forms of organisation, profit may serve as a benchmark for efficiency of firm or efficiency of some innovation or technological change. Thus, in all situations, if a firm is making larger profit compared to some other similarly placed firm, it must be more efficient or must be using either better resources or better techniques. But decision like introduction of better techniques involves some risk as well. Hence, often attempts are made to relate profit to elements of uncertainty and risk. To understand her role, we can divide entrepreneurial functions into two parts:

a) Organisation and

b) Risk bearing

a) **Organisation:** This consists of routine day-to-day activities associated with a business organisation and is called management. We find that these days, most companies are being managed by professional

managers, who receive salaries and other benefits. Such an arrangement places a part of entrepreneurship at par with labour.

b) **Risk Bearing:** Every business activity runs some risk of failure in the market. This arises because of uncertainty of marketplace, natural causes, political factors etc. If a business fails, the entrepreneur looses substantial parts of investment. Thus, risk of loss is always present. However, some activities like introducing a new product, using a new technology etc., involve much greater risks and reward for these activities must be higher. Otherwise, these would not be undertaken. Hence it is said that profits are reward for risk bearing.

1) **Accounting Profits and Economic Profits**

An account defines the profit as the difference between total revenue earned during the year and cost (including depreciation) incurred during the same period. The cost comprises payments for raw materials, fuels/energy, wages and salaries, rents, insurance and interests. The depreciation is provided for taking care of wear and tear of capital stock. So the net surplus earned during the year, after meeting the above costs, is called profit by the accountant.

However, such calculations do not seem to account for some implicit costs. Take for example the remuneration to the person when she is actually working for her business. Similarly, companies accumulate some funds of their own in course of time. Should interest of those funds be also calculated and added to the cost? Economic profit will take into account this kind of implicit cost as well. So economic profit will be less than accounting profit by the amount of such implicit costs.

2) **Theories of Profits**

Economists have, over the years, developed several theories regarding profits. For example, Joseph Schumpeter attributed profits to innovation. But Frank Knight associated them with uncertainty.

a) **Profits as Rewards for Innovation**

Schumpeter regards profit a phenomenon, which is related to a dynamic economy only. He identifies five types of changes that lead to economic development or make the society dynamic. These changes are:

i) Introduction of new products

ii) Introduction of new methods of production

iii) Discovery of new raw materials

iv) Discovery of new markets

v) Introduction of new forms of organisation

Innovations are actual application of some new body of knowledge to real business situation. An innovator need not be an inventor. But she uses some invention to change her production function or the relationship between inputs and outputs. Such innovation might be in form of new technique of production, may involve reaching out to new markets, involving all the activities pertaining to marketing etc.

Schumpeter is of the opinion that one who innovates is able to earn more profits, and thus gets more incentive to innovate further. She will soon attract

followers or imitators. These people, very soon catch up with original innovator. As a consequence, she makes more efforts to stay ahead. Thus, innovation leads to profits and profits make it possible to innovate (acting as incentive).

b) **Uncertainty and Profit**

Frank Knight defined profit as the difference between selling price and costs. In such situation profit emerges as a residual. Selling price and costs depend on a host of factors. Some of those can be covered by 'risk'. Such risks can be anticipated and provisions can be incorporated into the cost structure. Most of predictable risks are 'insurable' as well. Hence, company can get an appropriate insurance policy to cover such risks. The premium paid for such policy is included in cost of production. This type of risk condition is completely predictable and discountable. Hence it would be as good or as bad as production under perfect certainty.

But Knight points to another dimension of uncertainty and says that producer is all the time anticipating consumer's wants and preferences in advance. She must do so, as she has to produce things that can satisfy those swans at a point of time in future. This essentially happens because of time lag involved between anticipation of demand, production and offering goods to consumer. To some extent, future results of her operations to produce things to satisfy that demand are also uncertain. Further, even the manager doing routine organisation work is liable to make error of judgement. Here, she bears uncertainty and risk in the sense of having to protect factors of production against fluctuation in their income from an uncertain market. Thus, the income of entrepreneurs consists of two components, a salary or wage component, which is contractual in nature and another residual income that may fluctuate in response to change in market place. Some economists prefer to call only this second component as 'profit'.

Thus, we find that one significant difference between other factor incomes and profit. Whereas wage, rent interest are all payments, which have been agreed to and settled in advance, profits cannot be put on a similar footing. Uncertainty leads to fluctuation in both costs and revenue. They may not balance. Thus, ultimately profits are the 'surplus' that remain after meting the entire contractual payment obligation.

c) **Profits and Market Structure**

Some economists insist that profit as one generally understood is essentially a result of market imperfections. If perfect competition prevailed, every producer will use same technology, will have perfect knowledge about product, cost and market condition. Such a scenario leads to cost minimisation for all the production. They sell at going market price. All the cost and revenue determinants are perfectly certain. Hence, entrepreneurship is just organisation or day-to-day supervision only. So, profits should drop down to bare minimum or 'normal' compensation for supervision etc.

However, if market is not perfect, firm can determine quantities or prices in such a manner that suits it best. It may involve breaching the condition of perfect information. Firms may devise some innovation and keep it a secret from others. So long as that secret is maintained, the concerned firm continues to earn more than others do.

A.P. Lerner tried to measure the effect of monopoly power over profit. We

know that equilibrium condition for a firm is equality between marginal cost and marginal revenue. When competition is perfect, price (average revenue) is also equal to marginal revenue. Prices tend to deviate from marginal revenue only when competition is no longer perfect. Hence, the difference between price and marginal revenue, that is, P – MR (or P – MC) will indicate firms control over market. It is expressed as a fraction of price. Thus, the degree of monopoly is (P – MC)/P. Higher this ratio, higher will be the rate of profits earned by a firm.

5.6 ROLE OF FACTOR PRICES IN PRICING DECISION OF THE FIRM

Several factors play a role in the decision making of a firm regarding production of goods and services. The intrinsic factors are cost of production, marketing, product differentiation and objectives of the firm. These factors directly shape the production process of the firm. A firm needs to decide its cost of production which is dependent on the availability and cost of factors of production. A firm also needs to differentiate its product from similar products to increase its demand. The quantity of output to be produced depends on the objectives of the firm. If the objective is to maximise profits, only that much output would be produced where the cost of production is less than the price. Similarly a firm needs to decide its marketing strategy and the expenditure for it. The extrinsic factors are demand, competition, suppliers and economic conditions.

How can a change in factor prices affect the pricing decisions of the firm? Suppose due to a government regulation, there is a rise in minimum wage rates of construction labourers. As wages are an essential part of cost of production of any industry, rise in the minimum wage rate leads to a rise in the cost of production of a real estate firm. In this case, the firm has two alternatives. Either the firm can continue to use the services of the same number of construction labourers and absorb the rise in cost of production or try to substitute some amount of capital for labour. For e.g. in place of using services of 10 labourers to lift the load of cement, the firm may buy a trolley with wheels which may be dragged by 2 labourers. Thus change in the prices of factors of production can alter the pricing decisions as well as production decisions of the firms.

Check Your Progress 2

1) What is theory of marginal productivity? How does it explain the process of determination of factor prices?

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2) Distinguish between interest and profits as rewards of factors of production.

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3) Explain loanable fund theory in 50 words.

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4) What are the main functions of entrepreneur?

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5.7 LET US SUM UP

This unit introduces the concept of factor markets by discussing the meaning and need for factors of production in an economy. There are four factors of production in an economy namely land, labour, capital and entrepreneur. These factors of production are required in the production of goods and services. As demand for factors of production is linked to the demand for goods and services, their demand is derived demand. Moreover more than one factor of production is used in the production process and so their demand is interlinked and interdependent. This interdependency between product and factor markets results into interactions between demand and supply of goods and services. Each factor of production is paid its return for its contribution in the process of production. The returns to land are called rent and it is the price paid for the use of land which is fixed in supply in the short run as well as in long run. The returns to labour are known as wages and both rent and wages are determined through the interaction between demand and supply. Interest is the return to capital. The theories determined the rate of interest are: Loanable fund theory, liquidity – Preference theory, and time Preference approach. Profits are the returns to entrepreneurs for their organisation and management skills used in conducting the production process. Several theories have been developed regarding profits.

5.8 REFERENCES

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2) Lipsey. R.G., *An Introduction to Positive Economics*. (6th edition), E.L.B.S and Weidenfeld and Nicolson: London.

3) Varian, Hal (1999), *Intermediate Microeconomics*, W.W Norton &Co, New York, Chapter 26, page no. 456-466.

4) Robert H Frank and Ben S Bernanke, *Principles of Economics*, Chapter 14 and 21, Third Edition, Tata-McGraw Hill, Indian Reprint.

5.9 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) Read Section 5.1 and 5.2 and answer.
2) Read Section 5.3 and answer.
3) Read Section 5.3 and answer.

Check Your Progress 2

1) Read Section 5.4 and 5.5 and answer.
2) Read Section 5.5 and answer.
3) Read Section 5.5 (Interest) and answer.
4) Read Section 5.5 (Profit) and answer.

