PERIYAR UNIVERSITY

NAAC 'A++' Grade with CGPA 3.61 (Cycle - 3)

NAAC A++ Grade – State University – NIRF Rank 56, State Public University Rank 25.

SALEM - 636 011

CENTRE FOR DISTANCE AND ONLINE EDUCATION

(CDOE)

M.A. ECONOMICS

SEMESTER - I

ADVANCED MICRO ECONOMICS

(Candidates admitted from 2025 onwards)

PERIYAR UNIVERSITY

CENTRE FOR DISTANCE AND ONLINE EDUCATION (CDOE)

2025 admission onwards

Prepared by:

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SEMESTER – 1

CORE – I

ADVANCED MICRO ECONOMICS

Unit I: Consumer Choice

Cardinal and Ordinal Utility – Indifference Curve – Slutsky's Decomposition of Price effect into substitution effect and income effect – Consumer Surplus – Marsdhall's and Hicksian measures – Compensatory Demand Curve – Revealed Preference Theorem – and Derivation of Marginal utility schedule for Money income.

Unit II: Market Structure Models

a. Perfect Competition – Price and Output determination – Optimum firm
b. Monopoly – Short run and long run equilibrium – Price discrimination monopoly control and regulation – Contestable market
c. Monopolistic Competition – Chamberlin Model – Selling cost – Excess capacity
d. Oligopoly – Duopoly price game – Dominant strategy – Nash equlibirrum Non clollusive Models – Cournot – Bertrand – Chamberlin – Edgeworth – Sweezy – Stackelberg – Oligopoly.
e. Monopsony – Priceand output determination – Workable competition.

Unit III: Economics of Information

Informational asymmetry – Choice under Uncertainty – N – M Index – Inter- Temporal choice – Market for Lemons – Adverse Selection – Insurance Market and adverse selection – Solution to principal agent problem – Hicksian action (Moral Hazard) – Signalling and Screening.

Unit IV: Alternative Theories of Firm

Full cost pricing Rule – Limits Pricing theory – Bains Theory – Sylos – Labini Models – Modigliani's Models – Input – Output Models – Linear Programming applications in decision Making – Peak Load Pricing – Administrated Pricing – Purchasing Power Parity Price

Unit V: Distribution Theories

Neo – Classical approach – Marginal Productivity theory; Product Exhaustion Theorem – Modern theory of Distribition – Factor Pricing in imperfect product and factor markets – Determination of Wages – Labour supply and wage determination – Role of trade uniins and collective bargaining – Theories of Interest - Theories of Profit.

Text Books:

1. Jhingan M. L. (2004 Reprint) Advanced Economic Theory, Vrindha Publication (P) Ltd, New Delhi.
2. Agarwal, H.S. Micro Economic Theory, Ane's Books Pvt., Ltd., New Delhi.

References:

1. Hall R. Varian (2004), Intermediate Micro Economics, East – West Press, New Delhi
2. Ruffin Roy. J (1992), Intermediate Micro Economics, Harper & Collins Puvblishers.
3. Koutshiannis A. (1978), Modern Micro Economics, Macmillan – London.

Web Resources:

1. http://open.oregonstate.education/intermediatemicroeconomics/chapter/module-I.
2. http://sayordotorg.github.io/text_introduction-toeconomianalysis/s.16-monopoly.html.
3. http://saylordotorg.github.io/text_introduction-to-economianalysis/s17-games-andstrategic-behaviou.html.

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Unit – 1

Consumer Choice

Introduction

The ordinal and cardinal approaches to utility measurement are covered in this unit. It covers key instruments and ideas such the decomposition of price impact, consumer's equilibrium, indifference curve analysis, and the law of declining marginal utility. Consumer choice theory studies how people choose products based on price, budget, and personal preferences. In order to model consumer behaviour and forecast the best options, it presents important ideas such as utility, marginal utility, and indifference curves. Budgetary restrictions, ideal customer choice, and the impact of price and income fluctuations on demand are all covered in this course. Elasticity, individual and market demand curves, and practical applications of consumer choice theory are also covered.

Objectives

- Recognize the cardinal method to utility measurement.
- Talk about the ordinal method to utility assessment.
- Describe key laws like consumer equilibrium and the law of declining marginal utility.
- Examine indifference curves and break down the impact of a price shift into two parts: the substitution effect and the income effect.
- To provide the essentials of consumer behaviour, preferences, and choices.
- The law of declining marginal utility, total utility, and marginal utility are used to clarify the subtleties of utility analysis.
- To clarify how ordinal and cardinal utility assessments of consumer behaviour vary from one another.
- To talk about how budgetary constraints affect the attainment of consumer equilibrium.
- In order to demonstrate the idea of consumer surplus and how it is used in decision-making.

Contents

1.1 Consumer Choice – Meaning and Features

Considering the pricing of various goods, customers choose how much of each according on their interests, preferences, and ability to pay. The following presumptions underlie the decisions, tastes, and preferences of consumers:

Completeness: A customer might express their personal choice or lack thereof between two different product baskets.

Transitivity: The preferences of a single customer are constant.

Non-satiation: A customer is never completely satisfied. If "some" is nice, then "more" of the good is better; more is always desired.

Because of their usefulness, commodities are sought after. A commodity's utility is its capacity to meet or fulfil the needs of a customer. The happiness a customer gets from purchasing a something is known as utility. In mathematics, utility is determined by the amounts of several commodities that are consumed:

U= f(m1, n1, r1)

1.2 Cardinal Utility – Approach

A cardinal utility is a way for customers to express their happiness after using products and services. Cardinal utility theory may be applied to both intrapersonal and interpersonal comparisons since it is a measurably measurable item. Even though the cardinal utility has no unit, it is measured in "utils" to gauge customer happiness.

Cardinal utility theory:

According to cardinal utility theory, these two fundamental ideas—total utility (TU) and marginal utility (MU)—will explain everything.

Total Utility:

Total utility, or TU for short, is the term used to describe the total satisfaction a consumer receives after consuming a certain (fixed) quantity; the higher the consumption, the higher the

consumer's level of satisfaction. TUn, on the other hand, refers to the total satisfaction obtained from a number of quantities.

Marginal Utility:

The additional satisfaction that comes from consuming one more unit of a good is known as marginal utility (MU), which can be expressed as the change in total utility brought about by consuming one more unit of a good. For instance, consider the following scenario: 10 ice cream gives us 50 utils of total utility, and on the eleventh ice cream, TU reaches 60. As a result, the total utility has increased by 10 utils (60 utils minus 50 utils), meaning that the MU received from the eleventh ice cream is 10 utils.

$MU11 = TU11 – TU10 = 60 – 50 = 10$

"$MUn = TUn – TUn\text{-}1$" is the formula to get the MU of the nth unit, where n is the commodity's nth unit. The relationship between total utility and marginal utility is equivalent to this:

$TUn = MU1 + MU2 + \ldots + MUn\text{-}1 + MUn$

$TUn = \sum MU$

The TU obtained from the eating of n units of ice cream is therefore equal to the sum of the MU of the first and second units of ice cream up to the nth unit.

1.2.1 Law of Diminishing Marginal Utility

According to the Law of Diminishing Marginal Utility, an individual's increased satisfaction (or utility) from each additional unit of an item or service diminishes as they consume more of it. To put it another way, you value each extra unit of something less the more of it you have. For instance, while the first pizza slice may be quite fulfilling, you may find that you love each successive piece less and less as you consume more. For instance, if you have a packet of sweets and eat three of them, your taste buds could be delighted. It might not be as enjoyable after nine or ten pieces, though, as the first three that were eaten initially.

Assumptions of the Law of Diminishing Marginal Utility

The Law of Diminishing Marginal Utility is predicated on the following assumptions:

1. **Standard Unit Size:** When consumers purchase things, the law presumes that they do so in standard quantities. This indicates that they are eating complete units, such as a whole apple rather than a piece.
2. **Continuous Consumption**: It is anticipated that customers would continue to use the product continuously. This indicates that they are devouring each unit without interruption.
3. **Same Quality of Units:** The legislation is predicated on the notion that a product's

quality is the same throughout all of its units. Every apple a customer eats, for example, need to have a comparable flavour and size.

4. **Rational Consumer:** Only when a consumer behaves rationally does this concept apply. It indicates that they carefully consider their tastes when deciding what and how much to eat.
5. **Stability of Preferences:** The law makes the assumption that a consumer's income, habits, preferences, and likes do not alter while they are being consumed. The legislation remains applicable because of its stability.
6. **Measurable Utility:** The law is based on the notion that customers may quantify their level of pleasure, which is commonly known as "utils." This enables them to measure the level of enjoyment or contentment they derive from eating products.
7. **Single Purpose Consumption:** This rule states that instead of attempting to satisfy several requirements with a single item, a consumer utilises a product to fulfil one particular need or desire at a time.
8. **Divisibility of Goods:** According to this presumption, the objects are able to be divided into smaller pieces. Because they may take tiny amounts as needed, customers can eat the things more easily and quickly.
9. **Constant Value of Money Utility:** Lastly, the rule makes the assumption that the satisfaction obtained from the money left over after a purchase is equal to the satisfaction obtained from the entire quantity of money before to expenditure. This contributes to the consistency of the utility idea.

Importance of the Law of Diminishing Marginal Utility

The following justifies the significance of the Law of Diminishing Marginal Utility:

1. **Economic law's foundation:** This law, which illustrates consumer consumption of commodities, is the fundamental law of economics. The "Law of Diminishing Marginal Utility" serves as the foundation for a number of other economic principles, including the Law of Demand and the Law of Equi-Marginal Utility.
2. **Variability in output and consumption:** After using a product for a long time, we as customers always have a tendency to find new things more enticing. Manufacturers frequently alter the packaging. The product's pattern and design are based on this law.
3. **Taxation:** The Law of Diminishing Marginal Utility serves as the foundation for the idea of raising taxes. Because the marginal utility of money decreases as an individual's income rises, the tax rate on their income rises simultaneously.

Law of Diminishing Marginal Utility- Graphical Representation

Table – 1.1 Diminishing Marginal Utility tables

Drink(Quantity consumption)	Total Utility	Marginal Utility
1	30	30
2	50	20
3	60	10
4	60	0
5	50	-10
6	30	-20

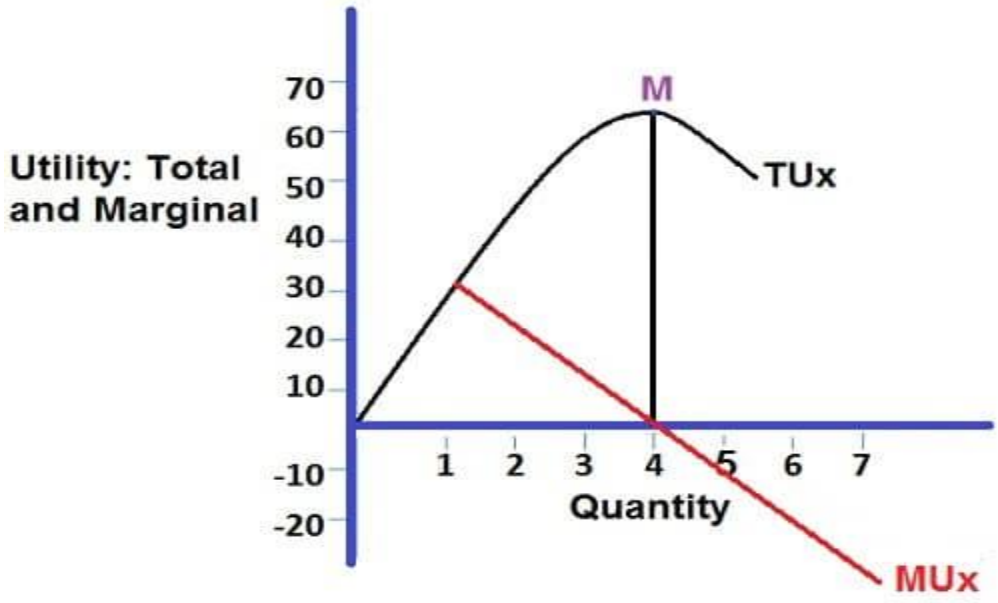

Chart – 1.1 Law of Diminishing Marginal Utility

Relationship between Total Utility and Marginal utility

According to the example:

1. The MU falls but stays positive as the TU rises, indicating that the customer can have more.
2. The MU drops to zero (where the customer stops) when the TU reaches its maximum.
3. Following that, TU begins to drop and MU turns negative (in this case, one additional unit causes the customer to be unhappy).

Limitations of the Law of Diminishing Marginal Utility

The enjoyment you get from consuming more units of an item tends to diminish as you have more of it, according to the Law of Diminishing Marginal Utility. This law does not, however, apply in the following circumstances:

1. **Very Small Units:** This legislation is not applicable to very small amounts of products. For example, you might not be less satisfied with each further tiny taste if you're only tasting a small portion of anything.
2. **Differing Units:** The law presumes that the units used are comparable in terms of both size and quality. The law might not be applicable if you're eating quite diverse things, such as a chocolate bar and a piece of fruit, because each one provides a different degree of enjoyment.
3. **Extended Intervals Between Use:** The legislation could not be effective if there is a significant interval between uses of the same product. For instance, the pleasure of eating pizza might not be diminished in the same manner as if you had it every day if you have it today and then not again for weeks.
4. **Mentally Unstable People:** In certain situations, such as when someone is intoxicated or under the influence of narcotics, getting more drinks or doses may actually make them feel better, which is illegal. The standard standards don't apply since their impression of satisfaction may be distorted.
5. **Rare Collections:** For hobbies such as collecting rare coins or stamps, the joy frequently grows with each new item added to the collection. Instead of feeling less pleased with more, collectors frequently feel more delight as their collection expands.
6. **Money:** Money is a special situation. In contrast to other commodities, individuals of all income levels frequently want more money. "The more you have, the more you want," says the adage. As a result, the Law of Diminishing Marginal Utility is not applicable to money.

1.2.2 Law of Equi-Marginal Utility

The foundation of this legislation is the idea that one should make the most of a restricted income. It clarifies how a buyer behaves when he purchases many goods. According to the rule, a consumer should allocate his meagre money among several goods such that, in order to maximise happiness, the last rupee spent on each good yields him an equal amount of marginal value.

Assume that several commodities, such as A, B, …, and N, exist. When there is balance, a customer will be most satisfied, meaning

MUA / PA = MUB / PB = … = MUN / PN

Where Ps are the commodity prices and MUs are the commodities' marginal utilities.

Assumptions of the Law

- The cost of the products or services has not changed.
- The consumer's income is fixed.
- Money has a constant marginal utility.
- A customer understands usefulness perfectly.
- The consumer seeks to be as satisfied as possible.
- In cardinal words, the utility may be measured.
- There are alternatives to products.
- A customer has a lot of desires.

Limitation of the Law

There are some limitations to this law. They are

- The law does not apply to knowledge because reading books increases knowledge and has greater utility;
- It does not apply to fashion and customs;
- It does not apply to very low income;
- It does not quantify utility;
- Not all consumers care about variety;
- The law fails when there are no options for the good; and it fails when prices change frequently.

Importance of the Law

- ✓ The sphere of production benefits from this legislation. A producer seeks to maximize profit while having limited resources.
- ✓ The area of exchange benefits from this law. Trade, import, export, wealth, and other items are all exchanged.
- ✓ Public finance is covered by it.
- ✓ The law helps employees manage their time between work and relaxation.
- ✓ It is helpful when it comes to spending and saving.
- ✓ In the event that prices increase, it is helpful to search for alternatives.

1.3 Ordinal Utility Approach

The Cardinal Utility method was condemned for being very restricted. The cardinal strategy was critiqued by English economist Edgeworth for its unrealistic presumptions. He believed that it was not essential nor feasible to assess usefulness on a quantitative basis. The ordinal method was born out of this concept. Edgeworth also thought that the Indifference Curve Approach could be used to understand all consumer behaviour and that it could be assessed in terms of rankings and preferences. Although Edgeworth was the first to propose this method, Vilfred Pareto (1906), Slutsky (1915), and then RGD Allen and J.R. Hicks helped make it widespread.

1.3.1 Indifference curve analysis

J.R. Hicks examined customer behaviour using the idea of the indifference curve. When presented with several bundles of two products, a buyer seeks to maximise his enjoyment by selecting the combination that offers him the most utility. During the decision-making process, the customer discovers that products may be interchanged and discovers other combinations of items that provide him with an equivalent degree of happiness. An indicator curve is created when all of these combinations are displayed visually.

A curve that depicts every possible combination of products that provide the same level of satisfaction to the customer is known as an indifference curve. The customer prefers each combination equally since they all provide the same level of enjoyment. The term "indifference curve" comes from this.

To further comprehend the indifference curve, consider this example. Peter has twelve units of clothes and one unit of food. In order to maintain his level of pleasure, we now ask Peter how many units of clothes he is prepared to forgo in return for one more unit of food.

Peter consents to forgo six pieces of clothing in exchange for one more piece of food. As a result, Peter feels equally satisfied by the following two food and outfit combinations:

1. One food unit and twelve clothes units
2. Six clothes units and two food units

By posing comparable queries to him, we obtain the following combinations:

Table 1.2 Combination Table

Combination	Food	Clothing
A	1	12
B	2	6
C	3	4
D	4	3

Graphical Representation: Indifference Curve

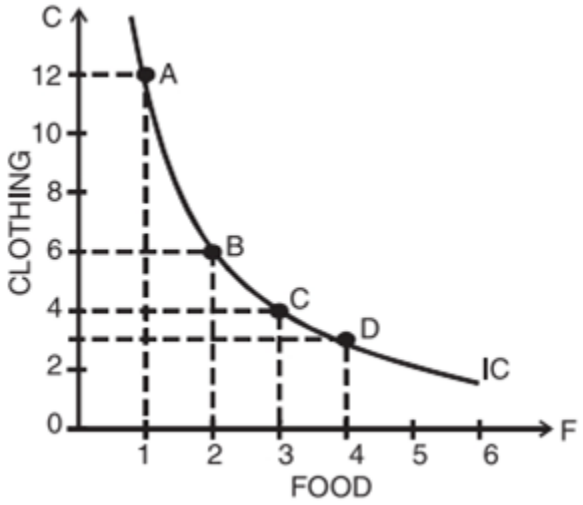

Diagram 1.2 Indifference curve

An Indifference curve (IC) is depicted in the diagram. The degree of customer satisfaction is the same for every combination that falls on this curve. It is also known as the Iso-Utility Curve.

Map of Indifference

A collection of indifference curves is called an indifference map. It shows a customer's choices in their entirety. Three curves make up the indifference map seen in the following diagram:

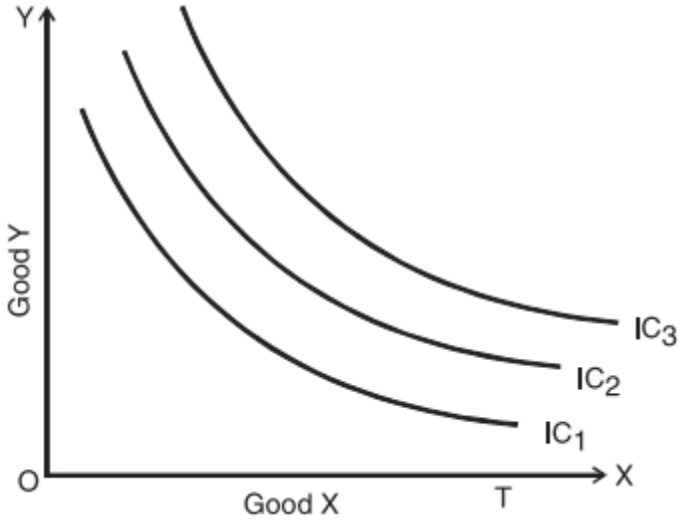

Diagram 1.3 Indifference Map

A customer is known to be unconcerned with any combination that falls on the same indifference curve. He does, however, like the combinations on the higher indifference curves over those on the lower ones, which is significant.

This is so because a higher degree of enjoyment is implied by a higher indifference curve. As a result, whereas every combination on IC1 provides the same level of happiness, every combination on IC2 provides higher levels of satisfaction.

Marginal Rate of Substitution

This is the rate at which a buyer is willing to trade in a good X for Y. Returning to Peter's earlier example, we obtain the following table:

Table 1.3 Marginal Rate of Substitution

Combination	Food	Clothing	MRS
A	1	12	–
B	2	6	6
C	3	4	2
D	4	3	1

In this scenario, Peter initially gives up 6 units of clothes to gain an extra unit of food. Hence, the MRS is 6. Likewise, the MRS for following exchanges is 1 and 2, respectively. Consequently, the MRS of X for Y is the amount of Y whose loss can be offset by a unit increase of X while maintaining the same level of happiness.

It's interesting to note that Peter's MRS decreases as he gathers more food, indicating that he is willing to forgo fewer units of clothes for food. This is due to two factors:

1. As Peter obtains more units of food, his intensity of desire for further units of food lessens.
2. The majority of the products are not perfect replacements for one another. MRS would not change if they could perfectly replace each other.

An Indifference Curve's (IC) characteristics

The characteristics of an indifference curve are as follows:

- **An IC dips downhill to the right**

This slope shows that as the quantity of one commodity in combination is raised, the amount of the other commodity falls. On an indifference curve, this is necessary for the degree of satisfaction to stay constant.

- **In all cases, an IC is convex to the origin.**

- ✓ We know from the foregoing discussion that Peter is prepared to give up less and less clothes as he replaces meals with it. This is the marginal rate of substitution that is decreasing. The indifference curve has a convex form due to the rate. There are two extreme situations, though:
- ✓ Two commodities are perfect substitutes for one another; in this instance, the MRS is constant and the indifference curve is a straight line.

A car's petrol and water are an example of two goods that are perfectly complementary to one another. In such cases, the IC will be L-shaped and convex to the origin.

- **Indifference curves do not cross across.**

There will never be an intersection between two ICs. Furthermore, they are not need to be parallel to one another. Examine the diagram that follows:

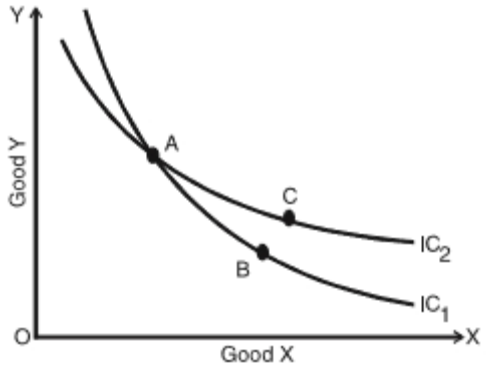

Diagram 1.4 Intersecting Indifference curve

Two ICs are shown crossing at point A in Fig. 1.4. Points A and B provide an individual with the same degree of enjoyment because they are located on IC1. Likewise, since locations A and C are on IC2, they provide the same degree of enjoyment. Thus, it is logically illogical to suggest that B and C provide the same degree of enjoyment. As a result, no two ICs may come into contact with or cross across.

Compared to a lower IC, a greater IC denotes a higher degree of contentment. A consumer who has a higher IC prefers more products than not.

An IC does not touch the axis because we assume that a consumer considers different combinations of two commodities and wants both of them; if the curve touches either of the axes, it indicates that he is satisfied with only one. The indifference curve is one of many aspects of modern economics that have been criticized for being oversimplified or for making irrational assumptions about human behaviour. For instance, consumer preferences can change significantly over time, making accurate indifference curves obsolete; others contend that concave indifference curves, as well as circular curves that are convex or concave to the origin at specific points, are theoretically possible; still others contend that accurate indifference curves are theoretically possible.

Budget Line

A customer will strive to achieve the greatest IC in order to maximise his level of satisfaction since a higher IC indicates a better degree of contentment. He must purchase more items and operate under the following two restrictions in order to do this:

1. He must pay the item's price, and
2. His restricted salary limits the amount of money he can spend on these purchases.

Diagram 1.5 Budget Line

Every possible combination of two things that a consumer might buy with the money at the specified prices is shown on a budget line, as can be seen above. Every combination he can afford is included on the budget line.

A point outside the line (point H) indicates a combination that is beyond the consumer's pricing range. On the other hand, the consumer has underspent if they have a point inside the queue (point K).

Consumer Equilibrium

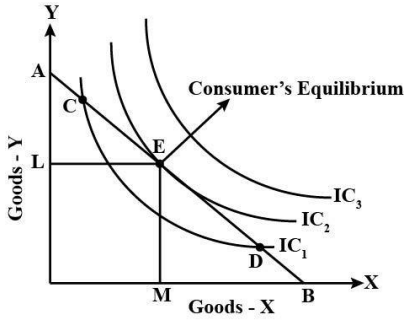

Diagram 1.6 Consumer Equilibrium

The pricing line or budget is shown in fig 1.6. AB. Indifference curves are IC1, IC2, and IC3. On the price line AB, a customer can purchase any of the combinations of good X and good Y, A, B, C, D, and E. He is unable to reach any combination on IC3 since it is above the AB price line. In addition to being on the price line AB, he can purchase those combinations that also align with the highest indifference curve, in this instance IC2. The pricing line (AB) is tangent to the

greatest indifference curve (IC2) at combination 'E', therefore the consumer will be in equilibrium there out of combinations A, B, C, D, and E. Undoubtedly, the customer may also purchase combinations C and D, but since they are located on the lower indifference curve (IC1), they won't provide him with the highest level of enjoyment. This indicates that the point of tangency between the price line and the indifference curve is the consumer's equilibrium point. At equilibrium, MRSXY=PX/PY, or the slope of the budget or price line, equals the slope of the indifference curve.

Moreover, IC2 is convex to the origin at point E. Equilibrium is stable as a result. When the customer is in equilibrium, they are purchasing OL of good Y and OM of good X. He is making the most of his happiness right here. Less enjoyment would result from deviating from this point.

Key Difference between Cardinal Utility and Ordinal Utility

- ✓ **Cardinal utility** is the use of numbers to quantify how satisfied or happy a person is with a product. This implies that the degree of enjoyment may be quantified and represented numerically. Ordinal Utility, on the other hand, examines how consumers evaluate their level of pleasure with products without giving those levels a numerical value. Cardinal utility is measured in "utils," whereas ordinal utility utilises "ranks" to display the order of preferences. "Utils" provides a direct measure of satisfaction, whereas "ranks" just indicate which product is chosen.

- ✓ **Ordinal Utility** is more subjective than Cardinal Utility, which assesses satisfaction in a more objective manner. Because it's hard to quantify contentment properly, Cardinal Utility may be unachievable. Conversely, Ordinal Utility is more useful because it is founded on qualitative preferences.Another distinction is that Ordinal Utility is based on the idea of indifference curves, whereas Cardinal Utility measures satisfaction using marginal utility. Hicks and Allen presented the Ordinal Utility theory, whereas Alfred Marshall produced the Cardinal Utility theory.Because it yields more lucid results, Ordinal Utility is more trustworthy. Cardinal Utility is still utilised in some contexts, such as determining wellbeing or in risky situations, despite being seen as antiquated.

1.4 Consumer’s equilibrium with change in price

This section will examine how a change in the price of one of the items affects consumer equilibrium. Given a two-good model, a change in the price of one product, let's say good X,

affects both the consumer's real income and the price of good X (i.e., PX) in relation to good Y. The price effect is the overall shift in the quantity of good X that is desired as a result of a change in its price, ceteris paribus. This modification may be further divided into two parts:

Effect of substitution: Substitution suggests a shift away from the comparatively costly product. The substitution impact, which accounts for changes in real income, measures how a shift in the relative price ratio affects the amount of the product whose price has changed. Conversely, the income effect quantifies how changes in actual income impact the amount of an item whose price has changed.

There are two methods for breaking down the price effect into the income and substitution effects:

- Slutsky's method
- The Hicksian method

The Hicksian Method:

By altering the relative price of an item while maintaining the consumer's real income constant, Hicks has distinguished between the income and substitution effects and the price impact. Assume that at point R on the budget line PQ, where the indifference curve I1 is tangent to it in Figure 1.7, the consumer is initially in equilibrium. Let good X's price drop. The customer is in equilibrium at point T on the higher indifference curve I1, which is where his budget line spins outward to PQ.

The price effect of the decline in the price of X is shown by the shift on the horizontal axis from R to T or B to E. The consumer's actual income rises as the price of X declines.

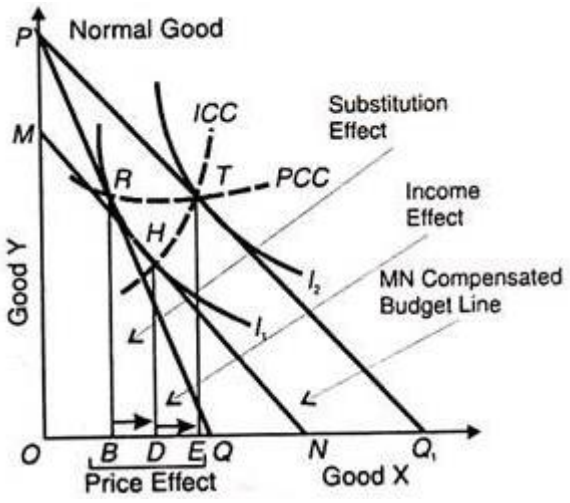

Diagram 1.7 Normal goods

By placing the budget line MN parallel to PQ1, the consumer's money income is decreased to the equivalent of PM of Y or Q1N of X, making it tangent to the initial indifference curve I1 at point H. This creates the compensatory fluctuation in income that is necessary to isolate the substitution impact.

The replacement effect, shown by the shift from R to H on the I1 curve, occurs when a customer increases his purchases of X from B to D on the horizontal axis by replacing Y with X since it is less expensive.

It should be mentioned that the substitution effect always results in a rise or fall in the amount requested of good X when its price decreases or increases. Therefore, when real income is maintained constant, the substitution impact of a price shift is always negative, and the relationship between price and quantity requested is inverse.

Named for Slutsky, who initially proposed it in connection with the Law of Demand, this is known as the Slutsky Theorem.

Return the money that was taken away from the customer so that he returns to the budget line PQ1 and is once more in equilibrium at point T on the curve in order to separate the income effect from the pricing effect. The income effect of the decline in the price of item X is represented by the shift from point H on the lower indifference curve I1 to point T on the high indifference curve I2. The consumer's actual income has grown due to the decrease in the price of X, according to the approach of compensating for fluctuation in income.

The buyer moves from D to E on the horizontal axis as they buy more of this less expensive product, X. This is the income impact of a typical good X's price decline. Regarding the price change for a typical product, the income effect is negative. In the aforementioned instance, the decrease in the cost of item X has raised the quantity that DE is requesting because to the rise in the consumer's actual income.

Therefore, the overall price effect BE is negative as well; that is, a decrease in the price of good X has resulted in an increase in the quantity demanded by BE on both counts. This is because the negative income effect DE of the decline in the price of good X reinforces the negative substitution effect BD for the normal good.

Price Effect (-) BE = (-) BD (Substitution Effect + (-) DE (Income Effect) is how this may be expressed using the Slutsky equation.

Substitution and Income Effects for an Inferior Good:

If X is a subpar item, a decrease in its price will have a positive income effect as consumers would desire less X as their actual income rises. The reason for this is that quantity requested and price follow the same path.

Conversely, the amount requested of X will rise as a result of the negative substitution effect. In the case of subpar items, the negative replacement impact outweighs the positive income benefit, resulting in a negative overall price effect.

It indicates that because of the compensatory change in income, the customer buys more of the inferior commodity when its price drops. Figure 1.8 illustrates the situation when X is an inferior good. At point R, where the budget line PQ is tangent to curve I1, the consumer is initially in equilibrium.

As the price of X declines, he advances to point T on the budget line PQ, which is located at the higher indifference curve l2. The pricing effect is shown by his movement on the horizontal axis from R to T or from B to E. He is in equilibrium at point H on the new budget line MN along the original curve I1 by adjusting for the variance in income.

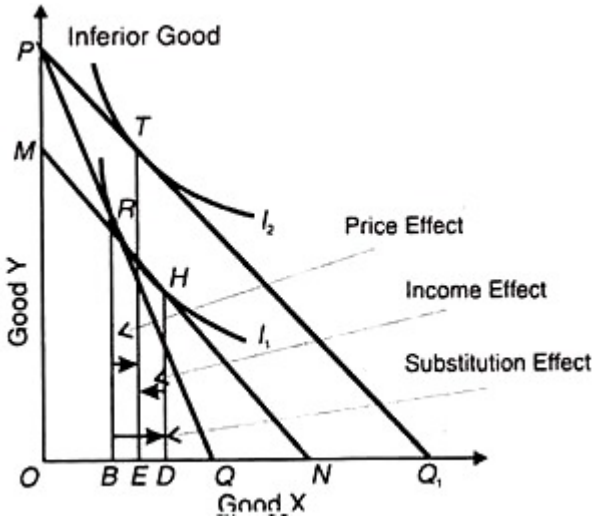

Diagram 1.8 – Inferior Goods

The horizontal substitution impact as determined by BD of X is shown by the movements from R to H on the I1 curve. Return the increased real income that was taken from the customer to place him back at point T of the PQ tangency line and curve I2 in order to isolate the income effect. The income effect of the decline in the price of X is represented by the shift from H to T, which is quantified by DE.

Because the decline in the price of the subpar good X causes a compensatory variance in income, DE's desire for it declines, this income effect is positive. The income effect is always positive when there is a direct relationship between quantity requested and price through compensating variation in income.

When an inferior item is involved, the overall price effect is negative because the negative substitution effect outweighs the positive income benefit. Price Effect (-) BE, thus, is equal to (-) BD (Substitution Effect) plus DE (Income Effect).

Substitution and Income Effects for a Giffen Good:

A Giffen good is a strongly inferior good, named for Sir Robert Giffen, who discovered that potatoes were a necessary food item for the impoverished Irish peasants. During the 1848 famine, he noticed that a rise in the price of potatoes led to a rise in the quantity demanded, and a subsequent decrease in the quantity demanded. This direct relationship between prices and the quantity demanded in relation to essential food items is known as the Giffen paradox.

The cause of this contradictory trend is that as the price of some food products, such as bread for mass consumption, rises, consumers' actual incomes decrease because they spend less on more costly food items, which in turn raises demand for bread.

In a similar vein, as bread prices decline, people who buy more costly foods instead of bread have more money, which lowers the demand for bread.

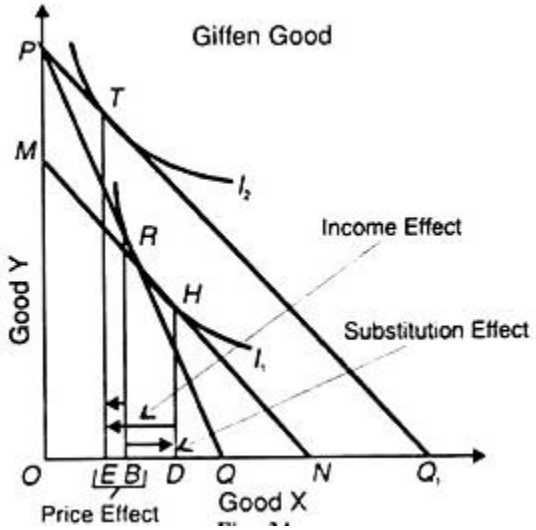

Diagram 1.9 Giffen Goods

When the price of a Giffen product drops, consumers purchase less of them because the positive income benefit outweighs the negative substitution effect. Figure 1.9 provides an illustration of this. Assume that X is a Giffen good and that the budget line PQ is tangent to the indifference curve I1 at the initial equilibrium point, R.

The consumer now travels to point T of the tangency between the budget line PQ1 and the curve I2 as the price of X declines. He decreases his consumption of X by BE, which is the price impact that causes him to migrate from point R to point T.

The higher real income resulting from the drop in the price of X is taken away from the customer by drawing the budget line MN parallel PQ in order to isolate the substitution impact. and at point H, tangent to the initial curve I1. He so travels along the arc from point R to point H. This is the negative substitution effect that causes him to purchase more BD of X as its price drops while keeping his real income same. In order to isolate the income impact, the customer must relocate from point H to point T in order to lower his consumption of X by a significant amount DE after receiving his money back.

This is the positive income impact when DE lowers the amount sought of Giffen good X due to a compensating variance in income when its price declines. In other words, it is positive in terms of price change, meaning that a decrease in the amount required results from a drop in the price of item X due to the income impact.

Therefore, the overall price effect is positive in the case of a Giffen good because the positive income effect outweighs the negative substitution effect. For this reason, the demand curve for a Giffen good slopes higher from left to right. Therefore, BE=DE (income effect) + (-) BD (substitution effect) is the price effect.

The Slutsky Method:

Slutsky used the consumer's apparent real income as a constant to explain the pricing effect's income and substitution effects. When the consumer's actual income rises, the price of X falls, but it is adjusted so that the customer can still have the same quantity of X if he so chooses, maintaining a constant apparent real income.

This is because when the substitution effect occurs, he advances to a higher indifference curve. It suggests that rotating budget lines around a point where they intersect, like point R in Fig. 1.10, correspond to the Slutsky effect.

In his book A Revision of Demand Theory, Hicks refers to this as the cost difference technique. Assume that although the price of X decreases, the consumer's apparent real income remains unchanged. In order to allow him to have the original combination of X and Y, his higher income as a result of a price decrease is taken away from him. Fig. 1.10 shows the consequences of Slutsky.

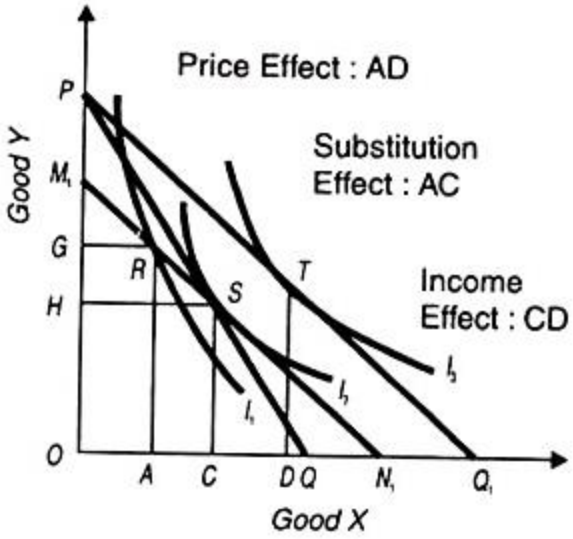

Diagram 1.10 Slutsky views of Substitution effect

At point R, when the budget line PQ is tangent to the I1 curve, the consumer is in equilibrium. PQ1 becomes the consumer's new budget line when the price of X drops, and he is in equilibrium at point T on the indifference curve I3.

The price impact is the consumer's movement along the horizontal axis from point R to point T or from point A to point D. Since it is believed that the consumer's apparent real income stays constant, the cost difference from the drop in the price of X is to be deducted from his higher income, allowing him to purchase the original combination R.

This is accomplished by drawing the line M1 N1 so that it passes through point R. This is the same as deducting PMX quantity of Y or Q1 N1 of X from the consumer's income. However, the consumer is in equilibrium at point S, where this line intersects curve I2, on this new budget line M1 N1.

In actuality, the buyer replaces Y with X as X is now less expensive than Y. In order to get AC quantity of X, he therefore compromises GH quantity of Y. The Slutsky Substitution Effect occurs when the customer moves from point R to S or from point A to C on the horizontal axis.

The customer will move to point T on curve I3 if his withdrew income is refunded to him. The income impact is the shift on the horizontal axis from S to T or from CD. As a result, as the price of X drops, the customer purchases more X from point R to point T or AD. The substitution effect AC, which transfers the customer from R to S, is the first consequence of the pricing impact. He is moved from point S to point T by its second impact, the income effect CD.

Slutsky vs. Hicks—Separation of Income and Substitution Effects from Price Effect:

The price effect's income and substitution impacts are distinguished differently by Hicks and Slutsky. Hicks claims that as the price of X decreases, the consumer's real income rises and, thanks to the substitution effect based on the compensating variation, he stays at the same indifference curve.

This results from shifts in the relative pricing of X and Y, which allow the consumer to spend his higher real income in a way that neither improves nor degrades his previous situation. Through the substitution effect, the consumer travels from one point of equilibrium to another along the same indifference curve I1, as seen in Figure 1.11.

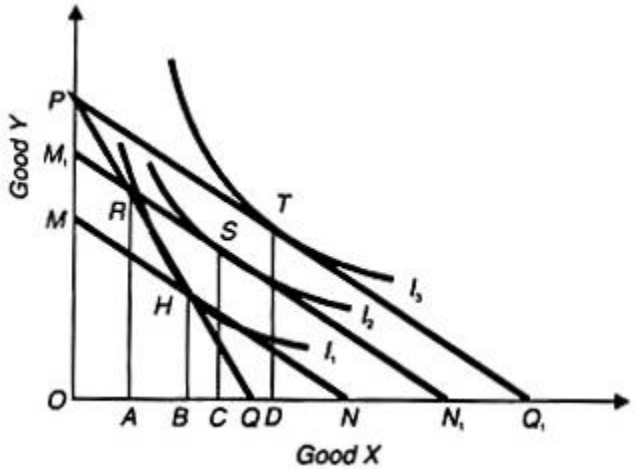

Diagram 1.11

However, according to the Slutsky substitution effect, when the price of item X drops, the consumer uses his extra money to purchase the original amounts of A and Y if he so chooses, and his apparent actual income remains same. However, as seen in Figure 1.11, the substitution effect occurs as he advances to the higher indifference curve l2.

In the example of normal products, Figure 36 illustrates how the price effect's income and substitution impacts are separated using both the Hicksian and Slutsky methods. In this case, PQ is the initial budget line, and R is the equilibrium point on the indifference curve I1, where the customer purchases OA of X and RA of Y.

The budget line now extends to PQ1 due to the decline in X's price, and the customer moves to point T on the higher indifference curve l3.

The price impact, shown by the shift from R to T, indicates that the customer purchases more AD of X as a result of the price reduction. The income effect and the substitution impact, which may be divided into two halves, combine to form the price effect. In accordance with Hicks, we construct a line MN parallel to PQ1 so that, at point H on the budget line MN, the consumer is at the same real income level on the original indifference curve I1.

The substitution impact is measured by the I1 curve's shift from point R to point H. The client consequently purchases AB more of X. The revenue effect from H to T is what causes the remaining growth in BD of X. According to the Slutsky technique, a new budget line M1 N1 is drawn parallel to PQ1 such that, even when the price of X declines, the consumer's apparent actual income stays the same. The client has the same income to purchase combination R as he had at the previous budget line PQ if M1 N1 travels through point R.

On the budget line M1N1, however, the customer really favours the combination S over combination R since point S is on the budget line that is tangent to a greater indifference curve I2, whereas point R is on a lower indifference curve I1. The Slutsky substitution effect is the transition from R to S.

Consequently, the customer purchases more AC of X, and the income effect is the shift from S to T or CD of X.

The distinctions between the two approaches of calculating the income and substitution impacts are also shown in Figure 1.11. By BC amount of X, the Slutsky substitution impact is greater than the Hicksian substitution effect. However, the Slutsky income effect CD. X as an Inferior Good is less than the Hicksian income effect BD. The Hicks and Slutsky approaches can be used to explain the income and substitution impacts of the price effect when the price of X decreases if X is an inferior item. According to Hicks and Slutsky, the price effect is represented by the consumer's movement on the horizontal axis from R to T or A to D in Figure 1.12.

On the identical indifference curve I1, the Hicksian substitution effect is responsible for the migration from R to H, but on the higher curve I2, the Slutsky substitution effect is responsible for the movement from R to S.

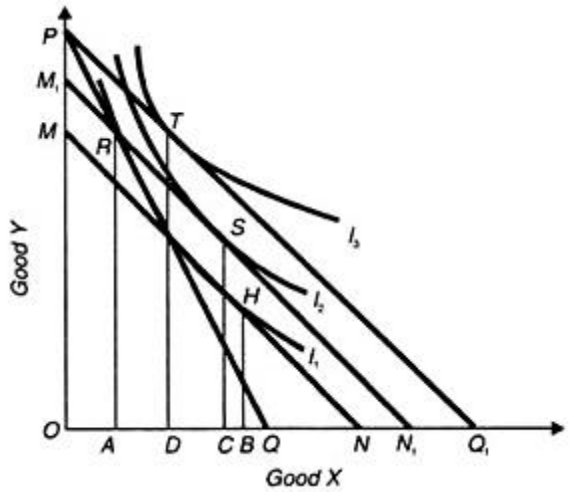

Diagram 1.12

When the price of an inferior item, X, drops, the substitution impact outweighs the income effect, causing the customer to purchase more of X. Both approaches have classified this fact. Nevertheless, the Slutsky substitution effect (RS or AC) is less than the Hicksian substitution effect (RH or AB). In the same way, the Slutsky income impact CD is less than the Hicksian income effect BD.

1.5 Consumer's Surplus

The concept of consumer surplus was first used in economics by Alfred Marshall, but it dates at least to the writings of the French economist Duput in the first half of the nineteenth century. Two economists who won Nobel Prizes disagree on the concept's usefulness; John Hicks saw it as a key component of welfare economics, while Paul Samuelson thinks it can be discussed or abandoned without causing harm. Another issue is whether we can refer to the concept of consumer surplus as a whole or just for a single household or a group of consumers of a product.

The theory of consumer surplus is derived from the law of diminishing marginal utility, which states that the price we pay for an item only measures its marginal utility and not its total utility; only on the marginal unit that a man is just persuaded to purchase does the price exactly match the satisfaction he anticipates from that unit, but he experiences some additional satisfaction on other units that he purchases.

In comparison to what he already spends for these units, he would be willing to pay more for them. The economic measure of a consumer's surplus is the difference between the amount of enjoyment he receives from his purchases and the price he actually spends for them.

It stands for the excess of satisfaction he obtains, which is equivalent to the difference between the value of the money given up and the value of the items purchased. If the item had been taken away from him, he would have been compelled to use the money to buy other goods that would have given him less satisfaction but not the same amount.

Under economic theory, Alfred Marshall used the phrase "consumer's surplus" to illustrate how, under a variety of circumstances, a customer gets more from a good than he pays for it.

Marshall explained consumer's surplus thus:

"A person's price for an item can never be higher than what he would be willing to pay instead of forgoing it; therefore, the satisfaction he receives from purchasing it usually outweighs the satisfaction he forfeits in paying for it, and he thus derives a surplus of satisfaction from the purchase."

The economic measure of this surplus satisfaction is the difference between the price he would be willing to pay and the price he actually pays. In other words, someone's consumer surplus is the benefit they receive from buying something at a low price that they would prefer to pay a high price for than to forego.

We occasionally discover that a consumer's willingness to pay for a good may exceed the cost he actually incurs. His individual demand price is the price he is willing to pay for a product, and the market price is the amount he actually pays. Consumer surplus, as defined by Paul Samuelson, is simply the difference between the individual demand price and the market price of a good (or, more simply, the positive difference between the potential price and the actual price of a good).

Therefore, another approach to display the consumer's surplus is as follows:

Total Utility minus (Total units purchased x marginal utility or price) is the consumer's surplus. The positive difference between the overall usefulness of a something and the whole amount paid for it is known as the consumer's surplus.

1.13 may also be used to demonstrate the idea of consumer surplus:

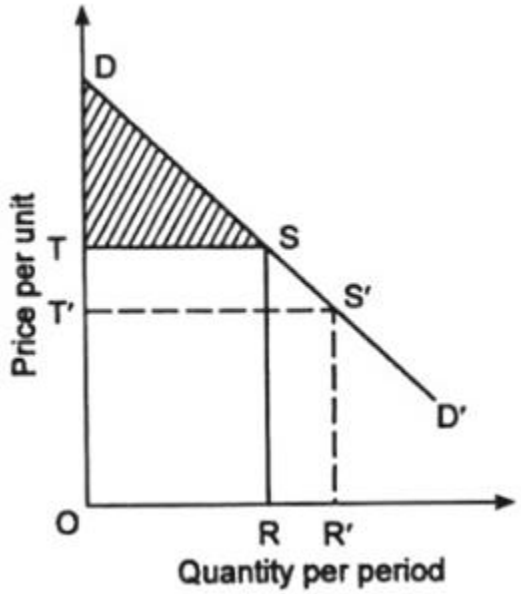

Diagram 1.13 Marshalian approach of Consumer Surplus

A commodity's quality is measured on the horizontal axis in Figure 3, while its marginal usefulness or production is measured on the vertical axis. The demand price for it is denoted by DD'. A customer receives a level of pleasure equal to the area DORS if he purchases all the units (OR) at the RS price per unit. However, he only spends ORST, therefore DTS—the darkened

area—is his surplus satisfaction. He would purchase OR' and his excess would rise to DTS' if the price dropped to R' S'.