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THE PEOPLE'S
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UNIT 6 LABOUR MARKET

Structure

6.0 Objectives

6.1 Introduction

6.2 Meaning of Labour Markets

6.3 Labour Market: Different Market Structures

6.3.1 Perfect Competition

6.3.2 Imperfect Competition

6.4 Labour Market Policies

6.4.1 Minimum Wage Laws

6.4.2 Role of Labour Unions

6.5 Why Wages Differ?

6.6 Let Us Sum Up

6.7 References

6.8 Answers or Hints to Check Your Progress Exercises

6.0 OBJECTIVES

You have already studied the basics of factor markets in the Unit 5. This unit discusses in detail the characteristics of and price mechanism in labour market as labour differs significantly from the other factors of production. Households supply labour and are paid wages in return of their services. Labour is inseparable from a labourer and this characteristic distinguishes labour market from land and capital markets. After going through this unit, you will be able to:

- state the meaning of labour markets;
- explain the demand and supply mechanisms in perfectly competitive labour markets;
- analyse demand and supply mechanisms in imperfectly competitive labour markets;
- discuss the policies in labour markets; and
- identify the reasons behind variations in wage rates.

6.1 INTRODUCTION

The decisions that people make about work determine the economy's supply of labour. Their decisions about savings determine the economy's supply of funds in the capital market. Economists use the basic model of choice to help understand the patterns of labour supply. The choice of work is a choice between consumption and leisure. Holding technology and other inputs constant, there exists a direct relationship between the quantity of labour inputs and the amount of output. The law of variable proportions states that after a certain level, each additional unit of labour input will add a smaller and smaller

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amount to the total output. Thus, there are diminishing returns to labour. This unit aims at analysing the meaning and mechanism of labour markets by undertaking a demand-supply analysis of a labour market in both perfectly competitive and imperfectly competitive market structures.

There are government interventions, labour market policies, labour rights and labour laws in an economy. This unit has looked into the implications of the presence of minimum wage laws and labour unions in detail. The last section of the unit looks into the reasons leading to variation in wage-rates across professions. A deeper understanding of labour markets would help you to understand how labour as a resource functions in an economy.

6.2 MEANING OF LABOUR MARKETS

In order to understand the meaning of labour markets, one needs to understand who are the demanders and suppliers in the labour market. Firms and other employers demand labour to produce goods and services. Households supply their labour services and in return, get wages. The labour market is studied by microeconomists as well as macroeconomists as both use the tools of demand and supply. The labour market refers to the supply and demand for labour, in which employees provide the supply and employers the demand. It is a major component of any economy, and is intricately tied in with markets for capital, goods and services. At the macroeconomic level, supply and demand are influenced by domestic and international market dynamics, as well as factors such as immigration, the age of the population, and education levels. Commonly used measures in labour markets are unemployment rate, labour productivity, labour intensity, participation rates and total wage income as a percentage of GDP. Wages represent the price of labour, which provide an income to households and represent a cost to firms. In a hypothetical free market economy, wages are determined by the unregulated interaction of demand and supply. However, in real mixed economies, governments and trade unions can exert an influence on wage levels. At the microeconomic level, individual firms interact with employees, hiring them, firing them, and raising or cutting wages and hours of work. The interaction between supply and demand influences the hours the employees work and compensation they receive in form of wages, salary and other benefits.

6.3 LABOUR MARKET: DIFFERENT MARKET STRUCURES

As labour is generally demanded for producing goods and services, the demand for it would depend on the structure of the market for goods and services too. We would study it under two major heads:

- Perfectly competitive market
- Imperfectly competitive market

6.3.1 Perfect Competition

DEMAND FOR LABOUR

We begin the discussion by analysing what determines the number of workers the employers would like to hire at any given wage rate. Demand for labour depends on both productivity of labour and the price that market sets for

worker's output. The more productive the workers are, the more is the value of the goods and services produced by them and the greater the number of workers an employer wants to hire at the given wage-rate. Table 6.1 shows the relationship between output and the number of workers employed in a computer hardware company. Column 1 shows the possible number of workers that may be employed by the company and Column 2 shows the output produced depending on the number of workers hired. Column 3 shows the marginal product of labour which is the additional production due to addition of one more worker. As discussed earlier, as more and more workers are hired by an organisation, beyond a certain limit there are decreasing returns to labour. The law of diminishing returns to labour states that if the quantities of capital and other inputs are held constant, then the greater the quantity of labour employed, lesser would be their marginal contributions to production. This can be observed in Column 3 which depicts marginal product of labour. Column 4 shows the value of marginal product at each level of employment. The value of marginal product of labour is the amount of extra revenue that an additional worker generates for the firm. Specifically, the value of the marginal product of workers is workers' marginal product multiplied by the price of output. Here the price of output is taken as Rs. 20,000 per unit. Monthly wage rate of computer hardware workers in the market is Rs. 20,000/-.

Table 6.1 : Relationship between output and number of workers

Number of Workers	Computers Produced per Year	Marginal Product	Value of Marginal Product (In Rs)
(1)	(2)	(3)	(4)
0	0	-	-
1	15	15	15 × 20,000 = 3,00,000
2	28	13	13 × 20,000 = 2,60,000
3	39	11	11 × 20,000 = 2,20,000
4	47	8	8 × 20,000 = 1,60,000
5	52	5	5 × 20,000 = 1,00,000
6	55	3	3 × 20,000 = 60,000
7	57	2	2 × 20,000 = 40,000
8	57	0	0 × 20,000 = 00

The company would hire an extra worker if and only if the value of his marginal product is at least as great as the wage payable to him. In our example above, the second worker's marginal product is 13 computers during the year. These are valued at Rs. 2,60,000/- but, at the rate of Rs. 20,000 per month, this worker gets only Rs. 2,40,000/- as wages during the year. Thus, the company clearly earns Rs. 2,60,000 – Rs. 2,40,000 = 20,000/- as a surplus on giving employment to this worker. The company will not employ the 3rd worker, his marginal product will be valued at Rs. 2,20,000/- only, which is Rs. 20,000/- less than the wage payment necessary to employ him.

Suppose market wage rate drops down to Rs. 15000/- per month. There will be a change in employment decision of the company. Every worker will not receive Rs. 1,80,000/- per annum. We can read from Column 4 of the Table 6.1 that marginal product of the third worker is valued at Rs. 2,20,000/- and this exceeds annual wage payment to him by Rs. 40,000/-. The company will definetly employ this person as his employment adds to the surplus. However, the fourth person will still not be considered 'employable' by the company as his marginal product (Rs. 1,60,000/-) will be less than his wage bill (Rs. 1,80,000/-).

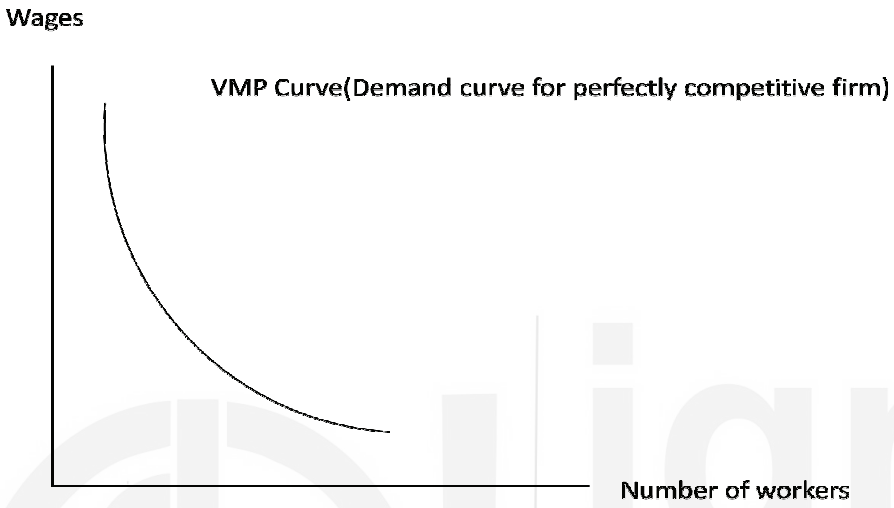

Fig. 6.1: Demand curve of labour

FACTORS AFFECTING DEMAND FOR LABOUR

The number of workers the company hires at any given real wage rate depends on the value of their marginal product. Changes in the economy that increase the value of workers' marginal product will increase the value of extra workers to the company and would thus affect the demand for labour at any given real wage. This implies that any factor which raises the value of the marginal product of the company's workers will also shift the company's labour demand curve to the right. In short, the two factors which directly affect and increase labour demand are:

a) An increase in the price of company's output

b) An increase in the labour productivity of company's workers

This can be easily shown using the above example (Table 6.2). Suppose the price of output increases from Rs. 20,000 per unit to Rs. 30,000 per unit. The value of marginal product of labour would change in accordance to the price change and will also change the number of workers to be hired by the company if the ongoing wage rate remains the same.

Table 6.2 : Value of Marginal Product and Firm's decision to Hire

Number of Workers	Computers Produced per Year	Marginal Product	Value of Marginal Product (In Rs)
0	0		
1	15	15	450000

2	28	13	390000
3	39	11	330000
4	47	8	240000
5	52	5	150000
6	55	3	90000
7	57	2	60000
8	57	0	0

Here, if market wage rate remains Rs. 20,000/- per month the 4th worker is also hired- as value of his marginal product (Rs. 2,40,000/-) equals the wage payable to him during the year (Rs. 2,40,000/-). But hiring the 5th worker will not be in the company's interest – he would add only Rs. 1,50,000/- to the total revenue, but claim Rs. 2,40,000/- as wages.

The next possibility is rise in labour productivity. We are showing it in Table 6.3. The wage rate is retained at Rs. 20,000/- per month and the market price of computers is assumed to be Rs. 20,000/- as in Table 6.1.

Table 6.3 : Improvement in labour productivity and Demand for labour

Number of Workers	Computers Produced per Year	Marginal Product	Value of Marginal Product
0	0		
1	25	25	5,00,000
2	48	23	4,60,000
3	68	20	4,00,000
4	84	16	3,20,000
5	96	12	2,40,000
6	105	9	1,80,000
7	112	7	1,40,000
8	115	3	60,000

The Table 6.3 shows that workers are able to produce more computers at every level of employment. Now, the value of 5th worker's marginal product will be just equal to his wage claim. The company can consider employing him as well.

We can, now say, in the light of our examples in Tables 6.1 to 6.3 that:

i) if the wage rate declines, employment increases;

ii) if the price of output rises, employment increases; and

iii) if the productivity of labour increases, employment increase, given the market price of the product, value of the marginal product of labour rises.

SUPPLY OF LABOUR

Economists use the basic model of choice to help understand patterns of labour supply. The decision about how much labour to supply is a choice between

consumption and leisure. Leisure implies the time available to a person when not working. By giving up leisure, a person receives additional income and this enables him/her to increase consumption. On the other hand, by working less and giving up some consumption, a person enjoys more leisure.

The suppliers of labour are workers and potential workers. At any given real wage, potential suppliers of labour must decide if they are willing to work. The total number of people who are willing to work at each real wage is the supply of labour. The minimum payment or the reservation price which one sets for labour is the compensation level that leaves one indifferent between working and not working. In economic terms, deciding whether to work at any given wage depends on the cost-benefit principle. The willingness to supply labour is greater when the wage rate is higher. This results into the upward slope of supply curve upto a point and then bends backward supply curve.

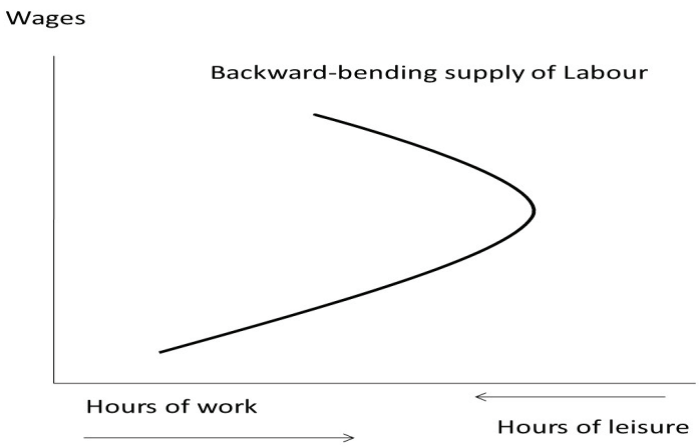

Fig. 6.2 : Supply curve of labour

The backward-bending shape of labour supply curve results from the fact higher wage rates create disincentive for longer hours of work. Why? This is so because longer working hours imply less leisure hours. As the wage rate increases, the individual's income rises enabling workers to have access to more leisure activities. So beyond a certain level of the wage rate, the supply of labour decreases as the worker prefers to use his income on more leisure activities.

FACTORS AFFECTING SUPPLY OF LABOUR

Any factor that affects the quantity of labour offered at a given real wage will shift the labour supply curve. At the macroeconomic level, the most important factor affecting the supply of labour is the size of the working-age population which is influenced by factors such as the domestic birth rate, immigration and emigration rates, and the ages at which people normally enter the workforce and retire.

Check Your Progress 1

1) State the features of a labour market?

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2) Derive the demand for labour in a competitive market. How is Value of Marginal product and Marginal revenue product curve relevant in the derivation of labour demand?

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3) What is the slope of supply curve of labour in perfectly competitive markets? Comment on its shape.

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6.3.2 Imperfect Competition

Demand for Labour

The firms in this market can sell larger output only if they are willing to accept a lower price. The demand curve facing a typical firm will be downwards sloping. Employment of an additional worker leads to rise in output which can be sold at a lower price only. The firm has to compare its rise in cost which change in revenue because of increase in output on account of hiring of one more worker.

Consider demand schedule for a product faced by monopolistically competing firm. It is presented in Table 6.4.

Table 6.4 : Demand schedule of product by a Monopolistic Firm

Price	Quantity Demanded	Total Revenue	Marginal Revenue
10	1	10	10
9	2	18	8
8	3	24	6
7	4	28	4
6	5	30	2
5	6	30	0
4	7	28	-2
3	8	24	-4
2	9	18	-6

Since MR is falling at a rate faster than AR = Price, MRP = MR × MP will decline at a rate faster than the rate of decline of VMP = Price × MP.

Thus, we get two curves: VMP & MRP, which are depicted in Fig. 6.3.

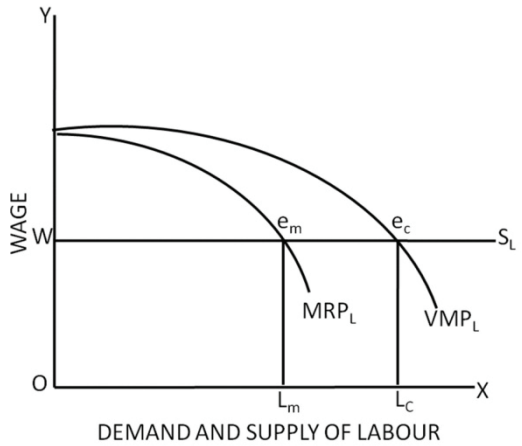


Fig. 6.3

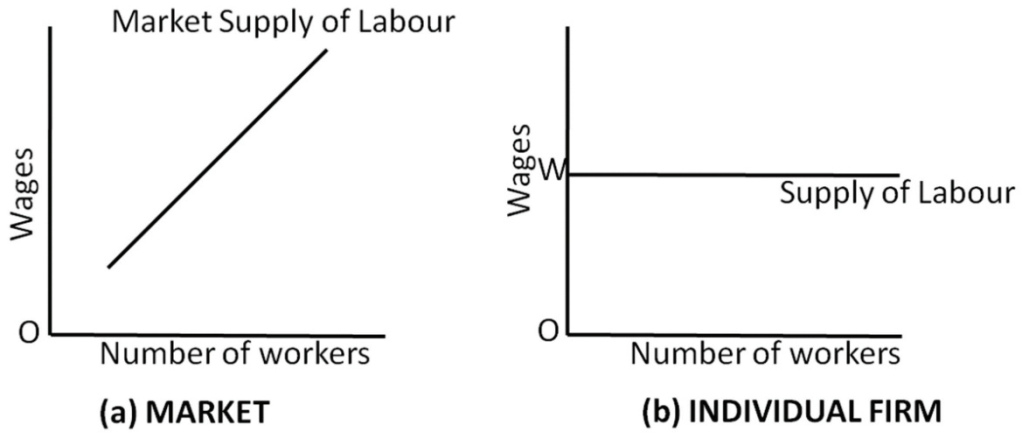
Under the competitive conditions of the labour market, any firm can hire as many workers as it deems necessary at the going market wage rate. Therefore, the supply curve of labour for the firm will be horizontal. It is depicted by its. Line WS_L.

VMP can be regarded as demand curve for labour for a firm which is operating in competitive, than its demand for labour is represented by MRP_L.

Now compare the two situations. The wage rate paid by both firms remains same, OW- But a competitive firm will employ OL_C number of workers while a monopolistic firm will stop at OL_m. This latter firm hires fewer workers. It shall produce smaller output even when size of plant and state of technology was one used by competitive firm.

SUPPLY OF LABOUR

The supply of labour is not affected by the fact that firms have monopolistic power. Market supply of labour is the summation of the supply curves of individual households. Supply curve that an individual firm faces is however perfectly elastic and that of the market is positively sloped at the given wage rate.



(a) Market **(b) Individual firm**

Fig. 6.4: Supply curve of labour

EQUILIBRIUM

The market price of the factor is determined by the intersection of the market demand and the market supply. An important difference in this case is that the

market demand is based on the MRP and not on the VMP. This means that when the firms have monopolistic power in goods market, the labour is paid its MRP which is smaller than the VMP. So the workers are paid less than case of perfect competition where MRP was equal to VMP.

Check Your Progress 2

1) Distinguish the demand for labour in perfectly competitive and imperfectly competitive markets.

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2) Draw and explain the supply curve of labour of an imperfectly competitive firm.

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3) How is equilibrium achieved in an imperfectly competitive market? How is it different from equilibrium under perfectly competitive markets?