Therefore, the area under the demand curve but above the market price is used to calculate consumer surplus. One challenge is that as prices down, demand rises while consumer real income rises. Therefore, an adjustment must be performed to counteract the effect of the difference in real income at the higher price (RS) and the lower price (R'S') in order to get a more accurate assessment of the benefit of the surplus.

The main criticisms of the doctrine are the following:

(1) Money's Constant Marginal Utility
(2) Inaccurate Measurement
(3) Challenges in Assessing Consumer Surplus
(4) In the case of necessities, an infinite consumer surplus
(5) Overt Consumption Items
(6) Cardinal Utility Cannot Be Meaningful
(7) Challenges in the Complementary and Substitute Situation
(8) An entirely speculative and unrealistic idea
(9) Ineffective Toy for Theory
(10) Interest in History and Doctrine

Prof. Hicks' explanation of consumer surplus:

Prof. J.R. Hicks revived the idea of consumer surplus even in the absence of utility measurement. In this sense, Hicks has stated that the best approach to see consumer surplus is to think of it as a method to convey, in monetary terms, the benefit that the consumer receives as a result of all price changes.

In his "Indifference Curve Analysis," Hicks uses resources to examine a man's outward behaviour, namely his preference for one scenario over another, and uses this ordinal utility function to determine the Consumer's Surplus.

For example:

Assume that the consumer is unaware of commodity X's pricing. He decides to have the OR of X commodity and OS amount of money, or combination A, on IC1. Stated otherwise, he is willing to pay the OS quantity of money and the OR commodity of X commodity. Stated otherwise, he is willing to pay the TS sum of money for OR commodity of X.

Let's now assume that he is aware of X's price, which is shown by the TM budget line. With the same money, the customer discovers that he can go up the indifference curve. B, the tendency between IC2 and TM, represents the consumer's new equilibrium. Customers now have a mix of the UO amount of money and the OR quantity of X commodity.

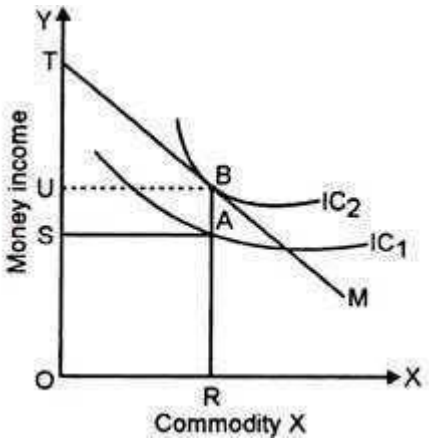

Diagram 1.14 Hicksian approach of Consumer Surplus

Stated otherwise, the customer is willing to pay TS for the same quantity of X goods, but he must only spend TU. Consumer's Surplus is thus equal to SUBA. Thus, we may deduce that in the study of indifference curves, Consumer's Surplus represents a shift from a lower to a higher indifference curve, which is made feasible by an economic subject's environment.

Consumer surplus and price elasticity of demand

How does a demand curve's elasticity impact consumer surplus?

1. Consumer surplus is zero when demand for an item or service is fully elastic, meaning that the price individuals pay is precisely what they are willing to pay.
2. On the other hand, consumer surplus is unlimited when demand is fully inelastic. In this case, a change in price has no effect on demand. The amount requested is the same regardless of the pricing. Do you know of any items with this kind of zero price elasticity of demand? A life-saving product with no clear alternatives is perhaps the closest we can come; in this case, customers will be very prepared to pay.
3. It is expected that the bulk of market demand curves slope downward. There is a larger possibility for consumer surplus when demand is inelastic (i.e., Ed<1) since certain consumers are ready to pay a premium to keep using the product. When demand is inelastic, businesses frequently raise prices in order to convert consumer excess into producer surplus.

1.6 Compensated Demand Curve

The amount of a good that a customer would purchase if he received income compensation for a change in the good's price is displayed by the compensated demand curve. To put it another way, the compensated demand curve for an item is a curve that illustrates how much the customer would buy at the altered price if the income impact were removed.
Both the Hicks and Slutsky theories of the substitution effect may be used to explain the compensated demand curve. The construction of the uncompensated (also known as ordinary or Marshallian) and Hicks and Slutsky compensated demand curves is depicted in the two-story Figure 1.15.

The combined pricing effect and the substitution effects of the Hicks and Slutsky analyses are displayed in the upper part of the picture.

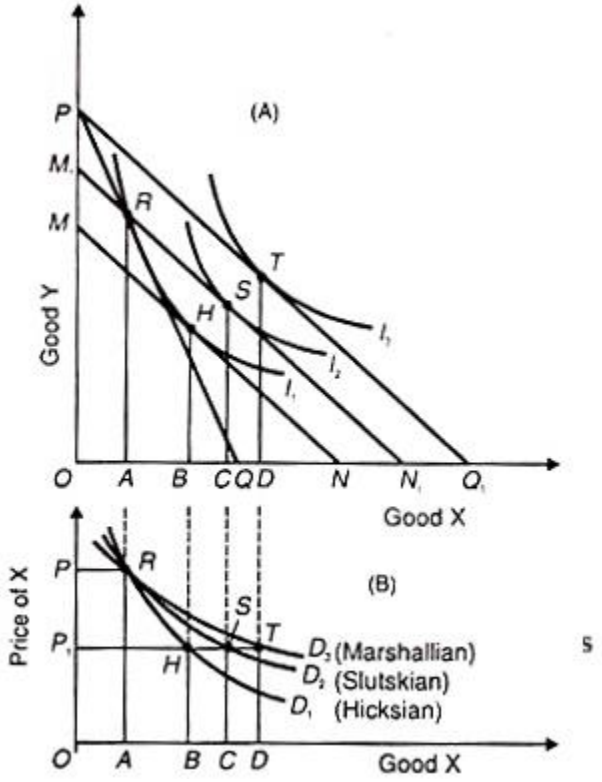

Diagram 1.15 Compensated Demand curve

The regular demand curve and the Hicks and Slutsky adjusted demand curves are derived in the lower part of the picture. First, look at graphic (B), which shows the price of good X on the vertical axis. When the budget line in the upper picture is PQ, the price of X is displayed at point P, an arbitrary point on this axis. Point P1 in the lower figure represents the decline in X's price as shown by budget line PQ1.

The Marshallian Uncompensated Demand Curve:

We begin by outlining how the Marshallian uncompensated demand curve was derived. Assume that the consumer's initial equilibrium is at point R, where the budget line PQ is tangent to the indifference curve I1, and that the customer purchases the OA of good X in the preceding diagram.

Allow X's price to drop. Consequently, the consumer is at a higher point of equilibrium T on the indifference curve I3, and the budget line PQ extends to PQ3.The price impact, which encompasses both the income and substitution effects, is what causes the change from R to T. The D3 curve in the figure's lower section illustrates this. This is the uncompensated (also known as ordinary or Marshallian) demand curve, which illustrates how the amount requested of good X rises from OA to OD as its price drops from P to P1.

The Hicksian Compensated Demand Curve:

We extend the work above and derive the Hicks substitution effect since the compensated demand curve is predicated on the substitution impact of a change in the price of item X. Let's draw a compensated budget line MN parallel to the budget line PQ1 to subtract the gain in consumer real income caused by the drop in the price of X equal to PM of good Y and Q1 N of X good.

At point H, this line MN is tangent to the initial indifference curve I1. The substitution impact, which follows the demand curve D1 in the lower part of the image when the demand for X rises from OA to OB with the price of X falling from P to P1, is shown by the shift from point R to H on the I1 curve.

The Slutsky Compensated Demand Curve:

To determine the Slutsky substitution effect, we will draw the Slutsky compensated budget line M1N1, parallel to PQ, which passes through the original point R on the I1 curve, where he will purchase the same amount of OA of X. This will remove the increase in the consumer's apparent real income equal to PMX of Y and Q1N1 of X. However, since X is now cheaper, he will purchase more of it in order to reach point S on the higher indifference curve I2, which is tangent to the budget line M1N1. In the lower portion of the picture, the Slutsky adjusted demand curve D2 is therefore traced by the shift from R to S.

This curve demonstrates how demand for product X rises from OA to ΞC when its price drops from P to P1.

Examining Hicks' and Slutsky's adjusted demand curves D1 and D2 reveals that D2 is more elastic than D1.This is because, under the Slutsky technique, the overall cost of purchasing good

X is higher than in the Hicks approach. However, even the Slutsky demand curve D2 is less elastic than the traditional demand curve D3.

It's also crucial to remember that the compensated demand curve, whether it's Hicks or Slutsky, always slopes downward since it is designed in such a manner that the income impact is completely negated by compensating variation in income and only the substitution effect is at work. However, the typical demand curve could or might not have a declining slope. Both the income and substitution effects are at work in the case of the typical demand curve, such as D, and they account for the curve's downward slope.

Because the substitution impact is greater than the income effect in the case of the conventional demand curve, it will be more elastic than the compensated demand curves D1 and D2, even though it will slope downward if X is an inferior item. However, if X is a Giffen good, the income impact will be greater than the substitution effect, causing the normal demand curve to slope upward from left to right. However, since the compensated demand curves are not impacted by the income effect, they will have a negative slope.

1.7 The Revealed Preference Hypothesis

In 1938, Samuelson coined the phrase "revealed preference" in the field of economics. The body of literature in this area has expanded since then. Because it has made it possible to establish the "law of demand" directly (based on the revealed preference axiom) without the use of indifference curves and all of their constrictive assumptions, the revealed preference hypothesis is regarded as a significant advancement in the theory of demand.

The revealed preference hypothesis has an advantage over the Hicks-Allen method in terms of the ordering of customers' preferences since it proves the existence and convexity of the indifference curves (although it does not accept them axiomatically). Nevertheless, the demand curve is derived without the use of the indifference curves. After looking at how the "law of demand" was derived, we will demonstrate how to create indifference curves.

The revealed preference axiom, or hypothesis, which holds that preference is disclosed by choice, forms the foundation of Prof. Samuelson's theory of demand. Taking this into consideration, a customer purchases a pair of products because he prefers them to others or because they are less expensive.

Let's say the customer chooses combination A over combinations B, C, or D. Thus, he expresses his inclination towards combination A. There are two reasons why he can do this. First, compared to combinations B, C, and D, combination A could be less expensive.

Second, even if combination A is more expensive than the others, he still prefers it. One may say that A is revealed superior to B, C, and D in this case, or that B, C, and D are revealed inferior to A. Figure 1.16 explains this.

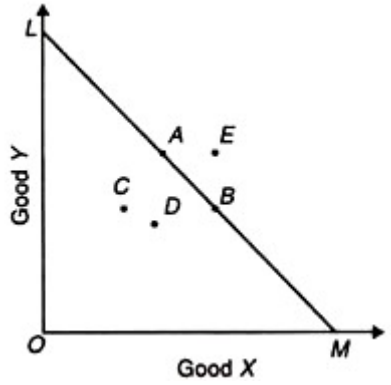

Diagram 1.16

LM is the consumer's price-income line, given the income and prices of the two commodities, X and Y. The triangle OLM, which displays the different combinations of X and Y on the specified price-income scenario LM, is the consumer's preferred region.

To put it another way, the customer can select any combination of A and on line LM or C and D below this line. It becomes clear that A is favoured over B if he choose it. Because combinations and D fall below the price-income line LM, they are shown to be inferior than A.

However, because combination E is beyond his price-income line LM, it is out of the consumer's price range. As a result, A is shown to be preferred above other combinations. Prof. Hicks claims that when a customer expresses a desire for a certain combination based on observed market activity, he is acting under strong ordering, which occurs when the selected position is demonstrated to be favoured above every other position on the triangle OLM. Therefore, the customer rejects all other possibilities, including Ò, C, and D, when he expresses his clear choice for combination A both within and on the OLM triangle. As a result, option A is highly ordered.

Assumptions:

1. **Rationality:** It is considered that the consumer acts rationally as he favours product bundles that contain larger amounts of the commodities.
2. **Consistency:** The customer exhibits consistent behaviour, meaning that if he selects bundle A while bundle B is also an option, he will not select bundle B in any subsequent circumstance when bundle A is also an option. In symbolic terms, B!> A if A > B.
3. **Transitivity:** A > C in any given circumstance if A > B and B > C.
4. The revealed **preference axiom** states that a buyer expresses his choice for a certain set

of items by selecting them in any given budgetary scenario. It turns out that, given the financial constraints; the selected bundle is the most popular of all the other viable bundles. The "basket of goods" that is selected maximises the consumer's utility. The maximisation of the consumer's utility is implied (axiomatically) by the disclosed desire for a specific set of products.

Derivation of the demand curve:

Assuming that the consumer has the budget line AB in figure 1.17, he indicates his choice for this batch by selecting the set of items indicated by point Z. Assume that if x's price drops, AC will be the new budget line that the customer sees. We'll demonstrate that there will be more x in the upcoming batch.

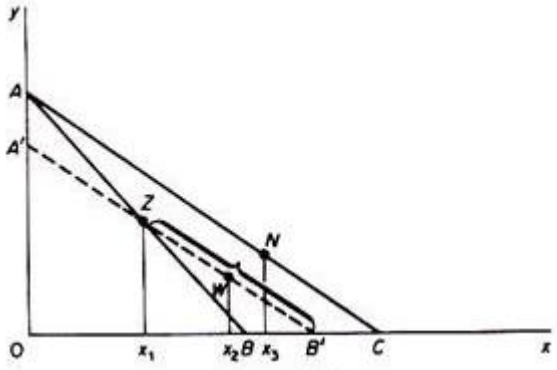

Diagram 1.17

Initially, we create a "compensating variation" of the income, which entails lowering the income to the point where the customer has just enough money to keep buying Z if he so chooses. Figure 1.17 illustrates the compensating variation by parallel shifting the new budget line so that the "compensated" budget line A'B' crosses Z. Given that all of the batches on A'Z were initially shown to be inferior than Z, the consumer will not select any bundle to the left of Z on the segment A'Z while he still has access to collection Z. This is because his selection would be inconsistent.

Thus, the customer will either keep purchasing Z (where the replacement impact is zero) or select a batch on the ZB' segment, such W, which has a higher amount of x (specifically x2). Second, the customer will select a batch (like N) to the right of W if we eliminate the (fictitious) income decrease and let him go on the new budget line AC (assuming the commodity x is normal with a positive income effect). A greater amount of x (i.e., x3) is included in the newly disclosed equilibrium position (N) as a result of the price decline. As a result, the demand curve may be derived directly from the revealed preference axiom and the implied consistency of choice: more of x is bought when the price drops.

Derivation of the indifference curves:

Although not essential for demonstrating the law of demand, indifference curves can be produced and their convexity demonstrated via the revealed preference hypothesis. The neoclassical cardinal utility theory requires more information than the indifference-curves method. However, it still demands a lot of the customer because the theory assumes that he can consistently and logically rate any potential set of items.

The customer is not required to rank his preferences or provide any other details about his likes in order to use Samuelson's revealed preference theory. By just monitoring the consumer's conduct (his decision) at different market prices, we may create the consumer's indifference map based on the revealed preference, provided that:

(a) He consistently makes the same decision; (b) His preferences remain constant over time and are not influenced by his choices; and (c) The consumer is rational in the Pareto sense, meaning he prefers more products to fewer.

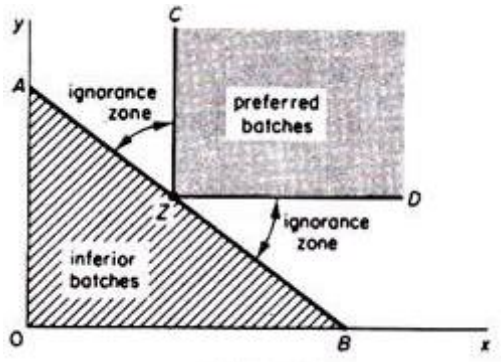

Diagram 1.18

Assume that the client selects batch Z and that his beginning budget line is AB in figure 1.18. Inferior batches to Z are indicated by all other points on the budget line and under it. All of the batches that are on these lines and in the region they define to the right of Z are favoured over Z if we draw perpendiculars through Z, CZ, and ZD because they include more of at least one commodity. There are currently no orders for batches of items in the remaining region (below CZD and above the budget line). However, by using the following process, we may rank them in relation to Z. Allow x to drop in price until the new budget line EF crosses below Z.

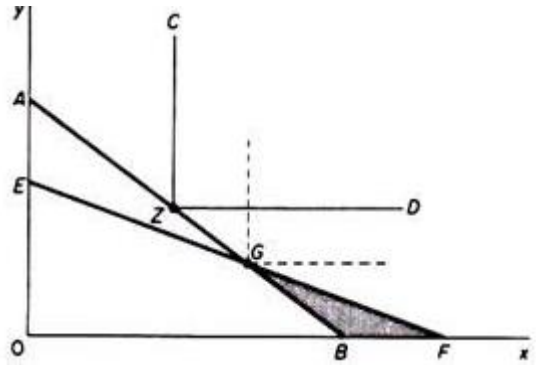

Diagram 1.19

Since points on EG would indicate inconsistent decision, being below the initial budget line and so inferior to G, the customer will select either G or a point to the right of G (on GF). Let's say the customer choose option G. In the previous scenario, Z > G, and in the revised budget scenario, G > (GBF), according to the transitivity assumption, hence Z > (GBF).

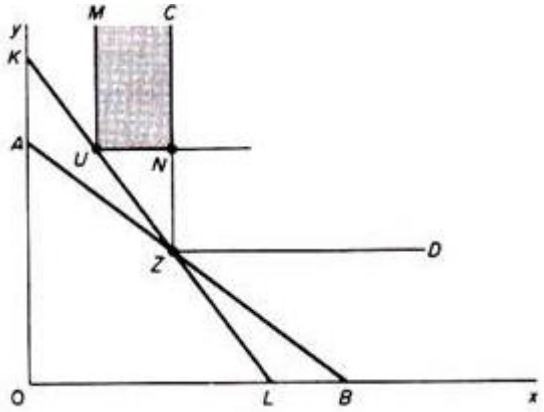

Diagram 1.20

We were able to rank every batch in GBF in relation to Z in this fashion. By putting budget lines below Z and progressively identifying all the batches of the "lower ignorance zone" that are below Z, we might continue this process. In a similar manner, we might rank every batch in the "upper ignorance zone" (with relation to Z). For instance, suppose that the new budget line KL runs through Z and that the price of x rises. The customer will either select a location, like U on KL, or remain at Z (figure 1.20).

The rationality assumption leads us to the conclusion that (M UN) > U.

Both the transitivity postulate (MUN) > Z and the revealed preference principle U > Z As a result, we were able to rate the batches in (MUN) as being better than Z. By repeating this process, we may progressively reduce the "ignorance zone" until we find the indifference curve inside the desired range. The indifference curve may therefore be derived from customer

behaviour (actual choice) in a variety of market scenarios according to the revealed preference axiom.

The following is a graphic representation of the indifference curve's convexity. The first financial scenario should be redrawn (figure 1.21). We note that since the indifference curve across Z cannot have any other form, it must be convex and fall somewhere in the ignorance zone. Since Z indicates that all other points on AB are inferior to Z, the indifference curve cannot be the straight line AB. As a result, the customer cannot be simultaneously indifferent between them.

It cannot be a curve or line that cuts AB at Z since the consumer has already indicated that he prefers Z, and points below Z would suggest disinterest. Lastly, since all of the points on the indifference curve have previously been assessed as inferior to Z (having less goods), the curve cannot be concave through Z. As a result, the indifference curve can only have a convex form to the origin.

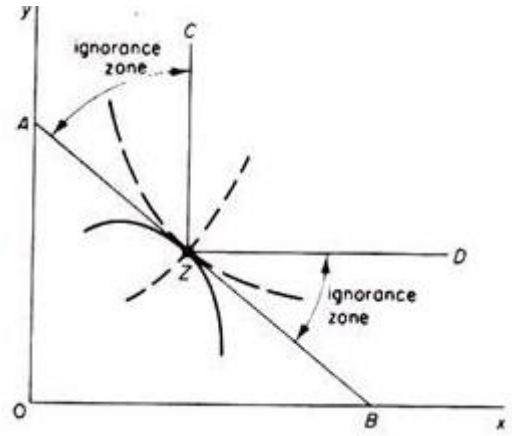

Diagram 1.21

Superiority of Revealed Preference Theory:

- This theory does not incorporate any introspective psychological data about consumer behaviour. Therefore, compared to the previous demand theorems, the revealed preference hypothesis is more practical and scientific.
- It circumvents the utility and indifference curve techniques' "continuity" assumption. A continuous curve that allows the customer to have any combination of the two products is called an indifference curve. Samuelson thinks that because the customer can only have one combination, there is discontinuity.

1.8 Derivation of marginal utility of money income

To illustrate the concept of diminishing marginal utility, a marginal utility schedule for money income is derived by calculating the additional utility gained from each incremental unit of

income received. This is accomplished by dividing the change in total utility by the change in income level, which essentially shows how much satisfaction each additional dollar provides to an individual.

Important considerations for creating a marginal utility schedule for money income include:

- ✓ **Total Utility:** To begin, you must create a total utility function that reflects the overall amount of satisfaction attained at a specific income level.
- ✓ **Determining Marginal Utility:** To get the marginal utility for each income level, divide the total utility at the current income level by the total utility at the prior income level.
- ✓ **The formula is:** Marginal Utility = (Change in Income) / (Change in Total Utility).

For instance:

Consider the overall usefulness of a person at various income levels:

- $10 in income: 10 utils is the whole utility.
- $20 in income: 18 utils is the total utility.
- $30 in income: 24 utils is the whole utility.

To calculate marginal utility, divide $20 by $10, or 18 utils minus 10 utils, to get 0.8 utils per dollar.

• The marginal utility at $30 is equal to (24 units minus 18 units) / ($30 minus $20) = 0.6 units per dollar.

Crucial Points to Remember:

- o **A decline in marginal utility:** The concept of declining marginal utility states that as income rises, the additional utility obtained from each more dollar often falls.
- o **Individual Differences**: Depending on personal tastes and situations, the marginal utility curve's form will change.
- o **Assumptions:** This idea simplifies real-world situations by assuming that utility can be quantified in cardinal terms.

1.9 Summary

Unrealistic assumptions that restrict the utilitarian approach to consumer behaviour include the inability to explain demand behaviour for inferior items, continuous marginal utility of money, interpersonal comparisons, and measurability in cardinal terms. The Indifference Curves method, which emphasises the idea of scale of desire, attempts to overcome these drawbacks. It makes

the assumption that customers are able to categorise potential commodity combinations into equal-satisfaction groups and can organise these groupings according to satisfaction levels. By contrasting the actual price paid with the amount the customer is prepared to pay rather than forego the product, indifference curves also calculate the consumer's surplus.

The Indifference Curves technique, in contrast to the utility approach, is not grounded on statistical observations and is therefore not suitable for statistical analysis. To appreciate the advantages and disadvantages of the utility and Indifference Curves techniques, it is possible to evaluate their assumptions and constraints.

1.10 Check your Progress

1. What are the assumptions of indifference curves approach?
2. State the properties of indifference curves and derive them from the assumptions upon which indifference curves are drawn.
3. What do you mean by marginal rate of substitution?
4. Why does marginal rate of substitution of X for Y fall when quantity of X is increased?
5. Define the concept of price consumption curve.
6. Where does it start from and why?
7. What do you mean by income consumption curve?
8. Where does it start from and why?
9. Explain the attainment of equilibrium position by a consumer with the help of an indifference curve.
10. Show that a budget price line is tangent to one and only one indifference curve.
11. Diagrammatically explain the concepts of income effect, substitution effect and price effect. Also show the manner in which price effect can be split up into income and substitution effects.
12. Explain the concept of consumer's surplus and show the way it is measured with the help of indifference curves.
13. Write a short note on the claimed superiority of indifference curves analysis over utility analysis.

1.11 References:

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Unit – 2

Market Structure Models

Introduction

Thus far, we have studied how supply and demand work together to generate an equilibrium price that distributes scarce resources and rations restricted outputs in a market system. Our goal in this lesson is to investigate how a business maximises its profit in a perfect market. Profit, as we all know, is the difference between income and expenses. The level of rivalry in the industry—which is defined as the total number of businesses offering a certain product—determines revenue in the particular demand-supply scenario. One of the four types of markets—perfect competition, monopoly, monopolistic competition, or oligopoly—applies to industries.

Objectives

- Comprehend the idea of a market;
- Identify the characteristics of perfect competition;
- Explain the conditions of equilibrium of industry under perfect competition;
- Describe the characteristics of a monopoly;
- Comprehend the characteristics of monopolistic competition;
- Comprehend the characteristics of an oligopoly;
- Distinguish between short run and long run equilibrium in different market structure and
- Compare various market structures after finishing this lesson.

Contents

2.1 Market Structure

Market structures in economics may be thoroughly comprehended by attentively analysing a variety of characteristics or elements displayed by various participants. These marketplaces are frequently distinguished by the seven unique characteristics listed below.

1. The buyer structure of the industry
2. The customer turnover rate
3. The degree of product uniqueness
4. The kind of input costs
5. The quantity of market participants
6. The degree of vertical integration within the same sector
7. The market share of the biggest firm

Similar characteristics can be identified by comparing the aforementioned characteristics to one another. As a result, classifying and differentiating businesses across linked industries becomes simpler. Economists have utilised the aforementioned characteristics to characterise four different kinds of market arrangements. Among them are oligopoly, monopoly, monopolistic, and perfect competitive markets.

Various market architectures based on competition are depicted in the following chart:

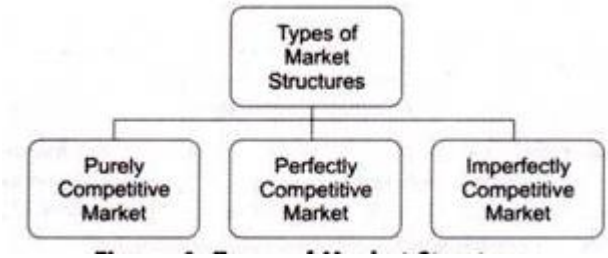


Diagram 2.1 Types of Market Structure

1. Purely Competitive Market:

A market with a high number of independent buyers and sellers of standardised goods is said to be simply competitive. Because the items are homogeneous or identical to one another, they are standardised in a pure competition. Additionally, all items in the market have the same pricing. Because there is no difference in the price or quality of items from different vendors, shoppers can buy from any seller. Sellers are powerless to affect the market price of goods in a pure competition. The reason behind this is because if a seller raises the price of their goods, buyers

could choose to buy from other vendors in order to obtain goods of the same calibre at a lesser cost.

On the other side, buyers could start to question the items' quality if a vendor lowers the pricing of their offerings. Consequently, sellers behave as price takers in a pure competition. Furthermore, there are no financial, technological, legal, or other obstacles preventing businesses from entering or leaving a market that is solely competitive.

The average revenue curve under the pure competition curve is seen in Diagram 1.2:

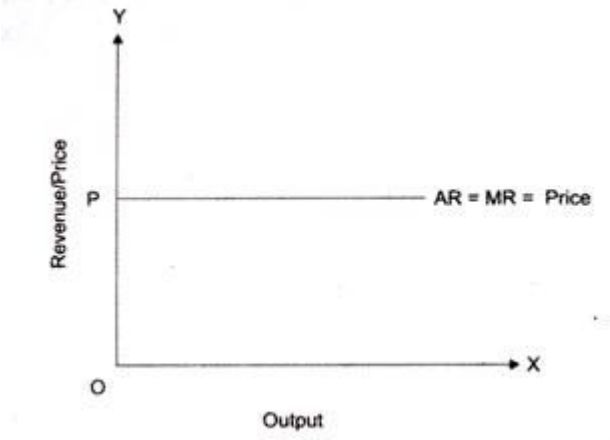


Diagram 2.2 Average revenue curve under perfect competition

The price level at which a seller can sell any number of goods at the set market price is known as OP in Diagram 2.2.

2. Perfectly Competitive Market:

In a market that is solely competitive, there are many buyers and sellers of similar goods. Compared to a simply competitive market, a completely competitive market is a broader phrase. A circumstance when there is perfect competition in the market is known as a completely competitive market.

Perfect competition entails the following additional requirements in addition to those suggested in pure competition:

i. A sizable buyer and seller base
ii. Products that are uniform
iii. Unrestricted access and departure
iv. Complete knowledge
v. No transport expenses
vi. Perfect mobility of production factors

3. Imperfectly Competitive Market:

A market scenario where the prerequisites for perfect competition are not met is referred to as imperfect competition in economics. To put it another way, a market that is exempt from the strict regulations of perfect competition is said to have imperfect competition. Differentiated products are a hallmark of imperfect competition, as opposed to perfect competition. English economist Joan Robinson was the first to articulate the idea of imperfect competition.

Furthermore, consumers and sellers lack knowledge about the market and product and service prices when there is imperfect competition. Businesses that deal in goods or services have the ability to affect the market pricing of their output when there is imperfect competition.

The many types of imperfect competition are depicted in Diagram 2.3:

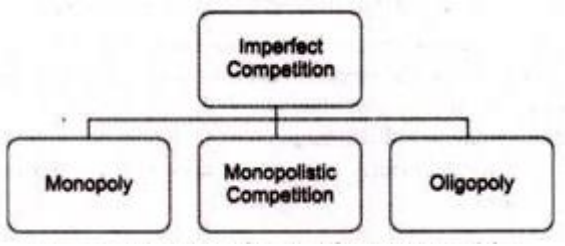


Diagram 2.3 Types of Imperfect Competition

Monopoly:

The word "monopoly" comes from the Greek word "monopolian," which means "one seller." A market structure known as a monopoly occurs when one manufacturer or seller controls the whole market. This one-person business sells goods for which there are no suitable alternatives. The primary characteristics of the monopolistic market structure are as follows:

i. One seller
ii. No product substitutes
iii. Entry barriers
iv. Information restriction

The following are a few obstacles that new organisations face while trying to enter the market:

i. Lawful Limitations
ii. Ownership of Resources
iii. Production Efficiency iv. Scale economies

Monopolistic Competition:

In his 1933 book Theory of Monopolistic Competition, Harvard University professor Edward H. Chamberlin coined the phrase "monopolistic competition." The ideas of monopoly and perfect competition have been covered. The actual state of the market, however, is only the intermediate state between these two extremes.

The combination of monopoly with perfect competition is known as monopolistic competition. When there are many buyers and sellers of goods in a market, it is referred to as monopolistic competition. That being said, every seller's goods is unique in some way.

The following are some traits of monopolistic competition:

i. A sizable number of buyers and sellers
ii. Unique products
iii. Free entry and exits
iv. Restricted Mobility of Factors of Production
v. Price Policy

Oligopoly:

Oligoi, which means few, and poly, which indicates control, are the Greek terms from which the word "oligopoly" is formed. As a result, an oligopoly is a market structure where a small number of suppliers sell either similar or unique goods. The telecommunications and aviation sectors in India are prime examples of oligopoly markets.

There are only few airlines in the aviation sector, including Indigo, Spice Jet, Air India, and Kingfisher. However, a small number of companies offer telecommunication services, such as Airtel, Vodafone, MTS, Dolphin, and Idea. These vendors are highly reliant on one another. This is due to the fact that each seller creates its own price strategy while considering the strategies of other market rivals.

The following are the primary traits of an oligopoly:

i. Few sellers and many buyers
ii. homogeneous or differentiated products
iii. entry and exit barriers
iv. mutual interdependence
v. Lack of uniformity vi. existence of price rigidity

2.2 Perfect Competition

Determination of Price and Output in Perfect Competition:

When there are many buyers and sellers of similar goods in a market, it is referred to as perfect competition.

Furthermore, there are no social, legal, or technological restrictions on an organization's ability to enter or leave a market in a perfect competition.

Both buyers and sellers are fully aware of a product's current market price when there is perfect competition. Therefore, none of them sell or purchase at a greater rate. As a result, the same price prevails in the market under perfect competition.

In a market with perfect competition, neither buyers nor sellers may affect the market price by raising or lowering their output or purchases, respectively. In a market with perfect competition, the industry sets the market price of goods. This suggests that two market forces—market supply and demand—are taken into consideration when determining a product's market price in a perfect competition.

Marshall states that "just as both of a scissors' blades are necessary to cut a piece of cloth, both of the elements of supply and demand are necessary for the determination of the price of a commodity." As was covered in the earlier chapters, market demand is the total of the amounts that each company in the sector wants.

Market supply, on the other hand, is the total amount supplied by all of the industry's companies. The intersection of the supply and demand curves determines a product's price in a market with perfect competition. Both the price and this point are referred to as the equilibrium price and equilibrium point, respectively. Furthermore, the quantity given and needed at this time is referred to as the equilibrium quantity. In the parts that follow, we will talk about how prices are set in a perfect market.

Demand under Perfect Competition:

Under perfect competition, demand is the amount of a product that buyers are willing to buy at a specific price, all other things being equal. Customers want less quantity at higher prices and greater quantity at reduced prices. As a result, demand fluctuates at various price points. The demand curve under perfect competition is shown in Figure 2.4:

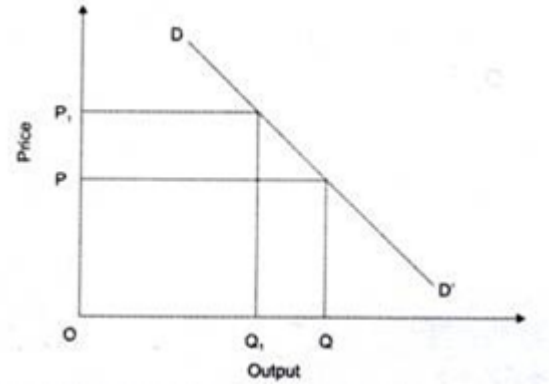


Diagram 2.4 Demand Curve under Perfect Competition

The demand curve (DD') slopes downward under perfect competition because, as diagram 2.4 illustrates, when the price is OP, the quantity demanded is OQ; conversely, when the price rises to OP1, the quantity demanded falls to OQ1.

Supply under Perfect Competition:

Supply is the amount of a product that producers are willing to supply at a specific price; typically, the supply of a product increases at high prices and decreases at low prices. Diagram 2.5 depicts the supply curve under perfect competition:

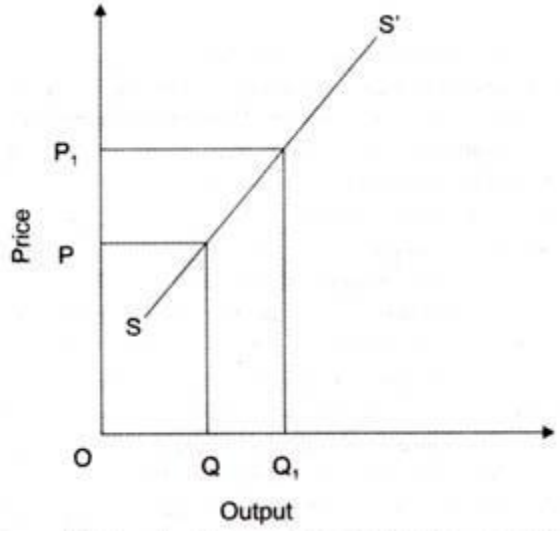


Diagram 2.5 Supply Curve under Perfect Competition

In Diagram 2.5, the amount delivered is OQ at price OP. The amount delivered rises to OQ1 when the price reaches OP1. This is due to the fact that producers may generate substantial profits by offering their goods at a premium price. Consequently, the supply curves (SS') slope higher in a perfect market.

Perfect Competition Equilibrium:

As previously said, in a market with perfect competition, a product's price is set at the intersection of the supply and demand curves. The equilibrium point is the name given to this location. The quantity that is given and required at this moment is referred to as the equilibrium quantity.

The equilibrium under perfect competition is depicted in Diagram 2.6:

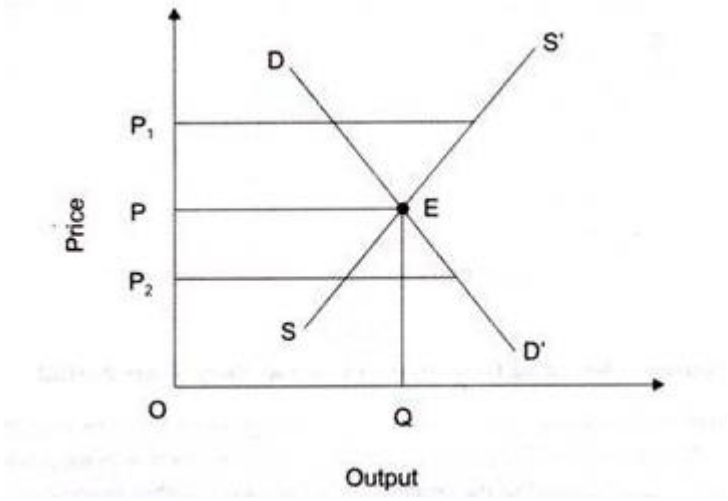


Diagram 2.6 Price and output determination under Perfect Competition

It is evident from Figure 2.6 that supply exceeds demand at price OP1. Prices will thus drop to OP. Likewise, demand exceeds supply at price OP2. Likewise, the prices will increase to OP in such a scenario. As a result, the equilibrium at which the equilibrium quantity is OQ and the equilibrium price is OP is E.

Three time periods may be distinguished in the analysis of price determination under perfect competition:

Determining Prices in a Very Short Time:

A product's whole supply is set in a relatively short amount of time. Since every company has a certain amount of inventory to sell, the supply curve is completely inelastic in a relatively short amount of time. Demand therefore affects a product's pricing.

Diagram 2.7 illustrates how demand affects price determination in a little amount of time:

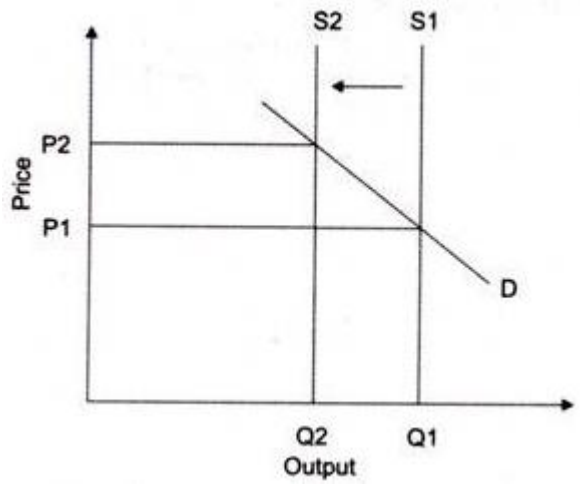


Diagram 2.7 Demand Determined Price in Very short period

As illustrated in Figure 2.7, the product's supply is fixed at SQ. The product's demand curve is represented by Di, and when the price is P and the output is OQ, the equilibrium is reached at point A. If the product's demand increases, the demand curve shifts from D to D2, and the price rises from P to P2 while the supply stays constant at OQ. At point B, the demand curve D2 and supply curve S intersect, and P2 is the newly determined price in a very short amount of time.

Let's say that a product has a constant demand but that its supply declines for a variety of causes, including floods and rising raw material costs.

Diagram 2.8 illustrates how supply affects pricing in a very little amount of time:

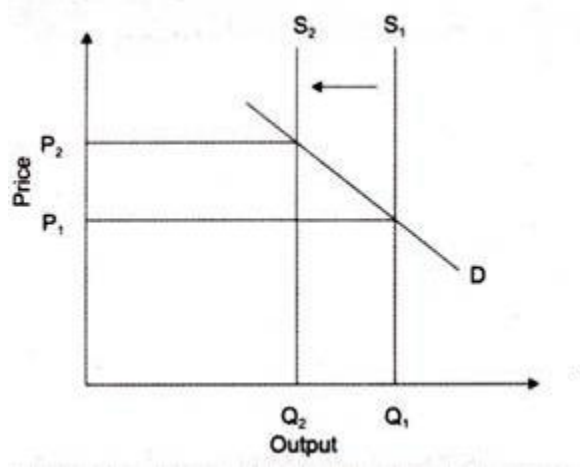


Diagram 2.8 Supply Determined price in Very Short Period

As seen in Diagram 2.8, a natural disaster causes the amount requested to stay constant while the supply curve moves from S1 to S2 and the price rises from P1 to P2. P2 is the new equilibrium price as a result. The stock market and the daily fish market are two instances of relatively short-term marketplaces.

Determining Prices in a Short Time:

A short run is a time frame during which businesses do not alter their manufacturing size. During this time, neither new organisations nor existing ones leave the industry. During this time, the supply of variable inputs can be increased or decreased. The supply curve is hence elastic. The short-term pricing determination is depicted in Diagram 2.9:

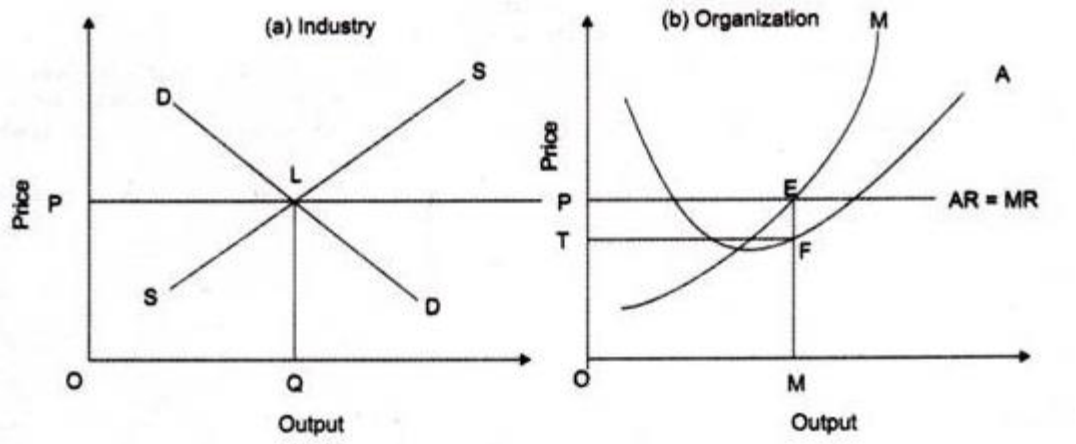


Diagram 2.9 Equilibrium under Short Run

In general, businesses must choose the output and pricing levels that will optimize their earnings. The following circumstances maximize profit in a perfect competition:

i. MR=MC=Price

ii. The MC curve needs to be rising at the equilibrium point.

The industry's pricing determination is displayed in Diagram 2.9 (a) at the point where the supply and demand curves intersect, at quantity OQ1 and price OP1. For every company in the sector, this price is set. An organisation must modify output at price OP1 in order to maximise profit. The organization's MR is displayed by the MR=AR line in Diagram 2.9 (b). The profit is maximized at point E, where MR=MC, when the market's dominant price is P1.

Let's introduce the AC curve in Diagram 2.9 (b) to ascertain the organization's profitability. AR (price) less AC equals profit. Since AR equals ME and AC equals MF, total profits in Diagram 2.9 (b) equal EF. Therefore, P1EFT is the region of profit. These are the organization's extraordinary profits.

There is a propensity for new businesses to enter the market at this profit level. Organisations, however, are unable to enter in the short term. At point E, the sector's organisations will be in balance, but the industry won't be in balance overall. Consider the scenario in which the price drops from P1 to P2. This can be seen in Diagram 2.10.

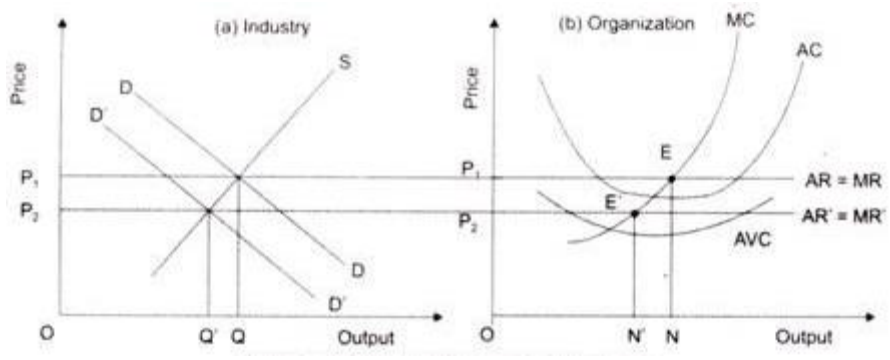


Diagram 2.10 Equilibrium when price falls

The demand curve DD changes to D'D' in Diagram 2.10 (a). This suggests that demand is declining. The price drops from P1 to P2 as a result. The current market price, P2, is shown in Diagram 2.10 (b) as being below the AC curve. Point E', where MR'= MC, is where the equilibrium is reached. Because AR is lower than AC, the organization will lose money. Organizations may be forced to leave the sector as a result of the losses. In the near term, it makes sense for businesses to keep producing. This is due to the fact that businesses may pay for both fixed and variable expenses if they continue to generate income.

Therefore, firms with perfect competition make money in the near term. They must, however, suffer losses in some circumstances. The company might not be able to sell its goods in the cutthroat market if it sets the price higher than the going rate. On the other hand, it must lose money if it sets the price lower than the going rate.

EXHIBIT-1

Shut-Down Point:

If businesses are losing money, it begs the issue of why they keep on producing. We are aware that fixed factors cannot be changed in the near term. Consequently, even if it stops operating, it must still pay for fixed factors. Short-term production halting only aids in preventing variable expenses. Therefore, an organization should continue to operate if its revenue exceeds its variable costs.

An organization should prepare to close if the price is so low that it cannot pay for variable expenses.

The following Diagram 2.11 helps to clarify this:

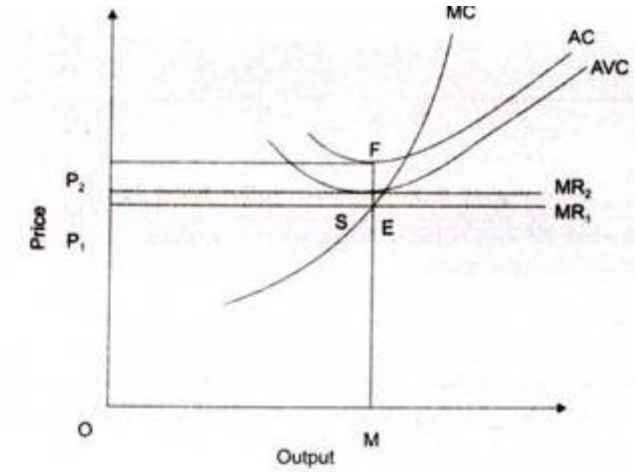


Diagram 2.11 Shut down Point

Price P is displayed beneath the AVC and AG curves in the previous illustration. It is evident that an organisation cannot pay for variable costs at this pricing. Therefore, it shouldn't generate any output at this time. The shut-down point, S., is when AVC meets MR2 and MC.

Long-Term Equilibrium:

The term "Ion. run" describes a time when businesses may readily alter both fixed and variable components, like as labour, capital, and machinery, even if the factors will ultimately change. Organizations have the option to replace or increase their fixed equipment. Additionally, businesses can readily enter or leave the sector at this time.

Decisions about output and price are influenced by the long-term AC and MC curves. ATC is also a significant factor in determining the long-term equilibrium point. The following two requirements must be met over an extended period of time in order to achieve equilibrium.

- ✓ Price = MC
- ✓ Price = AC
- ✓ Alternatively, Price = MC = AC

Businesses would make extraordinary profits if the price was higher than AC, which would encourage new businesses to enter the market. More businesses will boost the product's supply, which will lower the product's price. This will continue until the price hits AC and all businesses are making their regular profits.

On the other side, businesses would lose money if the price was lower. Companies begin to leave, which results in supply failure. The cost of AC goes up as a result. As a result, the surviving businesses will begin turning a profit as usual.

It should be mentioned that MC is more than AC when AC rises and lower than AC when AC lowers. As a result, MC=AC at the AC curve's minimum point, when AC is neither increasing nor dropping.