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6.4 LABOUR MARKET POLICIES

Labour markets are segmented and are of different types.

6.4.1 Minimum Wage Laws

Minimum wage laws prescribe a wage rate which the employers must pay to their workers. Minimum wages are most useful to the low-skilled workers. The mechanism of minimum wage and its effects can be understood using a diagram.

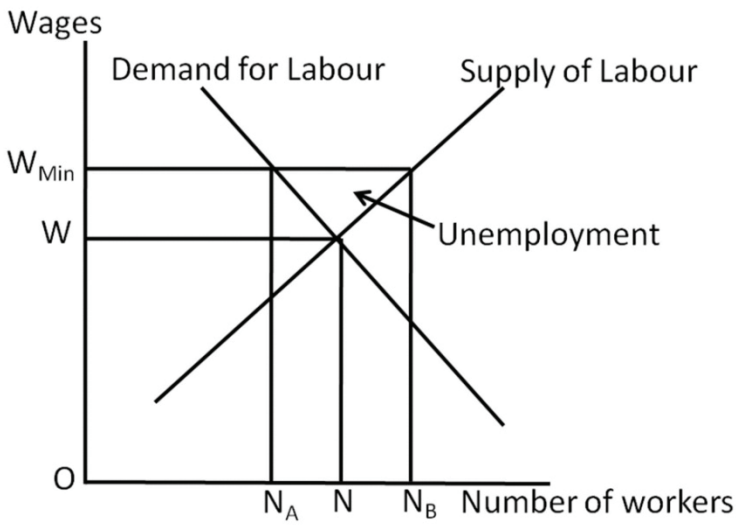

Fig. 6.5: Implications of Minimum wage laws on labour market

You may observe that W is the market-clearing wage at which the quantity of

labour demanded equals the quantity of labour supplied and the corresponding level of employment of low-skilled workers is N. Suppose there is a legal minimum wage W_{min} that exceeds the market-clearing wage W. At the minimum wage, the number of people who want jobs N_b exceeds the number of workers that employers are willing to hire. This results into unemployment.

6.4.2 Role of Labour Unions

Labour unions are organisations that negotiate with employers on behalf of workers. Among the issues that unions negotiate are the wages workers earn, rules for hiring and firing, duties of different types of workers, work hours and working conditions, procedures for resolving disputes between workers and employers. Unions gain negotiating power by their power to call a strike i.e. to refuse to work until an agreement is reached. Demand for higher wages by the union comes with its own costs and benefits. The effect of a high union wage would be similar to minimum wage. Higher union wage would enable union members and staff to enjoy higher salaries at the cost of other workers who are unemployed as a result of artificially higher union wage rate. Critics are of the view that although labour unions are important to safeguard the conditions of work and workers, yet in today's times firms having them are finding difficult to compete with their counterparts that have no unions as the former has artificially higher wages and thus higher costs.

6.5 WHY WAGES DIFFER?

This section deals with the fundamental question asked in labour economics that what makes people earn different wages. Why wage rates of doctors are higher than the wage rates of medical assistants? Why wage-rates of actuaries are higher than the wage-rates of fire-fighters? Is it the skill or the background or the age that brings about differential in wages of different workers? The answer is none of these. Differential wages are a result of the difference in demand-supply of jobs available. There are several possibilities to the differential existence of jobs. It is possible that workers currently employed as clerks may prefer their jobs despite the difference in their salaries as they do not want to become an engineer. Even acquiring skills of an engineer may have a significant cost. Wages for engineers may not be sufficiently high to compensate clerks for the training costs they would have to bear to become engineers. Moreover even if there were no training costs, clerks may not have the aptitude for science and mathematics necessary to work as engineers. Thus, training costs as well as differences in worker's abilities and preferences for particular jobs can lead to differences in equilibrium wage rates among persons and jobs; there is no tendency toward adjustments that would wipe out wage differentials due to such factors. Let us discuss such factors affecting wage differentials in some detail:

1) **Compensating wage differentials:** Many a times workers themselves make a decision to remain in a certain job even though they may be qualified for a higher pay package in a different job. For e.g., an experienced researcher in a university may be offered a job profile requiring him to work on some country project with a high package but may not choose to accept it as it may result into less time and freedom for his independent research.

   When workers view some jobs as intrinsically more attractive than others, the forces of supply and demand produce differences in the wages

paid. These differences are called 'compensating wages differentials' because the less attractive jobs must pay more to equalise real advantages of employment across jobs. For e.g., a certain person's abilities are identical to fit him in a teaching job or as a consultant in an MNC. At equal wages, he would prefer to be a teacher rather than consultant as the number of working hours of teacher is less than that of a consultant. So only if the wage rate of a consultant is 20 per cent higher than that of a teacher, then would the person shift from a teaching job to a consultancy job. Difference in money wages are necessary to equate the quantity of labour supplied and demanded in different occupations when the non-monetary attractiveness of jobs differs.

2) **Differences in human capital Investment:** Our ability to perform useful services can be augmented by training, education and experience. People can become more productive workers and more productive workers receive higher wage rates. This process through which workers augment their earning capacity is sometimes called human capital investment. Such jobs tend to pay higher wages. The reason is simple: if the wages were not higher, a few people would be willing to incur the training costs. The higher wages associated with highly skilled work are, in part, the returns on past investments in human capital.

3) **Differences in ability:** Worker's productive capacities depend not only on their training and experience (human capital investment) but also on certain inherited traits. The relative importance of these two factors is greatly disputed. For years people have debated whether genetic or environmental factors are more important in explaining IQs. Similarly possessing abilities that are scarce is no guarantee to a higher wage. What matters is the supply of persons with abilities required to perform certain jobs relative to the demand for their services.

Check Your Progress 3

1) What is the minimum wage? Does it influence the level of employment at firm's level?

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2) How does labour Unions in an economy influence the wage rate and level of employment?

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3) Why do you find variations in the wage-rates across different professions? Give reasons as to why a professor is paid higher salary than a school teacher?

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6.6 LET US SUM UP

The unit has dealt in some detail with the working of labour markets in an economy. The first part introduces the meaning of labour markets and explains how wages are returns to the services rendered by a labourer. In the second part, perfectly competitive and imperfectly competitive market structures have been discussed. The first sub section explains the determination of demand and supply curves of labour in the perfectly competitive markets. It shows how intersection of value of marginal product curve or marginal revenue product curve with the supply curve determines the equilibrium in this market structure. The second sub-section distinguishes demand, supply and equilibrium mechanisms of the imperfectly competitive markets by discussing the special case of a monopoly. As price and marginal revenue are different in case of monopoly, the determination of equilibrium wages and number of workers hired by a firm entirely depends on the intersection of the marginal product curve with the supply curve of the labour. The next section discusses the prominent labour market policies implemented for the welfare of workers across the world. Minimum wages are the minimum wages that need to be paid to labour for use of his/her services. Labour unions provide collective bargaining powers to workers of a firm and can bring about improvements in work conditions of workers.

The last section of the unit discusses about the most interesting debate in labour economics that why wages differ across different professions across the world. This section explains the various factors that lead to variations in the wage-rates of workers which includes compensating wages, human capital investment and differences in skill of workers. Yet relative scarcity of supply of a particular skill compared to the demand for the same remains critical determinant of its higher price.

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6.8 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) Read Section 6.2 and answer.

2) Read Section 6.3 and answer.

3) Read Section 6.3 and answer.

Check Your Progress 2

1) Read Sub-section 6.3.2 and answer.

2) Read Sub-section 6.3.2 and answer.

3) Read Sub-section 6.3.2 and answer.

Check Your Progress 3

1) Read Sub-section 6.4.1 and answer.

2) Read Sub-section 6.4.2 and answer.

3) Read Sub-section 6.5 and answer.

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UNIT 7 LAND MARKET

Structure

7.0 Objectives

7.1 Introduction

7.2 Rent as Return to Land Use

7.3 Effects of Tax on Land

7.4 Theories of Rent

7.4.1 Ricardian Theory of Rent

7.4.2 Marshall's Theory of Rent

7.4.3 Modern Theory of Rent

7.5 Let Us Sum Up

7.6 References

7.7 Answers or Hints to Check Your Progress Exercises

7.0 OBJECTIVES

After learning in detail about the factor markets and labour markets in Unit 5 and 6, here you will able to know the functioning of land markets. Land markets are very important in an economy as land is fixed in supply and so land markets are vulnerable to frequent changes in demand and price. Legally, the ownership of land consists of a bundle of rights and obligations such as rights to occupy, to cultivate, to deny access, to build, etc. It is a very crucial factor of production for any business. An unusual feature of land is that its fixed quantity (supply) is unresponsive to changes in prices. This is so because in general the supply curve of any factor of production is upward sloping implying that a rise in price causes rise in supply of that factor of production. However, this does not happen in the case of land markets as its supply is fixed. A detailed reading of this unit would enable you to:

- state the meaning of land markets;
- appreciate how rent can be viewed as a return to land;
- explain what would happen if there is tax on land; and
- discuss the theories of rent.

7.1 INRODUCTION

In common language, the term 'rent' is often used for contractual payment for use of an asset such as a house, shop, vehicle, machine, etc. However economists have traditionally used the term only for land. In fact, the term has its origin in feudal societies, where most of land was owned by landlords or zamindars. They used to charge some payment from the farmers who cultivated these plots of land. Rent is that payment which is given for productive use of soil. There is also another important difference in the

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terminology of rent and that is between land rent and land value. While land rent refers to the price for using one unit of land for a certain period of time, land value refers to the price for buying one unit of land at a point of time.

7.2 RENT AS RETURN TO LAND USE

The price of a fixed factor is generally known as rent or pure economic rent. Economists apply the term 'rent' not only to land but to any factor of production which is fixed in supply. The supply curve of land is completely inelastic i.e. vertical as its supply is fixed. The demand curve for land is downward sloping. Equilibrium is attained when the demand and supply curves intersect each other. The point of equilibrium gives the rent of land. Equilibrium is a stable equilibrium. If rent were above the equilibrium, amount of land demanded by all firms would be less than the fixed supply. Some landowners would be unable to rent their land and would have to offer their land for less and thus bid down the rent. Similarly rent could no longer remain below equilibrium. Only at a competitive price where the total amount of land demanded is equal to the total amount of land supplied, the market will be in equilibrium.

Land is 'a' factor of production which comprises free gifts of the nature to mankind. It includes, besides the surface, all the mineral, forests, water streams etc. So, some of the statements we make about non-responsiveness of supply of land to price changes will gave limited applicability to all facts of the resources grouped into single nomenclature 'the land'. The surface available for cultivation may be 'limited' – but we can always add to it by clearing forests, re-claiming barren lands, etc. Similarly, supply of natural resources like metallic and non-metallic minerals, mineral oils etc. may respond to prices which permit use of better technology that lets us dig deeper and utilise even those ores which were earlier regarded as inferior or non-viable for economic use. Even the fertility of soil can be improved/ enhanced/ restored through resort to 'new' technical and scientific knowledge.

Suppose a certain piece of land can be used to grow only cotton. If demand for cotton rises, then the demand curve for cotton land will shift up and to the right and the rent would rise. This leads to an important effect: The price of cotton land would become high because the price of cotton is high. This shows that demand for land is also a derived demand which signifies that the demand for the factor is derived from the demand for the product for which the factor is employed. Thus, the rent of land derives entirely from the value of the product and not vice-versa.

Demand for an input is a derived demand. This implies that price of input will be the value of the input's marginal product multiplied by the price of the output being produced. In other words, the amount a firm is willing to pay for another unit of the input equals the money it will earn when that input is purchased. This equals the quantity of product that additional unit will produce multiplied by the marginal revenue that quantity of product will generate in the marketplace. The horizontal sum of the demand curves of individual firms equals the market demand for the product. The market supply of an input typically depends on the behaviour of the owners of that input. In the case of land, however, the supply is approximately fixed. For most cases, therefore, the overall supply curve for land can be treated as vertical. In some cases, the possibility of creating usable land from landfill may move the supply curve somewhat away from vertical. Moreover, the supply of land for a particular

type of activity is not vertical in general because land can be moved from one use to another. In competitive markets, all actors are price takers. Hence no individual can affect the market price of an input. The price of land is found at the intersection of the (derived) demand curve and the (vertical) supply curve, and each user of land adjusts the quantity of land he rents (or buys) so that the value of her marginal product equals the market land rent (or value).

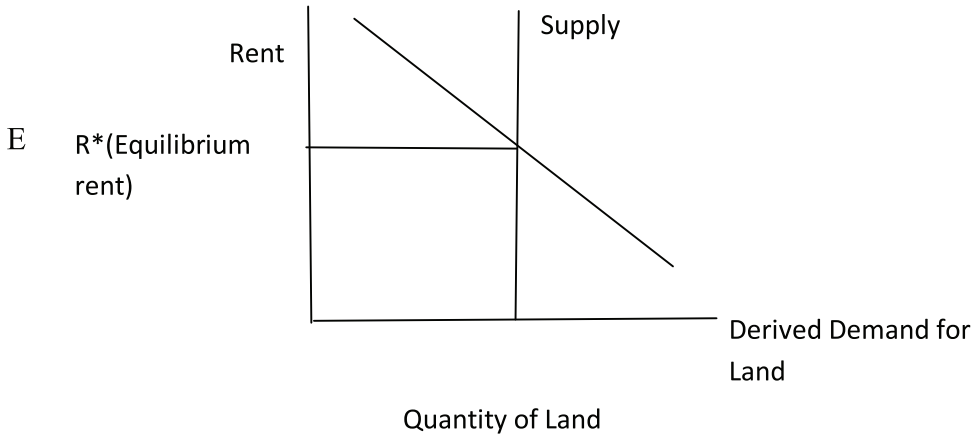

Fig. 7.1 : Determination of Equilibrium in Land Markets

The above figure shows how interaction of demand and supply curve in land market leads to determination of equilibrium rent. It can be observed that R* is the equilibrium rent where demand curve for land (which is a derived demand) intersects the supply curve of land (which is fixed).

7.3 EFFECTS OF TAX ON LAND

There is a need to understand the implications of the fixed supply of land. Suppose the Government wants to tax the incomes of the land-owners and introduces a land tax of 50 per cent on all land rents ensuring that there is no further tax on buildings or improvements. What would be the impact of this tax on total demand and supply of land? The reality is that after the tax, the total quantity demanded for land's services does not change even though the demand curve shifts. Even with a tax at the rate of 50%, people will continue to demand the entire fixed supply of land. Hence with land fixed in supply, the market rent on land services (including the tax) will be unchanged and remain at its original equilibrium at point E_1 in the Fig. 7.2.

What will happen to the rent received by the landowners? As the demand and quantity supplied of land remain unchanged, the market price will also be unaffected by the tax. Therefore, the tax must be completely paid out of the landowner's income. This brings a difference in the price paid by a farmer and the price received by the landowner. In case of landowners, when the government steps in to collect the 50 per cent tax, effect is the same as it would be if the net demand to the owners had shifted down from D_1D_1 to D_2D_2 in the diagram. Landowner's equilibrium return after taxes is now only E_2. The entire tax would be shifted backwards on to the owners of the factor in perfectly inelastic supply. However this reduction in factor incomes does not create economic inefficiencies. This happens because tax on pure rent does not change anyone's economic behaviour. Those who demand land are unaffected because the price of land remains the same. The behaviour of suppliers of land also remains the same as the supply of land is fixed in nature. Thus, the economy operates in the same way after tax, as tax leads to no distortions or inefficiencies in the system.

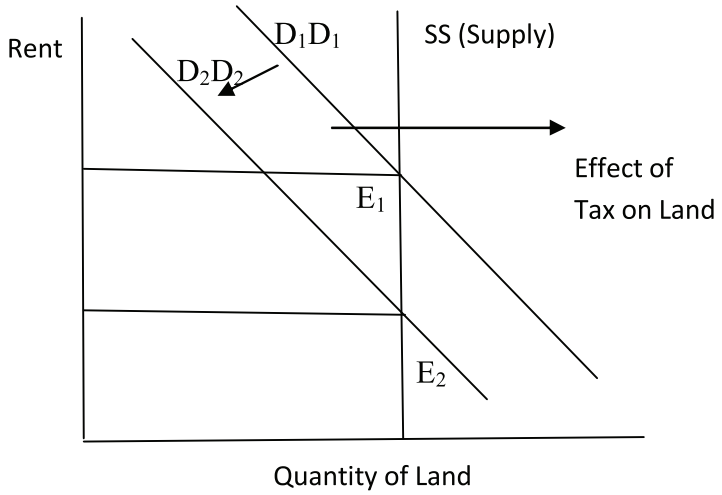

Fig. 7.2: Effects of Tax on Land

This result is based on Henry George's Single-Tax movement, later used by English economist Frank Ramsey to develop Ramsey tax theory. George argued, because the value of the unimproved land is unearned, neither the land's value nor a tax on the land's value can affect productive behaviour. If land were taxed more heavily, the quantity available would not decline, as with other goods; nor would demand decline because of land's productive uses. The reasoning behind Ramsey taxes is essentially the same as that shown in the diagram above. If a commodity is highly inelastic in supply or demand, a tax on that sector will have very little impact on production and consumption and the resulting distortion will be relatively small.

Check Your Progress 1

1) What do you mean by the term economic rent?

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2) Suppose the current rental rate of a 1BHK house in City X is Rs. 4000. What would happen to the supply of this type of houses if the Government decides to impose 5 per cent tax on rent? Give reasons in support of your answer.

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3) What is the essence of Henry George's tax theory?

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7.4 THEORIES OF RENT

It is important to understand why rent is paid and how rent is determined. In order to answer these questions three theories of rent have been propounded:

(i) the classical theory alternatively known as Ricardian theory of rent, (ii) Marshall's theory of rent and (iii) Modern theory of rent.

7.4.1 Ricardian Theory of Rent

David Ricardo, an eminent economist of the 19th century defines rent as, 'that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil'. So as per this definition, land possesses original and permanent properties with reference to its nature, situation, environment and conformation and rent is paid for the use of land only. However, rent accrues to the landlord both from extensive and intensive cultivation of land.