The equilibrium requirement may thus be reformulated as follows:

Price = MC = AC Minimum

The following Diagram 2.12 illustrates the long-term equilibrium:

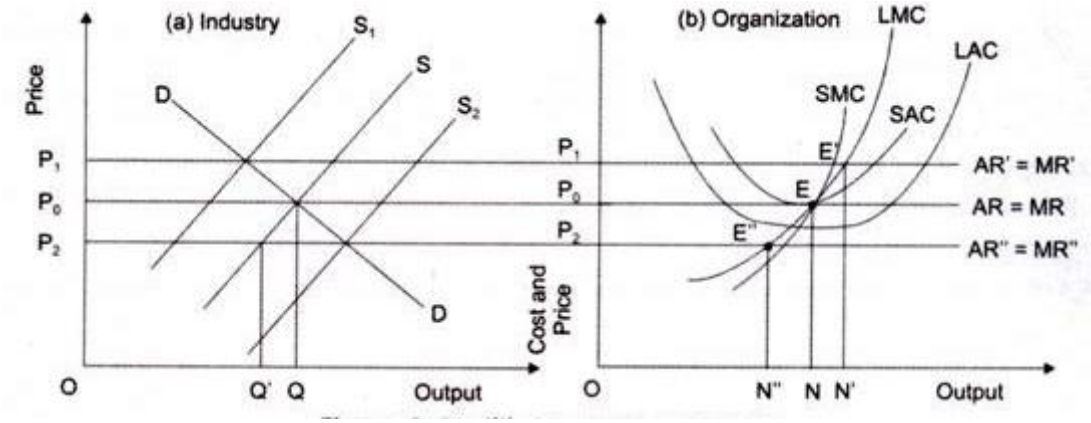


Diagram 2.12 Equilibrium in the long run

Organizations have the ability to enter and quit the sector throughout time. Equilibrium is reached at point E' in Figure 8 when the price is OP1. Profits are made at this stage because AR exceeds AC. This encourages additional businesses to join the market. As a result, the industry's supply curve will move from S1 to S2. As a result, the price will drop from OP1 to OP2. Because AR is lower than AC at this pricing, businesses begin to lose money. As a result, the majority of companies will leave the sector. This causes the supply of the commodity to decline, which raises the price even more until P0. As a result, complete equilibrium is reached at price OP0 and output ON, where all businesses in the sector are making regular profits.

LMC=Price=minimum LAC in this case. The long-run equilibrium leads to the conclusion that firms are compelled by rivalry to produce at the AC curve's minimum point. Customers benefit from this as the product is made at the lowest feasible cost.

Ideal Company: Definition and Clarification:

An optimal business is one that maximises its operational size and generates the best results at the lowest cost per unit.

In the short term, a company would construct the facility and run it at the lowest possible average cost. If the demand for the product rises from this least expensive output, it is considered the firm's optimal level of production since it is unable to quickly alter the quantity of land,

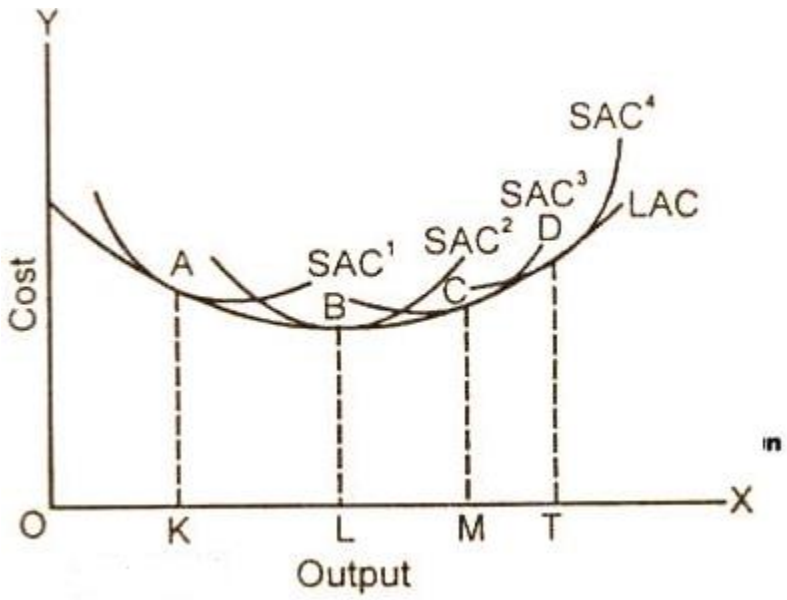
buildings, machinery, and other inputs. It must follow the same plant kind or scale. As a result, the diseconomies of scale start to drive up the average overall cost.

All inputs are vary over time. To address the shifting demand for the product, the company may either build larger factories or go back to smaller ones. The average cost per unit starts to decrease as the plant grows in size to meet the increased demand because of economies of scale, which include better and larger management specialisation, more labour specialisation, effective use of productive equipment, etc. The average cost of manufacturing keeps going down as long as the resources are used effectively.

The company eventually reaches a point where it can no longer employ the least expensive combination of inputs. The average cost of manufacturing increases as a larger factory is built. The ideal level of production for the company is the one where the cost per unit is the lowest.

The most efficient size of company.

The following Diagram 2.13 can be used to convey the idea of the optimal firm:



Units of production and cost are measured along the OX and OY axes, respectively, in diagram 2.13. There are four different plant scales shown in this picture. SCA4, SCA1, SAC2, and SAC3.

The company should select SAC1, the smallest facility, if the expected output rate is acceptable. This is because point A on plant SAC1 has the lowest cost per unit for OK production. SAC2 produces the lowest cost per unit at point B if the expected output rate is OL plant. This is the company's best plant, and it's the most effective size. Economies of scale, mostly of a managerial character, emerge if a larger facility of the SAC3 size is built to satisfy the growing demand for

the product. The production cost per unit starts to appear. As a result, the size SAC2 is the ideal plant, and BL is its least expensive output.

2.3 Monopoly

Two words, "Mono" and "Poly," have been combined to form the term "monopoly." "Poly" means "control," while "mono" means "single."

In this sense, a market condition where a commodity has just one seller is referred to as a monopoly.

The commodity it produces has no close replacements, and entry restrictions exist. The single producer might be a joint stock firm, a single partnership, or an individual owner. In other words, there is no distinction between a business and an industry when there is a monopoly.

Nature of Demand and Revenue under Monopoly:

Understanding the type of demand curve that a monopolist faces becomes crucial in a monopoly. There is no distinction between a business and an industry under a monopolistic scenario. Thus, with a monopoly, the demand curve of the company is the same as the demand curve of the industry. The monopolist encounters a downward-sloping demand curve since the consumer's demand curve slopes downward from left to right. It implies that demand for the product will rise if the monopolist lowers its price and vice versa. (Diagram 2.14).

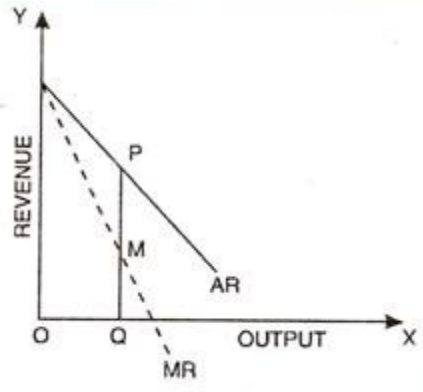


Diagram 2.14

The monopolist's average revenue curve in Figure 1 slopes from left to right. Additionally, marginal revenue (MR) declines and slopes from left to right. At OQ output, average revenue (= price) is PQ, but marginal revenue is MQ, as indicated by the MR curve, which is below the AR curve. In this manner, PQ > MQ or AR > MR.

Costs in Monopoly:

The cost curves in monopolies resemble those in perfect competition. The average fixed cost is a rectangular hyperbola, whereas the fixed costs curve is parallel to the OX-axis. Additionally, the average cost, marginal cost, and average variable cost curves have a U shape. The marginal cost curve is not the supply curve under a monopoly. The price exceeds the marginal cost. The statement that a monopolist is not required to sell a specific quantity of a good at a specific price is very helpful in this situation.

Calculating a Firm's Price and Equilibrium in a Monopoly

There are two distinct requirements for determining equilibrium and pricing under monopoly, and they are:

1. Marginal revenue and marginal cost must be equal.
2. MR must be sliced from below by MC.

Nonetheless, there are two methods for figuring out the equilibrium pricing in a monopoly, namely:

1. The approach of total revenue and total cost.
2. The approach of marginal revenue and marginal cost.

Approach to Total Revenue and Total Cost:

When the disparity between TR and TC is at its greatest, monopolists may make the most money. A monopolist attempts to determine the amount of output at which the gap between TR and TC is greatest by setting different prices. The equilibrium situation is the production level at which a monopolist makes the most money. Diagram 2.15 provides an explanation of this.

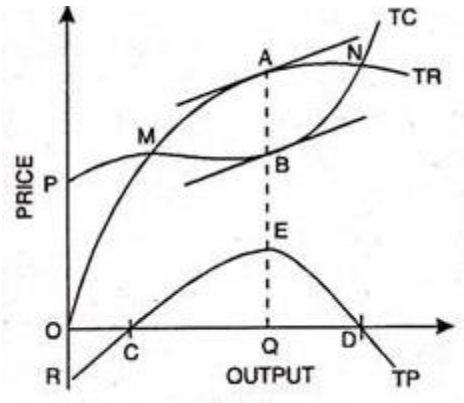


Diagram 2.15

TC stands for the total cost curve in Diagram 2.15. The total revenue curve is denoted by TR. The origin is where the TR curve begins. It means that TR will likewise be 0 at the output level

of zero. The TC curve begins at P. It illustrates that the company will have to bear the loss of fixed costs even if it stops producing.

The TP curve shows the firm's total profits. It begins at point R, which indicates that the company first experiences negative earnings. Now, TR rises in tandem with the firm's increased output. However, TR is increasing at a slower rate than TC in the early stages.

As a result, the RC portion of the TP curve indicates that the company is losing money. entire income and entire expense are equal at point M. It demonstrates that the company operates on a no-profit, no-loss basis. The breakeven point is denoted by point M. TR will exceed TC when the company generates more than point M. The TP curve slopes upward as well. It demonstrates that the company is profitable. The company will now be making the most money when the TP curve hits point E. We'll refer to this volume of production as equilibrium output.

Marginal Revenue and Marginal Cost technique: This technique states that a monopolist will be in equilibrium if two requirements are met: (i) MC=MR and (ii) MC must reduce MR from below. Based on this technique, two time periods may be used to analyse the equilibrium price.

1. The Short term
2. The Long Term

Short-Term Monopoly Equilibrium:

The term "short period" describes the time frame during which the monopolist must operate a certain existing plant. To put it another way, the monopolist is unable to quickly alter permanent components like machinery and plants. By altering the variables, Monopolist may boost his productivity. The monopolist may have regular earnings, supernormal profits, and losses throughout this time.

The following is a description of these three possibilities:

Supernormal Earnings:

The monopolist will make supernormal profits if the price he sets is higher than AC. The monopolist will continue to manufacture until MC=MR. Equilibrium output will be indicated by this limit. Diagram 2.16 shows the pricing on the Y-axis and the output on the X-axis. The short-term average cost and marginal cost curves are represented by SAC and SMC, respectively, whilst the average revenue and marginal revenue curves are represented by AR and MR.

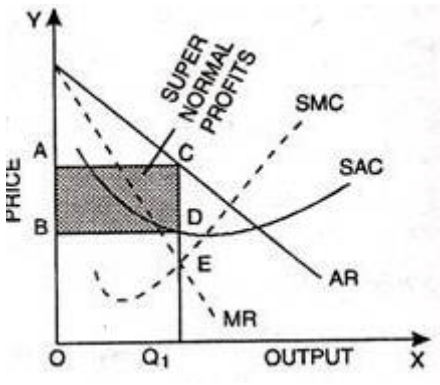


Diagram 2.16

Since both of the equilibrium conditions—MR = MC and MC intersecting the MR curve from below—are met at point E, the monopolist is in equilibrium. The monopolist will generate OQ1 level production at this equilibrium level and sell it for CQ1 price, which is more than the average cost DQ1 by CD per unit. Thus, in this instance, the monopolist's total earnings will match the shaded region ABDC.

Normal Profits:

When average revenue is exactly equal to average cost, a monopolist would have normal profits in the short term. We are aware that typical profits are included in the average cost of manufacturing. Diagram 2.17 can be used to depict this scenario.

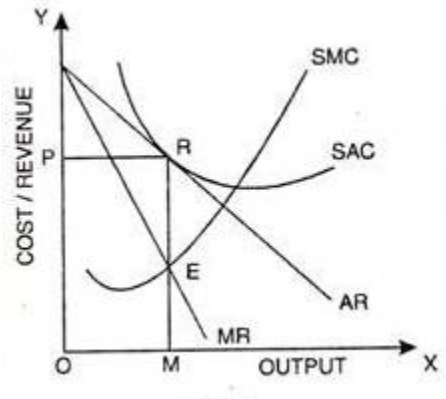


Diagram 2.17

The company is in equilibrium at point E in Diagram 2.17. In this case, marginal revenue and marginal cost are identical. The company's production is at the OM level. The average revenue curve at point P is touched by the average cost curve at the OM level of output. Price OR is therefore equal to the average cost of the entire product at point "P." Monopoly firms benefit from regular earnings in this fashion.

Minimum Losses:

The monopolist could have to suffer short-term losses. If the price drops below the variable cost in the short term, this happens. In other words, as long as the price covers the average variable cost, the monopolist will continue to produce even if prices decline as a result of a depression and a decline in demand. The monopolist will halt manufacturing as soon as the price drops below the average variable cost. In the short-term equilibrium, a monopolist must thus accept the smallest loss equivalent to fixed expenses. As a result, the average variable cost will equal the equilibrium price. Diagram 2.18 can also be used to clarify this problem.

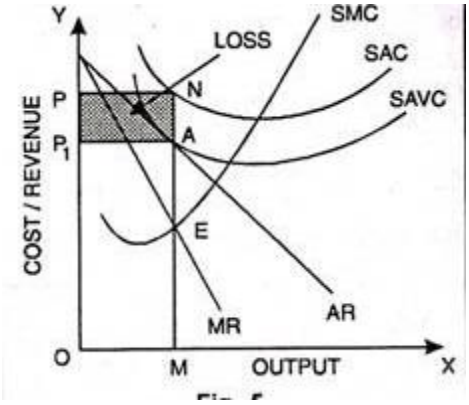


Diagram 2.18

The monopolist is in equilibrium at point E in Diagram 2.18. At point E, he generates output at the OM level and his marginal cost equals his marginal income. The monopolist-fixed equilibrium price at the OM level of production is OP1. AVC touches the AR curve at point A at the OP1 pricing.

It means that the company will only use the current pricing to cover typical variable costs. The company will lose its fixed cost, or A per unit, at the OP1 pricing. The entire loss corresponding to the darkened region PP1 AN will be borne by the company. Now, the monopolist will halt production if the price drops below OP1. The reason for this is that he will have to pay both fixed and variable costs if he keeps up output.

Long run equilibrium:

Under monopoly, is the time frame during which altering the factors of production may alter output. To put it another way, monopolists would select the plant size that best suits a given amount of demand because all variable components are changeable. In this case, equilibrium

would be reached at the production level where the marginal revenue curve is cut from below by the long-run marginal cost. Diagram 2.19 can be used to illustrate this.

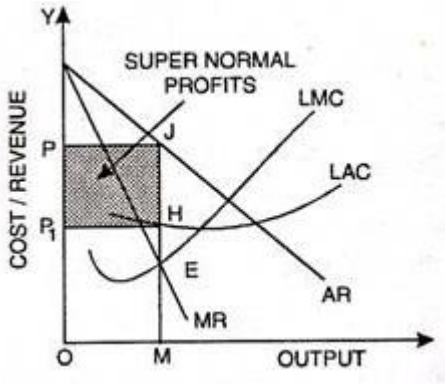


Diagram 2.19

The monopolist is in equilibrium at the output OM level in Diagram 2.19. The monopolist sets the OP price at the OM level of output, when marginal income equals long-term marginal cost. What is the average cost over the long term? Price OP is higher than LAC, or HM, which generates supernormal profits for the monopolist. Consequently, the monopolist's supernormal profit per unit is JM – HM = JH. The darkened region PJHP1 will be equivalent to his entire supernormal profits.

2.4 Discrimination in Prices in Monopoly

For the same commodity, the monopolist frequently charges varying rates to different customers. Price discrimination is the practice of charging varying prices for the same goods. "Charging different prices for the same product or the same price for the differentiated product is price discrimination," according to Robinson.

Price discrimination types include:

One typical pricing tactic employed by monopolists with discretionary pricing power is price discrimination. The monopolist uses this tactic to obtain a competitive edge or to seize market share.

Diagram 2.20 illustrates the three categories of pricing discrimination:

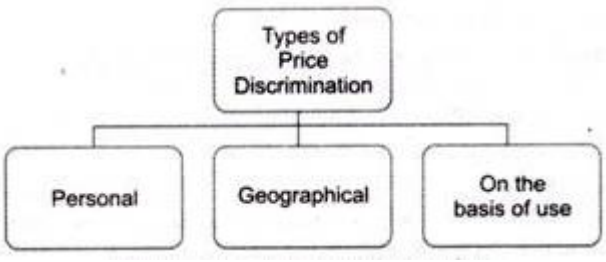


Diagram 2.20 Price Discrimination

The following explains the many forms of pricing discrimination (as seen in Diagram 2.20):

i. **Personal:**

Describes price discrimination that occurs when different people charge different prices. Customers' willingness to buy a product and their financial level determine the various prices that are charged. For instance, a doctor bills wealthy and impoverished patients differently.

ii. **Geographical:**

Describes price discrimination in which a monopolist sets different prices for the same commodity in various locations. Another name for this kind of prejudice is dumping.

iii. **Based on usage:**

This happens when a product's price varies based on its intended purpose. An power supply board, for example, charges higher rates for commercial use and lower prices for residential use.

Levels of Price Discrimination:

In practically every market, price discrimination has grown pervasive. Price discrimination is frequently referred to as yield management or monopolistic price discrimination in economic parlance. In many marketplaces, the level of pricing discrimination varies. The levels of pricing discrimination are displayed in Diagram 2.21:

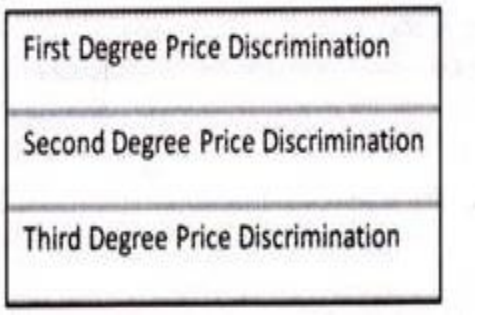


Diagram 2.21 Degrees of Price Discrimination

The following explains the three levels of pricing discrimination (shown in Diagram 2.21):

- **Price discrimination in the first degree:**

This occurs when a monopolist sets the highest price that any buyer is prepared to pay. Because it entails the greatest amount of consumer exploitation, this is sometimes referred to as perfect price discrimination. Customers do not benefit from any consumer surplus in this way. Doctors and attorneys practise first degree.

❖ **Second-degree price discrimination:**

This type of discrimination involves grouping purchasers into various categories and charging them varying rates based on their willingness to pay. This kind of pricing discrimination is used by airlines and railroads.

❖ **Third-degree pricing Discrimination:**

This type of pricing discrimination occurs when a monopolist splits the market into smaller markets and charges various rates in each of those submarkets. Thus, market segmentation is another name for third-degree price discrimination. The monopolist must split the market in this way to prevent items sold in one market from being resold in another in order to engage in price discrimination. Additionally, he or she needs to determine the price elasticity of demand for each submarket. The groups are separated based on geography, sex, and age. For example, older persons pay reduced rates on railroads. Students receive discounts at historical sites, museums, and movie theatres.

Price and Output Analysis in a Discriminating Monopoly

A monopolist's goal is to raise overall income and profit. The monopolist will set different prices in various submarkets under price discrimination. Assume that the monopolist controls two distinct markets with varying demand elasticity. To optimize his earnings, he must make the following three choices:

1. What is the ideal amount of output?
2. How can the whole production be split between two distinct markets?
3. In each market, what price ought to be charged?

Let's now take a closer look at these choices using Diagram 2.22.

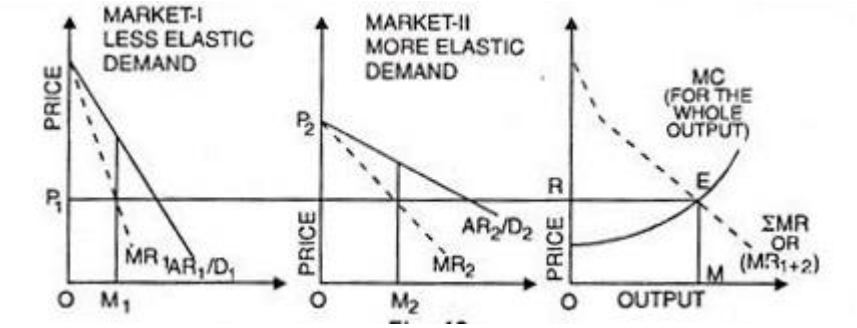


Diagram 2.22

1. **What is the ideal amount of total output?**

The monopolist must take into account his marginal cost (MC) for the entire output, regardless of the market in which it is sold, because it is considered that the product is homogenous. He compares the composite (combined) marginal revenue curve (ZMR) from markets I and II to this marginal cost (MC). The horizontal addition of the Market-I and Market-II marginal revenue curves yields the composite (combined) marginal revenue curve (ZMR).

The symbols 2MR or CMR stand for the composite marginal revenue curve, also known as the combined marginal revenue curve. As a result, the total output is set at MC = CMR (or ZMR). As a result, the monopolist will generate OM quantity of output in diagram 12. The additional cost of making the final unit at this output is exactly equal to the additional money he makes from selling that unit in either market.

2. How to Split Total Output Between Two Markets:

By matching the MC of the entire output with the MR in Market I (MR1) and the MC of the entire output with the MR in Market II (MR2), the monopolist will optimise his earnings. Stated otherwise, the amount of total output (OM) is split between two markets so that the marginal revenue in each market equals the whole production's marginal cost, which in turn equals the composite (combined) marginal revenue at OR.

This indicates that he will sell OM1 and OM2 production in markets I and II. The output in markets I and II will then be added at OR to get the combined output at price OR, where ZMR is the marginal cost for the entire output. Since it must be equivalent to the same MC (i.e., the marginal cost for the entire production), which is also equal to OR, MR must be the same in both markets (i.e., MR1 = MR2). In any event, if it were different, the monopolist might move output from an area with lower marginal revenue to one with greater marginal revenue, increasing profits.

3. In each market, what price should be charged?

The monopolist will set different prices in each markets in order to maximise his profits since the elasticity of demand varies in each market. In market-I, where demand is less elastic, the price will be greater than in market-II, where demand is more elastic. Market-1 will see the sale of an output OM1 at the OP1 price, whereas Market II will see the sale of an output OM2 at the OP2 price. Since the demand in market I is less elastic than in market II, a smaller amount may be sold at a higher price in market I

than in market II, which explains why the prices in the two markets differ (i.e., OP1 = OP2).

The monopolist will be in equilibrium when, for the whole output, MR1 = MR2 = CMR = MC. This distribution, or the point at which the monopolist makes the most money, is where he maximises his earnings. It is claimed that the monopolist is in balance.

Multi plant Monopoly

A condition known as "multiplied plant monopoly" occurs when a monopolist produces in two or more plants. The cost structure of each facility is unique. The multi-plant monopoly makes two choices in this scenario.

They are as follows:

To determine the quantity of product to be produced and the selling price in order to optimize earnings.

To determine how production should be divided among several plants.

Presumptions:

The following presumptions form the basis of the multi-plant monopoly:

(i) X and Y are two plants.

(ii) X is a more efficient plant than Y.

(iii) The two plants' cost structures differ.

(iv) The monopolist is aware of the MR curve and the market demand curve.

Diagram 2.23 provides an illustration of the multiple plant monopoly.

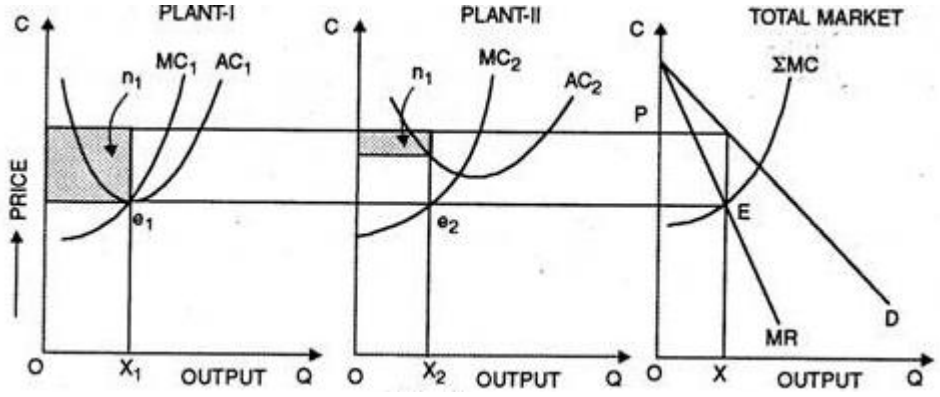


Diagram 2.23

Diagram 2.23 shows that SMC = MC1 + MC2 at position E = MR = SMC, which is the horizontal summation of MQ and MC2.

In order to make the most money, the monopolist will sell OX production at OP. The producer chooses how to divide the production of OX units between plants 1 and 2 at points e1 and e2 by

extending point E leftward to reduce MQ at e1 and MC2 at e2. To put it briefly, we draw perpendicular to the X-axis from point e1. It provides O1 as the amount of output that plant 1 produces. Once more, plant 2's output level is OX2, and OX = OX1 + OX2.

"." The sum of the two shaded rectangles, represented by a and n2, is the total profit.

Monopoly Power Measurement

The following are some of the several actions that have been proposed:

1. **Concentration Ratio:**

   The percentage of total market sales that the largest group of sellers controls is known as the concentration ratio.

   The inclusion of many companies' market shares in the concentration ratio is predicated on the potential for large companies to follow a price-output policy that is similar to what they would if they were managed by a single entity. However, this presents a challenge since they might not. For the exercise of monopolistic power, a high concentration ratio may thus be required, although it is insufficient.

2. **Profit-Rate as a Metric:**

   J.S. Bain employed the profit-rate to gauge monopolistic power. High profits, according to economists, are returns that are much more than all opportunity costs that would discourage prospective newcomers from entering the market. In a monopoly, new firms will typically not compete away monopoly profits, but there will be a certain level of profits at which new firms will find it worth taking the risk of trying to break the monopoly. The stronger the monopolist's position, the greater the profits he will be able to earn without attracting new rivals. In other words, neither the concentration ratio nor the profit-rate are ideal measures of the degree of monopoly power, although both are useful and widely used.

3. **The Measure of Lerner:**

   Based on the difference between the monopolist's pricing and his marginal cost, it is the oldest metric. Bober provides the equation 1/E. As a result, the degree of monopolistic power fluctuates in opposition to the commodity's demand elasticity.

   Nonetheless, the formula that is most frequently applied is:

   Degree of Monopoly Power = (P-MC) / P

   where MC is his marginal cost and P is the monopolist's pricing.

   When there is perfect competition,

P = MC Hence the answer to the formula (P-MC)/P is 0, signifying the absence of monopolistic power. The formula records unity and MC = 0 if the monopolised product is a free good. As a result, the monopolistic power index ranges from 0 to 1. Monopoly power is seldom as high as unity since monopolised things are rarely free. This approach has flaws because:

(i) It doesn't account for non-price competition. Second, monopolistic power manifests itself in both production limitation and high prices. The underutilisation of existing capacity or the restriction of new entrants can both limit output.

(ii) These facets of monopolistic power are not clarified by Lerner's approach.

Techniques for Managing Monopoly

Monopolists use price discrimination and do not produce at their maximum capacity. There is no competition under this arrangement, and although less is produced, more money is made. It makes income disparity worse. As a result, several measures to control monopolies are proposed. Three strategies exist for managing monopolies.

1. **Taxation-based regulations:**

Tax imposition:

Taxation is one way the government may control monopolies. The government may apply a lump sum tax regardless of production or a specific tax per unit of output. **First Example: Applying a Particular Tax:**

Commodity taxes such as sales tax and excise duty are examples of specific taxes. Production is subject to an excise duty, while sales are subject to a sales tax.

In general, a variable cost is comparable to particular tax. Diagram 2.24 illustrates the impact of a particular tax, where

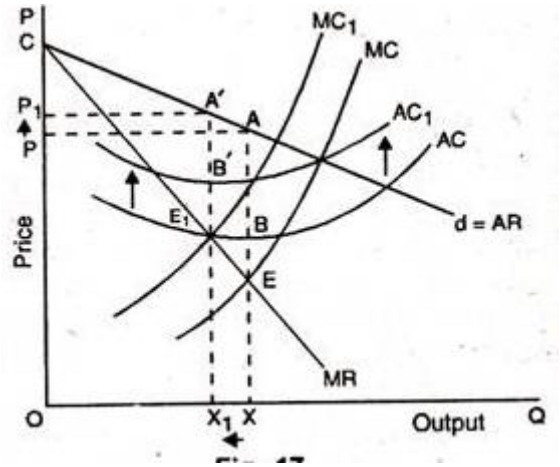


Diagram 2.24

Point E = This is the state of balance prior to the imposition of the tax. The company manufactures OX units and sells them for OP. A firm's profit per unit is AB. AC1= The higher AC curve AC1 indicates that the AC rises when the government imposes a certain tax on the company.

MC1 = The updated MC curve following the imposition of a certain tax

Point E1: At point "E1," when MR = MC1, the company is in equilibrium following taxes. The company charges OP1 for OX units. The earnings per unit are A'B'.

The following lists the consequences of a certain tax:

1. Sales of output decline.
2. Price rises are imposed on customers, who must bear a portion of the tax.
3. Profit declines.
4. How much the monopolist will transfer to the customer in the form of a per-unit tax. The elasticity of his product's supply and demand will determine this.

Second Case: Lump Sum Tax Imposition:

Monopolists are occasionally subject to a lump sum tax from the government. No matter how much a company produces, it is still subject to taxes like licence fees and earnings taxes. It is not included in the monopolist's MC as it is seen as a fixed cost. Diagram 2.25 shows the impact of lump sum tax.

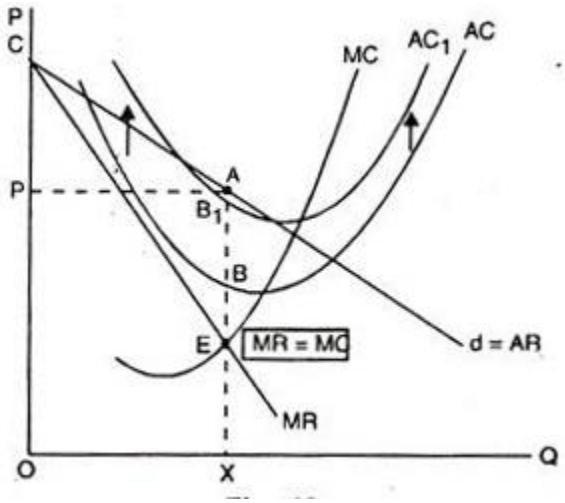


Diagram 2.25

When: Prior to the imposition of lump sum tax, Point E is the equilibrium point when MR = MC. OX units are sold by the company at OP. AB per unit is the profit that is earned. AC1 = The firm's AC curve will move higher by the tax amount since the lump sum tax is imposed on it regardless of its production. The MC curve stays the same, whereas AC is the new AC curve.

Point E = After taxes are collected, the equilibrium point remains at point E. The equilibrium price and production are same. However, the profit is now AB1 per unit instead of AB per unit. The following are the results of lump sum tax:

(i) The amount of output sold stays the same;

(ii) The price stays the same;

(iii) Profit decreases; and

(iv) The purchasers will not be burdened by the occurrence of a lump sum tax, which is entirely on the sellers.

2. Price regulation, regulated monopoly, or marginal cost pricing:

Essential services including power and water supplies, passenger transport, communication, and railway infrastructure are all referred to as "public utilities." The public should be able to access these services at affordable costs. The majority of public utility companies are controlled monopolies, often known as natural monopolies.

These monopolies are either directly operated by the government or subject to price limitations set by public bodies that are not too low in comparison to the monopoly price. Customers are spared from paying exorbitant monopolistic pricing as a result. This reduces the power of

monopolies. The issues that come up are: How much should natural monopolies cost? Is it better to use AC or MC? How may their pricing be controlled?

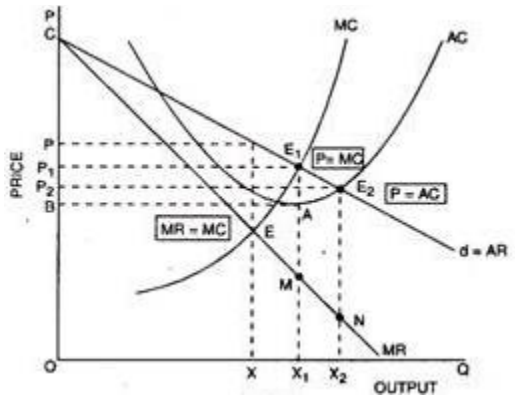


Diagram 2.26

The three pricing principles—profit maximization, AC pricing, and MC pricing—are depicted in Diagram 2.26.

The OP price, which is established by point E when MR = MC, is the profit-maximizing price. The monopolist wants to charge OP for OX units. Profit is made by the monopolist. Setting a maximum price below the monopoly price (OP) is the government's goal.

Marginal Cost Pricing: The monopolist's demand curve becomes P1 E1d if the regulatory body chooses to fix the price of natural monopolies in accordance with MC pricing, which is when P = MC, and this happens at point E1. The E1d part of the demand curve indicates that production above X1 will be sold at decreasing prices. The monopolist can sell any output up to X1 at the regulated price of P1.

Because of the MC pricing rule, the demand curve that faces the monopolist has "a kink" at point E. P1E1MN provides the corresponding marginal revenue curve. The section that corresponds to the demand curve's P1 E1 part is called P1E1.

The monopolist sells X1 units at price P1 and makes a profit; the profit is E1A per unit or the total profit is represented by the shaded rectangle P1E1AB. MN is equivalent to the E1d portion of the demand curve. The kink at point E1 on the demand curve results in the E1M discontinuity or vertical section of the MR curve.

Average Cost Pricing: An even lower price that complies with the AC norm, or P = AC, may be determined by the regulatory body. Point E2 is where this happens. OX2 units of production are sold by the monopolist for price OP2. The cost structure takes into account the monopolist's regular earnings. Whether or not this return is a "fair" return is a matter of debate among

economists. Any poor decision will result in losses and long-term inefficient resource allocation. In order to avoid losing money, the monopolist will never raise output over X2.

In the relevant range of production, LMC is probably lower than LAC because natural monopolies enjoy the advantages of economies of scale. The monopolist may suffer losses as a result of the MC price. An example of how MC pricing might result in losses is shown in Diagram 2.27.

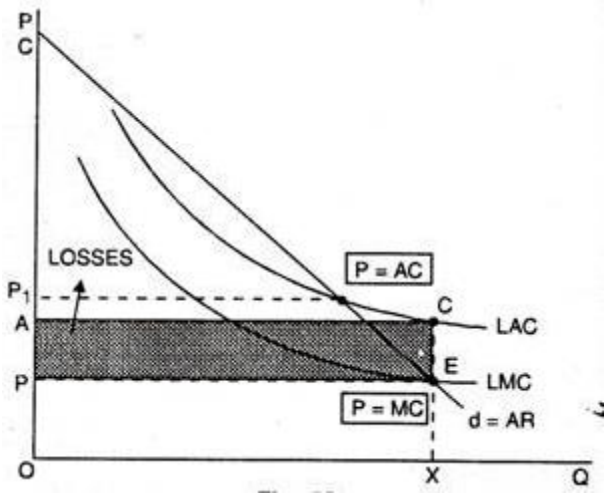


Diagram 2.27

As can be seen in Diagram 2.27, point E, where P = MC, determines the MC Price, which is OP. OX units are sold by the monopolist at OP. The darkened rectangle ACEP represents the overall loss he experiences, or the loss of CE per unit. If the government subsidises it through general taxes, the monopolist will continue to produce. The alternative is to put the price at OP1, where P = AC, in accordance with the AC pricing rule. This will guarantee that the monopolist's usual earnings or surplus profits are zero.

It is challenging to determine whether the MC or the AC pricing rule provides a more equitable return on the monopolist's capital expenditure in this case. In order to be able to sell at greater prices, the monopolist always tries to incorporate as many assets in its capital base as feasible.

3. **Peak Load Pricing:**

This refers to a situation where peak and off-peak supply are priced differently. As an illustration, the demand curves for power vary during the day. It is referred to as the peak time when demand is higher and the off-peak period when it is lower. The summer months are the busiest for hotels at hill stations, while the monsoon months are the slowest. Woollens are higher in demand throughout the winter (peak season) and less during the summer (off-peak period). After work, there is a greater traffic jam

on the roadways.

Another illustration of a peak time is the weekend rush to amusement parks. Therefore, it is advantageous for the monopolist to charge different prices in the two periods if the demand for a thing is different in the two times and the cost of production likewise varies. Because resources are strained to produce more during peak hours, costs are greater during these times.

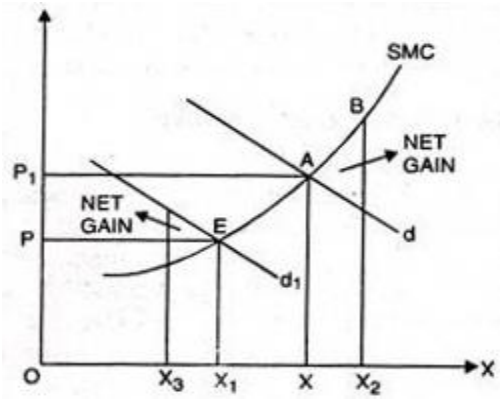


Diagram 2.28

Diagram 2.28 illustrates how a discriminating monopolist sets various power prices during peak and off-peak hours. Every time SMC cuts the demand curve, the price will be fixed. Diagram 2.28 above provides proof of the following findings:

The demand curves facing the monopolist during peak and off-peak periods are represented by the equations d and d1.

Peak-load price is represented by OP1. Customers will buy OX units at peak hours at this pricing.

OP = This is the price for off-peak hours. OX1 will be bought by customers at off-peak hours. During peak hours, consumers will try to manage their power usage more efficiently.

2.5 Monopolistic Competition

In his widely read 1933 work "The Theory of Monopolistic Competition," American economist Prof. E.H. Chamberlin introduced the idea of monopolistic competition. Monopolistic competition, to put it simply, is a market scenario in which a commodity is sold by several vendors, but each seller's offering is unique.

Demand and Cost Characteristics:

(i) The Demand Curve

Similar to monopoly and perfect competition, the intersection of supply and demand determines price in monopolistic competition. Therefore, we need to understand a firm's supply and demand curves before we can investigate how prices are set under monopolistic competition. Because of product differentiation, a business typically confronts a downward-sloping demand curve under monopolistic competition. He can sell any quantity of the goods since it is extremely elastic but not perfectly elastic within a meaningful price range.

The rationale is that some consumers will stop purchasing a product from a manufacturer who raises the price and switch to a competitor who hasn't raised prices. However, he will draw in some new clients if he cuts his pricing. Diagram 2.29 depicts the demand curve's form.

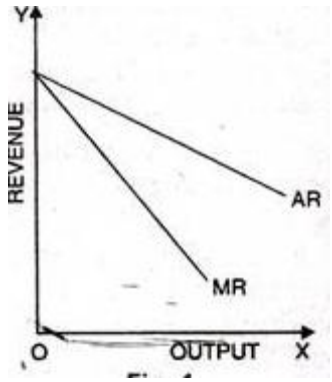


Diagram 2.29

(ii) Cost Curve:

Average Cost (AC), Average Variable Cost (AVC), and Marginal Cost (MC) all have a U-shape when there is monopolistic competition. We are aware that the unique characteristic of imperfect competition is the selling price. In essence, product advertising results in selling expenses. Chamberlin claims that the selling cost curve is likewise y-shaped. Product differentiation makes it impossible to construct the supply curve in an industry with monopolistic competition.

A state of equilibrium Under monopolistic competition, price and output:

Short-Term Equilibrium:

Professor Chamberlin asserts that under monopolistic competition, the company must make more choices than in perfect competition. The company may change the quality of its product, alter its pricing and, therefore, its output and sales, and participate in sales-promotional activities like propaganda, publicity, and advertising.

Therefore, in monopolistic competition, there are three variables:

(i) price,

(ii) product, and

(iii) Selling expense.

Discussing their consequences at the same time would be quite challenging. Thus, assuming that selling expenses are not present, the equilibrium of a single business is examined here in relation to price and output modifications. To put it another way, we will look at individual equilibrium first, followed by group equilibrium.

Individual firm Equilibrium:

Keep in mind that under both monopolies and perfect competition, two requirements must be met for maximum profits:

(1) MC = MR and

(2) MC must cut MR from below.

When these two requirements are met, a business will generate the highest profits under monopolistic competition as well.

It is not required for all enterprises to have iso-classic demand curves in a short period of time. Under monopolistic competition, the buyers' attachment determines how elastic the demand curve is. Therefore, the age of the company (and the product) will determine this.

An established business will have been selling its goods for a long period, which means that consumers' demand for them will be less elastic or inelastic. Conversely, a very new company's product demand curve will be more elastic.

As a result, older businesses will have a bigger price advantage than newer businesses. The cost curves of various businesses will be the same as it is believed that there is no product differentiation or the impact of selling expenses.

Therefore, it stands to reason that whereas newer businesses may have normal earnings or even losses, older businesses may generate abnormal profits. In the short term under monopolistic competition, a business may have three equilibrium conditions, to put it simply and clearly:

(1) It may lose money; or

(2) It may only make normal profits.

(3) Supernormal Earnings

(1) Super Normal Profit

When MC=MR and MC reduces MR from below, a business is in equilibrium or makes its maximum earnings under monopolistic competition. Diagram 2.30 shows that the company is in equilibrium at the OX level of production and at point E, when MC cuts MR from below and MR and MC are equal.

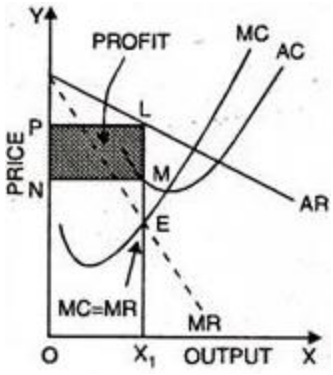


Diagram 2.30

Because average revenue exceeds average cost, or AR > AC, the company is making super-normal or abnormal profits. The primary cause of these unusual earnings is the inability of the other competing companies to create highly competitive alternatives. As a result, they struggle to draw customers to their goods.

(2) Normal Profit:

The company will make a normal profit if the product price is equal to AC in a monopolistic market. At point E in Diagram 2.31 MC equals MR. This is the point of balance. The price is OP1 and the equilibrium output is OX1 at the equilibrium point. At this moment, AC=AR, meaning that both AC and AR are NX1. As a result, the company will only make regular earnings.

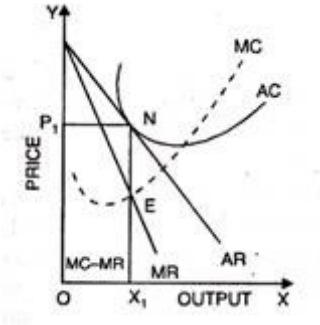


Diagram 2.31

(3) Sustaining Losses:

If a company sets a price equivalent to its SAC, it may not be able to draw customers to its product since demand may not be advantageous to it under monopolistic competition. However, it is forced to sell its goods for less than even its average cost during a brief period of time.

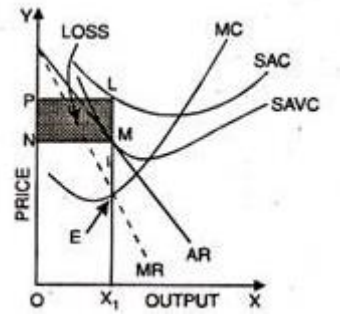


Diagram 2.32

Therefore, if it is unable to alter demand in relation to cost circumstances through product differentiation and advertising, the company may experience losses and eventually exit the sector. At point E in Diagram 2.32, when MC=MR, the company is in equilibrium. OX1 is the output at price OP at this equilibrium level. This is supported by the fact that average cost LX1 is higher than average revenue MX1. The company will experience losses equivalent to the shaded area PLMN as sales is less than cost.

Long Run Individual Equilibrium:

This is the amount of time that each company has to alter both its fixed and variable components in order to alter its production capacity. Older companies may leave the industry, and new ones may enter it. In essence, the businesses will eventually make their regular earnings.

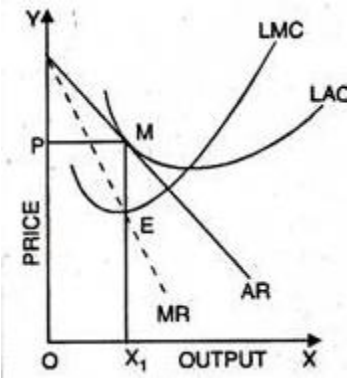


Diagram 2.33

If, the present businesses are producing super typical profits, it will attract some of the new enterprises in the industry. The arrival of new enterprises will result into excess production which will have a lowering influence on price. As a result, all businesses will eventually see regular profits. Diagram 2.33 shows the pricing on the Y-axis and the output on the X-axis. LMC is the long-term marginal cost curve, while LAC is the long-term average cost. At point E, MC = MR, indicating that the firm is in equilibrium. OX1 is the equilibrium output, while OP is the

price. The enterprises are making normal profits because the average revenue curve at this equilibrium is tangent to the long-run average cost curve at point M.

Group Equilibrium in Monopolistic Markets

The equilibrium of a single organization in a monopolistic market. However, under monopolistic competition, an organisation must examine the output and prices of other companies in the industry. Group equilibrium is the price-output balance of all organizations. Chamberlin proposed the idea of group equilibrium. The price and production of organizations with near substitutes are represented by group equilibrium. However, it is challenging to create market demand schedules and supplies because of product differentiation.

In order to solve the issue, Chamberlin proposed the idea of a "product group," which consists of goods that are both technologically and financially equivalent to one another. While economic replacements are items that have the same costs and satisfy the same customer needs, technological substitutes are products that are identical in terms of their technical aspects. Technically speaking, a product group is a collection of products with highly elastic demand. This is because, within a product group, changes in the prices of other items within the group affect the demand for a particular product. As a result, the group's products have high prices and cross-elasticity of demand.

Different kinds of organisations naturally occur in a business. The car sector, for instance, is divided into several divisions according to the kind of product. One segment in this business makes automobiles, while another makes trucks.

However, since vehicles and trucks are near equivalents for one another, the primary rivalry would be between companies producing similar goods. Organisations' cost and demand curves vary greatly as a result of product diversification. As a result, an organization's pricing, output, and profitability vary from one another.

Consequently, Chamberlin has made the following two assumptions in order to make product group analysis simpler:

i. He made the assumption that all of the items in the group had identical or consistent demand and cost curves. The homogeneity assumption is the name given to this premise. This presumption holds that customer preferences are uniformly distributed and that there isn't much of a difference between them that might result in price variations.
ii. He also believed that many vendors could not affect one another's choices in monopolistic competition. This suggests that a company's rivals would not be

significantly impacted if it changed its prices or output level. The term "symmetry assumption" refers to this kind of assumption.

Group equilibrium analysis is based on these two presumptions. An organisation within the group is more likely to generate supernormal earnings if it has built a strong brand. Over time, though, other businesses would try to imitate the functionality and style of the product. Supernormal earnings would cease to exist in that scenario.

This applies to all organisations that are monopolistically competitive. However, if the group as a whole is making abnormally high profits, outside organisations will be drawn to them unless economic or legal restrictions are put in place.

The short-run group equilibrium is depicted in Diagram 2.34:

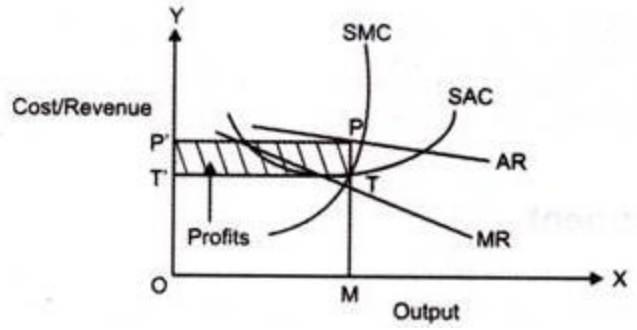


Diagram 2.34

The equilibrium point in Diagram 2.34 is denoted by P, where output is OM, price is MP, and average cost is MT. Marginal cost and marginal revenue are identical in this situation. As a result, businesses are making supernormal profits (P'PTT'). Over time, though, these extraordinary profits vanish.