What is intensive cultivation? When a farmer keeps on employing more of other factors of production on the same piece of land in order to increase production he is using land more intensively. He employs more labour as long as the marginal revenue product of hiring additional worker is greater than the market wage rate, it is known as intensive cultivation. Ricardo assumes that the law of diminishing returns operates in this case in the sense that when more and more units of labour and capital are used in cultivation, there are diminishing returns from the agriculture. The following diagram throws light on how the agricultural yield may decline due to excessive usage of capital and labour inputs due to law of diminishing returns.

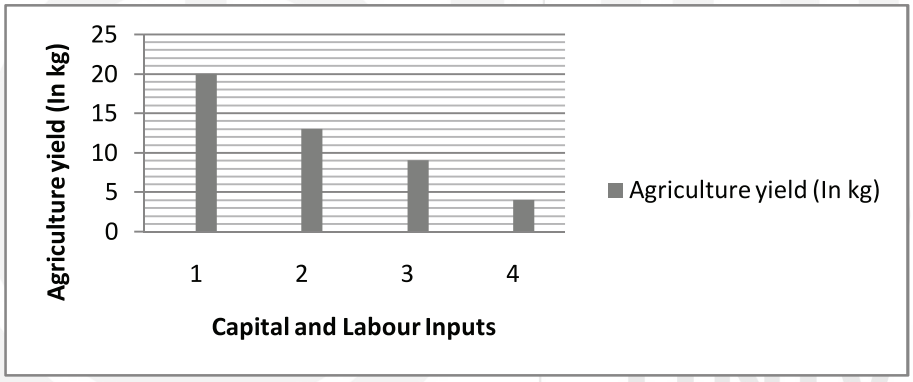
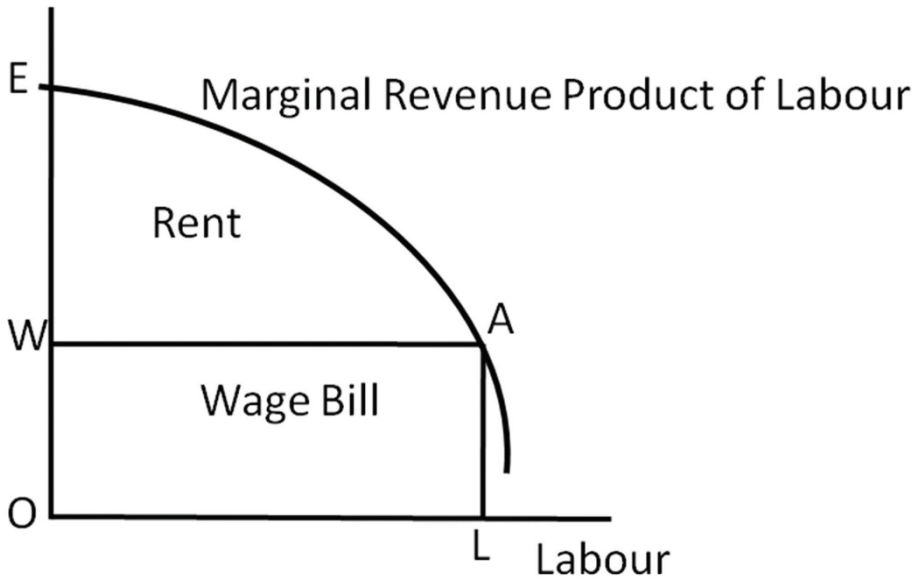


Fig. 7.3: Diminishing Returns due to Intensive Cultivation

Observe Fig. 7.3 carefully. You can see, that the agricultural yield is declining from 20 to 9 kgs as the usage of capital and labour increases from 1 to 3. Would this land earn rent? The answer is yes and requires you to recall the concept of factor demand curve covered in Unit 5. The demand curve of labour is given by the marginal revenue product curve of the variable factor. This demand curve is used to determine the share of labour in total product i.e. the wage bill and the surplus is called rent as seen the Fig. 7.4 below.

What is extensive cultivation? Extensive cultivation implies that as the demand for output increases, land under cultivation is also increased. However there is a difference in the quality of land used for cultivation as the area under the plough changes owing to increase in demand. Suppose there are 5 different types of land available to a farmer: A, B, C, D, E arranged in the descending order of their fertility with plot A as the most fertile land available and plot E the least fertile land available to the farmer in Fig. 7.5. To begin with, a farmer would sow crops only in the most fertile plot of land as it would give him high agriculture yields. Due to rise in population, if the demand for agriculture



Here it assumed that there are only two factors of production

Fig. 7.4: Determination of Rent in Recardian Theory

goods increases in such a way that the supply of food grains from plot A is found insufficient to meet the demand, the farmer would bring plot B into use. However plot B being of inferior quality would generate lesser revenue even if same amount of inputs are used.

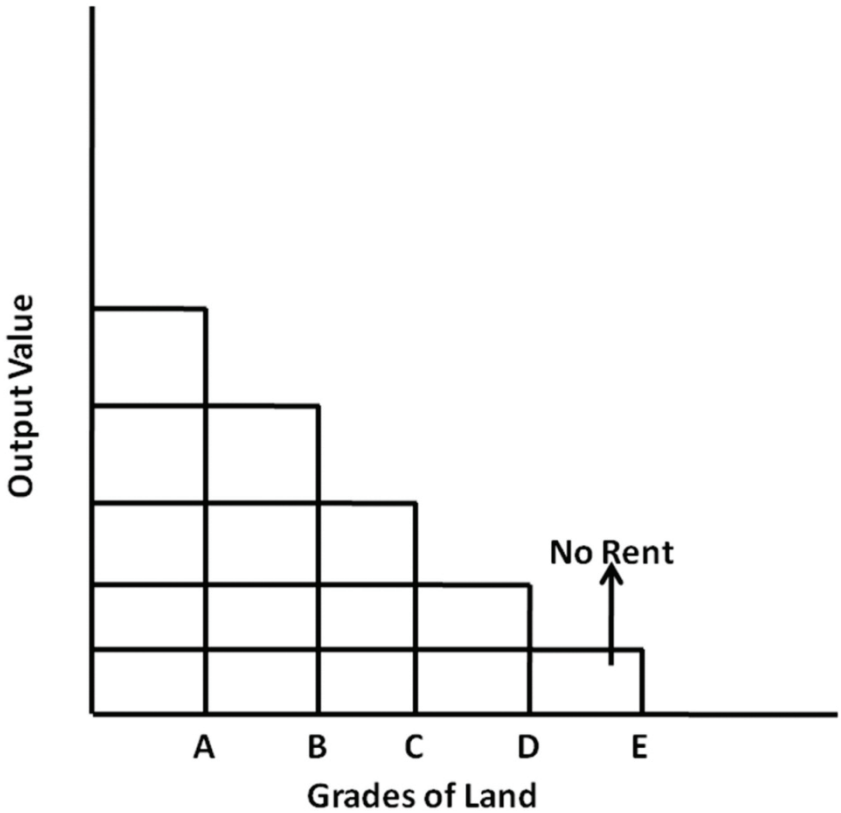


Fig. 7.5: Extensive Cultivation and Rent

Similarly, due to an increase in demand for agricultural output, plots C, D and E would also be used by the farmer to increase production so as to be able to meet the market demand. However plot E being of inferior quality and least fertile would generate no surplus and plot A generates the highest surplus. This

surplus is known as rent. In order to be able to earn rent, the market value of agriculture output produced on a plot of land should be higher than the cost of cultivation on that land and this is the highest on plot A. For inferior quality lands, the cost of cultivation is very high and so it can be inferred that only the land of superior quality can generate surplus or rent. Ricardo also explained that rent of land depends on price of the land's produce. Rent is thus the excess of the market value of land produce to the cost of cultivation as seen in the Fig. 7.5.

Ricardo's theory of rent is based on the following assumptions:

1) There is perfect competition in the economy

2) Supply of land is limited

3) Law of diminishing returns operates

4) Rent is applicable only on land

5) Rent is price determined

6) Land is cultivated in a quality varying sequence in the sense that the most fertile land is cultivated first and the least fertile is the last.

An interesting aspect of the Ricardian theory is the role of location of land in determination of rent. The theory says that apart from the fertility of soil, rent also arises from the difference in the cost of transporting agricultural produce of a land to the market. As land situated farther and farther away from the market is brought under cultivation with increase in demand for agriculture produce, the transportation charges increase. Those plots of land which are nearer to the market pay lesser transportation charge compared to the distant lands. Thus, rent would be higher for land situated near the market compared to the ones away from the market.

The critique of the Ricardian theory of rent can be summarised in few lines. There is absence of perfect competition in real agricultural markets. The difference between superior and inferior land occurs due to intervention of the owner/farmer through use of technology and inputs and does include costs. Superior quality of land may be inaccessible if it is flooded, covered with shrubs or under disputed private ownership. The original and indestructible powers of land are prone to change with the advent of technological progress. It is now possible to increase the fertility of land and bring more and more land under cultivation through heavy capital machinery. However despite these criticisms, Ricardian description of rent as unearned differential surplus that arises due to economic progress has helped in the policy making across the world. Abolition of zamindari system in India as well as other countries was on the grounds of this 'unearned surplus' to the owners.