The long-term group equilibrium is depicted in Diagram 2.35:

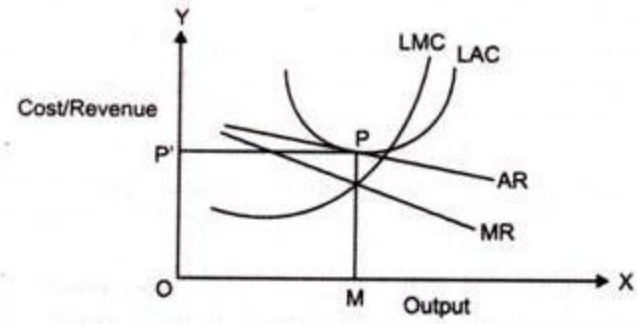


Diagram 2.35

Diagram 2.35 illustrates how the supernormal gains have vanished. Additionally, Figure 6 shows that average revenue (AR) is perpendicular to LAC, indicating that price and average revenue are

same. At the output level of OM, marginal revenue equals marginal cost. This demonstrates that all businesses in the sector are turning a profit over the long term.

Theory of Monopolistic Competition and Excess Capacity

Wicksell and Cairnes's early writings contain the idea of surplus capacity. It was also described by Mrs. Joan Robinson and P. Sraffa.

However, it was Chamberlin who presented it in the most methodical way, and Kaldor, Kahn, Harrod, and Cassels came next.

"The difference between ideal (optimum) output and the output actually attained in the long-run" is the definition of the notion of surplus (or unutilized) capacity, which is linked to monopolistic competition over the long term.

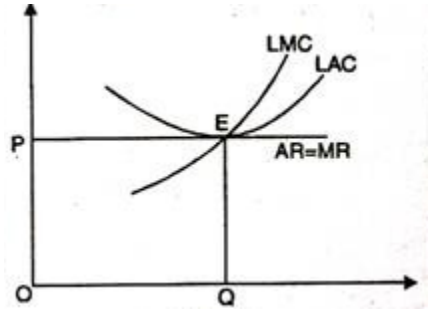


Diagram 2.36

However, with perfect competition, the long-run average cost curve (LAC) is tangential to the demand curve (AR) at its minimum point, and the entire equilibrium requirements are met: AR (price) = Minimum LAC and LMC = MR. This implies that as new businesses enter the market, the established businesses are eventually forced to optimise their use of resources in order to produce at the lowest possible average total cost. Because MR = LMC = AR = LAC at its minimum point E and OQ will be the most efficient output that society will enjoy, aberrant profits will be driven away at point E in Diagram 2.36. This is the optimal or ideal output that businesses generate over an extended period of time.

The demand curve that each business faces under monopolistic competition slopes downward rather than horizontally as it would in ideal competition. At its lowest, a demand curve that slopes downward cannot be tangent to the LAC curve.

LMC = MR = AR (d) = Minimum LAC, the double condition of equilibrium, will not be met. As a result, even when the businesses are making typical earnings, they will still be smaller than

ideal. Since producing more than the equilibrium production will result in a larger long-term marginal cost than marginal income, no business will be motivated to create the optimal output.

Because of this, every company operating under monopolistic competition will be smaller than ideal and operate at surplus capacity. Diagram 2.37 shows this, with MR1 representing the equivalent marginal revenue curve and d representing the demand curve of the monopolistic competitive company. The long-run average cost and marginal cost curves are denoted by LAC and LMC.

OQ1 production is fixed at the price Q1A1, and the company is in equilibrium at E1, where the LMC curve crosses the MR1 curve from below. Since d is tangent to the LAC curve at A1, to the left of the minimum point E, OQ1 is the equilibrium output but not the ideal output. Any attempt by the company to produce more than OQ1 will result in losses as LMC > MR1 beyond the equilibrium point E1. As a result, the company cannot use its negative surplus capacity, as indicated by OQ1, when operating in monopolistic competition.

With the aid of Diagram 2.37, which compares the equilibrium positions under monopolistic and perfect competition, it can be seen that a business operating under monopolistic competition produces less and charges a higher price for its goods than one operating under perfect competition. The monopolistic competitive price Q1A1 is greater than the competitive equilibrium price QE, and the monopolistic competition output OQ1 is lower than the perfectly competitive output OQ. The reason for this is that monopolistic competition results in surplus capacity.

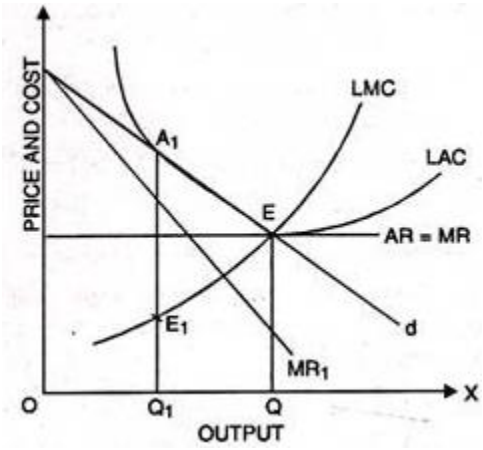


Diagram 2.37

Chamberlin's Concept of Excess Capacity: The theory of excess capacity, as explained by Professor Chamberlin, differs from the notion of optimal production under perfect competition.

Each firm's horizontal demand curve is tangent to its LAC curve at the point where it produces the least under ideal competition.

There is no long-term capacity surplus, and its output is optimal. The firm's long-term equilibrium is located to the left of the LAC curve's minimum point because, in monopolistic competition, the firm's demand curve slopes downward as a result of product differentiation.

According to Chamberlin, the tangency point between the firm's demand curve and the LAC curve would result in the "ideal output" and no surplus capacity as long as the product group under monopolistic competition has price competition and freedom of entry.

The following presumptions underlie Chamberlin's idea of excess capacity:

- ✓ There are many large firms;
- ✓ one provides a comparable product independently of the others;
- ✓ it may offer a cheaper price and draw in other clients; and it will lose some clients if it raises its price.
- ✓ The preferences of "consumers" are dispersed rather evenly throughout the many product variations.
- ✓ There is no institutional monopoly on the product; businesses are free to enter the producing sector.
- ✓ All of the companies have the same U-shaped long-run cost curves.

Reasons:

In a monopolistic competitive market where businesses are free to enter, surplus capacity occurs when there is no active price competition, according to Chamberlin. He cites the following explanations for this circumstance:

i. When setting pricing, businesses may take expenses into account rather than demand.
ii. They may pursue average profits as opposed to maximum profits;
iii. They might adopt a "live and let live" approach and refrain from lowering prices.
iv. They may engage in open pricing associations, trade organisations, or explicit or implicit agreements to maintain prices and foster esprit de corps.
v. It is possible that manufacturers may impose consistent prices on dealers.
vi. Businesses may try to divert attention from price reduction by overly differentiating their products.

vii. Firms are prevented from engaging in aggressive price competition by business or professional ethics.

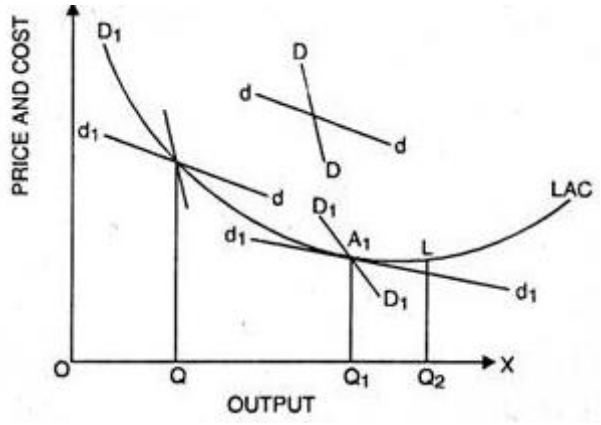


Diagram 2.38

The companies are solely concerned with the group DD curve and the curve dd is of no consequence when there is no price rivalry because of the predominance of these elements. Assume that because the price OP at point S is above the LAC curve, the businesses are making supernormal profits during the first short-run equilibrium, which is at S.

As more firms join the organisation, super-normal earnings will be challenged. The DD curve will be pushed to the left as d1d1 in Diagram 2.38 when the new firms split the market among themselves. At point A1, it becomes tangent to the LAC curve, indicating stable equilibrium in the absence of price competition for all of the group's firms, which are only making normal profits. Every company produces and sells OQ output at a price that is QA (= OP). O1 is the "ideal output" according to Chamberlin's analysis. However, in the absence of price rivalry, every business in the group is producing OQ production. Therefore, in non-price monopolistic competition, OQ1 stands for surplus capacity.

Chamberlin comes to the conclusion that the creation of excess productive capacity, which lacks an automatic corrective mechanism, is what causes prices to grow and costs to remain unchanged over extended periods of time under non-price competition. Under pure competition, this surplus capacity may arise as a result of producers' errors in judgement or abrupt shifts in the cost or demand landscape.

Due to the inability of price competition to work, it may, however, evolve over extended periods of time with impunity, with prices always covering expenses. In fact, it may become permanent

and typical under monopolistic competition. High costs and waste are the outcome of the extra capacity, which is never abandoned. They are monopolistic competition's waste.

Analysis of Selling Prices

Monopolistic competition is not the same as ideal competition when it comes to sales promotion. Since all businesses' goods are the same or homogenous in quality, no individual firm in a perfect competition has any motivation to market its product.

Since multiple sellers create somewhat different items, the profits from advertising by a single company have spillover effects, meaning that they would be shared across all monopolistic competition scenarios. A seller who is engaged in monopolistic competition can exert some form of monopoly power due to product differentiation.

In this situation, vendors engage in sales and promotional operations to get more customers to purchase their goods. Therefore, selling costs—which should be separated from manufacturing costs—are a part of sales promotion. Total production costs plus total selling costs equal the overall cost of manufacturing a product in the context of monopolistic competition. The idea of selling cost was initially proposed by Chamberlin. A company asserts that its product is superior to that of its competitors through a variety of advertising campaigns and sales promotion initiatives. Therefore, selling costs are expenses made by a business to entice customers to purchase its goods rather than those of competitors.

Selling costs are expenses made by monopolistically competitive firms "to alter the position or shape of the demand curve for a product," according to Chamberlin. Therefore, the goal of selling costs is to enhance overall revenue and, eventually, profit by capturing the saleable markets.

Sellers are enticed to expend selling costs because consumers have little knowledge about the company, pricing, product quality, existence of competing sellers, etc., and because there is a chance that advertisements and other sales promotional activities will change buyers' desires. As a result, the demand curve moves to the right and selling costs rise.

We will now examine how advertising affects monopolistically competitive sellers' decisions about pricing and production. Finding the ideal output, pricing, and selling expenses is our challenge. This is what we do in Diagram 2.39. Two functions of advertising are to raise prices and move the demand curve upward. The firm's average revenue curve before any selling charges are incurred is known as the AR curve.

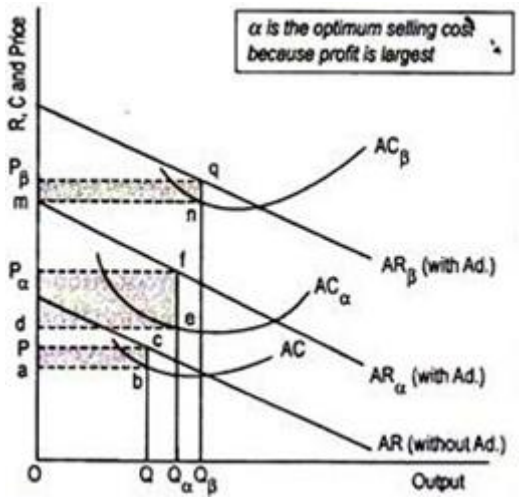


Diagram 2.39 Selling cost equilibrium

AC is the average cost of production excluding advertising and selling expenses. We haven't utilised the MR and MC curves for the diagram's neatness. However, the intersection of the MR and MC curves determines the output that maximises profits, as explained here. Because the MC and MR curves (not shown) are identical at this output, our company makes the most profit by creating OQ output when price OP is established. Because the AC curve is below the AR curve, the shaded region (abcP) represents the total profit, which is the amount of money made before any advertisements are placed.

Assume for the moment that our company incurs selling costs. Due to this selling charge, the average cost curve (which includes advertising costs) rises to ACα and the demand curve to ARα. As a result, equilibrium output becomes OQα, and the resulting optimal price becomes OPα. The volume of profit has increased at this production level (def Pα—the shaded region).

Our company will be persuaded to spend more on advertising (β amount) since earnings have grown after spending on it. Consequently, the AR curve will change to ARβ. Now, the AC curve will change to ACβ. At this point, OQβ is the equilibrium output and OPβ is the equilibrium price. This time, our company makes a little profit, but it's not as much as it was when the money was spent (mnqPβ < def Pα).

It should be mentioned that the company does not make the most money when it spends P. As a result, it should decide to create OQα and sell it for OPα, with ACα serving as the selling expense and the best advertising investment for the company.

Therefore, we may conclude that the company will profit from raising extra selling charges as long as each rise in selling expenditures results in higher revenue than costs. Profit will be at its

highest only when the additional revenue net of production expenses created is equal to the additional or marginal amount invested to achieve such net revenue.

Therefore, sales promotion may not always result in higher profitability. The selling price has an ideal level. Profits are expected to drop, though, if the advertising effort does not induce the demand curve to move to the right. Free entrance and free departure will gradually eradicate surplus profit, especially when all businesses in the monopolistically competitive market pursue sales promotion.

2.6 The oligopoly

The Greek terms "Oligoi," which means "a few," and "pollein," which means "to sell," are the origin of the phrase "Oligopoly."

It happens when a small number of companies in an industry produce either the same product or a product that is distinct.

To put it simply, "Oligopoly is a situation in which there are so few sellers that each of them is conscious of the results upon the price of the supply which he individually places upon the market." In other words, there are more than one seller, but not enough to make the influence of any one seller on the market price insignificant.

Oligopoly Price Determination: Collusive and Non-Collusive

The Kinked Demand Curve (Rigid Prices) Sweezy Model (Non-Collusive Oligopoly):

Prof. Sweezy used the kinked demand curve analysis in his 1939 paper to explain pricing rigidities that are frequently seen in oligopolistic marketplaces. Sweezy makes the assumption that if an oligopolistic company cuts its pricing, its competitors would follow suit to keep its clients.

As a result, the company that lowers the price won't be able to significantly boost demand. Its demand curve is comparatively inelastic un this area.

However, if the oligopolistic business raises its price, its competitors won't follow suit and won't alter their own rates. This will result in a significant decrease in the quantity requested of this organization. This demand curve segment is rather elastic. Price rigidity in these two scenarios is explained by a kink in the oligopolistic firm's demand curve at the going market price.

Its Premises:

The following presumptions form the basis of the price rigidity kinked demand curve hypothesis:

(1) The oligopolistic industry has a small number of businesses.

(2) One company's product is a near equivalent for those of the other companies.

(3) The quality of the product is the same. No product distinction exists.

(4) No money is spent on advertising.

(5) The product has a set or prevailing market price that all sellers are happy with.

(6) The mindset of each seller is influenced by that of his competitors.

(7) If a vendor tries to increase sales by lowering the price of his goods, other sellers will follow suit and contradict his strategy.

(8) Should he increase the price, other sellers will not follow suit; instead, they will maintain the current price and serve the clientele, leaving the price-raising merchant in the dark.

(9) To ensure that changes in marginal cost have no effect on output and pricing, the marginal cost curve crosses the dotted area of the marginal revenue curve.

The Model:

Based on these hypotheses, Diagram 2.40 illustrates the price-output connection in an oligopoly market. KPD represents the kinked demand curve, and OPo represents the oligopoly market's prevailing price for the OR product of a single seller. Any price rise over point P, which represents the current OPo pricing, will significantly lower his sales since his competitors are unlikely to follow his price hike.

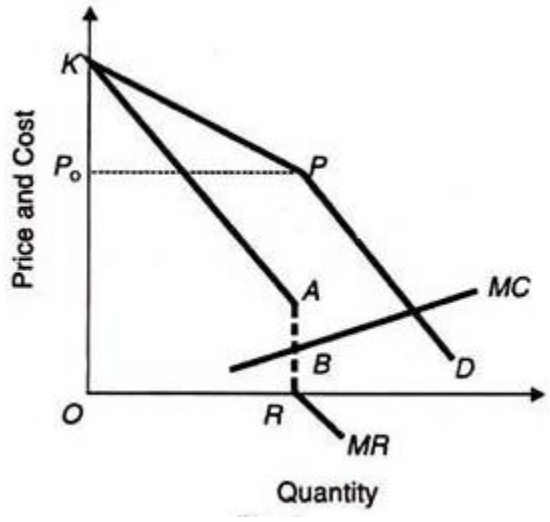


Diagram 2.40

This is because the kinked demand curve's KP section is elastic, and the MR curve's equivalent KA portion is positive. As a result, raising prices will lower his overall sales as well as his overall income and profit.

However, if the seller lowers the product's price below OPo (or P), his competitors will follow suit. His sales will rise, but his profit will be lower than it was previously. This is because the marginal revenue curve's equivalent component below R is negative, and the kinked demand curve's PD piece below P is less elastic.

As a result, the seller will lose in both price-raising and price-lowering scenarios. He would adhere to the current, inflexible market price, or OPo. Let's examine how price stability in an oligopolistic market is affected by changes in cost and demand circumstances in order to better understand how the kinked demand curve operates.

Cost Changes:

According to the kinked demand curve study, oligopoly does not change the prevailing price when costs fall within a specific range. Assume that the manufacturing cost decreases to the point that, as shown in Diagram 2.41, the new MC curve is MC1 to the right. The MR curve is sliced in the gap AB, allowing OR to be sold at the OPo price and maximise profits. It should be mentioned that the new MC curve will always cut the MR curve in the gap when prices are reduced since, for two reasons, the gap AB keeps growing as costs decrease:

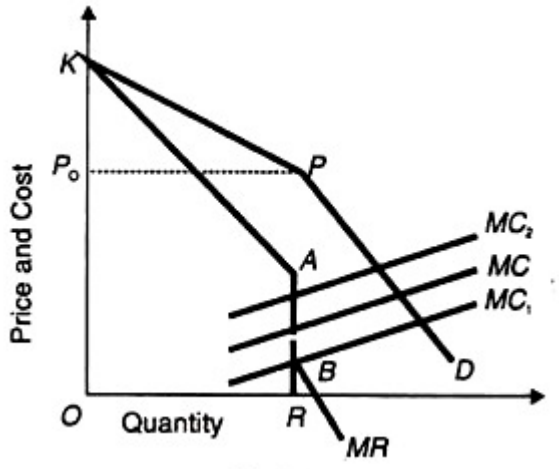


Diagram 2.41

(1) The top part KP of the demand curve gets more elastic as costs decrease since it is more likely that competitors won't follow a seller's price increase and that his sales will be significantly lowered.

(2) The lower part of the kinked curve's PD becomes more inelastic as costs decrease since there is a larger chance that other competitors will follow suit if one seller lowers their price.

Any AC curve below point A will cut the marginal revenue curve inside the gap because the angle KPD tends to be a straight angle at P and the gap AB grows. Large profits for the oligopolistic vendors and the same production OR at the same price OPo are the end results. The marginal cost curve will move to the left of the previous curve MC as MC2 if the cost of production increases. The price situation will remain stiff as long as the higher MC curve crosses the MR curve within the gap up to point A.

The price, however, is unlikely to stay constant forever due to cost increases, and if the Ml curve climbs above point A, it will cross the MC curve in section KA, resulting in a higher price for a smaller quantity sold.

As long as the MC curve cuts the MR curve in its discontinuous component, we may argue that price stability may exist under oligopoly even when costs shift. Nonetheless, the likelihood of pricing rigidity is higher in situations where costs are falling than in those where they are increasing.

Demand Changes:

Using Diagram 2.42, where D2 is the initial demand curve, MR2 is the equivalent marginal revenue curve, and MC is the marginal cost curve, we now describe pricing rigidity in situations when demand changes. Assume that the D1 curve indicates a decline in demand, and the MR1 curve represents its marginal revenue.

Other competitors will follow a vendor who lowers prices as demand declines. As a result, the bottom part of the new demand curve, LD1, will be less elastic than the lower part of the previous demand curve, HD2.

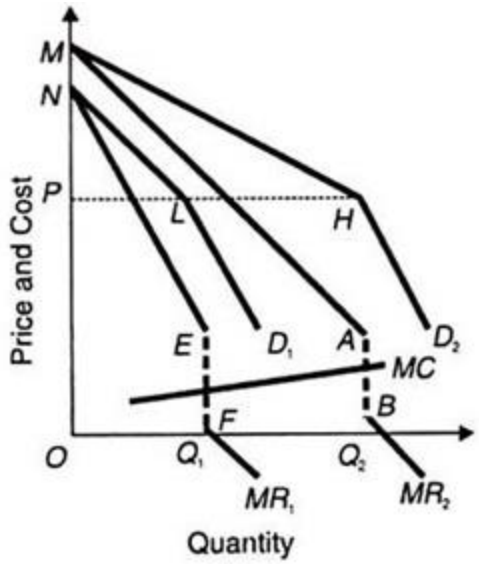


Diagram 2.42

The angle at L will tend to become closer to a right angle as a result. Consequently, the MR1 curve's gap EF is probably larger than the MR2 curve's gap AB. As a result, the oligopolistic industry will have a stable price when the marginal cost curve (MC) intersects the lower marginal revenue curve (MR1) within the gap (EF).

Following the decline in demand, the same price OP is maintained since the level of the kinks H and L of the two demand curves stays constant. However, the level of production drops from OQ2 to OQ1. By using D1 and MR1 as the initial demand and marginal revenue curves and D2 and MR2 as the higher demand and marginal revenue curves, respectively, this scenario may be inverted to demonstrate a rise in demand.

Although the output increases from OQ1 to OQ, the price OP remains same. Price rigidity will persist as long as the MC curve crosses the MR curve in the discontinuous section.

However, a greater price might result from increased demand. A seller may decide to raise the product's price in response to rising demand, and others are likely to follow suit. As a result, the new demand curve's higher MH component will likely be more elastic than the previous curve's NL portion.

As a result, the angle at H shifts from the right angle to an obtuse one. A higher price and lesser production are indicated by the MC curve intersecting the MR2 curve above the gap, which narrows the MR2 curve's gap AB. However, price stability exists if the marginal cost curve crosses the MR2 gap.

2. **Collusive Oligopoly:**

This occurs when businesses in a certain sector decide to band together as a single entity in order to maximise their combined earnings and engage in negotiations to share the market. The market-sharing cartel is the name given to the latter, and the joint profit maximisation cartel to the former. Another kind of collaboration that is predicated on unspoken agreements is called leadership. Under it, one company sets the product's price and serves as the price leader, with other companies following suit. There are three categories of price leadership: barometric, dominant, and low-cost firms.

(A) Cartels:

A cartel is a group of separate businesses operating in the same sector. The cartel adheres to standard operating procedures for pricing, production, sales, profit maximisation, and product distribution. Depending on the government's policies on their establishment, cartels can be open or hidden, voluntary or required.

Therefore, depending on their kind, cartels can take many different shapes and employ a variety of tools to adhere to different shared principles.

The two most prevalent kinds of cartels are covered below:

(1) Perfect cartel, or joint profit maximization; and

(2) Market-sharing cartel.

1. **Joint Profit Maximisation Cartel:**

Rival businesses are encouraged to establish the ideal cartel by the unpredictability of an oligopolistic market. An extreme variation of complete collaboration is the perfect cartel. In this case, companies who manufacture a uniform product create a centralized cartel board inside the sector.

This central board receives the price-output choices from the different enterprises. The price to be paid, the division of industry earnings, and output quotas for its members are all decided by the board. The central board functions as a single monopoly with the primary goal of maximising the combined profits of the oligopolistic industry as it controls pricing, outputs, sales, and profit distribution.

Its Premises:

The following presumptions form the basis of the study of the joint profit maximization cartel:

1. In the oligopolistic industry that makes up the cartel, only two companies, A and B, are presumed.
2. Every company manufactures and markets a uniform product that is an ideal replacement for the others.

3. There are a lot of purchasers.
4. The cartel is aware of the product's market demand curve, which is provided.
5. Although the enterprises' cost curves varied, the cartel is aware of them.
6. The cartel's policy is determined by the product's pricing.
7. The cartel seeks to maximise profits collectively.

Joint Profit Maximization Solution:

When the industry MR equals the industry MC, joint profits will be maximised. This is based on these assumptions as well as the market demand curve and its matching MR curve. This scenario is depicted in Diagram 2.43, where MR is the equivalent marginal revenue curve and D is the market (or cartel) demand curve.

The lateral summation of the MC curves of companies A and B yields the industry's aggregate marginal cost curve, or SMC = MCa+ MCb.

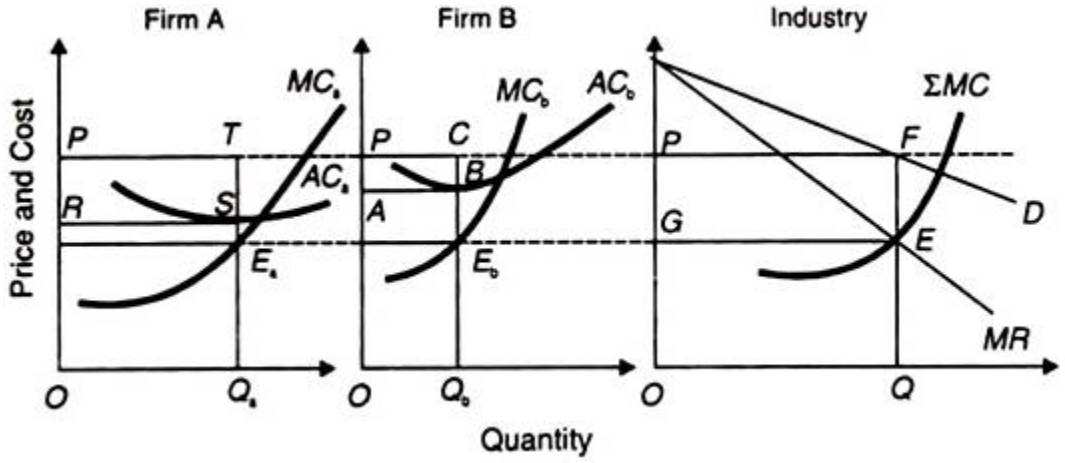


Diagram 2.43

The intersection of the industry MR curve and the SMC curve at point E yields the cartel solution that maximises shared profit. As a result, OQ, the whole production, will be sold for Qp = (Qf). The cartel board will distribute the industry output by matching the industry MR to each firm's marginal cost, just like under a monopoly.

By drawing a straight line from point E to the vertical axis that crosses over the curves MCb and MCa of businesses B and A at points Eb and Ea, respectively, the share of each firm in the industry production is determined. Accordingly, company A's share is OQa, and firm Ò's is OQb, which equals the total production OQ (=OQa + OQb).

The monopoly solution is the distribution of the price (OP) and the output (OQ) between businesses A and B in the ratio OQa: OQb. OQa > OQ b because firm A, which has lower expenses, sells more output (OQa) than firm B, which has higher costs. However, this does not imply that A will make more money than B. The total of A's and B's respective RSTP and ABCP represents the joint maximum profit.

According to the agreement reached by the two companies at the time of the cartel's establishment, it will be combined into a fund and disbursed by the cartel board. This kind of pooling arrangement will allow both businesses to optimise their combined profit as long as their individual earnings don't surpass the former.

2. **The Sharing of Markets Cartel:**

Market-sharing by cartel member businesses is a practical example of another kind of perfect cooperation in an oligopolistic market. In order to create a cartel, the companies sign a market-sharing agreement, "but retain a considerable degree of freedom concerning the style of their output, their selling activities, and other decisions."

There are two primary approaches to market sharing: quota systems and non-price competition. They are talked about as follows:

Cartel of Non-Price Competition:

A loose type of cartel is the non-price competition agreement between oligopolistic enterprises. The low-cost companies want a low price under this kind of cartel, while the high-cost companies demand a high price. However, in the end, they decide on a price that they will not sell for.

They must be able to make some money at that pricing. By changing the product's colour, design, form, packaging, and other features, as well as by engaging in unique advertising campaigns and other sales tactics, the companies may compete with one another without focussing on pricing. As a result, each company sells the product at the agreed-upon common price while sharing the market on a non-price basis.

This kind of cartel is inherently unstable because if one low-cost company undercuts the others by charging less than the going rate, it would draw clients from other member companies and increase its earnings. Other companies will exit the cartel once they learn about this. The industry's lowest-cost company will eventually survive a pricing war.

The low-cost enterprises in a cartel could not adhere to the common pricing if their cost curves diverge. They could use covert price reductions in an attempt to grow their market share. They could also turn to more effective sales advertising strategies.

Their demand-cost circumstances are likely to be further altered by such actions. As a result, pricing differences between businesses increase. In the end, a price war breaks out and the cartel agreement turns into a farce. As a result, the cartel agreement is broken up.

(a) **Market Sharing by Quota Agreement:**

Quota agreements between businesses represent the second approach to market sharing. In an oligopolistic market, all businesses band together to set a consistent pricing. However, the primary agreement pertains to the equitable distribution of the market among participating businesses, ensuring that each firm generates profits from its sales.

Its Premises:

The following presumptions form the basis of this analysis:

1. Only two businesses use the quota system to enter into market-sharing agreements.
2. Every company manufactures and markets a uniform product that is an ideal replacement for the others.
3. There are a lot of purchasers.
4. The cartel has access to and knowledge of the product's market demand curve.
5. The elasticity of each firm's demand curve is equal to that of the market demand curve.
6. The two companies' cost curves are the same.
7. The market is evenly shared by both companies.
8. The product is sold by each at the uniform price that has been agreed upon.
9. There is no risk of new businesses entering the market.

Market-Sharing Solution:

Based on these hypotheses, Diagram 2.44—where D represents the market demand curve and d/MR represents its matching MR curve—explains the two businesses' equal market sharing. The industry's overall MC curve is known as S MC. The QA (=OP) price and the industry's total output OQ are determined at point E, when the SMC curve crosses the d/MR curve. This is the market-sharing cartel's monopolistic solution.

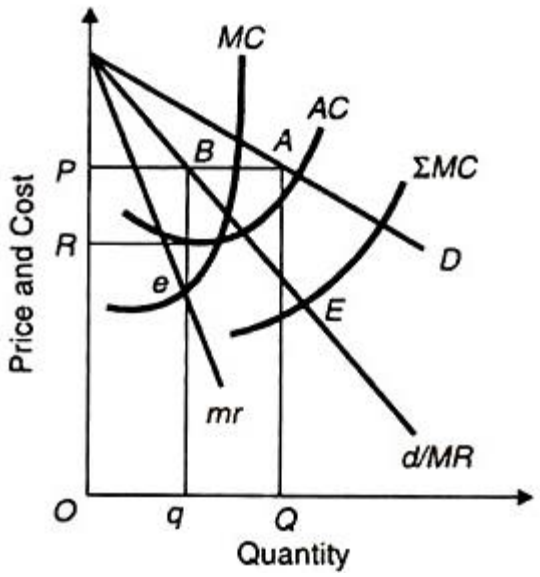


Diagram 2.44

How will the two businesses split the industrial output equally? Let's now suppose that each firm's demand curve is represented by d/MR and that its matching MR curve is represented by mr.

They have the same cost curves, AC and MC. Each firm's profit maximisation output is Oq since the MC curve crosses the mr curve at point e. According to their respective quota agreements, the two companies divide the industry's entire production equally since it is OQ, which is equal to 2 x Oq= (OQ=2Oq).

Each makes RP per unit profit as a result of selling Oq production at the same price qB (= OP). Each firm's overall profit is RP x Oq, and for both, it is either RP ×-2Oq or RP x OQ. In reality, though, there are more than two companies in an oligopolistic sector that do not fairly divide the market.

Additionally, their cost curves differ from one another. Their market shares will vary if their cost curves diverge. Every company will set its own price based on its own MC and MR curves. At the agreed-upon common price, they might not sell the same quantity.

Depending on its cost circumstances, they can be charging a price that is marginally higher or lower than the one that maximises profits. However, each will want to be as close to the price that maximises profits as possible. The market sharing agreement will eventually be broken as a result of this.

With the Danger of Entry:

Thus far, our study has only looked at collusive oligopoly without considering the possibility of new competitors entering the market. Assume that the oligopolistic industry is always threatened by new competitors. If the companies agree on the OP price, then new companies will enter the market, which will lower their earnings and sales.

In the end, this can result in excess capacity and unprofitable businesses in the sector. Excess capacity and unprofitable businesses will cause average costs to rise to level B (not depicted in Diagram 2.44) and result in typical earnings for the businesses. Every company will sell fewer units than Oq.

If the current oligopolists are more astute, they may prevent entrance by setting their prices below the optimal price for profit. By lowering their prices now, the collusive oligopolists will increase their profits later on and maintain their sole grip over the market by permanently excluding new competitors.

We may draw the conclusion that there is no fixed pattern of price behaviour under perfect collusive oligopoly pricing. The collusive oligopolists' response to the price of profit maximisation and their perspective on current and prospective competitors will determine the final price and production.

(B) Price Leadership:

When all oligopolistic businesses in an industry follow the example of one large firm, this is known as imperfect collusion. The companies have an unspoken agreement to sell the goods at a price determined by the industry leader, which is the large company.

There may occasionally be a formal meeting and a firm agreement with the leader. A consistent pricing is set if the items are similar. Prices might also be consistent when it comes to distinct items.

The leader occasionally makes announcements about pricing adjustments, and the other companies follow suit. Products like biscuits, cement, cigarettes, flour, fertilisers, petroleum, milk, rayon, steel, and so on are examples of price leadership sectors in America. They have to do with both differentiated and pure oligopoly.

There are several kinds of price leadership. However, we go over the three most popular pricing leadership models below.

1. **The Low-Cost Price Leadership Model:**

Under this model, an oligopolistic business with lower costs than the others sets a lower price that the other firms must abide by. As a result, the low-cost company takes the lead in pricing. With equal market shares and with unequal market shares are the two low-cost pricing leadership

approaches.

The Model

(1) Equitable Market Shares:

In light of these presumptions, both businesses engage into a tacit agreement whereby the expensive company B will share the market equally and adhere to the price established by the price leader company A. Diagram 2.45 shows the price policy that both must adhere to.

The industry demand curve is represented by D, and the associated marginal revenue curve is represented by d/MR. This represents the demand curve for both businesses, whereas mr represents their marginal revenue curve. The low-cost firm A's cost curve is ACa and MCa, whereas the high-cost firm B's cost curve is ACb and MCb.

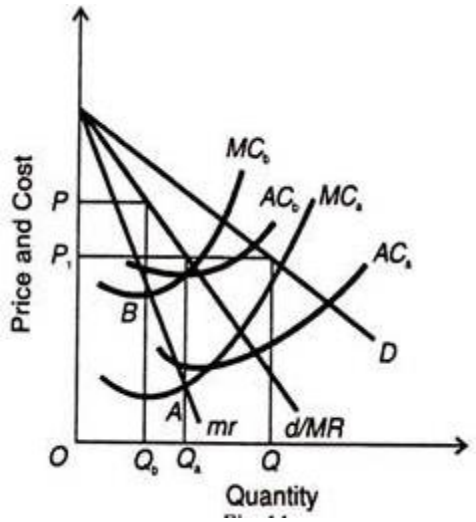


Diagram 2.45

As indicated by point B, where its MCb curve cuts the mr curve, the high cost business B would sell OQb quantity and charge OP price per unit if the two firms operated separately. Likewise, based on point A, where its MCa curve intersects the mr curve, the low-cost company A would sell OQa amount and charge OP1 price per unit.

The high-cost firm B is forced to follow the price leader firm A because of the unspoken agreement between the two businesses.

As a result, even though it won't be making the most money, it will also sell OQa quantity at a reduced price OP1.

However, by selling OQa quantity, price leader A will make significantly more money at OP1 price.

The whole market demand OQ is split evenly between A and B as they both sell the same

amount OQa, hence OQ = 2 OQa. However, as the product is uniform, all of its clients will go to company A if firm Ò maintains the OP pricing, which will result in zero sales.

However, by setting a price below OP1 and below company B's average cost ACb, price leader firm A can force firm B out of the market. Company A would turn into a monopoly. However, it will have to deal with legal issues in such a scenario. Therefore, in order to maximise its profits and share the market evenly, it will be in its best interest to fix OP, price, and tolerate firm '.

(2) **uneven Market Shares:**

The pricing leadership model with uneven market shares will result in distinct demand and cost curves for the two companies. The demand curve of the low-cost company will be more elastic than that of the high-cost company. While the low-cost company would sell more at a lower price and maximise profits, the high-cost company would maximise earnings by selling fewer items at a higher price.

By generating somewhat less than the maximum profits, the high-cost business would benefit by selling more at a lower price established by the price leader if they were to engage into a single pricing agreement. However, this is only feasible if the leader's pricing includes the high-cost company's AC.

In order to simplify the study, the market demand curve is not included in Diagram 2.46, which depicts the price leadership model with uneven market shares. The low-cost business A's demand curve is represented by Da in the figure, and its marginal revenue curve is represented by MRa.

The high-cost company B's demand and MR curves are Db and MRb, respectively. When its MCa curve crosses its MR curve at point A, the low-cost business A determines the quantity OQa and the price OP.

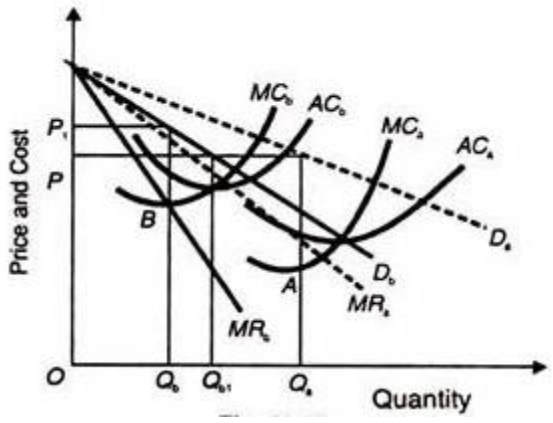


Diagram 2.46

When the high-cost firm B's MCb curve crosses its MRb curve at point B, the price OP1 and quantity OQb are ascertained. Following price leader company A, firm ђ sells more OQb1 and makes less than maximum profits when it accepts the price OP.

As long as this price covers its average cost, the follower business will be compensated for selling this amount at the OP price. It will have to shut down if it tries to sell OQb quantity at its profit-maximizing price (OP1) instead of following the leader firm, since its consumers would go to the leader firm, which charges cheap prices for OP.

However, in the absence of a market-sharing agreement between the leader and the follower firms, the follower may adopt the leader's price (OP) but produce less (less than OQb1) than is necessary to keep the price in the market, forcing the leader to produce less in order to maximise profits.

2. The dominating Firm Price Leadership Model:

This is a common instance of price leadership in which the sector is composed of several small businesses and one large dominating firm. The dominant firm sets the industry-wide price, minor businesses sell as much as they want, and the dominant firm fills the remaining market. As a result, it will choose the price that maximises its earnings.

The Model:

Based on these hypotheses, each business's demand curve is completely elastic at the price that the dominant firm sets for its products. Consequently, the horizontal demand curve and its marginal revenue curve align.

When the firm's marginal cost and marginal income are equal, it will create that product. The aggregate supply curve is produced laterally by combining the MC curves of all the minor businesses. While the dominating business acts passively, all of these firms act competitively. Small businesses are able to sell everything they want at that price since it sets the pricing.

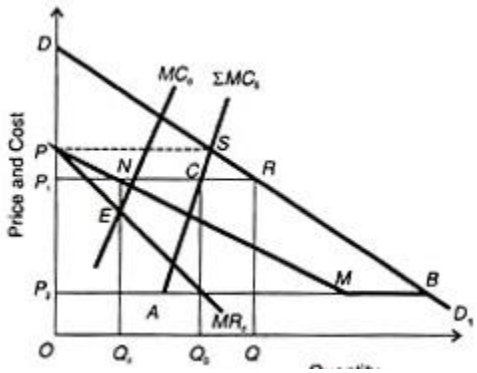


Diagram 2.47

Diagram 2.47, where DD is the market demand curve, provides an explanation of the situation where the dominant business has price leadership. SMCs are the whole supply curve for all small businesses. The demand curve encountered by the dominating business, PNMBD1, may be represented as follows by deducting SMCs from DD1 at each price.

Assume that the price OP is established by the dominant enterprise. Small businesses are able to offer PS in sufficient quantities to satisfy the full market demand at this pricing. However, at the OP price, the dominating business would not supply anything. Therefore, the demand curve's beginning point is Point P.

Take a price that is OP1 less than OP now. When their SMCs curve crosses their horizontal demand curve P1R at point C, the small businesses would deliver P1C (=OQs) production at this price OP1. The dominating business would supply the CR (=QSQ) amount since the minor enterprises supply the P1C quantity and the total quantity required at the OP1 price is P1R (=OQ).

P1N = CR on the horizontal line P1R indicates that the supply of the dominating firm is P1N (=OQd). Therefore, we subtract the horizontal distance from point P1 to N from the demand curve DD1 to obtain point N on the dominating firm's demand curve.

The dominating firm's demand curve aligns with the horizontal line P2B across the range MB and subsequently with the market demand curve over the segment BD1, since minor businesses do not provide anything at prices below OP2 because their SMCs curve surpasses this price. Thus, PNMBD1 is the demand curve for the dominating business. At the moment where its marginal cost curve (MC) crosses its marginal revenue curve (MRd), the dominating business will maximum its earnings. It determines the equilibrium point E, when OQd production is sold by the dominant business at the OP1 price.

Since the small companies' marginal cost curve (SMCS) equals the horizontal price line P 1 R at C, the small firms will sell their production in OQs at this price.

OQ = OQ d + OQs will be the industry's entire output. Small businesses would sell P2A and the dominant firm AB if the dominant firm sets the OP2 pricing. The dominating firm would satisfy all industry demand if the price were set below OP2, and tiny businesses would have no sales. Because small businesses act passively as price-takers, the price-quantity solution is stable, as demonstrated by the study above. However, this does not imply that a monopolist in the same market charges the same price as the dominant enterprise.

However, the degree to which other businesses follow the example is the true test of a dominating firm's pricing leadership. The model collapses as soon as the enterprises stop

following the price leader. Furthermore, the same price could not optimise short-term profitability for all of the businesses if their cost curves differ.

Price leadership in the dominant-firm model might take many different forms. In order to share the market at different prices, a number of small businesses may collude with two or more major corporations. Product differentiation could exist. However, the insights reached contribute to the explanation of price-output strategies in all of these circumstances.

3. The Barometric Price Leadership Model:

In this model, there isn't a leader firm per se; instead, one of the oligopolistic businesses with the most astute management announces a price adjustment first, and other firms in the sector follow suit. The dominating company with the lowest cost or even the biggest company in the sector could not be the overall price leader.

It is a company that serves as a barometer for predicting shifts in industry demand and cost dynamics as well as overall economic conditions. The other companies in the business recognise such a company as the leader and follow it when it comes to changing the product's pricing, either formally or informally.

The following factors contribute to the development of the barometer price leadership:

1. They accept one business as the price leader in response to past experiences of oligopolistic firms engaging in fierce rivalry and violent price swings.
2. The majority of businesses leave their estimations to one leading company that is capable of doing so since they lack the knowledge necessary to determine the industry's cost and demand circumstances.
3. The business that has the best knowledge and forecast ability regarding changes in direct costs, style, and quality, as well as changes in the overall state of the economy, is recognised by oligopolistic firms as the barometric leading firm. A company chosen as the barometer leader does not necessarily need to be an industry participant. It is possible for a company that is not associated with the industry to be selected as the barometer leader.

2.7 Duopoly

When two businesses jointly control all or almost all of the market for a certain good or service, this is known as a duopoly. The simplest type of oligopoly is a duopoly, which is a market where a few enterprises control the majority of the market. If the two players conspire on output or pricing, a duopoly may affect the market in the same way as a monopoly.

Duopoly Model Types

A systematic examination of oligopoly is challenging due to the ambiguity surrounding a firm's behaviour pattern under oligopoly, which arises from their unexpected actions and reactions. Nonetheless, a range of models based on various behaviour assumptions have been created by both classical and modern economists.

These models fall into two general categories: (I) current oligopoly models and classical duopoly models. According to duopoly models, there is a duopoly when there are just two sellers of a good.

An example of oligopoly is duopoly. Since the market must include at least two sellers in order to be considered oligopolistic, duopoly is a particular case of oligopoly in that it is a limiting case of oligopoly.

1. The Duopoly Model of Cournot
2. The Duopoly Model of Chamberlin
3. The Model of Bertrand's Duopoly
4. The Model of Edgeworth Duopoly

The Duopoly Model of Cournot:

The first formal duopoly model was created in 1838 by French economist Augustin Cournot. Cournot made the following assumptions to support his model:

a) Two businesses, each with an artesian mineral water well;
b) Both run their wells at zero marginal cost;
c) Both deal with a demand curve that is constantly sloping negatively; and
d) Each seller acts under the presumption that his rival won't respond to his decision to alter his price.

This is the behavioural assumption of Cournot.

Based on this approach, Cournot has determined that each vendor charges the same price and supplies one-third of the market. Additionally, a third of the market is still unsupplied.

Diagram Representation: Diagram 2.48 displays Cournot's duopoly model. Assume there are just two businesses to start the analysis. First, A and B, and that. The market's sole supplier of mineral water is A. He sells quantity OQ at price OP2 where his MC = O MR in order to maximise his earnings (or income). He made OP2PQ in total.

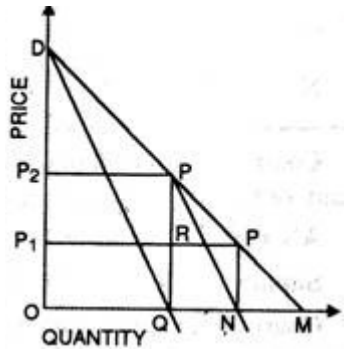


Diagram 2.48

Let B go into the market now. He has access to the QM market, which makes up half of the whole market. The other side of the market is where he may sell his goods. He believes that since A is making the most money, he won't alter his output or price; that is, he will keep selling OQ at OP2. As a result, the demand curve is PM and the market that B may access is QM.

B sells ON at price OP1 in order to maximise revenue; his total revenue reaches its maximum at QRP'N. Keep in mind that B only provides QN = 1/4 = (l/2)/2 of the market. When B enters, the price drops to OP1. Consequently, OP1 PQ has a higher projected profit than A. When confronted with this circumstance, A tries to modify his production and price to fit the new circumstances. Because he is generating the most profit, he believes that B won't alter his output QN and price OP1.

As a result, A has 3/4 (= 1–14) of the market at his disposal and thinks that B will continue to furnish 1/4 of it. to increase his earnings. provides 3/8 of the market, or 1/2 of (3/4). The market share of A has decreased from 1/2 to 3/8.

It is now B's turn to respond. B makes the assumption that A will only continue to supply 3/8 of the market, taking Cournot's assumption into account. The market that is available to him is equal to 1 – 3/8 = 5/8.

Under the current circumstances, B supplies 1/2 x 5/8 = 5/16 of the market in order to optimise his profit. A must now reevaluate the circumstances and modify his output and pricing as necessary.

This cycle of action and response keeps happening throughout time. B continues to increase his market share while A continues to lose it. When their market shares are equal at one-third each, the condition is finally attained.

Any additional effort to modify the output yields the same outcome. As a result, each company reaches its equilibrium level when it serves one-third of the market.

The following table 2.1 displays the businesses' equilibrium based on Cournot's model:

Table 2.1 Business Equilibrium

Period	Firm A	Firm B
I		$\frac{1}{2}(1)=\frac{1}{2}$ $\frac{1}{2}\left(\frac{1}{2}\right)=\frac{1}{4}$
II	$\frac{1}{2}\left(1-\frac{1}{4}\right)=\frac{3}{4}$	$\frac{1}{2}\left(1-\frac{3}{8}\right)=\frac{5}{16}$
III	$\frac{1}{2}\left(1-\frac{5}{16}\right)=\frac{11}{32}$	$\frac{1}{2}\left(-\frac{11}{32}\right)=\frac{21}{24}$
IV	$\frac{1}{2}\left(1-\frac{11}{32}\right)=\frac{43}{128}$	$\frac{1}{2}\left(1-\frac{43}{128}\right)=\frac{85}{256}$
–	--------	--------
–	--------	--------
–	--------	--------
N	$\frac{1}{2}\left(1-\frac{1}{3}\right)=\frac{1}{3}$	$\frac{1}{2}\left(1-\frac{1}{3}\right)=\frac{1}{3}$

The equilibrium solution of Cournot is stable. Considering the action and response, none of the two vendors can grow their market share.

It can be shown in this way:

1/2(1 – 1/3) = 1/3 is A's share.

Likewise, 1/2 (1 – 1/3) = 1/3 is B's share.

The broad oligopoly can be modelled after Cournot's duopoly model. For instance, when each business supplies one-third of the market, the industry and firms will be in equilibrium if there are three sellers. As a result, 3/4 of the market is supplied by the three suppliers combined, leaving 1/4 of the market empty. In an oligopolistic market, each seller's share is calculated using the formula Q -f- (n + 1), where n is the number of sellers and Q is the market size.

2. A Small Group Model:

Chamberlin's Duopoly Model acknowledges the interdependence of businesses in this type of market. Chamberlin contends that because enterprises are not as accustomed to operating under an oligopoly, they are unable to learn from their prior mistakes. But his assumptions are the same as those of the proponents of the classical models. To put it another way, his model is predicated on the idea that goods are uniform, businesses are the same size and have the same expenses, new businesses cannot enter the market, and demand is well understood.

Our conclusion differs significantly from Cournot's due to the recognition of the interconnectedness of enterprises in an oligopolistic market. According to Chambrilin, businesses are conscious that their choices regarding output or pricing would undoubtedly cause other businesses to react. He does not envision a pricing war in oligopolistic markets as a result.

Additionally, he excludes the idea that businesses may gradually modify their outputs to attain equilibrium at a lower production level than would be achieved under monopoly.

According to Chamberlin, identifying potential strong reactions to price or output manipulations by an oligopolistic business would prevent detrimental competition between the companies in that market and lead to a stable industrial equilibrium with the monopoly price and monopoly output. He added that this answer may be attained without any collaboration.

In an oligopolistic market, farms will set the monopoly price in order to maximise their individual and combined profits if they are conscious of their mutual reliance and are prepared to learn from their previous mistakes.

Duopoly market theory may be used to explain Chamberlin's model. Like Cournot, Chamberlin makes the assumption that the product's demand is linear. For the sake of simplicity, we'll assume that the cost of creating the item is zero even in this scenario.

Diagram 2.49 is an illustration of the Chamberlin model. The market demand curve is represented by DQ in this picture. Firm A will create output OQ1 if it enters the market first because, at this output level, its marginal revenue and marginal cost are equal (MR = MC = 0). The monopoly price, or OP1, is what the company may charge.

Its earnings will be maximised in this way. The elasticity of demand at price OP is equal to one. In order to maximise its profit, Firm B, which is joining the market at this point, will manufacture Q1Q2 as it believes that its demand curve is CQ. The cost will be OP2.

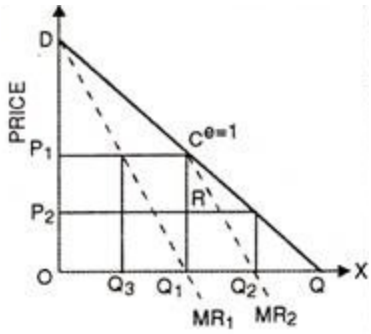


Diagram 2.49

It now chooses to cut the output to QQ3, which is half of the monopoly output QQ1, after seeing that it cannot sell the quantity of QQ1 at the monopoly price. Q1Q2, which is the same quantity as Q3Q1, can be produced by Firm B.

As a result, the industry's production is OQ1, and prices increase to OP1. From the perspectives of companies A and B, this is the best scenario. The combined production of the two businesses

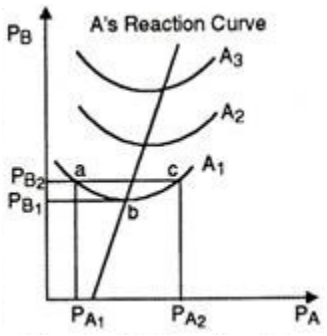
in this instance is monopoly output, and they charge monopoly prices. As a result, businesses A and B will share the market equally if expenses are assumed to be equal (costs = 0).

3. **Bertrand's Duopoly Model:**

In 1883, French mathematician Bertrand created his own duopoly model. Regarding its behavioural premise, Bertrand's model is different from Cournot's. In the Bertrand model, each seller sets his price based on the premise that his rival's price, not his output, stays constant, but in the Cournot model, each seller thinks that his rival's output stays constant.

Price competition is the main emphasis of Bertrand's concept. The duopolists' response function is one of his analytical tools. Iso-profit curves are used to develop reaction functions. For a given level of profit, an iso-profit curve is created using different combinations of prices that the competing companies charge. He made the assumption that there were just two companies, A and B, and that the prices of each were measured along the vertical and horizontal axes, respectively.

The pricing of the two companies are used to create their iso-profit curves. As seen in Diagram 2.49 (a) and (b), the two companies' iso-profit curves are concave to their respective pricing axes. Firm A's iso-profit curves are convex to its pricing axis PA (Diagram 2.49 (a)) whereas Firm B's iso-profit curves are convex to PB (Diagram 2.49 (b)).



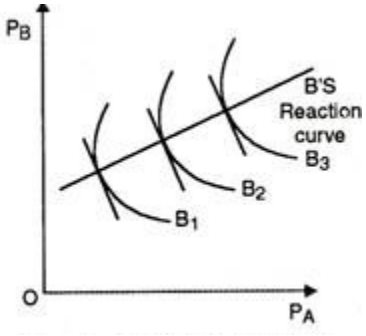


Diagram 2.49 (a) **Diagram 2.49 (b)**

A's reaction Curves **B's Reaction Curves**

Curve A in Diagram 2.49 illustrates how A may benefit from a variety of combinations of its own and its competitor's prices. For instance, the iso-profit curve A1 shows that pricing combinations at points a, b, and c result in the same amount of profit. business A has two different pricing, Pa1 and Pa2, to achieve the same level of profit if business B fixes its prices, Pb1.

A may decide to raise or lower its pricing in response to B's price reduction. When he is at point c, A will lower its price, and when he is at point a, he will raise it. However, this price

modification is only feasible up to a certain point. Point b illustrates this point. Therefore, A must set a special price to optimise its earnings. The iso-profit curve's lowest point is where this special pricing is located.

All other iso-profit curves, A1, A2, and A3, may be analysed in the same way to obtain A's response curve. Take note of the response curve's rightward tilt in A. This is because as A acquires market share from his rival B, the iso-profit curve tends to move to the right.

B's response curve may be created using the same procedure, as seen in Diagram 2.49. By combining the reaction curves of businesses A and B, as seen in Diagram 2.50, the equilibrium of duopolists proposed by Bertrand's model may be found.

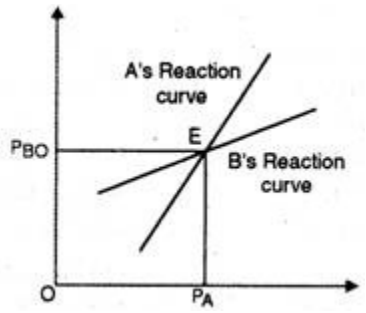


Diagram 2.50

Point E is the equilibrium point as it is where the reaction curves of A and B cross and when their expectations are realised. This balance is steady. Therefore, if any of the businesses disagree with this point, it will set off a chain of events and responses amongst the firms that will ultimately take them back to point E.

4. The Duopoly Model by Edgeworth:

In 1897, Edgeworth created his duopoly model. Bertrand's premise that each seller expects his rival's price, rather than his output, would stay constant is followed by Edgeworth's model. Diagram 2.51 is an illustration of his model.

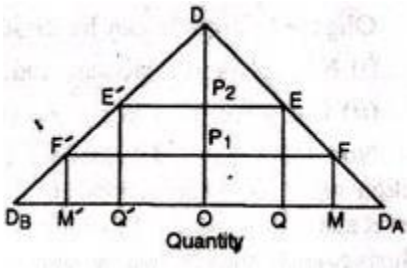


Diagram 2.51

We have assumed that two sellers, A and B, are facing similar demand curves in the market in this picture. A's demand curve is DDB, and as such, Assume further that seller B has a maximum production capacity of OM' and seller A has a maximum output capacity of OM. The price is measured by the ordinate ODA.

Let's start by assuming that A is the sole vendor in the market in order to understand Edgeworth's model. He sells OQ and charges a price, OP2, in accordance with the monopoly seller's profit-maximizing rule. OP2EQ is his monopolistic profit at zero cost. Let B go into the market now. B believes that since A is making the most money, he won't alter his pricing. He is able to sell his whole production by setting his price just below A's price (OP2). He takes a sizable chunk of A's market at this pricing.

However, Seller A claims that his sales have decreased. A sets his price somewhat lower than B's in an attempt to reclaim his market. This causes the vendors to engage in a price war. Price-cutting is the form of the price war, which lasts until the price hits OP1. Both A and B can sell all of their output at this price; A sells OQ, while B sells OQ. As a result, one may anticipate that the price of OP1 would remain steady. However, Edgeworth believes that the price of OP1 shouldn't remain constant.

The straightforward explanation is that the sellers see an intriguing fact once the market price OP is established. In other words, each seller believes that he may raise his price to OP2 and earn a clean profit since he is aware that his adversary is selling all of his produce and will not alter his price.

Their actions and reactions are based on this realisation. Let seller A, for instance, take the initiative and increase his price to OP2. assuming that A keeps his OP2 pricing.B discovers that he can sell all of his production at a higher price and turn a bigger profit if he raises his price just below OP2. As a result, B increases his price in line with his strategy.

It is now A's responsibility to understand the circumstances and respond. A discovers that his overall sales have decreased and that his pricing is greater than B's. Thus, A lowers his price marginally below B's pricing, providing B keeps his price the same.

The pricing war between A and B so starts over. The price keeps fluctuating between OP1 and OP2, and this process never ends. Since price and production are never fixed, equilibrium is obviously unstable and indeterminate in Edgeworth's duopoly model. According to Edgeworth, "the index of value will oscillate, or rather, vibrate irregularly for an indefinite length of time, through an indeterminate tract."

In summary, Edgeworth's model, like Cournot's, is predicated on a native assumption, meaning that each seller maintains the belief that his competitor will never alter his price despite being repeatedly shown to be incorrect. But according to Hotelling, Edgeworth's model is unquestionably better than Cournot's as it makes the assumption that the sellers' primary deciding factor is price rather than production.

5. The Model of Stackelberg:

Assuming that each seller understands how the activities of others are interdependent, the German economist Stackelberg offered a solution to the duopoly dilemma. Every vendor considers himself a follower or a leader. Every seller decides how much money he can make by being both a leader and a follower.

After that, he will decide to play the character that would yield the highest earnings. Therefore, if their desires are in line with one another, there is market equilibrium. The reaction curves serve as the foundation for the Stackelberg solution. The output of each seller is expressed as a function of that of his competitor in each response curve.

Therefore, if QA is seller A's output and QB is seller B's, then seller A's reaction function is Q = f (QB), and seller B's is QB = F (QA). The profit indifference maps of each individual duopolist are used to create these response functions. For each given value of B's output (QB), the value of QA that maximises A's profit is therefore provided by A's response function.

Likewise, for each given value of A's production, B's profit is maximised by the matching value of B's output. The following figures provide an illustration of this, showing that seller A's leadership point LA lies on firm B's response curve and seller B's leadership point LB lies on firm A's reaction curve. The following four scenarios are included in the Stackelberg model. They are predicated on each duopolist's aim to maximise his earnings from assuming the roles of both leader and follower.

(1) Retailer B wants to be a follower, whereas A wants to be a leader:

The answer is clear-cut in this case, and the duopolists behave in predictable ways. Diagram 2.52 serves as an example of this, with price serving as the "variable." in the price rises of this competitor. In the event that A, in his capacity as leader, raises his price from LB upward, Ò follows suit by raising his price from LA upward, until both get at the equilibrium point E. The solution is therefore definite.

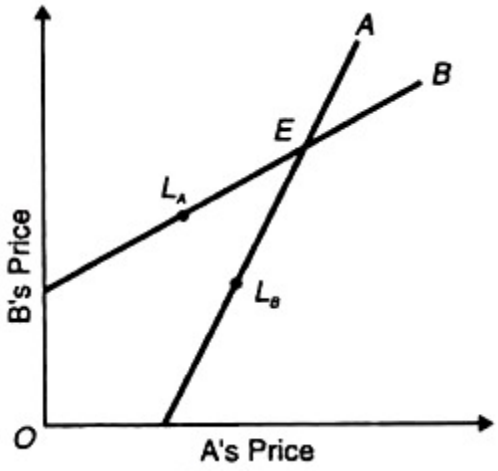


Diagram 2.52

(2) If "A" wants to be a follower and "B" wants to be a leader:

Because both exhibit consistent patterns of activity, the solution is once again definitive. Figure 2 provides another illustration of this. At this point, A is the follower and B is the leader. A raises his price from LB upward in response to Ò's price increase from LK upward, until both increase their prices to E, the equilibrium point. As a result, the answer is once more definitive.

(3) If A and B both want to be in charge:

Each believes that his response function controls the other's conduct. In actuality, however, neither follows the other's reaction function. As a result, there is no state of equilibrium. The "Stackelberg disequilibrium" is the term for this. Diagram 2.53 serves as an illustration of this, with the quantity of output being read as the "variable." The increase in his competitor's output hurts every seller.

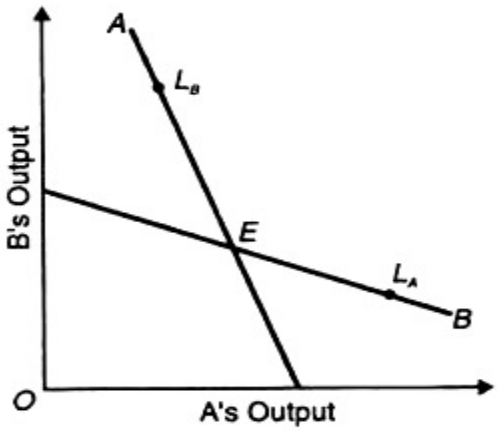


Diagram 2.53

When a competitor's output rises, a seller's output that maximises profits decreases. A would respond by lowering his production from LB downward if B takes the lead and raises it from LA

onwards. However, A does not follow Ò because he does not lower his production from LB downward since he also views himself as a leader. Therefore, equilibrium at point E is not possible. The Stackelberg disequilibrium is this.

(4) If A and B both want to follow:

Since both behave as followers knowing that the other would follow suit, there is a definitive answer. In the event that seller B in Diagram 2.52 believes that seller A has increased the price of his goods, will follow suit and raise the price of his own product.

It is now A's turn to follow and raise his product's price. After that, Ò will follow him, and so on, until they both arrive at point E of equilibrium. The followership answer is hence definitive.

2.8 Monopsony

A market condition known as monopoly occurs when there is only one consumer for a good or service. It is applicable to any circumstance where there is a "monopoly" component to purchasing.

Monopsony occurs, for instance, when a single large factory in a remote area is the only buyer of certain grades of labour, when consumers of a particular commodity are organised, when a socialist government controls imports, or when a particular person happens to have a taste for a commodity that no one else needs.

The monopoly price analysis is comparable to the monopoly pricing analysis. In the same way that a monopolist may affect the price of a product by how much he offers for sale, he can also affect the supply price of his purchases by how much he purchases.
Once more, the goal of the monopolist is to maximise his earnings, but he also wants to maximise his surplus. To optimise his profits, the monopolist compares his marginal cost and marginal D income. In order to maximise his consumer's surplus, the monopolist controls his purchases such that marginal cost and marginal utility are identical.

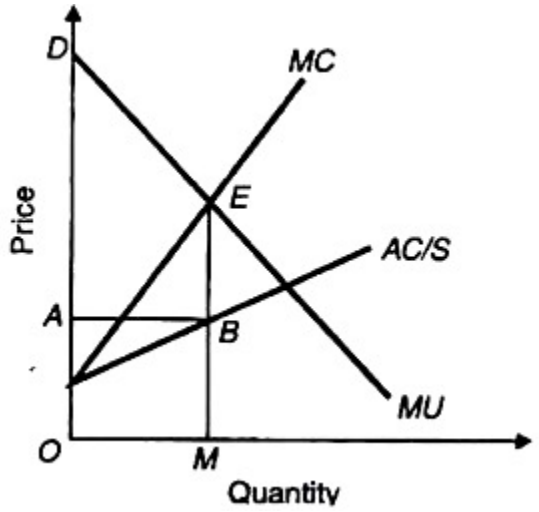


Diagram 2.54

Diagram 2.54 explains how prices are determined under monopsony. The monopolist's average cost is the industry's supply curve. He purchases the product from the industry. The figure's AC/S curve serves as a representation of this. Its corresponding marginal cost curve is denoted by MC. The monopolist's marginal utility curve is denoted by MU.

When the product's marginal benefit to the monopolist is equal to its marginal cost, the monopolist equilibrium is reached at E. He purchases OM amount at the supply price for that output, which is OA (=MB). The area DEBA, or the difference between what the quantity monopolist is Diagram 2.54 prepared to pay ODEM and what he really pays OABM, is the surplus that he obtains. For example, DEBA = ODEM – OABM.

2.9 Workable Competition in the Market:

In 1940, economist J.M. Clark introduced the concept of workable competition. The term "workable competition" has no precise definition. Numerous writers have interpreted it in terms of meeting certain requirements.

"Competition is rivalry in selling goods, in which each selling unit normally seeks maximum net revenue, under conditions such that the price or prices each seller can charge are effectively limited by the free options of the buyer to buy from a rival seller or sellers of what we think of as 'the same' product," according to Clark. This means that each seller must make an effort to equal or surpass the attractiveness of the others' offering to a sufficient number of sellers to accomplish the end in view.

Conditions of Workable Competition:

Clark uses this term to clearly define the idea of workable competition and provides three requirements, which are as follows:

1. A demand curve needs to be sufficiently steep to allow the business owner to cover costs per unit.
2. Potential competition and the potential for intercommodity replacement are active threats.
3. Sufficiently non-homogeneous items in tiny quantities create ambiguity regarding rivals' responses.

An industry is viable and competitive, according to Stigler,

1. "when a significant number of businesses selling closely related products in each market area are present."
2. There is no cooperation between these companies, and
3. A new company's long-term average cost curve is not much greater than an established company's.
4. A large number of customers and sellers, the lack of coercion and collusion, open admission, and profit incentives are all essential elements of viable competition, according to Edwards.

"Market structure and behaviour patterns that may be expected to give rise to or associated with workable performance" is how Bain defines it.

As we've seen, the idea of viable competition is normative and linked to the economy's overarching goals. The question of what kind of market structure is best for the economy is one of social policy. It is a regulatory tool designed to strengthen the connections between market conduct, market performance, and market structure in the most advantageous manner.

2.10 Summary

This unit looks at how price-taking businesses adjust their production decisions in response to market pricing. A market structure known as a monopoly occurs when there is just one provider and a large number of buyers. It is based on the concepts of perfect knowledge, barriers to entry, maximising profits, and the lack of close substitutes. Price discrimination charges various prices for the same item from different customers, but public monopolies utilise AC and MC pricing for social or public gain. Monopolistic competition, which is based on the principles of a large client and seller base, unique products, unlimited entry and exit, and profit maximisation, is practiced by several companies selling closely related items.

The most common market structure is oligopoly, which is characterised by obstacles to entry, mutual reliance, a small number of dominating enterprises, and uniform or distinctive goods. Massive capital investment, absolute cost advantage, product differentiation, economics of large-scale production, and mergers are some of the factors that contribute to oligopoly. Because oligopoly lacks a comprehensive theory, it differs from other market arrangements in how prices and production are determined. There are several non-collusive oligopoly models, all of which assume that one business seeks to maximise its overall profits under the assumption that the other firm maintains its output at a constant level.

2.11 Check Your Progress

1. Explain briefly the prerequisites for perfect competition
2. Explain the difference between monopoly and oligopoly.
3. Explain briefly the long run equilibrium of the perfectively competitive firm.
4. What are the conditions that might give rise to a monopoly?
5. Discuss the demand and the cost conditions, and the pricing and output decisions under monopoly;
6. Explain the short-run and the long-run equilibrium of a monopoly firm
7. The demand curve facing a monopolist is downward sloping, Explain.
8. Discuss the relationship between average revenue curve and marginal revenue curve of a monopoly firm.
9. Discuss the determination of price and output of a monopoly firm in the long- run.
10. What are the necessary conditions for price discrimination ?
11. Explain how will a profit maximizing discriminating monopolist distribute output in different markets? What prices will she charge in those markets?
12. Product differentiation means that consumers do not view the product of one firm as exactly identical to the product of another firm. Elaborate.
13. Show the short run equilibrium for a firm under monopolistic competition such that the firm makes some above normal profits. Explain why it is a temporary equilibrium.
14. What are the main characteristics of the oligopoly form of market?
15. In what respects the monopolistic competition differs from perfect competition? Explain with help of some suitable diagram.
16. What do you mean by collusion of oligopolists?
17. State the types of Non-cooperative behaviour under oligopoly.

18. What is the defining feature of a non-collusive oligopolistic market? What is meant by conjectural variation?
19. Describe how the firms under Bertrand model arrive at the equilibrium price.
20. Describe the process of negotiation in price among the firms in the Edgeworth model of oligopoly?
21. Diagrammatically where does the equilibrium occur in Stackberg model?

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Unit – 3

Economics of Information

Introduction

One of the fundamental presumptions that characterizes a perfect competitive market structure is that all parties involved in the transaction have complete and symmetric information, meaning that no buyer knows more about the costs of the product than a seller, and no seller knows more about its characteristics. This assumption is unrealistic because, in reality, one party to a transaction frequently has more information than the other about the characteristics of the good or service to be traded; this condition is known as asymmetric information.

For example, in the market for used cars, sellers have more information about the actual condition of the car than the buyer; in the financial market, the creditor has comparatively less information about the debtor's default risk than the debtor himself; in the health insurance market, the insurance company has less information about the individual's health status than the individual himself; and in the product market, the seller typically knows more about the quality of the good than the buyer; and in the labour market, employees typically know more about their abilities than potential employers. These represent a few typical instances of asymmetrical information.

The first welfare theorem of economics states that a Pareto-efficient distribution of resources results from perfect competition. A crucial presumption for the theorem to be valid is that every agent participating in the market should view all information pertaining to trade equally. Prices are skewed and a Pareto-efficient distribution of resources is not achieved when this assumption is not satisfied, i.e., when information is asymmetric and one person has more knowledge about the deal than the other agent or agents. This is known as the market failure scenario. The idea of asymmetric information will be covered in this unit, along with how it causes market failure and how equilibrium is reached when there is asymmetric information.

Objectives

- Explain the concept of asymmetrical information;
- Discuss how asymmetrical information leads to market failure
- Describe market solutions to the problem of asymmetric information;
- Define the problem of moral hazard resulting in the presence of asymmetric information; and
- Understand principal agent problems.

Contents

3.1 Asymmetric information

In the actual world, there is a great deal of uncertainty in every transaction. Inefficiency is not the result of uncertainty alone. By trading contingent goods, such as purchasing a shovel in January, buyers and sellers may get past uncertainty. When both parties to the transaction share the same limited understanding of the future, this uncertainty won't result in inefficiencies. When one party has better or more knowledge than the other, it can result in inefficiencies. It is believed that the side with superior information possesses what is known as asymmetric or private information.

George Akerlof initially examined the idea of asymmetric information in his 1970 work, The Market for "Lemons": Quality Uncertainty and the Market Mechanism. He gave the vehicle market as an example. There is asymmetric information when there is a persistently uneven set of information among the many parties involved in the trade. In other words, given asymmetric information, one actor will have more (or less) knowledge than the other if we suppose that there are buyers and sellers in the market. For instance, dealers of used vehicles know more about the true worth of the vehicle than buyers do in the market for used cars, also known as the "lemon market." The vendor is motivated to sell products of lower quality than the market average because of this knowledge asymmetry.

At that point, both the market size and the average quality of the products will decline. Furthermore, a customer with less knowledge is frequently deterred from making a purchase

because he wants to lower the possibility of purchasing a damaged vehicle, or "lemon." Therefore, the existence of asymmetric knowledge might lead to no transaction at all. As an additional illustration, in the market for health insurance, the policyholder knows more about their health than the insurance provider. There are many real-world instances. It is impossible to dispute the existence and permanence of asymmetrical information, and as a result, many marketplaces are unable to do business. This only indicates that the parties are unable to create a marketable price in the market because of the absence of information symmetry between them, and trade cannot occur without a tradable price. In this sense, market failure results from uneven information.

One solution to address the market failure caused by asymmetrical information is to eliminate such information asymmetry, or, to put it another way, where a more equitable distribution of information is feasible. For example, in used automobile markets, a certification or quality accreditation from an organization together with a few years of guarantee can assist buyers and sellers learn about the actual value of the used car. When looking for health insurance, a comprehensive medical examination can show the buyer's actual health situation. Borrowers' borrowing scores can be used to determine their true default rate in the credit market.

Asymmetric information comes from a variety of sources. While the other party does not, the parties would still know some inside information about themselves. Let's use health insurance as an example. When looking for health insurance, a consumer would be reluctant to disclose family medical history, including hereditary illnesses. Additionally, the client is fully informed on lifestyle factors and behaviors that might impact their health. However, the insurer would require that coverage be contingent upon maintaining a healthy lifestyle. It might be quite costly and time-consuming to keep track of habits and behavior-related data.

Inefficiencies would result from asymmetric information. Insurance providers could demand more prices and provide less coverage. Customers anticipate that their medical expenses will be less than the typical insured consumer's market withdrawal. Contractual clauses can be included to eliminate these inefficiencies. Instead of paying for each service call, a home maker may purchase a service contract that specifies a set charge for maintaining the equipment in use.A fixed-fee maintenance contract, on the other hand, would encourage the homeowner to use the appliance carelessly because any defaults or malfunctions would be the responsibility of the repairer until the contract's expiration.

3.2 Adverse selection

Inefficiencies are made worse by asymmetric information. Adverse selection is one factor contributing to market failure when asymmetric information is present. When parties benefiting from asymmetric knowledge are more willing to engage in trade than those who suffer from information asymmetries, this is known as adverse selection. In our examples from the previous section, vendors could be more likely to offer just lemons (poor-quality automobiles) if purchasers of used cars are unable to tell the difference between good and terrible cars.

Insurance companies may end up serving high-risk policyholders if they struggle to assess applicants' health status. They may also be unable to take advantage of cross-subsidies from low-risk policyholders, which could prevent them from breaking even because of the high insurance claims from the high-risk clients. Potential companies risk hiring underqualified personnel if they struggle to evaluate candidates' competence. In each of these instances, the knowledgeable parties—car sellers, insurance purchasers, and employees—are more inclined to trade when doing so benefits the ignorant parties—car buyers, insurance providers, and prospective employers, respectively. When the impacted, ignorant parties understand they are subject to adverse selection, they could be unwilling to even approach for trade, which would result in a market failure. This phenomenon is called adverse selection. Let's take a closer look at some of these instances that result in market failure and adverse selection.

The market for "lemon"

To demonstrate the ramifications of the issue of adverse selection, let's examine the typical example of a market for old automobiles.

Imagine a market where 100 individuals wish to buy a used automobile and 100 wish to sell their used autos. Everyone is aware that half of the vehicles are "lemons," or terrible automobiles, while the other half are good cars. The present owner is aware of each automobile's quality, but potential buyers are unaware of whether a particular vehicle is a lemon or a nice car. A decent car's owner is willing to part with it for Rs. 1,50,000, whereas the owner of a lemon is willing to part with it for Rs. 60,000. Customers are prepared to spend Rs. 200,000 for a high-quality automobile and Rs. 90,000 for a subpar one. There won't be any issues in this industry if it is simple to confirm the autos' quality. Good automobiles will sell for between Rs. 150,000 and Rs. 2,000,000, while lemons will sell for between Rs. 60,000 and Rs. 90,000. However, in the event that purchasers are unable to inspect the car's quality, they will have to estimate its value.

Assume that a normal customer would be prepared to pay the automobile's anticipated value if a car had an equal chance of being a lemon and a decent car.

The buyer would be prepared to pay [½ (90,000) + ½(2, 00,000)] = Rs. 1, 45,000 based on the figures mentioned above.

Only lemons would be offered for sale at Rs. 1,45,000 since the price that buyers are ready to pay for a "average" automobile is less than the price that sellers of decent cars want to get rid of their vehicles. The owners of the fine cars would not want to sell their vehicles—they probably require at least Rs. 1,50,000 to do so—but the owners of the lemons would surely be willing to sell their vehicles at this price. However, the customer wouldn't be prepared to pay Rs. 1,45,000 for it if he was positive he would receive a lemon! In actuality, the market's equilibrium price would need to fall between Rs. 60,000 and Rs. 90,000. Only owners of lemons would put their automobiles up for sale at this price range, so purchasers would (rightly) anticipate receiving a lemon. None of the good cars ever sell in this market! No such transactions will occur even when the price at which buyers are willing to purchase quality cars is higher than the price at which sellers are willing to sell them.

It is worthwhile to consider where this market failure originated. When someone chooses to try to sell a bad car, he influences the buyers' opinions about the average car on the market. This is the issue because there is an externality between the sellers of good and bad cars. This harms those who are trying to sell high-quality cars since it decreases the price that they are ready to pay for the typical car. The market failure is caused by this externality. The cars that people desire to sell the most are the ones that are most likely to be offered for sale. Offering to sell something conveys to a potential customer that it is of high quality. It is challenging for owners of high-quality products to sell their goods if there are an excessive number of low-quality items available for purchase.

Quality Choice

There were a certain number of cars of each quality in the Lemons model. Let's now look at a variant of that concept in which the producers may decide on quality. We shall demonstrate how this straightforward market determines the equilibrium quality.

Assume that two distinct qualities are offered and that each customer wants to purchase a single umbrella. High-quality umbrellas cost Rs. 240, while low-quality umbrellas cost Rs. 100. The quality of the umbrellas in the store cannot be assessed until a few rainstorms have passed.

In the event that the industry is perfectly competitive and some manufacturers produce high-quality umbrellas while others produce low-quality umbrellas, what would be the equilibrium quality of umbrellas produced? Assume that consumers evaluate the quality of umbrellas

available in the market based on the average quality sold, similar to the lemon market. If the fraction of high-quality umbrellas is q, then the consumer would be willing to pay p = 240q + 100(1 − q) for an umbrella. There are three scenarios to take into account.

Only subpar producers' goods: In this scenario, buyers would be content to spend just Rs. 100 on a mediocre umbrella. However, since producing an umbrella costs Rs. 180, none would be sold. In this instance, the producers would compete the price of an umbrella down to the marginal cost of Rs. 180, which is only produced by high-quality manufacturers. They would receive some consumer surplus since the customers are prepared to spend Rs. 240 for an umbrella. In this instance, competition guarantees that the price will be Rs. 180. Both qualities are created. Therefore, the average quality that is offered must be worth at least Rs. 180 to the customer.

This implies that 240q + 100(1 − q) > 180 is required.

Q = 4/7 is the lowest value of q that still fulfils this inequality. This indicates that customers are only prepared to pay Rs. 180 for an umbrella if four out of seven vendors are of a good caliber. Diagram 3.1 shows how the equilibrium ratio of premium producers was determined. The proportion of high-quality manufacturers, q, is measured on the horizontal axis. If the percentage of high-quality umbrellas available is q, the vertical axis indicates how much customers are willing to spend on an umbrella. The bold-colored horizontal line at Rs. 180 summarizes the supply situation since producers are prepared to offer either kind of umbrella at a price of $180.

Diagram 3.1: Equilibrium Quality

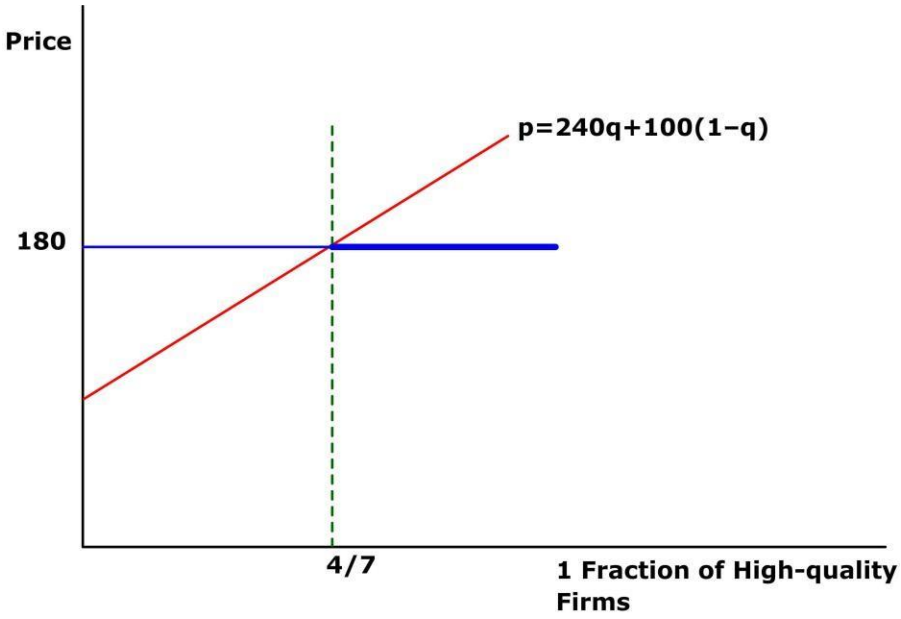

Diagram 3.1

The demand conditions are shown by the slanted line: if the average quality is higher, customers are prepared to pay more. Only when 240q+100(1 q) 180 will consumers be willing to buy

umbrellas; the dotted line shows the edge of this zone. The range of q's equilibrium value is 4/7 to 1.

Depending on the percentage of high-quality manufacturers, the typical umbrella's worth to a customer might range from Rs. 180 to Rs. 240, even if the market's equilibrium price is Rs. 180. Equilibrium is reached for any value of q between 1 and 4/7. From a social perspective, however, none of these equilibria are equal. Because pure competition and constant marginal cost are assumed, producers receive zero producer surpluses in all equilibria. It is clear from this that customers are better off when the average quality is greater. The equilibrium where only high-quality commodities are created is the optimal one from the perspective of the customers.

Let's switch up the model a bit. Assume that each producer has the option to choose the quality of umbrellas he produces, and that the cost of producing a high-quality umbrella is Rs. 180, while the cost of producing a low-quality umbrella is Rs. 170. Assume that the fraction of producers who choose high-quality umbrellas is q, where $0 < q < 1$. Take one of these producers. If it acts in a competitive manner and thinks it has little impact on the market price and quality, it will always want to produce only low-quality umbrellas. Since this producer is presumably a small portion of the market, it ignores its influence on the market price and opts to produce the more lucrative product.

However, all producers will use the same logic, and only subpar umbrellas will be made. But there is no balance since customers will only spend Rs. 100 on a subpar umbrella. Or there is no creation of either umbrella quality in the only balance. The market for both of the product's attributes has been ruined by the potential for subpar manufacture.

Market for Insurance

There is a great deal of asymmetric information in the insurance industry. For example, when it comes to health insurance, only the individual knows the fullest and most accurate details about their own health. The insurance provider frequently suffers from a lack of knowledge on the individual's actual state of health. People who are elderly and at high risk of illness or incapacity would rather get a large medical insurance policy in order to cover their medical expenses. Younger and healthier individuals with lesser health risks often do not require much insurance; therefore they would rather choose policies that appeal to them in terms of premiums and coverage. The insurance firm may not be able to maintain its operations if it offers insurance to a disproportionately higher number of elderly or ill individuals since it will not be able to take advantage of cross-subsidies from the young and healthy customers. Frequent claims will cost

the insurance company a lot of money, and it could be hard for them to break even. In these situations, the business that aims to maximize profits may leave the market.

It is challenging for the insurance company to distinguish between people with high and low health risks when there is asymmetric information. The issue of adverse selection in the health insurance market results from this. It may result in a more stringent clause (overpriced) for the healthy person and a less stringent clause (underpriced) for the ill person if the insurance contract's pricing, which is determined by the annual/monthly premium amounts and the insurance benefit in the event of illness, is the same for both the healthy and the ill person. This scenario is comparable to the "market for lemons." In such a situation, healthy people would be discouraged from purchasing insurance, but sick people might be highly motivated to do so. Because there are now more sick people than healthy people asking for insurance, adverse selection will win out and the insurance firm will lose money. The insurance market will fail as a result of this.

Market for Credit

The credit market has a similar issue with asymmetric information. When applying for credit, the borrower knows more about his actual creditworthiness than the lender does. Put another way, it is frequently challenging for the lender to determine the client's actual credit worthiness. Selecting the incorrect customer would increase the likelihood of default and, thus, the lender's losses. Low-quality or hazardous borrowers are more likely to apply for loans than high-quality or safe borrowers, just like in the market for "lemons." As a result, lending interest rates based on average default risk are forced to rise even more, which might cause safe borrowers to leave the market and attract more risky borrowers to lenders. Adverse selection in the credit market is the result of this.

3.3 Solution to asymmetric information signaling and screening

Signaling

Market failure frequently results from the issue of adverse selection, which is brought on by the presence of asymmetric information. What should be done now that asymmetric information is common? Market signaling is one strategy the buyer and seller might use to address this issue. When a buyer or seller signals an uneducated party to learn more about the goods under consideration, this is known as market signaling.

Let's look at the example of asymmetric information in the employment market to see how market signaling functions. In a labour market where there are both high- and low-ability individuals who are difficult to differentiate, hiring someone might be quite expensive for the

prospective employer. An employer will suffer a great loss if he hires a person with low ability for a position that requires high ability. It works perfectly in this situation. In contrast to all the other low-ability applicants, the high-ability worker can communicate his talents to the company. Signs may include having a stronger CV, being highly qualified, having a higher level of education, displaying good manners, using polite language, etc. High-ability workers frequently utilise these systems to let prospective employers know about their potential and ensure that they are given a high quality tag.

Screening

When asymmetric information is available, it encourages communication between the parties. We learnt in the previous subsection that in order to compensate for information asymmetries, knowledgeable parties (workers) give information to the ignorant parties (the prospective employer). There, the knowledgeable parties signal to the ignorant parties their secret kind in order to start a conversation. An alternative method of addressing information asymmetries is for ignorant parties to begin communication by testing the commodities they wish to trade or the knowledgeable parties. For example, in the market for used vehicles, a prospective buyer can find information about the car's quality by having a technician inspect it or by learning about its accident history. In a similar vein, a life insurance firm can learn more about an applicant's health by calling his present doctor, acquiring his medical records, or doing a physical examination. Creating and providing distinct contracts for the many kinds of agents with hidden information, as opposed to a single, uniform contract, is another popular method of putting screening into practice. This reveals the kind of each agent.

There is one important distinction between screening and signalling. While the less informed party initiates the communication meant to compensate for the information asymmetries in screening, the better informed party initiates the communication in signalling.

3.4 Moral hazard

Another source of moral hazard is asymmetric information, which occurs when agents act covertly such that one party's actions in a deal are not seen by the other, which impacts the latter's advantages. For instance, in the insurance market, an insured person's risk of dying or being disabled may rise in the post-insured period due to his bad lifestyle, which may include smoking, binge drinking, or not exercising. The insurance provider, however, is probably going to find it challenging to keep an eye on his conduct and modify its rates appropriately.

Because companies are unable to fully supervise their employees' conduct and efforts, moral hazard frequently occurs in the workplace. Employees become inefficient as a result, putting in

less effort than the employer would deem necessary. As we address in the following section, moral hazard is also common in large organisations, where individual managers may act in ways that serve their own interests at the expense of the business. Generally speaking, moral hazard happens when one party to a transaction engages in covert behaviour that its trade partner is unaware of and that compromises the latter's profits.

The following is a straightforward example that explains moral hazard in relation to the asymmetric information problem and how it raises costs. Think about a company's night security guard. No one watches what the security guard does because the assignment is for the night. The guard is then sufficiently motivated to shirk, or not guard, as a result of this. Let's say he routinely nods off during work hours since he is aware that no one is watching him.

Because of this, the business has a break-in one evening, which causes significant expenses for the business. This is because the guard's covert conduct, which the company is unable to witness, contains moral hazard. Consequently, market failure results from the existence of asymmetric knowledge.

Hidden Actions

The hidden-action model is the first of the two asymmetric information models. In insurance and other situations, these are also commonly referred to as the moral hazard model. In order to maximize their shared surplus, the principle wants the agent to respond or act. Since the principle is the one who offers the contract, he wants to keep all the excess for himself. When this model is applied, for example, to a relationship in which the owner is the principle and the management is the agent, the owner would prefer that the manager be present during business hours and perform his tasks on a regular basis.

Likewise, when it comes to accident insurance, the insurance provider wants the policyholder to stay accident-free. The principal cannot see the agent's actions because they are concealed. The principle may watch agents constantly in an attempt to observe their behaviour, which might be quite expensive. However, if the agent is aware that his activities are not visible, he would rather avoid carrying out his assigned tasks and instead choose the course of action and behaviour that best suited him rather of following the principle. For instance, arriving late to work or taking on more risk than the insurance company would approve, etc.

The contracts created by the principal by no methods lessen the shirking on behalf of the agent. Principal cannot attach them to any contract in order to remove shirking on their behalf but they may minimize shirking to some level by constraining their reward to certain observable results which are not disguised .For instance, in an owner-manager relationship, when the observable

result is the firm's profit, the owner might motivate the management to put in extra effort by linking the manager's compensation to the firm's earnings, which are then dependent on the manager's efforts.

Furthermore, the principle cares more about the visible result than the agent's covert actions, but this result is influenced by several random variables outside of the principal's control. The observable result of the firm's profit in an owner-manager application is dependent on a number of other factors, such as customer demand, which is further impacted by erratic economic conditions. Whether an accident occurs in the application of insurance relies on the agent's level of care as well as the actions of other people and the elements.

3.5 Principal-agent Problem

In order to comprehend asymmetric information problems, we frequently examine a simple model that has a single person on each side of the market. The principle is the agent who suggests the contract, and the agent is the one who decides whether to accept or reject it. The principle and agent are also responsible for the presence of moral hazard. The people the principal hires to accomplish the principal's goal are known as agents. When there exist knowledge asymmetries, the principal's and agents' preferences frequently diverge, and agents frequently prioritise their own objectives above the principals'. For example, the on-duty employee (or agent) has a motive to avoid work, which his employer (or the principal) ignores.

Relationships between corporate management and shareholders, politicians and voters, or brokers and markets—buyers and sellers—are typical instances of principal-agent relationships. Imagine a client (the principle) who is unsure if their attorney (the agent) is advocating drawn-out legal actions because it would benefit the lawyer financially or because it is actually essential for the client's welfare. In a similar vein, a surgeon may recommend a costly knee replacement procedure to a patient out of true need or because it would benefit the physician financially. The issue can really occur in practically every situation when one party is paid by another to do a task, with the agent receiving a little or no portion of the result.

When parties have conflicting interests and information asymmetries occur—the agent has more information than the principal—moral hazard issues occur. In these situations, the principle cannot explicitly guarantee that the agent is operating in their (the principal's) best interest, especially when the agent incurs costs for actions that are beneficial to the principal and when aspects of the agent's actions are expensive for the principal to monitor. A suboptimal result that can reduce overall welfare is when the principal is so worried about the agent's potential to take

advantage of them that they decide not to engage in the transaction at all, even if it would have been advantageous for both parties. Agency expenses are the result of the agent's departure from the principal's interest. Both public and private businesses might encounter principal-agent problems. Creating an efficient incentive system that allows the agent to get a portion of the profits is one method to address the principal-agent dilemma and ensure that the goals of the principal and the agents are in line. Giving managers (agents) a portion of the company's stock, for instance, would encourage them to fulfil their duties to the best of their abilities.

3.6 Choice under Uncertainty

We have observed how economic agents behave in situations when the outcomes of every decision were completely known in advance, or when there was certainty in the scenario. But if we include decisions that must be taken in the face of uncertainty, the theoretical recommendations are still unexplored. We require LO model selections that take into consideration believable occurrences like as changes in our income levels, prices we pay, or deteriorating health issues. Additionally, note that the majority of our decisions are predicated on the future: for instance, organising a vacation, purchasing insurance, or organising a trip. We typically base our decisions on our opinions on the best course of action for the now and the future. As a result, these decisions are made in an uncertain environment. As a result, there is a chance that our plans' underlying assumptions won't come to pass. We use probabilities and contingencies to prepare for such situations. In other words, we would need to incorporate the consequences of uncertainty into our models if we wanted a true model of choice.

Basic Concepts

1. **Subject Matter:**

A great deal of ambiguity surrounds many of the decisions that individuals make. We occasionally have to decide between dangerous undertakings.

What should we do with our funds, for instance? Should we put our money into the stock markets, which are riskier but more profitable, or something safer, like a bank savings account? Choosing a profession or a job is another example.

Which is preferable: joining a new business that offers less job security but faster promotion, or working for a big, established corporation with high job security but few opportunities for advancement?

In order to assess riskiness and other options, we need to be able to measure risk in order to respond to these questions.

We'll then look at ways that people may manage or lower risk, such as diversification, purchasing insurance, etc., or investing in more knowledge. Individuals must decide how much danger they are willing to take on in various circumstances. We must be aware of every conceivable consequence of a given action as well as the probability that each event will materialise in order to do a quantitative analysis of risk.

2. Explaining Risk:

Probability:

Probability is the possibility that something will happen. Assume that there is a 1/4 chance that the oil exploration project will succeed and a 3/4 chance that it will fail. Both subjective and objective probabilities are possible. The frequency with which particular occurrences have transpired is the basis for objective probability.

Assume that, based on our experience, 1/4 of the 100 offshore oil explorations that have occurred thus far have been successful, while 3/4 have failed. Since it is based on the frequency of comparable situations, the 1/4 chance of success is objective.

However, what if there are no comparable prior experiences to gauge likelihood? In these situations, a more subjective assessment of probability is required because objective measurements are not possible. Subjective probability is the perception that an event will occur and the perception is based on a person's judgment or experience, but not on the frequency of outcome observed in the past.

Whatever be the interpretation of probability, it is utilized to construct two crucial measurements that let us explain and compare dangerous options. The expected value and the variability of the potential outcomes are indicated by one measure.

Expected Value:

A weighted average of the values corresponding to each potential result, with the probabilities of each eventuality serving as weights, is the expected value of an unknown event. The central tendency is measured by the predicted value. Assume that we are evaluating an investment proposal in an offshore oil firm with two potential outcomes: a payout of Rs. 20 per share in the event of failure, and a payout of Rs.40 per share in the event of success. Anticipated Value = Pr (success) (Rs.40/share) + Pr (failure) (Rs.20/share) = 1/4 (Rs.40/share) + 3/4 (Rs.20/share)

= Rs.25/share is the anticipated value in this instance.

More broadly, the expected value E(X) is E (X) = Pr1X1 + Pr1 X2 …… if there are two alternative outcomes with payoffs X1 and X2, and the probability of each result are provided by Pr and Pr2.

Variability:

Let's say we have to choose between two sales positions with the same Rs.1,500 projected salary. The first is commission-based. The second position is paid. Under the first job, there are two equally likely incomes: Rs.1,000 for a modest effort and Rs.2,000 for a strong sales effort. The second employment pays Rs.1510 most of the time, but in the event that the firm fails, it would pay Rs.510 in severance compensation.

Table 3.1 summarizes these possibilities:

Table 3.1

Procedure	*Conventional designations*	*Error variance*
1. Retest with same form on different occasions	Coefficient of stability	Temporal fluctuation
2. Retest with parallel form on different occasion	Coefficient of stability and equivalence	Temporal fluctuation and item specification
3. Retest with parallel form on same occasion	Coefficient of equivalence	Item specificity
4. Split half (odd-even or other parallel splits)	Coefficient of internal consistency	Item specificity
5. Kuder-Richardson (and other measures of inter-item consistency)	Coefficient of internal consistency	Item specificity and heterogeneity

Because 0.5 (Rs. 2,000) +0.5 (Rs. 1,000) =0.99 (Rs. 1,510) + 0.1 (Rs. 510) = Rs. 1,500,

The predicted income for the two occupations is the same. However, the two vocations differ in the variety of the potential rewards. A metric that assumes that significant variations between actual and predicted payoffs—known as deviations—indicate increased risk can be used to assess the variability.

The differences between the actual and predicted salaries for the two sales positions are shown in Table 3.2:

Table 3.2 Derivation from Expected Income

	Dèviations from Expected Income (£)			
	Outcome 1	Deviation	Outcome 2	Deviation
Job 1	2,000	500	1,000	500
Job 2	1,510	10	510	990

The average variation for the first job is Rs. 500:

Consequently, the average deviation is equal to.5 (Rs. 500) +.5 (Rs. 500) = Rs. 500.

The average deviation for the second task is determined as follows:

Average Deviation =0.99 (Rs.10) +.01 (Rs.990) = Rs.19.80

Because the average deviation of Rs. 500 is far higher than the average deviation of Rs. 19.80 for the second job, the first job is thus far riskier than the second. The standard deviation (σ2), which is the square root of the variance, or the variance, which is the average of the squares of the departures of the payoffs associated with each result from their expected value, are two ways to quantify variability.