Check Your Progress 2

1) What is the Ricardian concept of rent? How is it different from the usual notion of rent?

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2) Do you think supply of land is limited? If yes, in what sense?

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7.4.2 Marshall's Theory of Rent

Alfred Marshall developed the concept of quasi-rent in order to extend the Ricardian concept of rent to other factors of production. He referred it to the surplus earnings generated by the factors of production excluding rent. Marshall's concept of quasi-rent was a short run concept unlike Ricardian long run concept of rent. This concept can be easily understood using an example of housing. Suppose that the demand for houses in an area of Ahmedabad increase suddenly due to onset of construction of metro rail in that area. It is not possible to increase the supply of houses in accordance to the demand. The increase in demand for houses would push up the prices and those who sell their houses during this period would get surplus earnings. This sudden increase in their earnings is called as quasi rent. Similarly the rental price of houses would increase during this period resulting into quasi-rent.

Quasi-rent will disappear in the long-run competitive equilibrium. Professors Stonier and Hague rightly remark, "The supply of machines is fixed in the short run whether they are paid much money or little so they earn a kind of rent. In the long run, this rent disappears for it is not a true rent, but only an ephemeral reward — a quasi-rent". But the case of land is quite different. The supply of land being a free gift of nature and non-reproducible, its supply is perfectly inelastic in the short run as well as in the long run. Thus the surplus earnings or rent earned by land persist in the long run also. It is thus clear that the earnings of land and of capital equipment (machines etc.) are similar only in the short run.

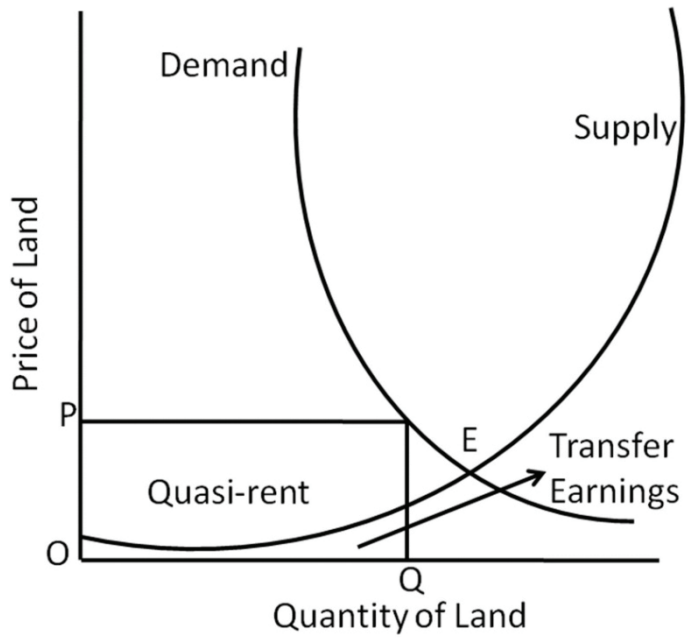

Fig. 7.6: Determination of Rent in Marshall's Theory

Distinction between quasi-rent, rent and interest: Quasi-rent is similar to rent in more than two ways. It arises when the demand for man-made goods increases, while rent arises when the demand for land increases. Just as the supply of man-made goods is fixed in the short-run, the supply of land is also fixed. Transfer earnings help in determination of both rent and quasi-rent. However still the two differ in the sense that quasi-rent is fixed in the short-run due to fixed supply of man-made goods and rent is fixed in the short-run as well as long-run due to fixed supply of land. Quasi-rent is a temporary phenomena which does not exist in the long run after supply of man-made goods is resumed. However rent persists in both the periods as supply of land cannot be changed.

7.4.3 Modern Theory of Rent

The modern theory of rent develops Marshallian theory of rent even further. This theory is different in terms of the determination of mechanism of rent. Here rent is determined using the demand-supply framework. The theory stipulates that even if land is very fertile, rent would arise owing to its fixed nature i.e. due to scarcity. The modern theory of rent assumes perfect competition, homogenous product and land of equal quality. Also, rent is dependent on the marginal revenue productivity of land and its demand curve is downward sloping indicating that more land would be used at lower rates of rent. The supply curve of an individual firm is perfectly inelastic but the supply curve of all the land owners taken together is upward sloping implying that with higher rates of rent, more and more land is offered for use. This has been depicted in Fig. 7.7.

The area under the supply curve denotes 'transfer earnings' which is the minimum payment needed to retain the given factor units in the present employment. In simple words, it is the opportunity cost of the factor. It refers to the earning of capital/land/labour in its next best use. Let us understand this concept using an illustration. Suppose cotton is grown in a piece of land and the cost of its cultivation is Rs.100. The cost of cultivation for wheat remains the same on this land and so there would be no transfer earnings. However if by producing soyabean, the cost of cultivation on this land comes down to Rs.70, then the transfer earning would be Rs. 30 and Rs. 40 would be the rent. Thus,

Rent = Actual earnings – Transfer earnings.

The above diagram shows the usual demand and supply curves for land. Point E is the point of intersection of the demand and supply curves. This equilibrium point shows OP as the equilibrium price at which suppliers of land are willing to supply OQ units of land. Note that the supply curve also depicts that how many different units of land are going to be supplied at each price. This area under the supply curve thus depicts the transfer earnings and the area above the supply curve depicts the quasi-rent.

As the supply of land is inelastic in nature, one can show how quasi-rent of land would differ depending on the different elasticities of the supply curves. Consider the Fig. 7.7, here demand curve intersects the three supply curves S_1, S_2 and S_3.

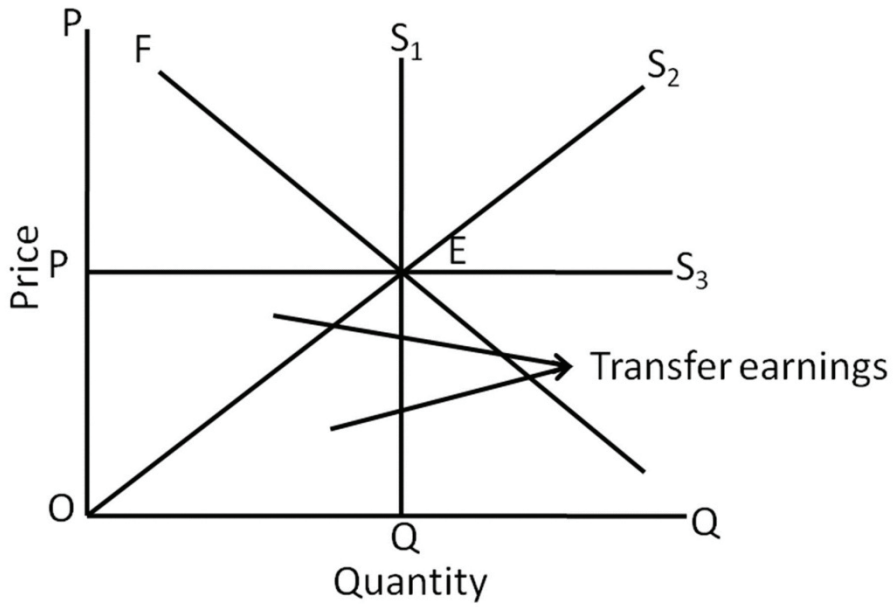

Fig. 7.7: Rent as per Different Elasticities of Land Supply Curve

These supply curves intersect the demand curve at E. At each of the supply curves, the equilibrium price and quantity are given by OP and OQ respectively. Area under a supply curve upto point Q is called transfer earning. The total factor payment in all the three cases is given by OPEQ. One can note that with supply curve S_1, transfer earning is zero while with S_3 supply curve, the entire factor payment becomes the transfer earning.

It is to be noted that Marshall's concept of rent was different from Ricardian concept of rent in the sense that the former calls the excess over the transfer earnings as rent while Ricardo considers it as the excess earnings of the owner over the cost of production. The modern theory of land is different from the original theory of Marshall and was built further by J.S.Mill, Joan Robinson and other neo classical economists because it was built further using the demand and supply framework.

Check Your Progress 3

1) What is quasi-rent? How is it different from economic rent?

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2) State the distinction between modern theory and Marshallian theory of rent?

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3) Explain how rent can differ depending on the elasticity of supply curve of land?

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7.5 LET US SUM UP

This unit has introduced the concept of land using different approaches. The term rent has been originally coined by economists to refer to earnings from ownership of land only. The unit further discusses the implications of a tax on land. When tax is imposed on land, it does not affect the demand for land as the price of land remains the same owing to fixed supply of land. Tax directly affects the landowner's income and is paid from their earnings without affecting the total demand and supply of land in the market.

Theories of land give an insight on the different approaches of determining rent in economic theory. The Ricardian theory of rent determines rent on the basis of the surplus earnings from land owing to its superior quality. The theory has two approaches: extensive cultivation and intensive cultivation which depict how there are surplus earnings and how they differ owing to different quality of land. The theory has been criticised on the grounds of its assumptions i.e. perfect competition, original and indestructible power of land which may alter through use of technology. Marshall's theory of rent is based on the concept of transfer earnings wherein the concept of quasi-rent has been developed. Marshall defines rent as the difference between actual earnings and transfer earnings from land and uses the notion of quasi-rent for other factors of production as well. Transfer earnings are those which are just enough to retain the factor of production in the present use. Rent is anything which is in excess to transfer earnings. The modern theory of rent developed by later classical economists like J. S. Mill, Joan Robinson, etc. have built upon the Marshallian framework by introducing the demand-supply framework.

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2) M L Jhingan (2006), *Principles of Microeconomics*, Chapter 42-44, Third edition, Vrinda Publications Pvt Ltd, New Delhi.

7.7 ANSWERS OR HINTS FOR CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) See Section 7.1 and 7.2

2) See Section 7.2 and 7.3

3) See Section 7.3

Check Your Progress 2

1) See Sub-section 7.4.1

2) See Section 7.2

Check Your Progress 3

1) See Sub-section 7.4.2

2) See Sub-sections 7.4.2 and 7.4.3

3) See Sub-section 7.4.3

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GLOASSARY

Allocative Efficiency : Producing goods and services demanded by consumers at a price that reflect the marginal cost of supply.

Abnormal Profit : Profit in excess of normal profit - also known as supernormal profit or monopoly profit. Abnormal profits may be maintained in a monopolistic market in the long run because of barriers to entry.

Adverse Selection : When one party to a deal is making suboptimal choice because of asymmetry in information.

Collusive Behaviour : In collusive oligopoly industry contains few producers wherein producers agree among one another as to pricing of output and allocation of output among themselves. Cartels, such as OPEC, are collusive oligopolies.

Cournot Model : The Cournot model of oligopoly assumes that rival firms produce a homogenous product, and each attempts to maximise profits by choosing how much to produce. All firms choose output (quantity) simultaneously.

Cartel : An association of manufacturers or suppliers with the purpose of maintaining prices at a high level and restricting competition.

Common Resources : These are resources where there are many users but no owner.

Comparative Advantage : A country has a comparative advantage in producing a good 'A' if the cost of producing 'A' is lower at home than in the other country.

Derived Demand : Refers to demand for factors of production as their demand is derived from the demand for goods and services.

Economic Profit : A firm's revenues less its economic cost.

Economic Cost : The economic cost includes the accounting cost and the opportunity cost of the factor of production in its next best alternative use.

Excess Capacity : **Excess capacity** is a situation in which actual production is less than what is achievable or optimal for a firm. This often means that the demand for the product is below what the business could potentially supply to the market.

Economic Rent : Refers to payment for the use of something which is fixed in supply.

Externalities : Externalities occur in an economy when the production or consumption of a specific good impacts a third party that is not directly related to the production or consumption.

Efficient Allocation of Resources : That combination of inputs, outputs and distribution of inputs, outputs such that any change in the economy can make someone better off (as measured by indifference curve map) only by making someone worse off (Pareto efficiency).

Free Rider : It means one person is using the benefits of a good without paying anything for it.

Factor Endowments : A country's endowments of resources like land, labour, capital etc.

Interest : Refers to payment for the use of capital. Interest is paid for man made goods which are used for production of goods and services.

Imperfect Competition : Imperfect competition exists whenever a market, hypothetical or real, violates the abstract tenets of neoclassical pure or perfect competition

Imperfect Information : Imperfect information is a situation in which the parties to a transaction have different information, as when the seller of a used car has more information about its quality than the buyer. In other words, a situation when information about the goods and services available to buyers' and sellers are not symmetric.

Indifference Curve or Utility Frontier : An indifference curve represents a series of combinations between two different economic goods, between which an individual would be theoretically indifferent regardless of which combination he received.

Isoquants : The isoquant curve is a graph that charts all input combinations that produce a specified level of output.

International Trade : The trade that takes place between buyer and seller of two different nations is called international trade.

Long Run : The time period when all inputs including plant capacity are variable.

Labour Union : A recognised organisation of workers that seeks protection of their rights.

Monopoly : A firm that is the sole seller of a product without close substitutes.

Monopolistic Competition	:	There are a large number of firms that produce differentiated products which are close substitutes to each other. In other words, large sellers sell the products that are similar, but not identical and compete with each other on other factors besides price.
Marginal Physical Product	:	Change in quantity produced as one additional unit of the variable factor keeping all other factors constant.
Marginal Revenue Product	:	Marginal physical product multiplied by marginal revenue.
Minimum Wage Act	:	Government law which fixes the minimum level of wages payable.
Marginal Rate of Substitution	:	The marginal rate of substitution is the amount of a good that a consumer is willing to give up for another good, as long as the new combination of the two goods is equally satisfying. It's used in indifference theory to analyse consumer behaviour.
Marginal Rate of Technical Substitution	:	The marginal rate of transformation or technical substitution is the rate at which one good must be sacrificed in order to produce a single extra unit (or marginal unit) of another good, assuming that both goods require the same scarce inputs. The marginal rate of transformation is tied to the production possibilities frontier (PPF), which displays the output potential for two goods using the same resources.
Market Imperfection	:	Conditions in market which are not conclusive to perfect competition.
Moral Hazard	:	Deliberate concealment of some information from the other party.
Market Failure		It refers to failure of market mechanism to achieve efficient allocation of resources in the economy.
Mercantilism	:	It is the trade theory which postulates that countries should encourage export and discourage import. The theory argues that a nation should increase export and reduce import and export is the only way to accumulate wealth.(in terms of precious metals like gold).
Normal Profits	:	Normal Profit is an economic condition occurring when the difference between a firm's total revenue and total cost is equal to zero. Simply, normal profit is the minimum level of profit needed for a company to remain competitive in the market.
Non Collusive Behaviour	:	Oligopoly is best defined by the actual conduct (or behaviour) of firms within a market. The

concentration ratio measures the extent to which a market or industry is dominated by a few leading firms. When these firms agree to behave in a particular manner it is said to be collusive behaviour of oligopoly market.

Non-exclusion : It means that we cannot exclude non-payers from consuming it.

Non-rival : It means that when person consume a good, it will not diminish other person's share.

Oligopoly : A state of limited competition, in which a market is shared by a small number of big producers or sellers.

Optimal Output Mix : The optimal mix of output is known in economics as the most desirable combination of output attainable with available resources, technology, and social values.

Perfectly Competitive Market : A market is perfectly competitive if it consists of many consumers and firms, none of whom have any appreciable market share, all firms produce identical products, and there are no barriers to entry or exit, and consumers have perfect information about prices.

Price Discrimination : When a firm charges different prices to different groups of consumers for an identical good or service, for reasons not associated with costs, it is termed as price discrimination.

Product Differentiation : The marketing of generally similar products with minor variations that are used by consumers while making a choice.

Prisoner's Dilemma A situation in which two players each have two options whose outcome depends crucially on the simultaneous choice made by the other, often formulated in terms of two prisoners separately deciding whether to confess to a crime.

Profits : Are returns to entrepreneurs for use of their organisation and management skills in the production process, as well as bearing risks.

Productive Efficiency : Production efficiency is an economic level at which the economy can no longer produce additional amounts of a good without lowering the production level of another product. This happens when an economy is operating along its production possibility frontier.

Production Possibility Curve : A graphical representation of the alternative combinations of the amounts of two goods or services that an economy can produce by transferring resources from one good or service to the other. This curve helps in determining what quantity of a nonessential good or a service an

economy can afford to produce without jeopardising the required production of an essential good or service.

Public Goods : A public good is a product that one individual can consume without reducing its availability to another individual, and from which no one is excluded. Economists refer to public goods as "non-rivalrous" and "non-excludable."

Price Ratio or Relative Price : Price of a commodity as it compares to another. The relative price is usually presented as a ratio between the two prices.

Public Interventions : Actions of the government in the markets for goods, services and factors.

Public Provision Direct supply of certain socially desirable services /goods by the government authorities/ agencies to the end users.

Price Ceiling It occurs when the government puts a legal limit on how high the price of a product can be.

Quasi Rent : Return to a factor of production over and above its average cost; it is a short-run concept.

Rent : Refers to payment for the use of land. Land refers to all natural resources available for the purpose of production.

Short Run : The time period when at least one of the inputs (size of the plant) is fixed.

Supernormal Profit : A firm earns supernormal profit when its profit is above that required to keep its resources in their present use in the long run i.e. when price > average cost.

Stackelberg Model The Stackelberg leadership model is a strategic game in economics in which the leader firm moves first and then the follower firms move sequentially. ... There are some further constraints upon the sustaining of a Stackelberg equilibrium.

Transfer Earnings : Minimum payment to be made to a factor of production to retain it in present employment. It refers to the earnings in the next best employment.

Wages : Refers to payment for the use of labour which refers to the human effort made for production of goods and services through technical expertise or manual labour.

VMP : Value of Marginal product, i.e. price times the marginal product of factor.

SOME USEFUL BOOKS

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