Given job 1, the variance (σ2) =.5 (Rs.2, 50,000) +.5 (Rs.2, 50,000) = Rs.2, 50,000 is the average of the squared deviations.

The square root of Rs. 2, Rs. 50,000, or Rs. 500 is the standard deviation. Likewise, variance (σ2) =.99 (Rs.100) +.01 (Rs.9, 80,100) = Rs.9,900 is the average of the squared deviations under Job 2.

The square root of Rs. 9,900, or Rs. 99.50, is the standard deviation (a). The second employment is less hazardous than the first, according to the variance or standard deviation that we use to quantify risk. The incomes earned have a reduced volatility and standard deviation. If there are several outcomes instead of simply two, the idea of variance still holds true.

Making decisions:

Let's say we have to choose between the two sales positions mentioned above. Which position ought we to accept? We will accept the second job if we don't enjoy taking chances. With less risk, it provides the same anticipated return as the first. Let's now assume that we boost the predicted payout from Rs. 1,500 to Rs. 1,600 by adding Rs. 100 to each of the payoffs in the first job.

The following is a description of the jobs:

Job 1: Variance = Rs. 2,50,000; Expected Income = Rs. 1,600

Job 2: Variance = Rs. 9,900; Expected Income = Rs. 1,500

Compared to job 2, job 1 is much riskier but delivers a larger predicted salary. It is up to us which work is desired. A risk-averse individual might choose the second option, whereas a risk-loving person might choose the greater predicted income and larger variance. To understand how consumers could choose between salaries that vary in riskiness and projected value, we must create a consumer theory.

3.7 Numan Morgan Utility Function

John von Neumann and Oskar Morgenstern used mathematical models in their book "The Theory of Games and Economic Behaviour" to study how people behave economically in uncertain situations. Although the new utility function will include certain characteristics of a cardinal utility function and is no longer strictly ordinal, it will serve as the foundation for a thorough examination of choices made in the face of uncertainty. Think of a dangerous scenario in which the person making the decision is unsure about the future status of the world. For simplicity, we suppose that there are two conceivable world states, 1 and 2, with $\pi 1$ and $\pi 2$ representing the corresponding probability of occurrence. If condition 1 happens, let c1 represent the individual's consumption; if state 2, let c2. The following form is one practical approach to depict the von Neumann-Morgenstern anticipated utility function:

$u(c1,c2) = \pi 1 v(c1) + \pi 2 v(c2)$

Where the utility obtained from a certain level of consumption is given by the function v(.)*.

The weighted sum of a function of consumption in each state, v(c1) and v(c2), may thus be expressed as vNM anticipated utility. The weights are determined by the probabilities $\pi 1$ and $\pi 2$, where $0 < \pi i < 1$ and also $\Sigma \pi i = 1$ for i = 1, 2. The utility of a certain consumption in state 1 is represented as v(c1) if one of the states is definite, such that $\pi 1 = 1$. Likewise, in state 2, v (c2) is the utility of a certain consumption if $\pi 2 = 1$. We can select a utility function with the additive form mentioned above when we state that a consumer's preferences can be represented by an expected utility function or that the consumer's preferences have the expected utility attribute.

The following presumptions form the foundation of VNM utility theory:

- **Completeness and transitivity:**

  The consumer's desire is complete and transitive, surpassing all other options, both certain and uncertain. The assumption we established for the conventional consumer theory model is obviously extended by this.

- **Continuity:**

  If a customer favours option X over option Y and Y over option Z, then Y falls somewhere in the middle of the customer's preference ranking. In order for the consumer to be unconcerned with the intermediate option Y and the lottery delivering the best option X with probability px and the worst option Z with probability (1 – px), there must be a probability px, where $0 < px < 1$.

- **Independence:**

  Assume that Z is any alternative and that the customer is unconcerned with options X and Y. Think of two lotteries: one with X and Z as the possible results, and another with Y and Z. Assume that the indifferent choices (X or Y) are given the same chance in each of these lotteries, and consequently, the other alternative Z. The customer must thus be undecided between these two lotteries.

- **Unequal probabilities:**

  Let's say the customer favours option X over option Y. When two lotteries with only two potential outcomes—X and Y—are considered, and each assigns a different probability to the two, the consumer will favour the lottery that gives her chosen result, X, a greater likelihood. Therefore, a customer would favour the wager that has a higher chance of winning the desired reward.

- **Compound lotteries:**

  A customer is presented with a selection of lotteries. The simple lottery known as lottery L1 offers specific outcomes (X1, X 2,…, Xm) together with corresponding probability (p1, p2,…, pm). Lottery L2 is a lottery with other lottery results. But in the end, the intermediate lotteries result in the same specific outcomes and the same corresponding probability (p1, p2,..., pm). The customer then has no preference between L1 and L2. Therefore, a logical buyer would concentrate on the final odds of the final results.

Therefore, the Expected Utility theorem of Von Neumann Morgenstern (VNM) states: Let L be the risky option, which is any lottery. Assume that the results are (X1, X2,…, Xm). The following are specific results or other lottery outcomes with corresponding probability (p1, p2, …, pm). The expected utility of the potential outcomes of the risky option L is then its utility. In other words:

$U(L) = p1\ U(X1) + p2\ U(X2) + \cdots + pnU(Xn)$

Perspective on Risk

The fundamental guidelines for making decisions in unclear and dangerous situations—expected return and level of risk—apply equally to other decisions.

Examining people's decisions when faced with danger is the main goal of this section. According to several previous theories of consumer behaviour, the consumer maximises his utility while selecting commodity bundles in the absence of risk or uncertainty. Below, we'll examine how a person maximises his predicted utility in the face of risk or uncertainty.

We will look at one composite commodity, namely money income, in order to determine the attitude towards risk. The market basket of items that a person is able to purchase is represented by his income. It is presumed that the person is aware of the likelihood of earning money in various circumstances. However, utility, not rupees, is used to quantify the results or payoffs. Risk preferences vary widely among people. In general, most people choose the less hazardous scenario (i.e., the scenario with less fluctuation in results or benefits). To put it another way, the majority of people are risk averters or risk averse because they want to reduce risk.

Nonetheless, some people are referred to as risk-seekers or risk-lovers because they like taking risks. Other people are referred to as risk-neutral since they don't care about risk. However, it's crucial to remember that these varying risk preferences rely on whether a person's marginal value of money rises, falls, or stays the same.

A risk-averse person's marginal utility of money decreases as his wealth grows, as will be discussed below, whereas a risk-seeker's marginal utility of money rises as his wealth grows. Since he has more money, the risk-neutral individual's marginal utility of money stays the same.

Risk Averter:

We will look at one composite commodity—money income—to understand the attitude towards risk. The market basket of items that a person is able to purchase is represented by his income. It is presumed that the person is aware of the likelihood of earning money in various circumstances. However, utility, not rupees, is used to quantify the results or payoffs. The utility function of a risk-averse person's money income is depicted by the curve OU in Diagram 3.2. This image illustrates how the slope of the overall utility function (OL) falls as an individual's income rises. Keep in mind that we use the X-axis to measure money revenue and the Y-axis to assess utility.

Diagram 3.2 shows that when an individual's income rises from 10 to 20 thousand rupees, his total utility rises from 45 to 65 units (a 20-unit increase), and when his income rises from 20 thousand to 30 thousand rupees, his total utility rises from 65 to 75 units (a 10-unit increase).

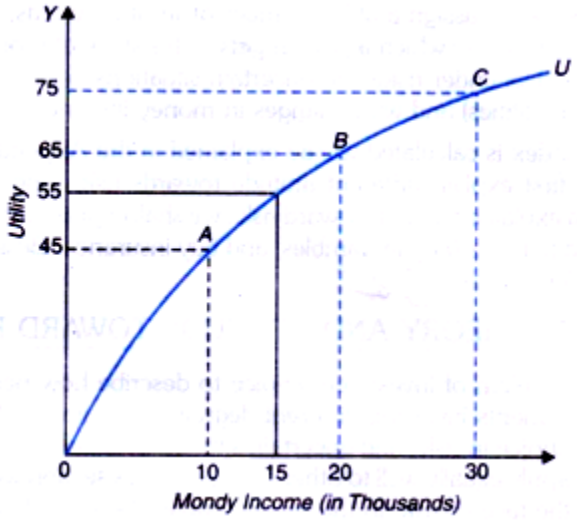

Diagram 3.2 Utility Function of a Risk Averter

Consequently, Diagram 3.2 shows this concave utility function. A risk-averse individual is represented by the fact that their marginal utility of money declines as their income does. Assume that the person is currently paid a fixed salary of Rs. 15,000 per month. With a set wage base, there is no risk associated with the income from this current work. Let's now assume that the person is thinking about accepting a commission-based sales position. Because his income in this position is uncertain, this new employment entails risk.

This is due to the fact that his salary may rise to Rs. 30,000 per month if he proves to be a successful seller, but it could drop to Rs. 10,000 per month if he is not. Assume that there is a 50/50 possibility of earning Rs. 30,000 or Rs. 10,000 in this new employment (i.e., each has a probability of 0.5). Uncertainty prevents a person from knowing the true benefit of a certain course of action.

However, we may compute the anticipated utility given the probability of various outcomes. By comparing the projected utility of the new dangerous work with the utility of the current job, one may determine whether the person will select the new, riskier career or keep their current, paid position with a certain salary. With certainty, the utility of Rs. 15,000 in money income is 55, as can be shown from the utility function curve OU in Diagram 3.2.

Additionally, in the event of a new, riskier employment, if he proves to be a great salesperson and his income rises to Rs. 30,000, his utility will be Rs. 75,000; if he fails to be a good salesman, his income would drop to Rs. 10,000, giving him a utility of Rs. 45. Note that E(X) =

0.5 x 10,000 + 0.5 x 30,000 = Rs. 20,000 is the projected income for the new, hazardous employment, which is Rs. 20,000. With a 0.5 chance of success or failure as a salesperson, the expected usefulness of the new position is determined by

E (U) = 0.5 U (10,000) + 0.5 U (30,000)

= 0.5 x 45 + 0.5 x 75

= 22.5 + 37.5

= 60.0

Therefore, the predicted usefulness of the new job or commission-based salesman is 60, while the current employment, which has a set pay of Rs. 15,000 with no uncertainty, is 55. Since the projected value of the hazardous work is higher than the utility of the current job with a particular salary, the person will select the dangerous job even if his utility function of money income indicates that he is risk adverse.

Now let's alter the data a little. Assuming that the person succeeds in his new work and makes Rs. 30,000, which is double the current guaranteed income of Rs. 15,000, but fails in his new, dangerous position as a commission-based salesman and his income drops to zero, the anticipated value of the risky employment is provided by,

E (U) = 0.5 U (0) + 0.5 U (30,000)

= 0 + 0.5 x 75

= 37.5

Now, with an assured income of Rs. 15,000, the expected utility from the new risky job is lower than the utility of 55 from the current job (keep in mind that the expected income in the risky job is also Rs. 15,000 [E(x) = 0.5 x 0 + 0.5 x 30,000 = 15000). Again, keep in mind that Diagram 3.2 considers the choice of a risk-averse individual whose marginal utility of money decreases as he has more of it.

At this point, we can actually define what a risk-averse person is. To be more specific, a risk averter or risk-averse person is someone who would rather have a fixed salary than a dangerous employment with the same predicted income. The most prevalent attitude towards risk is risk aversion.

Risk Lover

A risk-preferred or risk-loving individual, on the other hand, favours a hazardous result with an equivalent predicted income to a specific income. The convex total utility function curve (OU) in Diagram 3.3 illustrates how the marginal utility of income for a risk-taking individual rises as his income does.

Assume that this adventurous person now earns Rs. 20,000 from their employment. The usefulness of Rs. 20,000 is 43 units for this person, as may be shown in Diagram 3.3 Now, if he is offered a dangerous job with a salary of Rs. 30,000 if he is extremely efficient and Rs. 10,000 if he is not, with an equal chance of 0.5 in both occupations, the expected utility from the new job is provided by

E (U) = 0.5 U(10,000) + 0.5 U (30,000)

The utility of Rs. 10 thousand to this person is Rs. 20, and the utility of Rs. 30 thousand to him is Rs. 83, as can be seen in Diagram 3.3.

E (U) = 0.5 (20) + 0.5 (83)

= 10 + 41.5

= 51.5

The risk-loving person will choose the new risky job even though the expected income is also Rs. 20,000 because the expected utility from the new risky job is 51.5, which is higher than the utility of 43 from the current job with a certain income of Rs. 20,000.

This is because (0.5 x 10,000) + 0.5 (30,000) = Rs. 20,000.

As previously said, the majority of people are risk averse, however there is enough evidence of risk-takers. It is made up of risk-takers who gamble, purchase lottery tickets, commit crimes like robberies and major frauds, and risk severe punishment if detected.

Risk-Neutral:

If a person has no preference between an uncertain income with the same expected value and a definite income, he is said to be risk neutral. If a person's marginal utility of money income stays the same even as his money increases, he will be risk neutral. Diagram 3.4 displays the total utility function of a risk-neutral individual. This data shows that the usefulness of a specific income of Rs. 20,000 is 80. The usefulness of Rs. 30,000 is 120 units in a hazardous employment where income can rise to Rs. 30,000 if he shows to be a good seller.

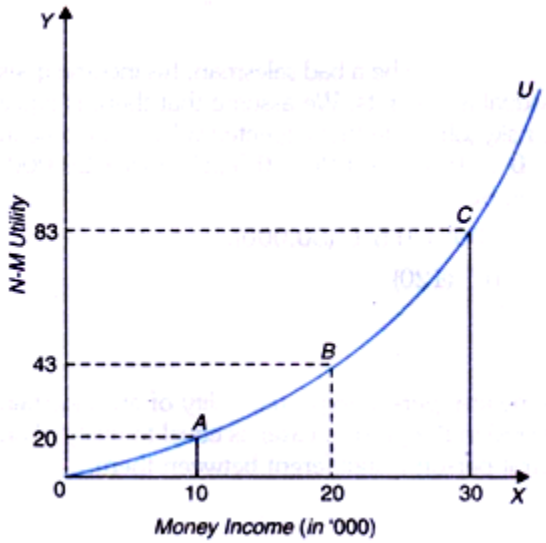

Diagram 3.3 Utility function of a Risk Seeker

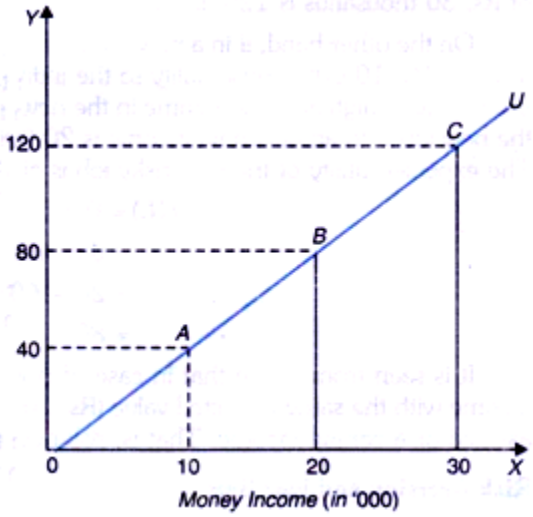

Diagram 3.4 Utility Function of a Risk Neutral

However, if he turns out to be a poor seller in a new, dangerous career, his income drops to Rs. 10,000, which is worth 40 units to the individual. We make the assumption that the new, riskier employment has an equal chance of paying well and poorly. Because (0.5 x 10,000 + 0.5 (30,000) = 20,000, the expected value of income in the new employment with an uncertain income is 20,000. The anticipated value of the new, dangerous employment is provided by

E (U) = 0.5 U (10,000) + 0.5 U (30,000).

= 0.5 (40) + 0.5 (120)

= 20 + 60

= 80

As can be seen from the foregoing, the expected utility of an uncertain income with the same expected value (in this example, Rs. 20,000) is equivalent to the utility of a guaranteed or certain income in the case of a risk-neutral person. In other words, a risk-neutral individual doesn't care about either of them.

Risk Aversion and Fair Bets:

The way that people see danger varies widely. A person whose marginal utility of money decreases will decline to take a fair gamble, according to Bernoulli's theory. When the projected income from a bet is guaranteed to be equal to the same amount of income, the game or gamble is considered fair. A person is considered risk averse if they turn down a reasonable wager.

A person who chooses a known income over a hazardous wager with the same predicted income is said to be a risk averter. The most prevalent attitude towards risk is risk aversion. Because of their risk-averse mindset, many individuals purchase insurance against a variety of risks, including home fires, serious illnesses, and auto accidents. They also favour stable-income positions over those with unpredictable incomes.

The Neumann-Morgenstern technique of calculating anticipated utility may be used to explain this risk-averse mindset. It should be emphasized that when a risk-averter's income rises, his marginal utility of income decreases. The Neumann-Morgenstern utility function curve U (I) is seen in Diagram 3.5. This graphic shows that the N-M utility curve begins at the origin and has a positive slope all the way through, suggesting that the person would rather have more money than less.

Additionally, Diagram 3.5, concave N-M utility curve illustrates how a person's marginal utility of income decreases as income rises. As a result, the risk averter scenario or attitude is represented by the utility curve in Diagram 3.5. A person's utility is 50 when his income is Rs. 2,000, and it climbs to 70 when his income reaches Rs. 3,000. His utility climbs to Rs. 75 as his income rises to Rs. 4,000.

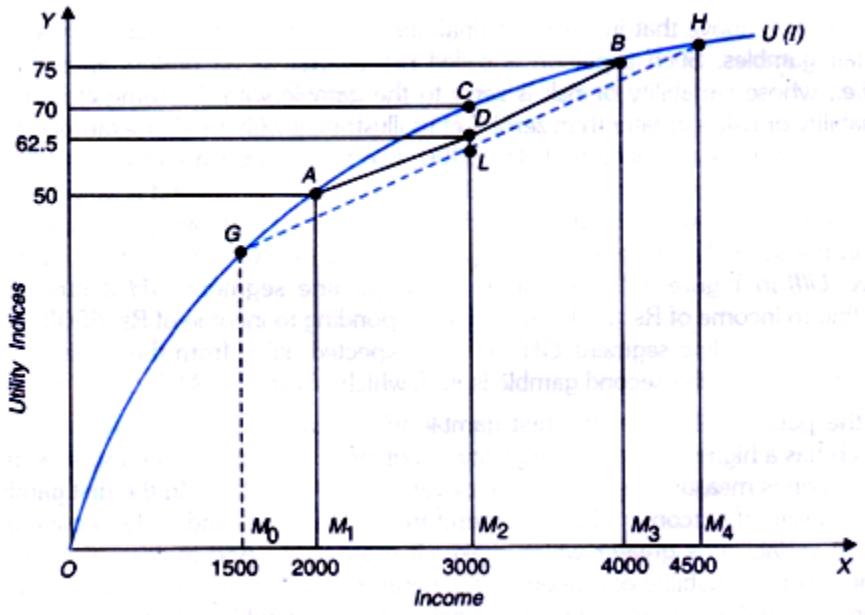

Diagram 3.5 The Neumann – Morgenstem Concave Utility Curve of a Risk Averter

Let's say that an individual with a current salary of Rs. 3,000 is presented with a fair risk where he has a 50/50 probability of winning or losing Rs. 1,000. His chances of winning are therefore 1/2 or 0.5. His earnings will increase to Rs. 4,000 if he wins the game, and they would drop to Rs. 2,000 if he loses the wager.

In this uncertain circumstance, the estimated monetary worth of his income is determined by:

E (V) = 1/2 x 4000 + 1/2 x 2000 = Rs. 3000

He will undoubtedly have his current salary of Rs. 3,000 if he decides not to take the chance. A risk averter will not take the chance even if the expected value of his uncertain income outlook is equivalent to his income with certainty.

This is because, in an uncertain scenario, he acts based on the expected usefulness of his income, which is Rs. 4,000 in the event of a victory and Rs. 2,000 in the event of a loss.

Expected Utility (EU) = π U (Rs. 4000) + 1 – π U (Rs. 2000)

Diagram 3.5 shows that a person's utility from Rs. 4,000 is 75 (point B on the utility curve) and from Rs. 2000 is 50 (point A). Based on this uncertain prognosis, the estimated utility will be:

E (U) = 1/2 (75) + 1/2 (50)

= 37.5 + 25 = 62.5

By joining points A (which corresponds to Rs. 2,000) and B (which corresponds to Rs. 4,000) by a straight line segment AB and then reading a point on it that corresponds to the expected value of the gamble, Rs. 3,000, the expected value of the utility is M2D (= 62.5), which is less than

M2C or Rs. 70, which is the utility of income of Rs. 3,000 with certainty. This is how the expected utility is found in the N-M utility curve U (I) in Diagram 3.5.

As a result, the individual will decline to take the risk (i.e., he will not gamble). It should be emphasized that he declined to gamble since his money income's marginal value was declining. In the event that he wins, the Rs. 1,000 in utility gain is smaller than the Rs. 1000 in utility loss if he loses the wager. Because of this, it has been determined that his expected utility from the uncertain income potential is less than the value he receives from the same income with certainty.

It follows from the foregoing that a person will refrain from taking fair bets if the marginal utility of money revenue declines. This type of individual is known as a risk averter because he would rather have a guaranteed income (i.e., one with zero variability or risk) than a gamble with the same expected value (i.e., one with more variability or risk). Let's look at another example to demonstrate it. Assume that two fair bets are presented to a person with a certain income of Rs. 3,000. As previously, there is a 50:50 chance of winning or losing Rs. 1000. There is also a 50:50 possibility of winning or losing Rs. 1,500.

The projected revenue in the second bet, with an equal probability of winning and losing, is 1/2 (1500) + 1/2 (4500) = Rs. 3000. We draw a straight line segment GH connecting point G (corresponding to income of Rs. 1500) and H (corresponding to income of Rs. 4500) on the N-M utility curve U (I) in Diagram 3.5. The expected utility from the estimated money value of Rs. 3,000 from the second gamble is M2L, which is smaller than M2D of the first gamble, as can be seen from this straight-line segment GH.

As a result, the individual will favour the first bet, which has less unpredictability, over the second gamble, which has more outcome variability. It is important to keep in mind that risk in this context is determined by the degree of result unpredictability. The first bet has a lower degree of outcome variability, which lowers risk; the second gamble has a higher degree of outcome variability, which raises risk. Furthermore, there is no outcome unpredictability and, thus, no risk involved when it comes to revenue that is assured. Therefore, a risk-averse individual would rather have a guaranteed income than take a bet with an equal predicted monetary worth.

3.8 Insurance and Risk Aversion

The majority of people get insurance because they are risk averse.

How much a risk-averse person will pay the insurance business in order to shield him from risk and uncertainty is now a crucial concern.

Assume that the person purchases a home that brings in Rs. 30,000 a month. However, his monthly income drops to Rs. 10,000 if the house burns down and the damage results, causing him to lose money. To simplify the study, let's assume that the house has a 50% risk of catching fire. Then, they anticipate that the value of revenue in this hazardous and unpredictable circumstance is

E (X) = 0.5 X 30,000 + 0.5 x 10,000

= 15,000 + 5,000

= 20,000

The weighted average of the two uncertain options (30 thousand and 10 thousand), considering their probabilities as weighty averages, is the estimated revenue of Rs. 20,000. Expected revenue would vary depending on the likelihood that these earnings (30 and 10,000) would occur. Additionally, keep in mind that the projected income is a weighted average of the two unknown possibilities rather than the actual income that a person would get.

Diagram 3.6 displays the utility function OU with a declining marginal utility of money income of a risk-averse person. His utility is 75 when his money income is Rs. 30,000, and it is 45 when his income is Rs. 10,000. The anticipated utility of the two possibilities, provided that each has a chance of 0–5, is determined by

E (U) = 0.5 U (30,000) + 0.5 U (10,000)

= 0.5×75 + 0.5 x 45

= 37.5 + 22.5

= 60

As you can see in Diagram 3.6, we have connected the utilities of 75 and 45 by a straight line AB.

As can be seen from Diagram 3.6, the expected utility is 60, which corresponds to Point D on the straight line AB, and corresponds to the expected value of income of Rs. 20,000. This straight line, or chord AB, is where the amount of expected utility will be corresponding to the expected value of income in the current risky and uncertain situation.

However, the utility function OU of the individual will show that a utility of 60 is equivalent to an ensured and definite income of Rs. 16,000. Because the expected utility of an uncertain expected income of Rs. 20,000 is equal to the utility of a certain income of Rs. 16,000, an

individual with an expected uncertain income of Rs. 20,000 will be willing to forgo Rs. 4,000 (or DC) in order to receive a certain or guaranteed income of Rs. 16,000.

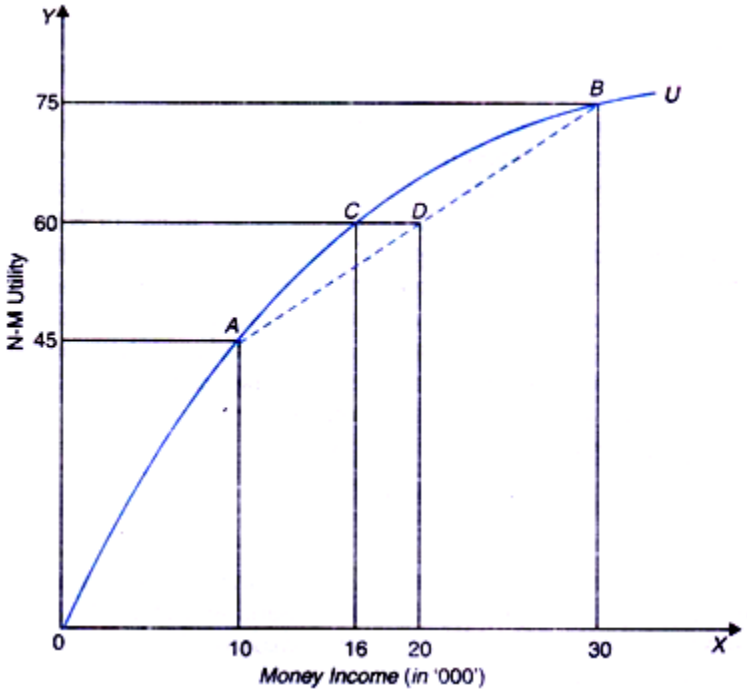

Diagram 3.6 Insurance and Risk Premium

This indicates that the guy will receive the same utility of 60 if he forgoes Rs. 4 thousand (20 – 16 = 4) from his uncertain predicted income as he would if he had a fixed income of Rs. 16 thousand. The risk premium is Rs. 4,000, which is equivalent to the distance DC. Consequently, the amount of money that a risk-averse person is ready to spend in order to avoid the risk is known as the risk premium. The person can insure himself against a significant loss from a fire and obtain an assured or definite income by paying the risk premium. The reasons why individuals get insurance for fire, accidents, illness, and even death are evident from the above.

3.9 Budgetary Restraints and Intertemporal Choice

Keynes' absolute income theory states that current income is the only factor influencing current spending.

However, this presumption isn't always accurate. In practice, people take into account both the present and the future when making decisions about their spending and saving. Those who consume more during the present time frame (today or this year) and save more during the next time frame (tomorrow or next year) will have less available for consumption.

Therefore, the decision (trade-off) between now and future consumption is always present. Households must thus examine both the consumption of products and services they are likely to

be able to afford as well as their anticipated future income when making consumption decisions. Irving Fisher created a model to examine the long-term buying decisions made by logical, forward-thinking customers.

Fisher's model of intertemporal choice shows at least three things:

1) The financial limitations that consumers face,
2) Their preferences for present versus future consumption, and
3) How these two factors work together to influence households' decisions about the best way to save and consume over a long period of time. In addition to this, contemporary economists have taken a step further and incorporated borrowing limits into their analysis of consumption choices across time.

The Intertemporal Budget Constraint:

People who are rational constantly want to consume more goods and services, either in terms of quantity or quality. However, most people's restricted money prevents them from consuming as much as they would want. To put it another way, people are subject to financial constraints that limit their spending.

Intertemporal budget constraints, which indicate how much revenue is available for spending both now and in the future, are faced by consumers since consumption decisions are made throughout time. A consumer's choice of how much to spend now and how much to save for the future is reflected in this restriction.

Let's say, for simplicity's sake, that our sample customer lives in two periods: his youth in period 1 and his old age in period 2. For the two periods, his income and consumption are Y1 and C1, respectively, and Y2 and C2. Here, we either represent all variables in real terms (after accounting for price inflation) or disregard changes in the price level. Consumption in any given time does not have to match current income since the consumer can borrow and save: $Y1 \neq C1$, and $Y2 \neq C2$.

Income in two periods limits consumption in two periods.

Savings is the gap between income and spending in the first period.

$S = Y1 – C1 \ldots (1)$

Consumption in the second period is equal to second-period income plus the total amount of savings (including interest received on those savings):

$C2 = (1 + r) S + Y2 \ldots (2)$

Where r is real interest, or nominal interest that has been adjusted for inflation. The customer is not obliged to save in the second period as the third period is not taken into account.

Either borrowing or saving might be represented by the variable S. In both situations, equations (1) and (2) are valid. S > 0 if C1 < Y1. S < 0 indicates that the customer is borrowing if C1 > Y1. For simplicity's sake, we assume that the interest rates for borrowing and saving (and lending) are the same.

Deriving the budget Restraint:

Equations (1) and (2) may now be combined to get the consumer's budget limitation. When S is changed from the first equation to the second, we obtain

C2 = (1 + r) (Y1 – C1) + Y2 … (3)

or, (1 + r) C1 + C2 = (1 + r)Y1 + Y2

[by bringing (1 + r) C, from the r.h.s. to the l.h.s.]

Finally by dividing both sides of equation (3) by 1 + r we get:

C1 + C2 / 1 + r = Y1 + Y2 / 1 + r… (4)

This equation explains the intertemporal budget restriction of consumers as it links consumption in two periods to income in both times.

Interpretation:

In the event when r = 0, equation (4) demonstrates that C1 + C2 = Y1 + Y2, meaning that total consumption and total income for the two periods are identical. However, C2 and r2 must be discounted by a factor 1 + r in the actual world, when r > 0. This discount factor must be used when making an intertemporal decision between saving and consuming since saving might generate interest (i.e., by sacrificing present consumption).

Y2 (say = Rs. 100) < Y1 (say = Rs. 100) because r > 0. This indicates that future income is less than the same amount of current income since a customer gains interest on savings. Similarly, the cost of future consumption is lower than the cost of present consumption because future consumption expenditures are funded by accumulated savings, which includes earned interest. The amount of period 1 consumption that must be given up in order to consume one unit in period 2 is measured by the discount factor 1/(1 + r).

The intertemporal budget constraint of the customer is represented by the line EFJG in Fig. 17.3. It displays the several combinations of consumption from periods 1 and 2 that the customer may select from. The customer spends all of his money in both periods (Y1 = C1 and Y2 = C2, S = 0, B = 0) if he is at point F. C1 = 0 and Y1 = S at point E.

Thus, C2 is equal to (1 + r)Y1 + Y2. Therefore, if he selects points between E and F, he saves the remaining amount for period 2 and spends less than his income in period 1.

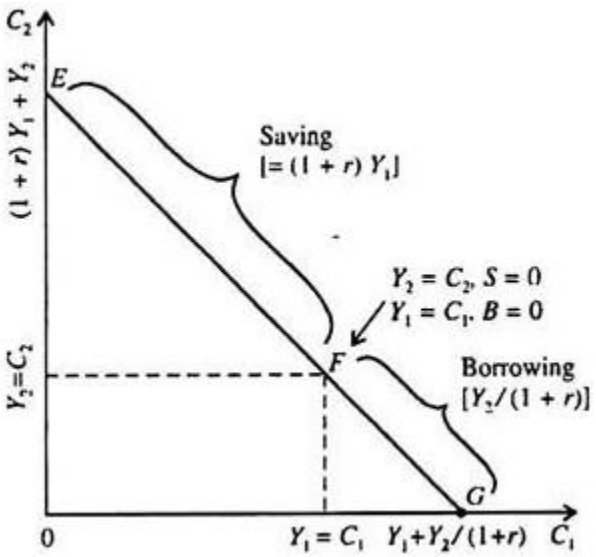

Diagram 3.7 Intertermporal Budget Line

C2 = 0 at point G. This indicates that the customer takes out the largest loan amount against Y2. C1 is therefore Y1 + Y2/(1 + r).

He thus borrows to make up the gap if he selects any point between F and G because his consumption exceeds his income in period 1. There are a number of other reachable points on the budget line EFG.

3.10 Curves of Time Indifference:

The consumer's desire for consumption in periods 1 and 2 may now be represented by time indifference curves. A locus of points that displays different combinations of C1 and C2 that provide the same level of customer pleasure is called a temporal indifference curve. Two consumer indifference curves, IC1 and 1C2, are displayed in Diagram 3.8. Any number of these indifference curves might come to mind. Since points E, F, and G are all on the same indifference curve, the customer is unconcerned about any of them. C1 drops to C'1 if the customer goes from point G to point F. In order to maintain his level of satisfaction, C2 must rise to C'2.

Otherwise, he would be unable to choose between the two spots G and F, which display two distinct C1 and C2 combinations. He needs further additional C2 as compensation if C1 is once more lowered from F to E.

An indifference curve's slope at any given point shows how much C2 the customer needs to make up for giving up one unit of C1. Thus, the marginal rate of substitution between C1 and C2 is represented by the slope. The pace at which the customer is willing to switch from C1 to C2 while maintaining the same indifference curve is known as the desired rate of intertemporal substitution.

The indifference curve is not a straight line because C1 and C2 are not perfect replacements for one another; that is, the benefit from raising the amount of C2 and the pain associated with losing C1 are not equal at every point. The MRS is therefore reliant on the consumption levels over the two periods.

The MRS is low when C1 is high and C2 is low, as it is at point G. This implies that for every additional unit of C1, the customer only requires a little amount of C2. The consumer need significantly more C2 to forgo one unit of C1 when C1 is low and C2 is high, like at point E, when the MRS is high.

The customer favours greater indifference curves over lower ones because they are constantly more satisfied. The traditional theory of consumer demand, which is thoroughly examined in microeconomic theory, explains why this is the case. He favours points K, L, M, and so on on the indifference curve IC2 over points E, F, G, and so on on the indifference curve IC1 in Diagram 3.8.

Any combination of C1 and C2 may be ranked using indifference curves.

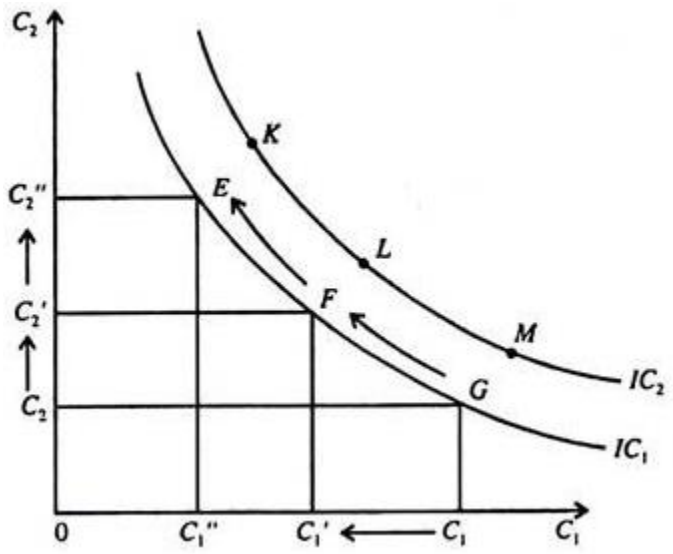

Diagram 3.8 The Consumer's Preference

3.11 Summary

The current unit examined the state of the market when complete and symmetric knowledge among the trading agents—one of the fundamental presumptions of perfect competition—does not hold true. When one side has more information than the other in a two-party exchange, this is known as asymmetric information. When resources are allocated inefficiently, it results in market failure. Adverse selection, which occurs when there is unequal knowledge, leads to such

an ineffective solution. Adverse selection causes high-quality workers or items to exit the market, leaving low-quality workers or commodities in its place. The markets for used automobiles, health insurance, finance, labour, etc. are a few examples of marketplaces that suffer from asymmetric information. When asymmetric information is present, society suffers deadweight loss because resources are not being allocated effectively. Market signalling or screening is one way to attain equilibrium when there is unequal information present. The unit then went on to discuss the issue of moral hazard, which arises when one actor attempts to avoid responsibility since the other agent is unable to see the former's behaviour. In this situation, the agent pursues his or her own objectives instead of the principal's.

We engaged ourselves in subsequent parts to gain an understanding of an individual's intertemporal decision-making process. We observed how a person selects the best stream of consumption over time. Intertemporal budget constraints, which merely equated the current value of the revenue stream with the present value of the spending stream, helped achieve this. In order to determine the best intertemporal option given the income stream and the market interest rate, we paired the budget constraint that limited us to two time periods with the indifference curves that showed an individual's preferences over consumption in the two periods. Last but not least, we examined the situation between a lender and a borrower by contrasting a person's income and consumption over time. We also looked at how an increase in interest rates impacts the intertemporal consumption of borrowers or lenders.

3.12 Check Your Progress

(1) Explain the concept of asymmetrical information;

(2) Define asymmetrical information? How does asymmetrical information lead to market failure?

(3) How does market for lemons turn into adverse selection?

(4) What is solution to the problem of adverse selection?

(5) Describe market solutions to the problem of asymmetric information;

(6) What is meant by the principal-agent problem? What leads to principalagent problem? How can that be corrected?

(7) What is a probability distribution? How does it explain the choice under uncertainty?

(8) Explain von Neumann Morgenstern utility function

(9) How does insurance help reducing risk?

(10) Define the concepts of Expected Value and Expected Utility. Explain their application in determining the attitude of an individual towards risk.

(11) As the interest rate rises, does the inter-temporal budget constraint become steeper or flatter? Give reason.

(12) State the concept of uncertainty and risk;

3.13 eferences

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Unit – 4

Alternative Theories of Firm

Introduction

Profit maximisers set their prices at the marginal cost according to the conventional theory of the firm. However, it was demonstrated in a 1939 paper by Hall and Hitch that the firms fixed the price at the average cost. The factors or reasons why the companies set the price at average cost are discussed in the sections that follow. The Bain's approach, in which businesses in a given industry set their prices to prevent new businesses from entering the market, would address this issue. The foundation of the Sylos-Labini model is the same as that of the Bain model. The behavioural theory of the company differs from the other two in that it focuses on how companies determine the best course of action for every given policy variable. Lastly, the game theoretic model adds a new dimension to the behaviourist approach by including the interdependence among the enterprises to give a solution to their choice dilemma, even if it shares the same theoretical flavor as behavioural theory.

Objective

The optimum decision of firms regarding pricing, output and other policy variables through framework different from traditional theory where pricing decisions are based on marginalistic concepts.

Contents

4.1 Hall and Hitch Full Cost Theory

Hall and Hitch from the University of Oxford launched a "root-and-branch" assault on the idea of profit maximisation in 1939 based on the responses of 38 business owners, 33 of whom were manufacturers, 3 of whom were retailers, and 2 of whom were builders.

They were questioned by Hall and Hitch on their elasticity, demand position, and efforts to equalise their projected marginal cost and marginal revenue. According to the responses, most of them didn't seem to try to predict demand or marginal cost elasticities, not even implicitly. They didn't think they had anything to do with the price procedure.

Based on the empirical analysis, Hall and Hitch came to the conclusion that most oligopolistic entrepreneurs set their selling prices based on what they refer to as "full cost" plus a profit margin, rather than on the equality of marginal cost and marginal income.

According to the principle of "fairness to competition" under oligopoly, the "right price," or the one that "ought to be charged," is thus the price based on the entire average cost. However, what is the whole cost? Average direct costs (AVC), average overhead costs (AFC), and a typical profit margin make up full cost, or full average cost: Price, then, is equal to AVC + AFC + profit margin, which is typically 10%.

According to Hall and Hitch, businesses adopt the full-cost pricing approach for the following reasons:

i. Producers engaging in covert or overt collaboration;
ii. Not understanding customer preferences;
iii. How rivals respond to price changes;
iv. A moral belief in justice; and
v. Not knowing the impact of price increases or cuts.

Oligopolistic producers are unable to establish a price below the full-cost price for all of these reasons.

As a result, businesses base their pricing decisions on the full-cost concept and sell at whatever price the market will bear. Despite shifts in costs and demand, they found that prices remained fixed in the oligopoly market. They used the kinked demand curve to explain why prices are sticky. The kink appears in Diagram 4.1 at the real location of the price QP (= OB) established on the full-cost basis.

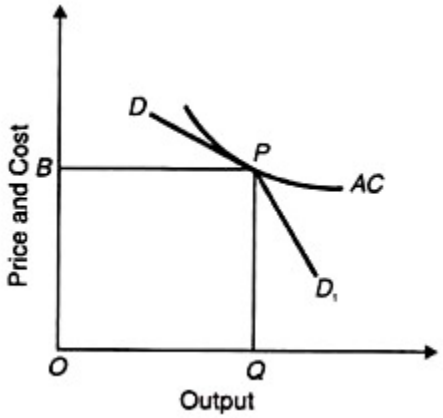

Diagram 4.1

Any price rise beyond it will result in lower sales for the company since its rivals will not raise their prices in response. This is due to the elastic nature of the kinked demand curve's PD component. Alternatively, if the company lowers its price below QP, its rivals will follow suit. Although the company's sales will rise, its profitability will decline. This is a result of the curve's PD1 region becoming less elastic. Therefore, the company will lose in both price-raising and price-cutting scenarios. Therefore, as long as the prices of the direct factors of production (raw materials, etc.) don't change, it would continue to operate at the QP price.

Price fluctuates inversely with output as the AC curve spans a wide range of output. Both the average cost and the product's price will increase with decreasing output levels. However, Hall and Hitch do not consider the potential of oligopoly enterprises charging higher prices and having small outputs.

Three explanations are offered:

- Oligopoly businesses advocate pricing rigidity;
- They are unable to raise prices because to kink; and
- They wish to "keep the plant running as full as possible, giving rise to a general feeling in favour of price concessions."

Two exceptions to this occurrence of an inflexible pricing are mentioned by Hall and Hitch:

(i) In order to preserve output, the price is probably going to be lowered if demand declines significantly and stays that way for a while. When the bottom part of the demand curve becomes more elastic, this is probably going to occur. The rationale behind this price reduction is that when one company panics and lowers its price, it forces other companies to do the same.

(ii) Any situation that causes the AC curves of all firms to rise or fall by comparable amounts because of changes in technology or factor prices is likely to result in a

revaluation of the full-cost price QP (= OB). However, prices do not likely to fluctuate more than the cost of wages and raw materials.

The Andrews Version:

The Hall-Hitch explanation is predicated on the idea that the company predetermines the price to be paid in an oligopoly market. The study is further complicated by the kinky demand curve. We provide a modified version of Prof. Andrews' full-cost price in order to make the explanation easier.

In his 1949 paper Manufacturing Business, Prof. Andrews describes how a manufacturing company determines the selling price of its goods based on the average or total cost. By dividing the current total expenses by the current total production, the company determines the average direct costs (AVC). Assumed to be constant throughout a broad range of output, these are the average variable costs.

Stated otherwise, assuming the prices of the direct cost variables are known, the AVC curve is a straight line that runs parallel to the output axis for a portion of its length. A company would often propose a price for a certain product that includes a costing-margin or markup in addition to the expected average direct costs of manufacturing.

When considering the industry as a whole, the costing-margin will often tend to cover the expenses of the indirect elements of production (inputs) and offer a regular level of net profit. The standard costing-margin (or mark-up) formula is,

M = P-AVC/AVC ……..(1)

The profit margin is represented by the numerator P-AVC, where M stands for markup, P for price, and AVC for average variable cost. If a book costs 100 rupees and costs 125 rupees,

M = 125-100/100 = 0.25 or 25%

If we solve equation (1) for price, the result is

P = AVC (1 + M) ……. (2)

The firm should set the price

P = Rs. 100 (1 + 0.25) = Rs. 125.

Once this pricing is determined by the company, the costing-margin will remain constant given its organisation, whatever the amount of its output. But it will tend to vary with any overall permanent changes in the pricing of the indirect components of production. No matter the quantity of output, the price will typically stay the same due to the firm's capacity and the cost of the primary components of production (raw materials and wages). At that price, the company's market will be more or less defined, and it will sell as much as its clients want.

However, how is the output level established?

One of three methods can be used to calculate it:

a. As a percentage of capacity output;
b. As the output sold during the previous production period; or
c. As the lowest or average output that the company anticipates selling going forward.

Only the first and third of these interpretations will apply whether the company is new or if an established company is launching a new product. Given that the plant's capacity will be determined by anticipated future sales, it is likely that the first will fall around the third in these conditions.

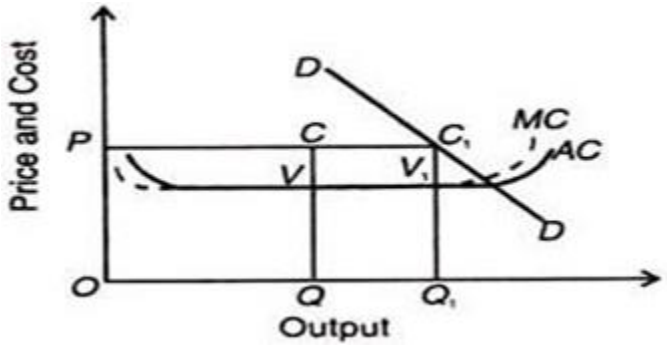

Diagram 4.2

The Andrews version of full-cost pricing is depicted in Diagram 4.2, where MC is the corresponding marginal cost curve and AC is the average variable or direct costs curve, which is represented as a straight horizontal line over a wide output range.

Let's say the firm decides on an OQ level of output. QC is the firm's total cost at this output level, which is composed of the costing-margin VC plus the average direct expenses QV. Consequently, its selling price (OP) will be equal to QC.

The company will keep charging the same OP price, but based on the curve DD, which shows the demand for its goods, it may sell more Diagram 4.2. It will sell OQ1 output in this case. This price will only change in response to changes in the prices of the direct and indirect elements, not in response to shifts in demand.

4.2 Bain's Limit-Pricing Theory of Markets Models

A few years prior to the publication of his seminal work Barriers to New Competition in 1956, Bain developed his "limit-price" hypothesis in an essay published in 1949. His initial article's goal was to explain why businesses, for a long time, kept their prices at a

demand level where the elasticity was less than unity—that is, they didn't charge the price that would maximise their profits.

He concluded that because a crucial element—the danger of possible entry—was left out of the price choice, the traditional theory was unable to account for this actual finding. Conventional theory only looked at actual entry, which led to the industry's and firm's long-term equilibrium (where P = LAC).

However, Bain contended that because of the hurdles to entry, the price did not eventually drop below the level of LAC. At the same time, the price was not set at a level that would maximise profits because to the possibility of entry. In actuality, he insisted that the price was set below the monopoly price—the price at which MC = MR and short-term earnings are maximized—and above the LAC (= price of pure competition).

This conduct may be explained by assuming that entry barriers exist and that the established businesses set the "limit price," or the maximum price they think they can charge without attracting new competitors, rather than the monopoly price. Two models of price setting in oligopolistic marketplaces are developed by Bain in his 1949 paper.

Presumptions:

- There is a fixed long-run demand curve for industrial output, which is unaffected by price changes of sellers or by entrance. Hence the market marginal revenue curve is determinate. The long-run industry-demand curve depicts the predicted sales at different prices sustained over lengthy periods.
- There is effective collaboration among the existing oligopolists.
- The well-established companies are able to determine a threshold price below which no entrance will take place.

The following factors will determine the level at which the limit price is set:

a. The estimated expenses of the potential entrant;
b. The market elasticity of demand; (c) the form and level of the LAC;
c. The market size; and
d. The number of companies in the industry.

- ✓ Entrance is enticed over the maximum price, and the sales of the existing enterprises (after entrance) are very unpredictable.
- ✓ The well-established companies aim to maximise their own long-term earnings.

Model A:

The new entrant is not the target of collusion:

Assume that Dabm is the relevant marginal revenue and that DABD' is the market demand (Diagram 4.3).

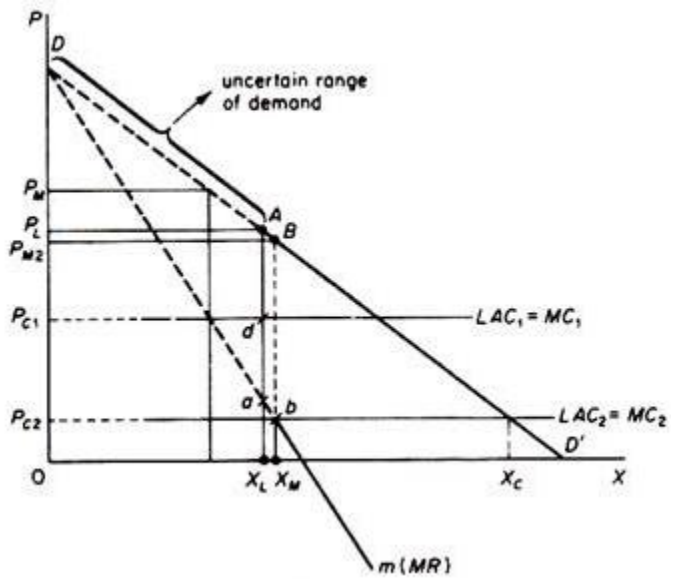

Diagram 4.3

Furthermore, assume that the limit price (PL) is accurately determined and known to both potential newcomers and established businesses. Only section am of the MR and part AD' of the demand curve are guaranteed for the enterprises given PL. Since the entrant's conduct is unknown, the portion to the left of A, or DA, is unclear.

The profitability of the options available to the enterprises, considering their expenses, will determine whether or not they charge the PL.

Assume that LAC1 is the LAC, which is exclusively established by adding the LMC = LAC of the collusive oligopolists. There are two options in this situation.

Either to charge the PL (and definitely achieve the profit PLAdPc1).

Alternatively, to charge the monopoly price, which is the price that results from the intersection of the MR and LAC1 = MC1. Although its exact level is unknown after admission, this price will be greater than PL (provided LAC1). As a result, the second option's rewards are unpredictable and need to be risk-discounted. The company will select the pricing (PL or PM) that generates the most overall profits after comparing the substantially risk-discounted earnings from the second "gamble" option with the assured profits from charging PL.

Suppose that LAC2 = MC2 is the LAC. In this instance, PM2 (which corresponds to the intersection of MC2 and MR across a certain range of the latter) is the price that maximises

profit. PL is higher than PM2. To increase earnings, the company will unambiguously charge PM2. In this instance, the price PL limit is not in effect.

A scenario where the limit price is low and the demand curve is cut at a point where the MR is negative (Diagram 4.4) justifies the observed occurrence of fixing the price at a level where e < 1. The elasticity of demand at price PL is less than unity since the MR is b*, which is obviously negative, if the limit price is PL*.

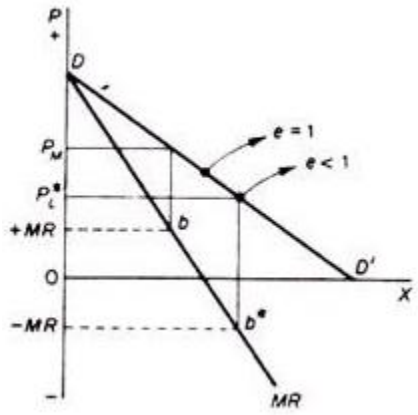

Diagram 4.4

In conclusion, the existing enterprises have three options now that an entry-preventing price PL has been created:

a. To prohibit admission and impose a payment equivalent to PL.
b. To prohibit access and charge a price below PL (this will be implemented if PM < PL).
c. To set a price higher than PL and assume the risks of the subsequent entrance and the uncertain circumstances that may emerge during the post-entry phase. If PL is less than LAC, this plan of action will be implemented regardless.

The option that maximises profit will be selected by the company.

Model B:

There is cooperation with the newcomer:

Assuming collusion between the newcomer and the existing businesses, the results remain unchanged. But the model is simpler. When collusion occurs, the share allotted to the new entrant at each price causes the entire D curve to move to the left. As a result of the collusion, both the new DD" curve and its corresponding m" (Diagram 4.5) are known with confidence at every location.

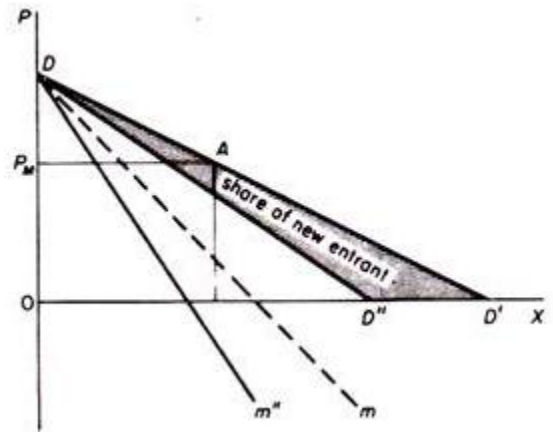

Diagram 4.5

Once more, the company has three options:

- ❖ Either exploit AD' without entrance or charge PL.
- ❖ Or raise the price over PL to draw in customers. Through a collusive arrangement with the new entrant, the company will ultimately shift to a point on the share-of-the-market curve DD.
- ❖ Or, if PM < PL, charge the price that maximises profits.

The company will select the one with the highest profit margin among these options.

The aforementioned analysis's fundamental and important presumptions are as follows:

- ✓ First, that newcomers respond based on the present price they anticipate the established enterprises' prices to remain at during the post-entry period;
- ✓ Second, the established enterprises can accurately estimate the limit price;
- ✓ Third, they are aware of the threat of possible entrance.

There are then three main options: Pricing to prevent entry with industry profits not maximised but established sellers' profits maximised, which is adopted when PL < PM and the certain profit from charging PL is greater than the heavily risk-discounted profit that would arise if the higher PM were charged and an uncertain quantity sold; and pricing to maximise industry profit with no entry resulting, which is adopted when PL > PM, i.e. the limit price is not operative because by charging the lower PM price (monopoly price corresponding to MC = MR).

setting prices to optimise industry profits while allowing entrants. PM > PL is implied by this. This course of action would be selected if it is more lucrative than charging PL and if PL is less than LAC.

Without entry or leave, the first two scenarios result in the industry's long-term equilibrium. Since entrance would be occurring in the third scenario, an unstable equilibrium is implied. Any transitional profit that existing sellers may have made by raising the price above PL and

prior to entry taking effect should be included to their earnings in each of the aforementioned situations.

Redrawing the market demand to take the danger of entrance into consideration is the new component in Bain's approach. After redefining demand, the model acknowledges collusion and profit maximisation as plausible theories that may account for the practice of establishing a price below the monopoly level, or below the level that maximises profit. Profit maximisation and Bain's model are not mutually exclusive.

If the monopoly price produces the most long-term profits, the limit price will be selected. Profit maximisation is the justification for using an entry-prevention strategy. When a limit price like this is set, it is assumed that the company has calculated the profitability of all possible options and has chosen the limit price because it maximises earnings.

4.3 The Sylos-Labini Limit-Pricing Model

A limit-pricing approach based on scale-barriers to entry was created by Sylos-Labini. His model's use of mathematical examples and overly strict assumptions make it awkward. But compared to Bain, his examination of the economies-of-scale barrier is more comprehensive. Modigliani's more broad concept of entry-preventing pricing was based on his discussion of the factors that determine the limit price and its ramifications.

In his research, Sylos-Labini focused on the example of a homogeneous oligopoly with economies of scale and technological discontinuities.

Presumptions:

1. The market demand has unitary elasticity and is provided. The product will be offered at a special equilibrium price and is homogeneous.
2. Three plant types make up the technology: a small plant that can produce 100 units; a medium-sized plant that can produce 1000 units; and a large plant that can produce 8000 units. Each company may only grow by multiples of the size of its original plant. In other words, a small business may grow by adding another tiny plant, a medium-sized business might grow by adding another medium-sized plant, and so on. As a plant grows in size, economies of scale result in cost reductions. However, we are unable to create a continuous LRAC curve using this inflexible technology. The three plant sizes are represented by our three cost lines (Diagram 4.6).

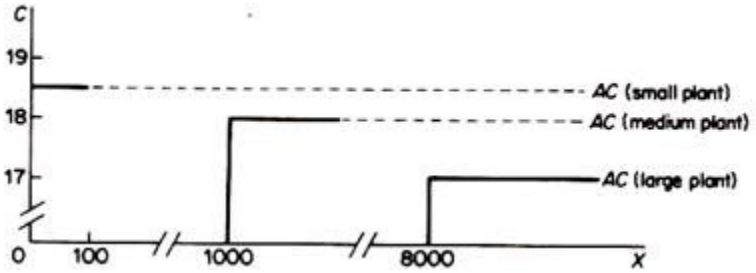

Diagram 4.6

3. The price leader, who is the biggest company with the lowest cost (ex theory), sets the price at a level low enough to keep competitors out. Price-takers are the smaller businesses. The price cannot be changed by any one of them alone. Together, though, they could exert pressure on the leader by controlling their production. Therefore, the greatest company cannot establish the price at will; instead, it must set a price that is both acceptable to other companies in the industry and prohibits entrance.
4. Every industry has a typical rate of profit. (Sylos thought that the usual profit rate was 5% in his case.)
5. It is anticipated that the leader is aware of the market demand and the cost structure for plants of various sizes.
6. It is presumed that the entrant with the smallest plant size enters the business.
7. The "Sylos's Postulate," as Modigliani dubbed it, describes how both new and old businesses act. Two behavioural guidelines are included in this, one of which describes the expectations of existing businesses and the other of entrants. First of all, if the prospective entrant believes that the price after entrance will drop below his LAC, the current businesses anticipate that he will not enter the market.

Second, the newcomer anticipates that the established enterprises will continue to produce at the same level as before their entry into the market. According to these presumptions, the market price decreases when entry occurs, and the new entrant benefits from the whole increase in quantity required. This is obviously the same as Bain's Model B.

Sylos provides no explanation for this pattern of conduct. Later authors have addressed the rationalisation of the Sylos's assumption.

The model:

Sylos-Labini shows his model with a numerical demonstration. He begins by analysing how equilibrium is reached in the market structure depicted in table 4.1, which is thought to have been generated at random. Since the market production is too low and the price is too high, entrance will occur, making the equilibrium at price 20 unstable.

Table 4.1 Initial Market Structure

		Initial market structure			
Plant size	*Capacity (units of X)*	*Number of firms*	*Total output X*	*Initial price (arbitrary units)*	*Market demand (value)*
Small (X_s)	$X_s = 100$	20	2000	20	40,000
Medium (X_m)	$X_m = 1000$	2	2000	20	40,000
Large (X_l)	$X_l = 8000$	1	8000	20	160,000
Total market		23	12,000		240,000

This is because, at the price of 20, the profits are excessively great for all enterprises, considering the cost structure of the industry's three factories (See Table 4.2). Table 4.2 shows that the profit rate for small businesses is 8.1%, for medium-sized businesses it is 11.1%, and for large businesses it is 17.6%. These rates are more than the industry's minimal profit rate, or normal profit, which is thought to be 5%. Entry will be prompted by the surplus earnings. Under the aforementioned strict technological assumptions, the potential for current enterprises to grow by multiples of their original plant size, and the unitary elasticity of demand, the following outcomes are shown.

Table 4.2 Cost Structure of firm with the assumed technology

		Cost structure of firms, with the assumed technology									
Plant size	*Capacity output*	TFC	AFC	TVC	AVC	TC	ATC	*Profit rate % on ATC*	*Unit profit*	*Price*	*Total revenue*
Small firm	100	100	1	1750	17·5	1850	18·5	8·1	1·5	20·0	2000
								5·4	1·0	19·5	1950
								5·0	0·9	**19·4**	1940
Medium firm	1000	2000	2	16,000	16	18,000	18	11·1	2·0	20·0	20,000
								8·3	1·5	19·5	19,500
								7·8	1·4	19·4	19,400
								6·7	1·2	19·2	19,200
								5·0	0·9	**18·9**	18,900
Large firm	8000	24,000	3	112,000	14	136,000	17	17·6	3·0	20·0	160,000
								14·7	2·5	19·5	156,000
								14·1	2·4	19·4	155,200
								12·9	2·2	19·2	153,600
								5·0	0·85	**17·85**	142,800

There won't be any new big companies joining the market. If it did, the price would drop to 12, which is below the lowest price that any company in the business would allow, and total sales would increase to 20,000 units. The minimum allowed pricing for the three plant sizes are 19-4 for tiny plants, 18-9 for medium-sized plants, and 17-85 for large-scale plants, as shown in table 4.2.

Given the expenses and industry demand, even the opening of a new medium-sized business is prohibited. Installing a medium-sized facility would raise sales to 13,000 units and lower prices to 18-4, which is unacceptable to small and medium-sized businesses.

Nonetheless, the market is open to up to three small businesses. Sales would increase to 12,300 units upon their arrival, and the price would drop to 19-5, which is more than the lowest price that any company could accept. When a fourth small business enters the market, the price would drop to 19-3, which is less than the small businesses' lowest acceptable price of 19-4. As a result, the entry-forestalling price is somewhat more than the lowest amount that the smallest, least effective businesses can tolerate.

Table 4.3 displays the aforementioned findings on the entrance conditions under the specified cost and demand factors. The calculations are predicated on the idea that demand has unitary elasticity, meaning that at all prices, the total spending is equal to the starting level of $240,000.

Table 4.3 Prices and Level of Output yielding a total expenditure of 240000

Prices and level of output yielding a total expenditure of 240,000

Output X	*Price* P	*Total expenditure* R = XP (e = 1)
12,000	20·0	240,000
12,100	19·8	240,000
12,200	19·6	240,000
12,300	19·5	240,000
12,400	19·3	240,000
12,500	19·2	240,000
12,770	18·8	240,000
13,000	18·4	240,000
18,000	13·3	240,000
20,000	12·0	240,000

Price determination:

We stated that the biggest, most effective company sets the price. All businesses in the sector must agree on the equilibrium pricing, which should be set at a level that discourages new entrants. There are as many minimum acceptable prices as there are plant sizes since businesses have varying costs. The average-cost concept determines the lowest permissible price for each facility.

$Pi = TACi(1 + r)$

where Pt = the minimum acceptable price for the ith plant size

TACi = total average cost for the ith plant size

r = normal profit rate of the industry

The TAC of the plant and the industry's typical (minimum) profit rate are covered by the minimum acceptable price (in Sylos's example, r = 5% for all plant sizes, meaning that the industry's typical profit is 5%). It is believed that the pricing leader is aware of the typical (minimum) industry profit rate as well as the cost structure of plants of various sizes. With this knowledge, the leader will choose the price that will discourage admission and be acceptable to the smallest, least productive businesses.

The largest and most efficient businesses benefit by letting the price settle at a level just above the entry barrier, which prevents the least efficient firms from charging as much. The most efficient company, known as the price leader, will set the price low enough to discourage new competitors while yet being acceptable to all current companies. The smallest plant scale, which has the largest cost, is used for entry.

Given that the most efficient firm (leader) does not think it is worthwhile to eliminate the smaller firms, either because doing so is not profitable or because the leader is afraid of attracting government intervention due to high industry concentration, the price in Sylos's model, which assumes differential costs, must be acceptable to the least efficient firms in addition to preventing entry, allowing them to earn at least the normal industry profit.

Large and medium-sized businesses will undoubtedly make extraordinary profits due to their lower expenses. However, tiny businesses typically make some unusual profits without drawing in new customers. The price leader will set the price so that, should an entrant choose to enter, the market price will drop below his minimum acceptable price, which is the same as the minimum acceptable price of the smallest, least efficient plant size. This is because the market demand is at the minimum acceptable price of the smallest, least efficient firm, and all established firms operate their plants to full capacity at that price.

The market demand at the lowest allowable price Ps of the smallest, least effective business is X in Diagram 4.7. The limit price PL > Ps will be determined by the leader. The price PL is the equilibrium price since it meets the two prerequisites and correlates to the production level XL = X – Xs. It is acceptable to all businesses and discourages entrance since, should entry take place, the price will drop to a level slightly below Ps, or the minimum acceptable price of the entrant, and the total production XL will rise to the level XL + Xs = X.

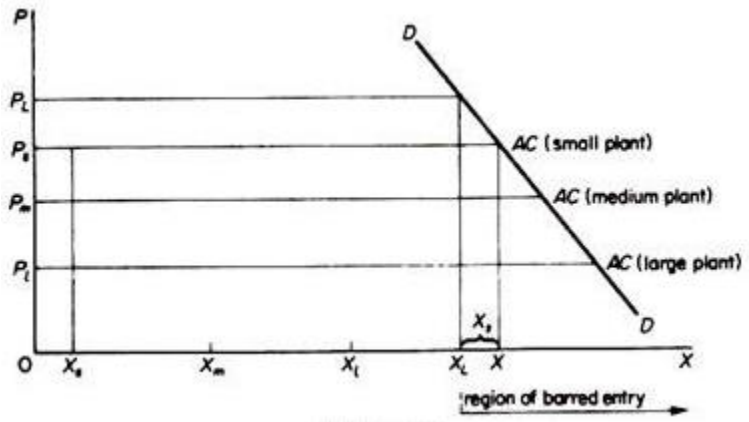

Diagram 4.7

Determining the total production that the existing enterprises will sell in the market indirectly determines the PL. The leader can identify the output X at which all established businesses operate their plants to capacity since the price cannot, in the long run, fall below the cost of the least efficient firm and only the smallest least-efficient plant size may be used by the newcomer. In order to prevent entrance, he then calculates the entire amount that the companies in industry XL will sell.

Because XL is such that if an entrant enters the market with the smallest viable size, Xs, the total post-entry production (XL + Xs) will just surpass X, which will cause the price to drop to a level just below the entrant's AC (= AC of the tiny least-efficient businesses). The market-demand curve DD is used to determine the limit price PL given XL. According to Sylos's Postulate, the entrant will be discouraged from joining the market as he is aware that doing so will result in the price falling below his AC. entrance is prevented by any output bigger than XL, but entrance is not prevented by any output lower than XL.

It should be evident that all businesses in Sylos's model generate anomalous profits, which rise with plant size. At the same time, the entry-preventing price has a higher and lower limit; the equilibrium price cannot be more than PL or lower than Ps.

The following factors determine the entry-preventing price in Sylos's model:

1. The market's absolute size, X.
2. The market demand's elasticity.
3. The industry's technology, which establishes the plant sizes that are available.
4. The prices of the manufacturing inputs, which, in conjunction with the technology, establish the businesses' overall average cost.

The size of the market in absolute terms:

The market's absolute size and the limit price have a negative connection. The entrance prevention price decreases as the market size increases. The impact on pricing and industry

structure is contingent upon the magnitude and rate of a dynamic rise in demand, which is indicated by a shift to the right of the industry-demand curve.

The current firms must lower their prices (or set a lower price initially, anticipating demand-side developments) and build up additional capacity to meet the demand (or have adequate foresight so as to keep a continuous reserve capacity) if they wish to prevent entry in the event of a significant and rapid increase in demand.

New or existing businesses will enter other industries if the price is high and the profits are substantial, and if the incumbent businesses are unable to increase their capacity quickly enough to meet the pace of demand growth. Some or all of the tiny businesses will be eliminated, and prices will drop, if we loosen the limiting assumption that the entrant would enter with the least optimal plant size and accept that major firms from other industries manage to enter at a lower cost.

Consequently, unless the current companies can maintain their shares by consistently maintaining sufficient reserve capacity, a sharp rise in the absolute market size would likely result in lower prices and larger average plant sizes in the sector. But this policy might be quite expensive. As a result, price reductions and entrance are nearly certain in rapidly growing businesses.

If demand grows slowly, the current firms will likely be able to meet the increased demand with appropriate reserve capacity and gradual new investment. Unless new, lower-cost techniques can be adopted for the larger scales of output to which the established firms are gradually led, prices will not be lowered.

The market demand's elasticity:

Additionally, there is a negative correlation between the limit price and the elasticity of market demand. Established businesses may offer lower prices without drawing in new customers when demand is more elastic. The impact on price and market structure is the same as when there is a change in market demand, provided that there is a significant rise in demand elasticity (for price reductions) at the going price and that the companies can clearly recognise this change.

In reality, it is nearly impossible to detect changes in elasticity, and established businesses are unlikely to rely on (or plan for) such unpredictable shifts in e. Since the current enterprises will not be able to handle the shift, the price will drop and new huge firms (formed abroad) will enter the market if it does alter significantly.

Technology and Technical Development:

The minimum size of a viable plant is determined by the technology. The bigger the minimum viable plant size in any certain "state of arts," the higher the limit price will be. Therefore, the premium contained in the limit price and the minimum viable plant have a positive relationship.

Costs will go down and prices will drop if technological advancements benefit plants of all sizes. The limit price won't alter, though, if technological advancements become so limited that only big businesses can access them. According to Sylos's approach, the price does not have to change, but the real earnings of the larger companies will be higher. The market price is often unaffected if technological advancement is linked to product innovation (as opposed to process innovation). Since every company in the sector would want to copy the invention, one should anticipate a rise in non-price competition.

Sylos appears to be suggesting that only huge companies with substantial R&D budgets can advance technologically. He contends that even if their expenses have decreased, big businesses will not be motivated to cut the price of their commodities in the real world. Large corporations will make more money under these circumstances, which will have a significant impact on how income and jobs are distributed. The second section of Sylos's book goes into further detail on this point. We won't address these macro-aspects of Sylos's thesis, though.

The cost of the production inputs:

Every company in the sector is impacted by changes in factor pricing. As a result, an increase in factor prices will raise industry expenses and the limit price. In a similar vein, the limit price will drop as factor prices decline.

Distinctive oligopoly:

Sylos went on to examine differentiated oligopoly in his findings. Sylos contends that because of marketing economies of scale, entry barriers will be higher in cases of diversified products than in those with homogenous oligopoly. He appears to agree that when output scales up, advertising unit expenses and maybe raw material prices per unit of output would likely decrease. As a result, the overall cost differential between the bigger and smaller facilities will be higher than in the case of homogeneous oligopoly. Therefore, product differentiation will strengthen the scaling barrier.

Sylos's homogeneous oligopoly model is more rigorous than his differentiated oligopoly analysis. However, he implies that his primary focus is on how technological discontinuities affect production and pricing, and that one of the primary concerns of the "theoreticians of imperfect competition," whose study Sylos's work complements, is product differentiation.

4.4 Franco Modigliani's Limit-Pricing Model

The Model's Assumptions:

Modigliani kept the scale-barriers assumption and the Sylos's Postulate's behavioural pattern while loosening the restrictive assumptions that form the basis of his model.

The following is a summary of Modigliani's presumptions:

1. Every company in the sector uses the same technology. The economies of scale are completely realised at a minimum ideal plant size (x). The LAC turns into a straight line when the minimal ideal scale is attained.

In these circumstances, the LAC is L-shaped and consistent across all enterprises (Diagram 4.8).

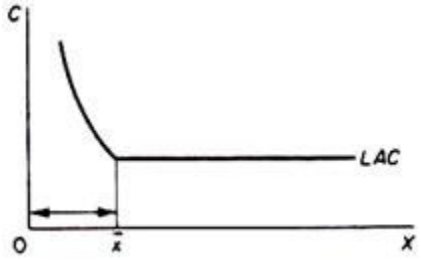

Diagram 4.8

2. The smallest possible ideal plant size is used for entry. Because it would eventually imply illogical conduct, entry of inferior size is prohibited. Regarding entrance, there is an implicit presumption that new enterprises are the source of entry.
3. The market need is understood, and the product is uniform. Given that in the long run equilibrium LAC = Pc (Diagram 4.9), the competitive output Xc and the competitive price Pc—that is, the price and quantity that would be sold at that price in the long run if the market were purely competitive—are determined by the point of intersection of the given demand curve with a line drawn at the level of the flat section of the LAC.

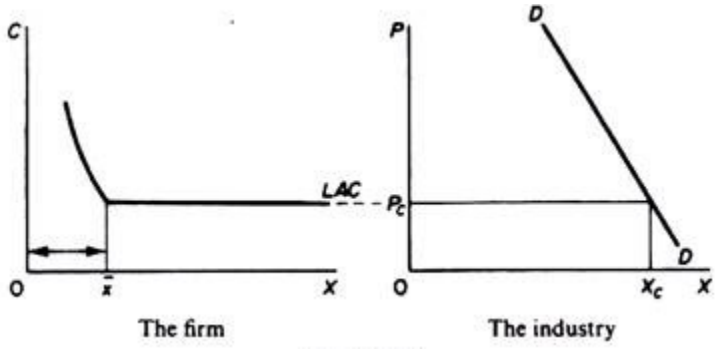

Diagram 4.9

4. The biggest company in the sector sets the price at a level that discourages new competitors.
5. The companies act in accordance with Sylos's Postulate. In other words, current companies anticipate that the entrant will not enter if he thinks the price after entrance will be lower than the flat part of the LAC and that he cannot enter with a plant smaller than the minimum optimum size x. The entrant anticipates that the existing enterprises will maintain their pre-entry level of output.

The Model:

The equilibrium price, PL, will be greater than the PC (= LAC) based on the aforementioned assumptions. The scale barrier, which is reflected in the minimum optimal plant size x, will cause the established firms to generate abnormal profits.

The companies' primary concern is setting prices at a level that will prevent new competitors. By calculating the entire production that every company in the industry will sell, the limit price, or PL, is indirectly established. The market's total output will just surpass the competitive output Xc, and the price will drop just below the Pc = LAC level (Diagram 4.10), if the entrant offers an additional quantity x (the minimum he can produce optimally), as the established firms choose to sell in quantity XL. This behaviour may be expressed symbolically as follows: the post-entry price drops to P < Pc (where Pc = LAC) and the entry-preventing output is XL, so that XL + x > Xc.

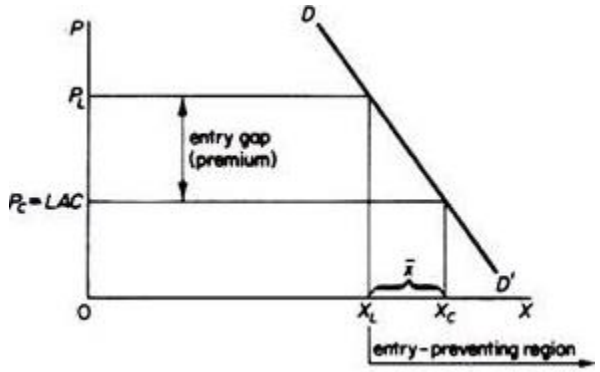

Diagram 4.10

The industry-demand curve is used to simultaneously estimate the entry-preventing price (PL) given XL. As long as X > XL, entry will be denied. There will be an entry if X < XL. Diagram 4.10 shows the industry-demand curve (DD'), the lowest optimal level of production (x), the output that existing companies should provide to avoid entrance (XL = Xc — x), and the entry-preventing price (PL), given XL and determined from the demand curve. Because of the scale restrictions, PL is greater than PC. The entrance gap, also known as the premium, is the

difference between PL and PC, which indicates how much the price may rise over the LAC without drawing in customers.

The following factors determine the entry gap and the price that prevents entry:

1. The absolute market size Xc
2. The demand price elasticity e;
3. The minimal optimal scale x;
4. The cost of manufacturing inputs, which, in conjunction with technology, establish the LAC and, thus, the competitive price PC.

Modigliani comes to the same findings as Sylos, which are that there is a definite equilibrium price PL that is negatively connected with the absolute market size Xc and the elasticity of demand e and positively connected with x and Pc (= LAC). Because the greater x, the higher the PC, the smaller the Xc, and the lower the price elasticity e, the higher the limit price will be.

Keep in mind that the price elasticity estimate with finite changes is unsatisfactory for high values of

x/XC = X1 - XC / XC.

The premium (price increase) will be greatly overestimated for high values of x/Xc, especially if the demand curve has constant elasticity.

The factors that determine the limit price include:

It is evident from the preceding formula that the bigger the minimum optimal scale of plant x, the less elastic the demand curve, and the smaller the market Xc's absolute size at the competitive price PC, the higher the limit price PL will be. In Diagram 4.11, 4.12, and 4.13, the link between PL and each of the aforementioned factors is visually displayed.

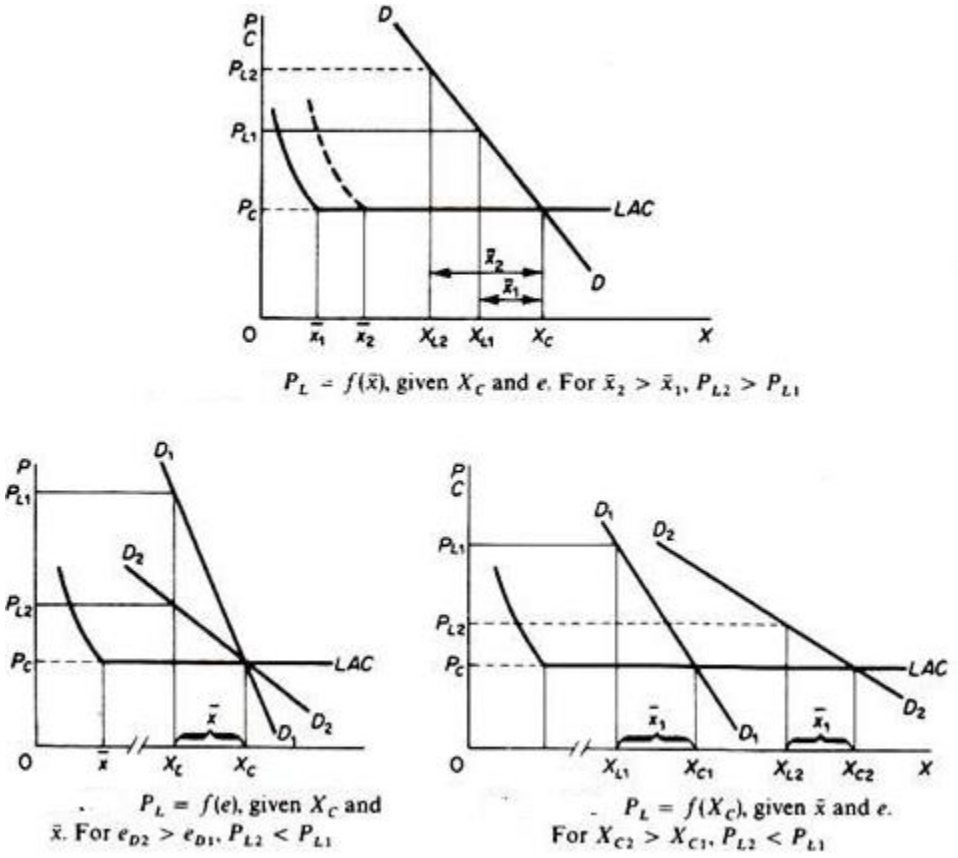

Diagram 4.11, 4.12 and 4.13

Diagram 4.11 illustrates the connection between the minimal optimal size of plant x and the limit price PL, given Xc and e. The established enterprises are able to charge a higher limit price (PL2) without drawing in new competitors due to the bigger minimum optimal scale (x2). Figure 4.12 illustrates how, given Xc and x, the limit price (PL) and the elasticity of demand (e) relate to one another. The D2 demand curve is more elastic than the D1 demand curve at PC. As a result, PL2, which is lower than PL1 and reflects the less elastic demand curve D1, is the price that the established businesses will charge.

In conclusion, Diagram4.13illustrates the correlation between PL and the market size Xc at competitive equilibrium, given x and e. The limit price decreases as the Xc increases.

4.5 Analysis of Input-Output

The input-output tableau, a model of industrial interdependence, is among the most intriguing innovations in contemporary economics. Prof. Wassily Leontief is credited with its inception. The national-income economist is particularly interested in input-output analysis because it offers a highly thorough study of the macro-aggregates and money flows. This paradigm is frequently employed in forecasting and planning.

Tables of Input-Output Flow:

In the economy Leontief envisions, products like iron, coal, alcohol, and so forth are made in their respective sectors using labour as the principal factor and other inputs like these. Coal is needed in order to produce iron.

An Example of Two Industries:

Following Leontief, let's consider a basic economy with two sectors: manufacturing and agriculture. Each directly needs labour as a main element in its production process, and each needs inputs from other industries' outputs in its productive process.

A basic illustration of such an economy may be seen in Table 4.4. The first two entries are manufacturing and agriculture, and each row will display the overall production of each of these industries. The third row is allocated to the principal factor, labour, of which the community has a total of 50 units (thousands of man-years) every year. In the sums of 10 and 40, respectively, these 50 labour units are distributed as inputs to the two sectors.

According to the first row total, 250 units (millions of tonnes) of agricultural production are produced annually. As indicated in the third column of row 1, 50 units of this total are directly used by families and the government. What happens to the 200 agricultural production units that are left over?

They are necessary as inputs to enable the community to produce agricultural and manufactured commodities. Therefore, as indicated in the second column of the first row, 175 units of agricultural output are needed as material inputs to enable industrial production.

The remaining 25 units of agricultural production, which are displayed in column 1 of row h, are needed for agriculture itself, such as for feeding cows that produce wheat. In a similar vein, row 2 displays how the 120 units (thousands of hundreds) of annual manufacturing industry production are divided between final consumption and intermediate inputs required by two industries.

40, 20, and 60 units of manufactured commodities are allocated annually to agriculture manufacturing and final consumption (households and governments) in row 2, columns 1, 2, and 3. Every item in Table 1 is a flow, meaning that it is made up of physical units every year rather than stocks like capital or intangibles.

Table 4.4 Inter – Industry Transactions

Inter-Industry Transactions				
Industries	Inputs to agriculture	Inputs to manufacturing	Final demand	Total outputs
Agriculture	25	175	50	250
Manufacturing	40	20	60	120
Labour services	10	40	0	50

The total labour input and output for each commodity are shown in the "total outputs" column. The agricultural industry's input or cost structure is described in the first column. To generate the 250 units of agricultural output, 25 units of agricultural products, 40 units of manufactured goods, and 10 units of labour were used.

In a similar vein, the second column describes the manufacturing industry's observed input structure. The commodity breakdown of what is available for government spending and consumption is displayed in the "final demand" column. It is considered that labour is not immediately consumed.

However, suppose that we had purposefully selected the physical units of measurement for each product so that one unit costs Re. 1 at specific base prices. The columns may then be measured digitally (literally) as cost numbers, and each item in Table 4.4 is converted to a rupee value. The entire cost of manufacturing the industry's output may be found by adding down the columns.

Total output and total revenue are equal as the output is also expressed in rupees. Therefore, the cost of production is Rs 75 million and the agricultural revenue (at base prices) is Rs 250 million. Manufacturing generates Rs 120 million in income and costs Rs 235 million. Thus, there was a Rs 115 million loss in manufacturing and a Rs 175 million profit in agricultural. These goods in Table 4.4 demonstrate how the two industries' sales to one another and to themselves may be categorised as "non-GNP" items. The labour row denotes the factor-cost side of GNP, whereas the "final demand" column represents the output side.

The economy may be viewed as a machine that generates ultimate consumption by using up labour (it has 50 units of work available annually). The economy can produce 50 units of agricultural products and 60 units of manufactured items annually with its 50 labour units.

The entire value sold or allotted to consumption and all industrial applications is displayed in Table 4.5 by adding together the rows. All columns add up to the same total as the matching row. When used in its "static" form, Leontief's input-output analysis addresses the specific question of

how much output each industry in an economy should create to meet the overall demand for the product.

It's easy to understand why the term input-output was chosen. The "correct" amount of steel output will rely on the input needs of all n industries because the output of any one sector, like the steel industry, is required as an input in many other industries or even for that industry itself. The output of several other businesses will therefore be used as inputs by the steel industry, and as a result, the "correct" levels of other goods will be partially determined by the steel industry's input needs. Because of this interdependency, any set of "correct" output levels for the n industries must be in line with all of the economy's input needs in order to prevent bottlenecks from forming elsewhere.

Given this, it is obvious that input-output analysis should be very helpful in production planning, such as when preparing for a nation's economic growth or national security program.

Table 4.5

Purchases by / Sales of	Industry 1	Industry 2	Industry n	Total sales
Industry 1	x_{11}	x_{12}	x_{1n}	$X_1 = \sum_j x_{1j}$
Industry 2	x_{21}	x_{22}	x_{2n}	$X_2 = \sum_j x_{2j}$
. . .	. . .	. . .	. . .	. . .
Industry n	x_{n1}	x_{n2}	x_{nn}	$X_n = \sum_j x_{nj}$
Total purchases	X_1	X_2	X_n	

Consider the following scenario:

i. Every industry produces a single, uniform good. (In a broad sense, this does allow for the production of two or more commodities in tandem, as long as they are produced in a specific ratio to each other.)

ii. The output of each industry is produced using a predetermined input ratio (or factor combination).

iii. Every industry's production is subject to constant returns to scale, meaning that if all inputs are changed by a factor of k, the output will also change by an identical k.

The input required for the i-th commodity must be a set quantity, which we will indicate by a1j, in order to generate each unit of the j-th commodity. In particular, a1j (amount) of the first commodity, a2j of the second,…., and anj of the nth commodity will be needed to produce one unit of the j-th commodity. (The input and output are denoted by the first and second subscripts,

respectively, such that a1j shows the amount of the i-th commodity needed to produce one unit of the j-th commodity.) We may alternatively use "a rupee's worth" of each commodity as its unit as we presume prices are supplied.

When a22 = 0.35 is used, it indicates that 35 paise of the third commodity is needed as an input to produce one rupee of the second commodity. An input coefficient is the term used to describe the a1j symbol.

As shown in Table 4.6, the input coefficient for an n-industry economy may be organised into a matrix A = [a1j], where each column indicates the input needed to produce one unit of an industry's output.

For instance, the second column indicates that the following inputs are needed to make one unit (a rupee's value) of commodity 2: twelve units of commodity 1, twenty-two units of commodity 2, etc. The elements in matrix A's major diagonal will all be zero if no industry utilises its own product as an input.

Table 4.6 The Open Model Case

The Open Model Case

Input	Output				
	1	2	3	...	*n*
1	a_{11}	a_{12}	a_{13}	...	a_{1n}
2	a_{21}	a_{22}	a_{23}	...	a_{2n}
3	a_{31}	a_{32}	a_{33}	...	a_{3n}
.					
.					
.					
n	a_{nn}	a_{n2}	a_{n3}	...	a_{nn}

The Open Model

The model is considered open if, in addition to the n industries, it includes a "open" sector (for example, households) that provides a primary input (for example, labour service) that is not produced by the n industries themselves and exogenously establishes a final demand (non-input demand) for each industry's product (Table 4.6).

The input-coefficient matrix A (or input matrix A for short) requires that the total of the elements in each column be less than one due to the existence of the open sector. The partial input cost (without the cost of the main input) incurred in manufacturing a rupee's worth of a commodity is represented by the sum of the columns; if this total exceeds Re. 1, production will not be economically justified. In symbolic terms, this truth can be expressed as follows:

$$\sum_{i=1}^{n} a_{ij} < 1 \qquad j = 1, 2 \ldots, n$$

Expanding on this idea, it can be said that since the value of output (Re. 1) must be entirely covered by the payment to all factors of production, the amount that the column sum is less than Re. 1 must be the amount paid to the open sector's primary input, in this case labour. Therefore, the value of the primary input required to produce one unit of the j-th commodity should be

$$1 - \sum_{i=1}^{n} a_{ij}$$

Industry 1 must meet the following equation with its output level x1 if it wants to generate just enough to satisfy the input needs of the n industries and the open sector's ultimate demand:

$$x_1 = a_{11} x_1 + a_{12} x_2 + \ldots + a_{1n} x_n + d_1$$
$$= \sum_{j=1}^{n} a_{1j} x_j + d_1$$

where a1j xj is the input requirement of the j-th industry and d1 is the ultimate demand for its product.

Another way to write the equation is:

$$(1 - a_{11}) x_1 - a_{12} x_2 - a_{13} x_3 \ldots - a_{1n} x_n = d_1$$

With the exception of the first coefficient (1 - α11), the other coefficients in the equation above may be taken straight from Table 4.6's first row, but they are now preceded by minus signs. With the exception of the variable x2 having the coefficient (1 – α22), the similar equation for industry 2 will have the same coefficients as the second row of Table 4.6 (again with negative signs added).

Therefore, the following system of n linear equations may be used to summarise the "correct" output levels for the complete collection of n industries:

$$\begin{aligned}
(1 - a_{11}) x_1 - a_{12} x_2 \ldots \quad \ldots - a_{1n} x_n &= d_1 \\
- a_{21} x_1 + (1 - a_{22}) x_2 \ldots \quad \ldots - a_{2n} x_n &= d_2 \\
\ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots & \\
- a_{n1} x_1 - a_{n2} x_2 \ldots \quad \ldots + (1 - a_{nn}) x_n &= d_n
\end{aligned}$$

In matrix notation, this may be written as :

$$\begin{bmatrix} (1-a_{11}) & -a_{12} \ldots -a_{1n} \\ -a_{21} & (1-a_{22}) \ldots -a_{2n} \\ \ldots \quad \ldots & \ldots \quad \ldots \quad \ldots \\ -a_{n1} & -a_{n2} \ldots (1-a_{nn}) \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ \ldots \\ x_n \end{bmatrix} = \begin{bmatrix} d_1 \\ d_2 \\ \ldots \\ d_n \end{bmatrix}$$

The new matrix is just -A = [- a1j] if the 1's in the matrix's major diagonal are disregarded. However, the matrix is really the sum of the identity matrix In (which has 1's in its primary

diagonal and O's everywhere else) and the matrix - A. Thus, it is also possible to write the aforementioned matrix.

(I-A) x = d

where the production vector is denoted by x, and the ultimate demand (constant-term) vector by d. We refer to the matrix (I-A) as the technology matrix. The inverse (I-A) can be determined, and the system will have the unique solution, if (I-A) is non-singular and there is no a priori reason why it shouldn't be.

x = (I-A)-1 d

The Closed Model

The open input-output model will become closed if the exogenous sector is incorporated into the system as just another industry. The input needs and the output of the newly imagined industry will take the place of the ultimate demand and main input in such a model. Since everything is created only to meet the input needs of the (n + 1) sectors in the model, all commodities will now be intermediate in nature.

On the surface, it would appear that the analysis would not be much altered by the conversion of the open sector into an extra industry. In actuality, though, the new industry must now pay a set percentage for the labour service they provide because it is presumed to have a fixed input demand. This is a substantial shift in the model's analytical framework.

In terms of mathematics, we will now have a system of homogeneous equations as the last demands have vanished.

By analogy of the preceding matrix, the "correct" output levels will be those that fulfil the following equation systems, assuming that there are only four industries (including the new one, indicated by the 0 subscript):

$$\begin{bmatrix} (1-a_{00}) & -a_{01} & -a_{02} & -a_{03} \\ -a_{10} & (1-a_{11}) & -a_{12} & -a_{13} \\ -a_{20} & -a_{21} & (1-a_{22}) & -a_{23} \\ -a_{30} & -a_{31} & -a_{32} & (1-a_{33}) \end{bmatrix} \begin{bmatrix} x_0 \\ x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

Since this equation system is homogeneous, it can only have a non-trivial solution if and when there is a vanishing determinant in the 4 x 4 technology matrix (I – A). The latter need is, in fact, always met: The input-coefficient matrix A's column total must now precisely equal (rather than less than) l as there is no longer a main input in a closed model.

a0j + a1j + a2j + a3j = 1

or a0j = 1 – a1j – a2j – a3j

This suggests, however, that the top element in each column of the matrix (I-A) above is always equal to the negative of the sum of the other three components. We must thus determine |I -A| = 0 since the four rows are linearly dependent. This ensures that there are non-trivial solutions in the system, in fact, an unlimited number of them.

This indicates that there isn't a single "correct" output mix in a closed model with a homogeneous-linear equation system. Unless the model is subjected to additional constraints, we are unable to establish the output values x1…….. x3 in absolute terms, but we may decide them in proportion to each other.

4.6 Linear programming

George B. Dantzig created the popular mathematical optimisation method known as linear programming (L.P.) in 1947 to address planning issues for the US Air Force. Even though "programming" on computers has nothing to do with L.P., the advancement of computers has been crucial to L.P.'s success.

Linear equations are repeatedly solved in L.P., with one variable changed each time, until the final solution is reached. In real-world industrial situations, there are too many restrictions and occasionally hundreds of linear equations are created, which are very difficult to solve without a computer.

L.P. is capable of analysing and resolving a wide range of economic business choices, such as choosing the optimum production method, allocating advertising budget dollars among competing media, and determining a company's optimal product mix. Every firm has certain goals, such as maximising profits, output, sales, minimising expenses, etc.

Applications of Linear Programming

One or two variables at a time are used to examine the decision-making issue in the neo-classical theory of the company. One industrial procedure at a time is its focus. In linear programming, the production function transcends these constrained areas of economic theory.

It accounts for the different capacity constraints and bottlenecks that occur during the production process. It chooses between the many intricate production processes in order to reduce expenses or increase revenue.

Assumptions:

The following presumptions form the basis of the firm's linear programming study.

(1) There are limitations or restrictions on the resources available to the decision-making body. These might include limitations on its operations related to financing, raw

materials, and space. In actuality, the type of restriction depends on the problem. The majority of them are fixed elements in the manufacturing process.

(2) It makes the assumption that there are just a few different manufacturing methods.

(3) It makes the assumption that there are linear relationships between the various variables, which means that inputs and outputs in a process are always proportionate.

(4) The coefficient and input-output prices are fixed. They are known for sure.

(5) Linear programming approaches are also predicated on the additive assumption, which states that the sum of the resources utilised by every business must match the total resources utilised by all firms.

(6) The approaches of linear programming also presume continuity and divisibility in factors and products.

(7) It is also expected that institutional elements remain constant.

(8) A certain time frame is assumed for programming. Although lengthier periods are not excluded, the period is often brief for convenience and more reliable findings.

In light of these presumptions, the firm's approach use linear programming to solve the following issues:

1. Output Maximisation:

Assume that a company intends to use X and Y inputs to make a commodity Z. Its goal is to increase production. It has two different manufacturing methods: labour-intensive process L and capital-intensive process C. As seen in Diagram 4.14, the restriction is a specific cost outlay MP. Every other linear programming approach assumption mentioned above is true.

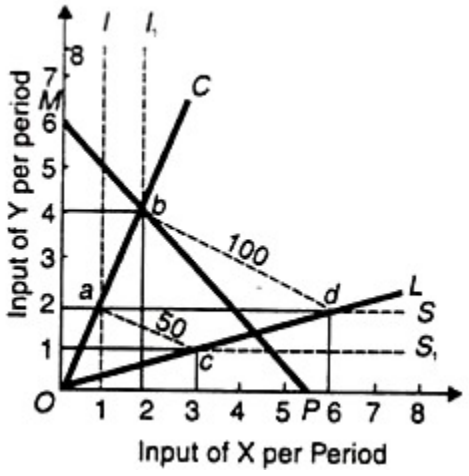

Diagram 4.14

The graphic displays units of input X per period on the horizontal axis and units of input Y per period along the vertical axis. 50 units of commodity Z will be produced if process C needs two units of input Y for every unit of input X. The output doubles to 100 units of Z if the inputs of X and Y are increased to 4 units of Y and 2 units of X.

Along the capital-intensive process ray ÞC, the output scale is established by these combinations of X and Y, denoted by a and b. On the other hand, procedure L can combine three units of X with one unit of Y to make the same number of units (50) of good Z. Additionally, by doubling the inputs A and Y to 6 units of X and 2 units of Y, 100 units of Z may be generated.

The input combinations c and d, which reflect the labour-intensive process ray OL, are used to establish these output scales. An isoquant (dotted) IacS1 is formed by joining the points a and c on the linear rays ΞC and OL at the 50 unit output level.The associated isoquant is l1bdS at the output level of 100 units.

The iso-cost curve MP represents the cost outlay restriction, which limits the firm's production capability. The triangle Obd represents the area that the business can create using either of the two possible procedures, á and L. It cannot develop anything outside of this "area of feasible solutions."

The point at which the iso-cost curve intersects the isoquant with the highest output is the ideal solution that maximises the firm's production. At point b on the process ray ¸C, the iso-cost curve MP in the figure hits the isoquant i1bdS. It indicates that the company will utilise the capital-intensive technology P to create 100 units of commodity Z utilising 4 units of input Y and 2 units of X.

2. Revenue Maximisation:

Consider a different company whose goal is to maximise profits while adhering to specific limitations in its capabilities. Assume that the company manufactures X and Y. Each of its four departments has a set capacity. Let Ð, Ò, C, and D be the departments that deal with producing, assembling, polishing, and packaging the product. Diagram 4.15 provides a pictorial representation of the issue.

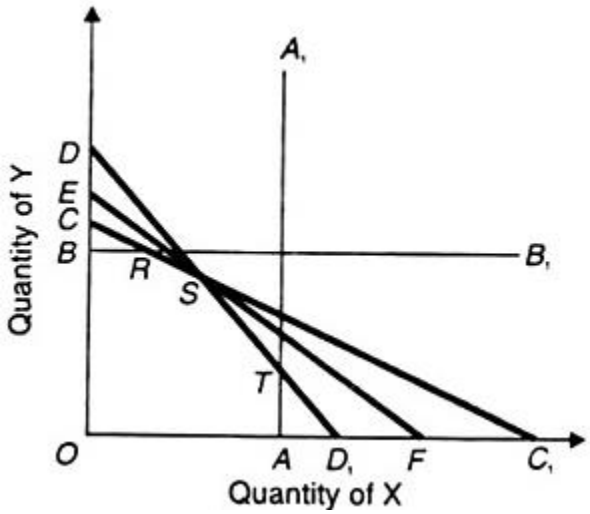

Diagram 4.15

Constraints A, B, C, and D affect how X and Y are produced. The production of X is restricted to OA by Constraint A. The production of Y is restricted to OB by constraint B. Constraint D restricts the creation of X and Σ to OD1 and OD, whereas constraint C restricts their production to OD1 and OD, respectively. Every possible combination of X and Y that can be created without going against any restrictions is displayed in the OATSRB section.

There is no chance of generating any combination outside of this area, which is the area of viable production where X and Y can be created. By drawing an iso-profit line inside the feasible zone, the best option may be identified.

All possible combinations of X and Y that result in the same profit for the company are represented by an iso-profit line. At point S, the polygon OATSRB's highest iso-profit line (EF) represents the ideal solution. The zone of possible production is any site outside of S.

3. Cost Minimisation:

The first economic problem that linear programming was used to tackle was the cost minimisation problem. It has to do with the issue of diet. Assume that a customer purchases butter (x2) and bread (x1) at the specified market pricing. How will the consumer reduce the cost of obtaining the total nutrients from different amounts of bread and butter, considering the nutritional levels of each? The issue is depicted in Diagram 4.16.

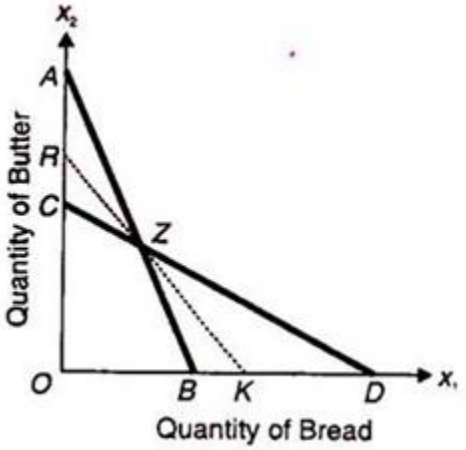

Diagram 4.16

Butter (x2) is measured on the vertical axis, whereas bread (x1) is measured along the horizontal axis. The combination of less bread and more butter is shown by line CD, and the combination of more bread and less butter is shown by line AB. The thick line AZD is where the workable solutions are located. Point Z, where the iso-cost dotted line RK crosses the junction of AB and CD, is the ideal location. The ideal answer in this issue will occur at point Z, however the practical solution may be at point A if bread were more expensive or at point D if butter were more expensive.

4.7 Pricing model

One of the most crucial elements of the marketing mix is price as it has a direct impact on consumers' willingness to pay. Given that Indian customers are thought to be extremely price-sensitive, choosing the right price becomes crucial for any business hoping to succeed in the marketplace.

The primary cause of a large portion of today's inefficient pricing is the concern of the majority of marketers, who set prices in order to meet operating expenses. Realising that price is an expression of cost rather than value is a basic pricing principle, particularly in India. The most important consideration in most businesses' pricing strategies is cost coverage, not customer value. User value and customer considerations are essentially disregarded. The idea of value should, in fact, constantly be taken into account when making crucial price decisions if a company is to succeed in the current competitive environment.

4.8 Peak load pricing model

Demand for some goods and services fluctuates according to the time of day, the week, the season, or the year, and supply prices also change in response to demand. For example, both houses and businesses require electricity during the day, which is more in demand during the day

than at night. Additionally, there is a greater demand for calls during business hours than there is outside of them. In a similar vein, rush office hours see higher traffic on toll roads and highways than other times of the day. Compared to other days of the week, airlines have higher travel volume on Mondays and Fridays and during vacations. In these situations, price structures must to be designed to take these circumstances into account.

The issue of high demand during peak periods and low demand during off-peak periods frequently affects public utilities. The available capacity is underutilised as a result of this issue. In order to pay the expenses of the resources consumed and guarantee effective capacity utilisation, these utilities need a suitable pricing mechanism. Profit maximisation necessitates charging a higher price for the product or service during peak hours and a lesser price during off-peak periods since it is often challenging to meet customer requests during these times.

Peak load pricing is the practice of charging a higher price for a service when capacity is fully used and demand is high, and a lower price when capacity is underutilised and demand is low. This means that different pricing must be charged during peak and off-peak hours. If the demand for a product or service is so great during peak hours that the company's capacity cannot accommodate all consumers at the same price, then peak load pricing should be used. In this case, prices can be reduced during off-peak demand hours and raised during periods of high peak demand. By dropping prices during periods of low peak demand, the company may improve profits by selling to some customers rather than none at all. Because customers are more eager to pay at peak periods, the company can profit from a portion of the consumer surplus when prices are higher. Lower business profits would result from a consistent pricing. Therefore, a company that uses the same facility to service many markets at various times can boost total profits by employing peak load pricing, just as a company that sells in multiple markets can increase earnings by using price discrimination.

According to the peak load pricing theory, the customers who place the highest value on a good or service and put the most strain on the production capacity need to pay more for it. If the following criteria are satisfied, this principle can be used.

1. The service or product cannot be stored, or if it can, storage expenses are substantial.
2. The services are offered by the same facility at various times.
3. The features of demand for various time periods differ from one another.

To put it simply, demand is valued differently at peak and off-peak times. Peak load price is depicted in the following figure. In a demand cycle, like a single day, we use a straightforward model that assumes two independent loads of equal length. The company wants to make as much

money as possible. This company might be any public utility, including a telecom service provider, a toll bridge operator, an electric power supplier, or any other product or service that possesses the three qualities listed above.

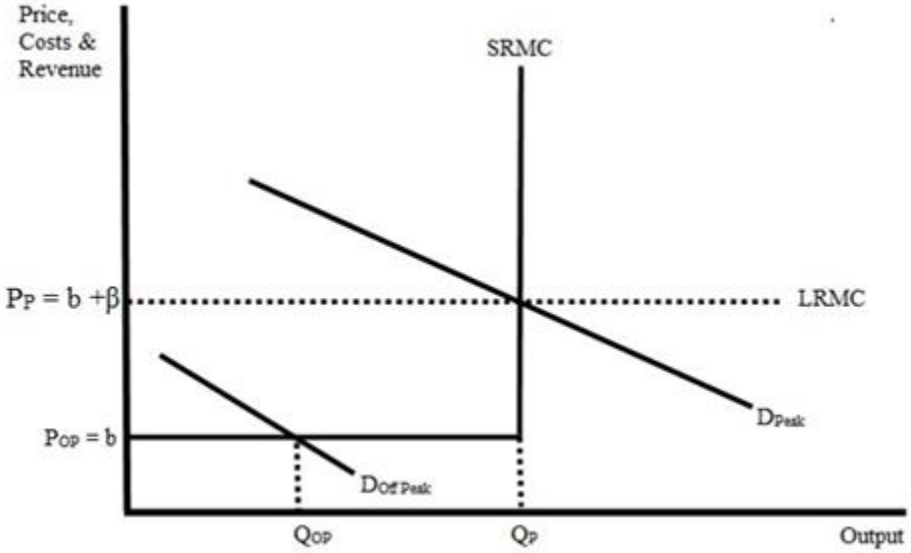

Diagram 4.17

Peak load pricing

The demand curves for the peak and off-peak time segments are denoted by DPeak and DOffPeak, respectively. Since DOffPeak is less than DPeak, it is presumed that the two demands are unrelated. According to the theory of independent wants, the amount required in one time is unaffected by the price in another.

The marginal (operating) costs of the company, or SRMC curve, are expected to remain constant until peak capacity output level QP is attained. As a result, at production levels below QP, the ideal plant size in the provided figure, the firm's rigid plant size has SRMC equal to b. The SRMC curve turns vertical at this production level, indicating that raising output above this point necessitates expanding the firm's capacity—possibly by constructing a second facility.

The marginal cost to supply a unit of output is represented by the LRMC at level b + β, whereas the cost of an extra unit of capacity is represented by β. The LRMC aids in determining if the current plant size is ideal. As previously stated, b represents the daily operating expenses per unit.

The price for each period should be established at the intersection of the appropriate demand curve and the SRMC, in accordance with the peak load pricing concept. When demand exceeds capacity during peak hours, the price would be PP = b + β. Since no extra capacity is needed, the off-peak time pricing is POP = b. When faced with these pricing, customers would buy output

level Qp during peak periods and QOP during off-peak periods. Since SRMC and LRMC are identical at this production level, QP's peak period demand is also the firm's capacity output.

Because on-peakers put a demand on capacity, peak users pay both marginal operating and marginal capacity charges, whereas off-peak users just pay marginal operational costs.

4.7 Administered-Pricing

One of two main ideas is used by the administered-pricing concept to explain how oligopolists determine prices. They are referred to as target-return pricing and cost-plus pricing.

Cost-plus pricing:

Cost-plus pricing or full-cost pricing is arguably the most commonly used strategy in oligopoly sectors such as steel, aluminium, newspapers, and autos. Businesses utilise it as a way to create goods and services. To determine the pricing, businesses simply figure out the product's variable cost, add a fixed cost allocation, and then add a markup or profit percentage to the entire cost.

For example, a product with a direct (variable) cost of Rs. 8, an assigned overhead of Rs. 6, and a target markup of 25% would have a price of Rs. 17.50 (= Rs. 8 + Rs. 6 + 0.25 x Rs. 14). Typically, markup is computed as a percentage of cost. A popular way to calculate profit margin is as a percentage of prices. Therefore, a 20% profit margin is equal to a 25% markup. Diagram 4.18 is an illustration of the cost-plus pricing approach. Three components make up the price (OP):

A portion of the company's overhead costs (average fixed costs) are covered by

- AB;
- the actual unit cost (average variable cost) of manufacturing a planned output of OQ units is covered by BC; and
- a profit margin is expressed as a fixed percentage of total unit costs (average variable cost plus average fixed cost) is covered by CD.

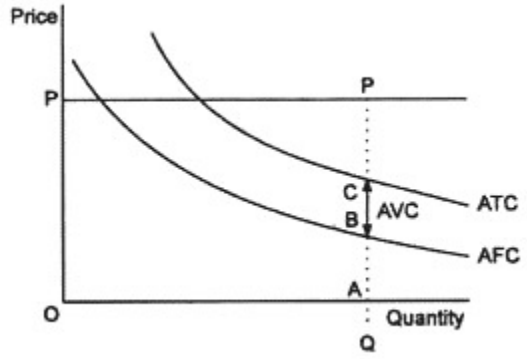

Diagram 4.18 The Components of Price

According to the full-cost pricing rule, businesses will mark up their average variable cost (AVC) to cover their average total cost.

Price (P) may thus be expressed as follows:

P = AVC + GPM = ATC

where GPM stands for gross profit margin (markup), which is made up of a predetermined net profit margin that is regarded as "normal" or "fair" for the sector as well as an overhead component. Supply factors will be the primary consideration in the price-setting process when this regulation is adopted. The phrase "full-cost pricing" refers to a pricing strategy in which businesses add a net profit margin to unit prices, with all expenses included in the calculation. According to the current iteration of cost-plus pricing theory, a selling price (P) is established by adding a percentage markup to the product's direct cost or average variable cost, regardless of the output level. So:

P = AVC+ % mark-up (AVC)

Example: To clarify the idea, provide an example. Assume that a company's average variable cost per unit is Rs. 40 at its anticipated level of output. Management would charge Rs. 60 per unit if it thinks a 50% markup on AVC will maximize its profit: P = 40 + 0.50 x 40 = 60 rupees per unit.

Management may choose to lower the markup to, say, 20% of AVC if it determines that this price is too high to maximise profits.

As a result, each unit costs Rs. 48.

P = Rs. 40 + 0.20 x Rs. 40 = Rs. 48 per unit

In the actual business world, the markup % is referred to as the contribution margin. Generally speaking, the markup is supposed to ensure that the seller makes a "fair profit," a target profit margin, or a goal rate of return. The portion of the price over a company's AVC that goes towards recovering fixed expenses or overhead and turning a profit is known as the margin.

Target-return Pricing:

Target-return pricing is the alternative hypothesis to cost-plus pricing in administered-pricing philosophy. At the anticipated level of output, Q, it is assumed that businesses set their prices to achieve a desired (targeted) percentage rate of return on stockholders' equity or ownership. The target return price, P, may thus be written as follows:

P = % target return (shareholders’ equity)/planned output quantity, Q + AVCQ

For instance, let's say a textile company intends to make 10,000 suits at an average variable cost of Rs. 80 per in the upcoming year. The company would charge Rs 180 each suit if the equity of its investors is Rs 5 million and it hopes to earn a 20% return.

Rs. 1,000,000/10,000 + Rs. 80 = Rs. 180 percent P = 20 (Rs. 5,000,000)/10,000 + Rs. 80

What effects does target-return pricing have on the economy?

The equation shows that three points are particularly crucial:

1. The average variable cost of the company is increased by the "mark-up." In this instance, the firm's AVC of Rs 80 is increased by the markup of Rs 100. The rationale is that the firm's contribution margin (= P – AVC) is determined by the markup amount.

   This helps to recoup fixed expenses or overhead and generate profit, as seen in the instance of cost-plus pricing. Naturally, if there is enough information available, management may decide to employ a full-cost markup based on average total cost, or ATC. Since it reflects the company's direct costs of creating the goods, the AVC basis is really the one that is most frequently used.

2. The price is inversely correlated with the amount produced and directly correlated with the average variable cost. For instance, if AVC increases or if Q decreases, prices would climb. This clarifies why oligopolists frequently raise their prices in response to growing expenses and/or decreasing production.
3. According to the hypothesis, the company may sell the amount of output it has planned at the target return price. To the degree that this is accurate, it contributes to the explanation of why oligopolistic businesses typically oppose price cuts in response to diminishing demand, opting instead to cut output.

4.8 Purchasing Power Parity

The law of one price (LOOP) is a well-known theory. Its foundation is the idea of arbitrage, or space speculation. Moving a commodity from a market with low prices to one with high prices is known as arbitrage. Prices in both marketplaces are identical as a result of this transfer. We refer to this as the LOOP winning out.

The argument will be seen from a straightforward example. Let's say that wheat costs more in London than it does in Manchester. Without government interference, businessmen would purchase wheat from Manchester and resell it in London under free commerce. As a consequence, coffee prices will increase in Manchester because of a scarcity and decrease in London because of an abundant supply.

In the end, arbitrage will cease when the prices in the two marketplaces are equal. As a result, two distinct places inside a nation's borders will have the same price.

Applying LOOP to the global marketplace results in purchasing power parity. It claims that when there is international arbitrage, a pound will be worth the same in the UK, the USA, or another nation like Japan. It is simple to determine the cause.

Traders will profit from buying coffee domestically and selling it overseas if it is possible to purchase more coffee domestically than overseas. The domestic price of coffee will increase in comparison to the overseas price as a result of the actions of arbitrageurs, whose goal is to maximise profits.

Likewise, the opposite is true. The arbitrageurs would purchase coffee overseas and resell it domestically if a pound could purchase more coffee in the United States than in the United Kingdom. The local price will drop below the overseas price as a result. The price of coffee will therefore be the same everywhere due to the actions of profit-driven international arbitrageurs.

PPP's connection to RER:

An interpretation of PPP in terms of RER might be proposed. The profit-seeking international arbitrageurs' quick reaction suggests that even little changes in the RER have a significant impact on net exports.

Arbitrageurs purchase items in their home country (where prices are cheap) and sell them abroad (where prices are high) when local prices slightly decline in comparison to international prices, or, to put it another way, when RER marginally declines. Likewise, the opposite is true.

Arbitrageurs import the same commodities when the relative price of domestic goods rises a little. This indicates that at the RER that balances the purchasing power of the countries, the net export schedule NX(er) is almost horizontal (i.e., fully elastic).

A little decline in the RER causes net exports to rise significantly. The equilibrium RER is quite near to the level guaranteeing purchasing power parity because of this very feature. This relationship is always valid.

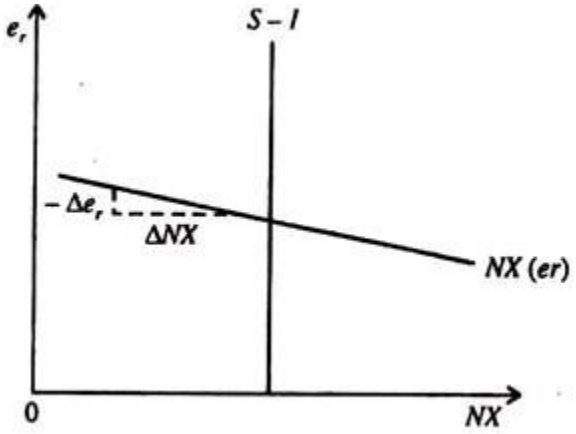

Diagram 4.19 Purchasing Power Parity

PPP's implications include the following two:

(1) Changes in investment and saving have no impact on the real or nominal exchange rate since the net export schedule is flat.

(2) All changes in the NER are caused by changes in the price level rather than by variations in the quality of imports and exports since the RER stays constant.

PPP Theory and Evidence: The PPP is not particularly practical. In this context, the following two points might be noted:

(i) **Untraded commodities:** Haircuts are among the many non-traded products and services. Even if prices vary across national borders, arbitrage is not possible. Even if a haircut in New York is more expensive than in London, a barber from London cannot occasionally travel to New York to make more money. (ii) **Substitutability:** In addition, the relative costs of Ford and Rolls-Royce automobiles might change somewhat because of personal preferences. This indicates that there are very few opportunities to profit from arbitrage activities.

Because of these factors, actual exchange rates can and frequently do fluctuate over time. Nonetheless, the PPP philosophy offers a crucial insight: the RER fluctuates relatively little and is short-lived. The explanation is straightforward: the more the RER deviates from the level that purchasing power parity predicts, the more strongly people are motivated to engage in international arbitrage.

4.9 Summary

The goal of the marginalist approach to market analysis was to maximise profit by reaching equilibrium through the application of the MR = MC principle. Alternative theories were developed as a result of this approach's lack of alignment with reality. According to Bain's argument, companies set prices higher than the long-run optimum because they want to keep new competitors out of the market. The Sylos-Labini model illustrates how manufacturing methods and scale efficiencies result in a leader establishing pricing for already-existing businesses, making money, and limiting entrants. Behavioural theory illustrates how businesses make choices while upholding the goals of every group operating inside the company. In oligopolistic marketplaces, game theoretic models demonstrate how competitor businesses' strategic interactions determine the equilibrium. The mathematical idea of linear programming is used to determine the best way to solve linear functions; it has practical uses in resolving a variety of issues. This section examines how various industries interact with one another as well as how each business determines its own production and pricing. The relevance of matrix algebra in practical applications is demonstrated by the connection between input-output analysis and linear programming problems. There are two types of pricing strategies: market-based and cost-based. Although marginal cost pricing could be the optimal course of action, cost-based pricing usually accounts for all expenditures. In real-world business settings, supply and demand, market circumstances, and competitive factors all have an impact on price setting.

4.10 Check Your Progress

1. What does the coalition of the firm mainly consist of?
2. What is meant by “limit price”?
3. What are the determinants of limit price in the Sylos-Labini model?
4. How is the price set in the market is Sylos limit price model?
5. Enlist the steps leading to a decision-making of a firm in behaviorial model.
6. What is an open input-output model?
7. Describe the features of a closed input-output model.
8. Indicate the applications of linear programming.
9. “Pricing should be value-driven, not cost-driven”, do you agree with the statement.
10. Describe the important features of cost based pricing.
11. Write a short note about target return pricing.

4.11 References

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Unit – 5

Distribution Theories

Introduction

A company's profit is typically calculated by dividing its entire revenue by its total expenses. This is how much factor earning the entrepreneur class enjoys. The idea of profit maximisation is frequently employed in conventional microeconomics literature to ascertain the equilibrium price and demand for both inputs and outputs. To investigate the source and genesis of profit, a number of ideas were proposed. According to Hawley's risk-bearing hypothesis, an entrepreneur's profit is the result of the risks he takes. Knight, however, distinguishes between risk and uncertainty and shows that increased production process uncertainty leads to profit. Conversely, Walker aims to develop a connection between the production's profit and the entrepreneur's skill. Profit, in his opinion, is the entrepreneur's reward for their skill. According to Schumpeter, new goods or innovative manufacturing processes lead to profit. According to Marxian philosophy, capitalist entrepreneurs use worker exploitation to make money.

Objective

- To understand the Concept and types of distribution
- Basic Concepts relevant to distribution theories
- Determine the implications of Marginal Productivity theory in Distribution
- Various theories of wages
- Theories associate with interest rate
- Theoretical understanding of different theories of profit
- To do comparative analysis of different theories of profit.
- How different micro and macro-economic concepts are applied to define and determine profit.

Contents

5.1 Meaning of Distribution:

"Distribution" is the term used to describe how the many sources of production share the wealth created.

Nowadays, the manufacturing of goods and services is a collaborative process. In a productive activity, all of the various production factors—land, labour, capital, and enterprise—combine. Therefore, productive activity is the outcome of these four forces of production working together to create greater wealth. These elements must get compensation or rewards for their contributions to the creation of wealth.

The term "distribution" in economics refers to two different concepts:

- ✓ personal distribution and
- ✓ Functional distribution.

i. Functional Distribution:

The term "functional distribution" describes the specific portion of the national income that individuals, as producers, get per unit of time in exchange for the special roles that their productive services fulfil. These portions of the total production are sometimes referred to as wages, rent, interest, and profits. It suggests determining a class of factors' factor prices. It's been referred to as the "Macro" notion.

ii. Personal Distribution:

On the other hand, personal distribution is a "Micro Concept" that describes the specific quantity of wealth and income that members of society obtain as a result of their economic endeavours, i.e., their individual earnings of revenue from a variety of sources.

The personal distribution of money is essentially the focus of the concepts of social justice, equality, and disparity in income distribution. The purpose of taxation is to affect how wealth and income are distributed among individuals in a community.

Personal income distribution is not covered by the theory of distribution; rather, it focusses on functional distribution. It aims to clarify the rules that determine how the prices of the components of production are established, including rent, labour, interest, and profits.

Importance of Distribution:

Currently, the study of "Distribution" holds a significant position within the field of economics. Since the systems and practices of distribution have a significant impact on the country's economic life, the various channels of distribution are satisfied with their operations when the work is carried out fairly and equitably.

Employee satisfaction boosts productivity, which in turn boosts output quality and volume. On the other hand, individuals will get dissatisfied if the distribution techniques are inappropriate and a certain class is being taken advantage of. Thus, it is evident from the distribution research that equality and a scientific approach to distribution are also crucial in a nation with a scientific production system.

Principal Distribution Issues:

Distribution's primary issues are as follows:

1. How will the property be divided?
2. How should it be allocated among the factors?
3. What distribution theory ought to be used?

1. How will the property be divided?

The national revenue is distributed.

However, there are two categories of national income: (i) gross national income and (ii) net national income.

Gross National Income is the total amount of money earned in a nation in a given year from the sale of products and services. However, it is important to keep in mind that the Gross National Income is never disbursed. Net national income is constantly distributed.

One must spend some costs in order to gain complete revenue. As a result, net national income is the amount of money left over after costs are deducted from total national revenue. The remaining funds are then allocated to the different sources of production.

Thus, Net National Income is equal to Gross National Income less (minus) the cost of raw materials, the cost of replacing circulating and fixed capital, the cost of depreciating and repairing fixed capital, taxes, and insurance fees.

1. Which Factors Should Be Divided Up?

The many components of production, such as land, labour, capital, and entrepreneurship, share the national revenue. After deducting land rent, labourer salaries, interest on capital, and the risk portion of an entrepreneur's investment from national income, the remaining net profit will be allocated.

2. What ought to be the distribution theory?

The following two guidelines are being followed with regard to the allocation of net national revenue.

They are as follows:

(i) The Theory of Marginal Productivity in Distribution.

(ii) Contemporary Distribution Theory.

5.2 The Theory of Distribution Based on Marginal Productivity

At the end of the 19th century, J. B. Clark established the marginal productivity theory of distribution, which offers a broad explanation of how the price (of earnings) of a factor of production is decided.

To put it another way, it makes some general recommendations on how the national revenue should be divided among the four elements of production.

This theory states that a factor's price (or profits) tends to be equal to the value of its marginal product. Therefore, the value of the land's marginal product (VMP) equals the rent, the labor's VMP equals the wages, and so on. The same profit maximisation concept (MC = MR) has been used by neo-classical economists to calculate the factor price. An entrepreneur may optimise profits by equating the marginal product of each element with its marginal cost, just as he can maximum his overall earnings by equating MC and MR.

Assumptions of the Theory:

The following seven presumptions form the foundation of the marginal productivity theory of distribution:

1. Perfect competition in the marketplaces for factors and products
2. How the law of diminishing returns works
3. The factor's homogeneity and divisibility
4. How the rule of substitution works
5. Maximising profits
6. Factors are fully utilised
7. The entire product's exhaustion

Some Key Concepts

Additionally, the theory is predicated on several fundamental Concepts. These are as follows:

1. **MPP:**

The first is a factor's marginal physical product. The rise in the firm's overall output when more

workers are hired is known as the marginal physical product (MPP) of a factor, such as labour.

2. **VMP:**

Value of marginal product is the second idea. The value of the marginal product (VMP) of a factor may be obtained by multiplying its MPP by the product's price.

3. **MRP:**

Marginal revenue product (MRP) is the third idea. The marginal revenue product (MRP), which is the increase in total revenue that occurs when increasing numbers of units of a factor are added to a fixed amount of other factors, is equal to the factor's VMP under perfect competition; in other words, MRP = MPP x MR under perfect competition. P = MR, which is just MPP times a fixed price. [MRP of a factor = MPP of the factor x MR under perfect competition, and VMP of a factor = MPP of the factor x product price per unit. Therefore, in a perfect market, a factor's VMP equals its MRP.]

The core of the theory:

According to the hypothesis, the company uses every factor up until the point at which its price equals its VMP. As a result, wages typically match the labor's VMP, interest matches the capital's VMP, and so on. A profit-seeking company maximises its overall earnings by matching the VMP of each component with its cost. Let's use the calculation of the price of labour, or wages, to demonstrate the theory.

Assume that the product has a constant price of Rs. 5 and that the salaries per unit of work are Rs. 200. Wages are the marginal cost (MC) when all other factors except labour stay the same.

Table 5.1 shows how to calculate the MPP, VMP, and MRP of a labour variable factor.

Land	Capital	Labour	Total Product	*MPP* of Labour	*VMP* or *MRP* of Labour	The Wage Rate *AW=MW*
1 unit	1 unit	1 unit	10 units	×	×	Rs. 20
"	"	2 units	16 "	6 units	Rs. 30	"
"	"	3 units	1 unit	5 units	Rs. 25	"
"	"	4 units	25 units	4 units	Rs. 20	"
"	"	5 units	28 "	3 units	Rs. 15	"
"	"	6 units	30 "	2 units	Rs. 10	"

With two or three workers, the VMP or MRP of labour is higher than wages, so the company can increase profits by hiring more workers; however, with five or six workers, the VMP or MRP of labour is lower than wages, so the company would hire fewer workers; however, with four workers, the wage rate (Rs. 20) equals the VMP or MRP of labour (also Rs. 20), and the

company makes the most money because its marginal cost of labour (or marginal wage Rs. 12) equals its marginal revenue (VMP or MRP, Rs. 20).

Therefore, a business uses a factor up to the point when its price is exactly equal to the value of the marginal product (=MRP of the factor) under the assumption of perfect competition. Similarly, it can be demonstrated that interest is equal to the VMP of capital, rent is equal to the VMP of land, and so on.

It is now possible to diagrammatically describe the idea. Refer to Diagram 5.1. In this case, WW is the wage line that shows the fixed rate of pay at every job level (AW = MW). In this case, MW stands for marginal wage and AW for average wage. The value of the marginal product curve of labour is represented by the VMP line, which slopes from left to right to depict a declining MPP of labour. Because it compares the MRP of labour with the pay ratio and makes the best labour purchases, Diagram 5.1 demonstrates that the company employs an OL amount of workers.

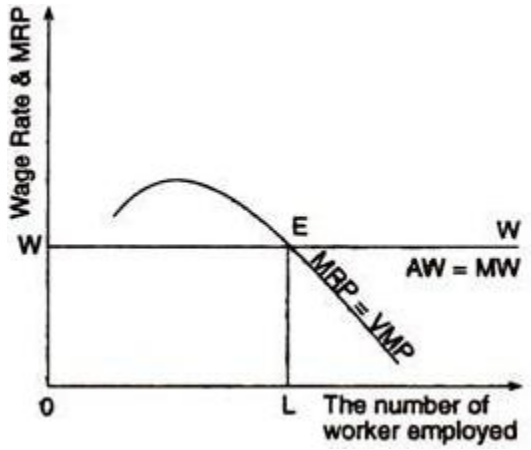

Diagram 5.1 Wage Determination

The Marginal Productivity Theory has been criticised.

The majority of economists believe that the marginal productivity theory has several intrinsic flaws while being theoretically coherent and flawless. They have challenged the theory for the following reasons:

1. The theory's fundamental premise is unrealistic
2. Not Every Factor Unit Is the Same
3. Not all factors are used
4. The mobility of factors is not perfect.
5. Not every factor is divisible
6. This Theory Is Not Short-Term Applicable

7. The theory in question is static.
8. Some have seen this theory as biased.
9. It is impossible to measure each factor's marginal productivity separately.
10. The Law of Diminishing Returns as It Relates to Business Organisation is the basis of the theory.
11. Personal distribution cannot be covered by the theory.
12. The Dealings' Normative Aspect Is Missing from the Theory

5.3 Demand and Supply Theory in the Modern Theory of Distribution:

As we have seen, the marginal productivity theory merely indicates how many employees a business would hire at a specific level in order to maximise profit. It doesn't explain how that pay scale is established. Furthermore, the challenge of determining a factor of production's reward only from the perspective of demand is described by the marginal productivity theory. Nothing from the supply side has been mentioned.

As a result, it cannot be said that the marginal productivity theory provides a sufficient explanation for how factor prices are determined. The Demand and Supply Theory's factor prices are satisfactorily explained by the contemporary theory of pricing. Just as the price of a commodity is established by the supply and demand for that commodity, the price of a productive service is likewise influenced by the supply and demand for that specific element.

The Demand Side

We will start by looking at the factor's demand side. Here, it's important to keep in mind that a component of production's demand is not a direct one. The demand for the product that the factor generates is the source of indirect or derived demand. For instance, we may argue that employment does not immediately fulfill our desires. The demand for commodities determines the demand for employment. The demand for the components that go into making those things will rise in tandem with the demand for goods.

The amount of the other elements needed for the process will likewise affect the demand for a factor of production. The more cooperative producing services there are, the higher the demand price will be for a given amount of a factor of production. The marginal productivity of a factor of production will decrease and the demand price for a unit of a productive service will be lower if more of the factor is used in production.

Furthermore, the value of the final product in which a factor of production is utilised determines the factor's demand price. A commodity's demand price is often greater if the final product it is

utilised in is more valuable. The demand price for a given amount of the factor will thus increase with its level of productivity.

The reasoning provided can be understood from the diagram below:

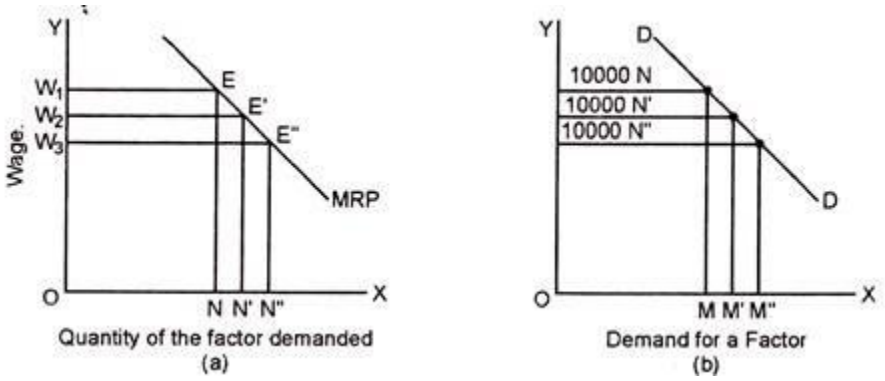

Diagram 5.2

The graphic shows that the demand for the factor is ON, the company is in equilibrium at point E, and the wage is OW. In a similar vein, "the demand is ON" at OW and at OW's salary. The demand curve for a production factor by a single company is known as the MRP (Marginal Revenue Productivity) curve.

When deciding a factor's price, the total demand—that is, the sum of the requests of all the businesses in the industry—matters more than the wants of any one firm. The sum of the marginal revenue productivity curves for each business yields the total demand curve. The figure displays this curve, DD. The law of declining marginal productivity states that the more a factor is used, the lower the marginal productivity, and this figure may be used to determine this.

The supply side

The different conditions of a factor's supply determine its supply curve.

For instance:

The population's size and makeup, occupational and geographic distribution, labour efficiency, training, projected income, relative work and leisure preferences, etc., all have an impact on the labour supply. It is feasible to create the supply curve of a productive service by taking into account each of these important variables.

Additionally, there are several non-economic factors that influence the labour supply in addition to economic ones. As a result, we may state that a factor's supply will rise in tandem with its price, and vice versa. As a result, a factor's supply curve increases higher from left to right.

This is illustrated in the following Diagram 5.3 :

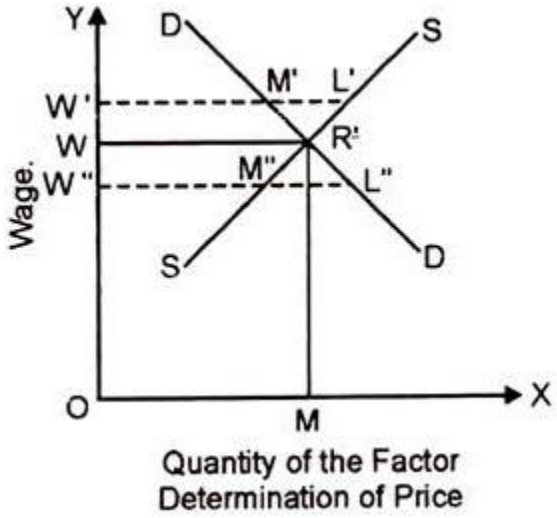

Diagram 5.3

The relationship between supply and demand:

Up until now, we have examined the supply and demand curves of the factor of production; nonetheless, both curves are required for price fixing.

In a market where supply and demand are balanced, the price will thus typically win out. The intersection of the supply and demand curves is where this equilibrium is located.

The demand and supply curves in the preceding picture cross at point R, and the factor's price will be OW at OW' when demand W' M' is smaller than supply W L'. In this situation, competition amongst service providers will likely result in OW paying less. However, at the OW price, the demand W "L" is higher than the supply W "M," therefore the price will often rise to the OW price, when supply and demand will be equal.

In summary, the interplay between supply and demand in relation to a factor of production determines its price in the factor market. Therefore, renowned economists believe that this is the appropriate, accurate, and adequate theory of distribution.

5.4 In markets with imperfect competition, factor pricing

The same process that governs perfectly competitive markets also governs the price of an input in the presence of defects in the commodity and actor markets: supply and demand determine the factor's price and employment level.

But when there are flaws in the market, the factors that determine supply and demand are different.

Four models with different types of flaws will be examined. While the factor market is completely competitive, the company is assumed to have monopolistic power in the product market in the first model. Next, we'll account for flaws in the factor's demand.

We will specifically look at a company that has monopolistic power in the input market and monopolistic power in the product market. The third scenario is a bilateral monopoly, in which labour unions control the supply and the corporation enjoys monopolistic power. Lastly, the fourth model discusses the situation of a company that faces a unionised labour supply and lacks monopsonistic power. The marginal productivity theory of factor pricing and income distribution is expanded upon in the aforementioned models.

Model A. Product Market Monopolistic Power:

(a) A Monopolistic Firm's Requirement for a Single Factor:

According to this model, the business employs only one variable—labor—and its market is flawless, setting the pay rate and ensuring that the supply of labour for each firm is completely elastic. But in the market for the product it manufactures, the company enjoys monopolistic power. This suggests that at all output levels, the firm's product has downward-sloping demand and marginal revenue is less than the price (Diagram 5.4).

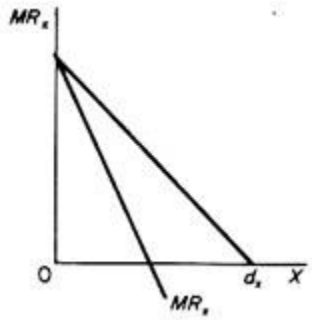

Diagram 5.4 Imperfect Product Market

In these circumstances, we will demonstrate that the marginal-revenue-product curve—which is calculated by multiplying the MPPL by the marginal income from selling the produced commodity—rather than the VMPL curve represents a firm's labour demand.

MRPL = MPPL. MRx

We might show how the marginal-revenue-product-of-labor curve is derived. Column 8 displays the VMPL (= MPPL.PX), whereas Column 9 displays the MRPL (= MPPL MRX). We find that VMPL is greater than MRPL. At every employment level, the VMPL curve is located above the MRPL curve in Diagram 5.4. This is because, at all production and employment levels, Px > MRX. Because its components (MPPL, Px, and MRX) decrease when output increases and product prices decrease, the VMPL and MRPL both have a negative slope.

We shall now demonstrate that its marginal-revenue-product curve represents the demand for labour. Keep in mind that the employment market is assumed to be totally competitive in this

model. As a result, each firm's labour supply is fully elastic. The horizontal line SL in Diagram 5.5, which crosses the market wage w, illustrates this.

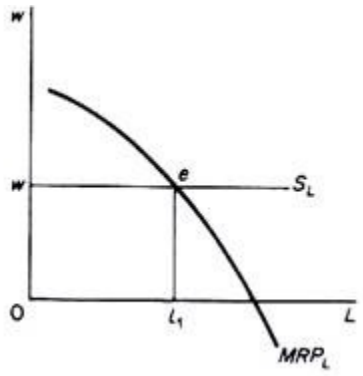

Diagram 5.5

With li units of labour, the company, which aims to maximise profits, will be in equilibrium at point e. Now

MRPL = MCL = w

Put another way, when a company uses labour units until its marginal revenue product equals its marginal cost, it is in equilibrium in the factor market. (Remember that in a perfect labour market, MCL = VP.) Since the firm's profit is maximised with employment I1, e is an equilibrium point. On the left, a unit of labour increases the company's income more than its costs; as a result, the company benefits from hiring more people.

On the other hand, at any position to the right of e, the total cost is more than the total income due to the additional unit of work. Therefore, a company that has monopolistic power in the product market and aims to maximise profits would use workers until the marginal revenue product equals the pay rate.

Any pay rate can be used to repeat the aforementioned study. Therefore, the monopolist's demand curve for a single variable element is the marginal-revenue-product curve. By hiring six units of labour, the company in our numerical example maximises its profit; at this level of employment, MRPL — w = Rs. 40 and total profits (Rs. 350) are at their highest.

(b) A monopolistic firm's demand for a variable factor when many variables are used:

The demand for a variable factor is not its marginal-revenue-product curve when many variable factors are utilized in the manufacturing process; rather, it is created from points on changing MRP curves. Assume that W1 is the market price of labour and that MRP1 (Diagram 5.6) is its marginal revenue product. With l1 units of labour, the monopolistic company is in equilibrium at

point A. If all else was equal, the company would shift to point A' along its MRPL curve if the wage rate dropped to w2.

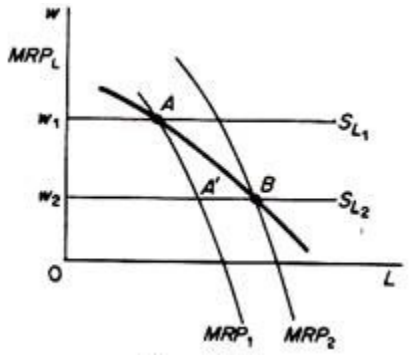

Diagram 5.6

Other things, though, are not always the same. As in the case of a completely competitive company, the pay rate decline has three effects: substitution, production, and profit maximisation. The marginal-revenue-product curve shifts to the right (generally) as a result of these influences, reaching equilibrium point B. The demand curve of labour is obtained by generating points A and B at different values of w.

It appears that when several variable inputs are employed in the manufacturing process, the demand for a variable element is more elastic. We get to the conclusion that, regardless of the level of competition in the product market, the demand curves for inputs are negatively sloped.

c) The market supply and demand for labour:

The total of the demand curves of the many monopolistic businesses represents the market demand for a component. However, when combining these curves, we need to consider how they change when the factor's price decreases since when all monopolistic businesses increase their output, the market price decreases. The marginal revenue and individual demand curves for the produced commodity go to the left.

With the exception of the fact that the individual demand curves are based on the factor's marginal revenue product (rather than the value of the marginal product, as in the case of a perfectly competitive product market, where Px is given for all firms), the graphic derivation of the market demand curve for labour is identical to that in Diagram 5.7. The monopolistic power of enterprises has no effect on the market supply. Therefore, the total of each person's supply curves represents the market supply of labour.

A factor's market price is established at the point where market supply and demand meet. The analysis remains unchanged as a result. There is a significant distinction, though, in that market demand is determined by the MRPL rather than the VMPL. This indicates that the factor gets paid its MRP, which is less than the VMP, when the businesses have monopolistic power. Joan

Robinson has referred to this impact as monopolistic exploitation. Diagram 5.7 and 5.8 depict it for a single business and the labour market, respectively.

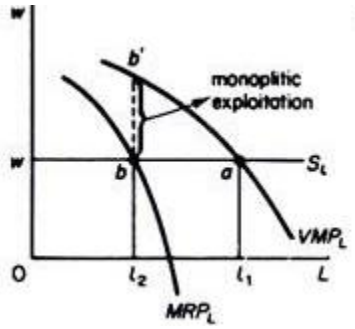

Diagram 5.7

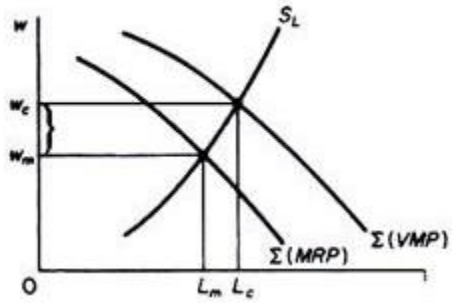

Diagram 5.8

A productive element is exploited, according to Joan Robinson, if its price is lower than the value of its marginal product (VMP). We observed that a profit maximiser will use a factor up until the point at which the total cost and total income increase by exactly the same amount with each new unit.

For a Perfectly competitive firm:

Therefore, in a fully competitive commodities market, enterprises that maximise profits pay factor prices equal to the factors' marginal product (VMP).

Nonetheless, a monopolistic firm's equilibrium state is:

MRPL = MPPL . MRx = w

and MRX is smaller than Px, meaning that factors get less than their marginal product value. The discrepancy between the bb' in Diagram 5.7 and the wcwm in Diagram 5.8 indicates that businesses with imperfect competition that maximise profits have factor prices that are lower than the value of their marginal output. Additionally, occupations in less competitive industries have lower employment levels (Lc > Lm).

One cannot take Joan Robinson's claim of "exploitation" at its value. The downward slope of the businesses' demand curve, which is caused by customer brand loyalty, is reflected in the fact that labour receives a lower salary in industries with imperfect competition. Customers' desire for variety is reflected in product diversification, which allows them to select from a range of alternatives.

This desire results in a lower salary and a discrepancy between pricing and marginal income. Therefore, the reduced salary is the cost that customers must pay for a variety of the same product and cannot be seen as labour exploitation by businesses. The claim of worker exploitation in monopolistic marketplaces might only be accepted if there is excessive product differentiation or if it is pushed on customers by big businesses.

Model B:

The company has both monopolistic and monopsonistic dominance in the commodity and factor markets:

(a) A monopsonist using a single variable component in equilibrium:

In this instance, the individual firm's labour demand is identical to that of Model A. In other words, the MRPL represents a monopolistic firm's demand for labour. However, because the business is vast, the labour supply to the particular firm is not fully elastic. To keep things simple, we'll suppose that the company is the sole buyer in the labour market, or a monopsonist. The supply of labour in this instance has a positive slope, meaning that the monopsonist must pay a greater salary as he increases the usage of labour (Diagram 5.9).

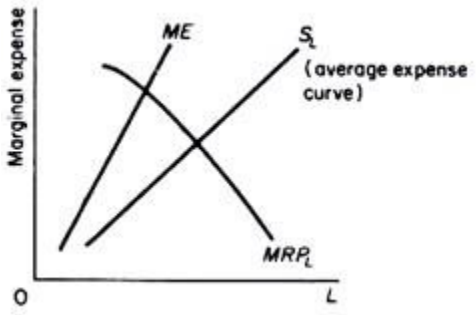

Diagram 5.9

The average cost or price that the monopsonist must pay at various employment levels is shown by the labour supply. The monopsonist's total input expense is calculated by multiplying the input price by the employment level.

However, the marginal cost of buying an extra unit of the variable element is the crucial size for the monopsonist's equilibrium. The difference in overall expenditure (on the factor) that results from employing one more unit of the factor is known as the marginal expense. Because all previously hired units are paid the new, higher price, hiring an extra unit of input raises the overall expenditure on the factor by more than the price of this unit. Therefore, the supply curve (also known as the average expense curve) is below the marginal expense curve.

The difference between the total expenditure at progressively greater levels of the factor's employment is known as the marginal expense. The computation of the marginal-expense-for-labor schedule is shown in Table 5.2. Table 5.2 shows that the marginal expenditure (ME) of the input is higher than its price at all employment levels since the price per unit of input grows as employment increases.

Table 5.2 Total and Marginal Expense on Labour

Units of labour	Price of labour	Total expenditure on labour	Marginal expense on labour
1	£4	£4	£—
2	5	10	6
3	6	18	8
4	7	28	10
5	8	40	12
6	9	54	14
7	10	70	16
8	11	88	18
9	12	108	20
10	13	130	22

The ME curve is located above and to the left of the input curve's supply and has a positive slope. Assuming linear relations, this suggests that the ME curve's slope is higher than the supply curve's.

When the firm's marginal spending on the item equals its MRP, it is said to be in equilibrium. Diagram 5.10's point e illustrates this. The definitions of the ME and MRPL curves serve as the foundation for the equilibrium proof. At e, the marginal revenue product of work equals the marginal expenditure of labour, also known as the marginal cost of labour. On the left, a unit of labour increases revenue more than it does input costs, therefore the company benefits from hiring more labour.

To the right of e, the profit is reduced since the cost of an extra unit of the factor exceeds the income it generates for the company. Therefore, using the amount of labour (le in Diagram 5.10) for which the ME equals the input's marginal revenue maximises profit.

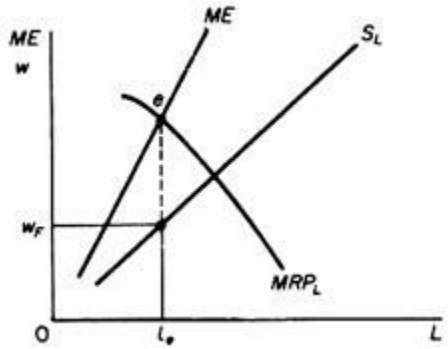

Diagram 5.10

The point on the supply curve that corresponds to the equilibrium point e is the wage rate, or wF, that the company will pay for the le units of labour. To put it another way, wF is the equilibrium pay that matches the equilibrium employment level (le in Diagram 5.10). The company pays the factor a price that is lower than both its VMP and MRP when it has monopolist power in the input market. In addition to monopolistic exploitation, this also leads to monopsonistic

exploitation. We observed that monopolistic exploitation results from a downward sloping demand for the product, such that MRX < Px.

In this instance, the price paid to the factor owners is equal to the factor's MRP, which is lower than its VMP. In addition to monopolistic exploitation, monopsonistic exploitation results from the monopsonistic power of corporations.

It is convenient to start with the equilibrium pay rate, which is reached when the factor and product markets are completely competitive, in order to demonstrate this. The market supply of labour (free from any union action) is represented by the SL curve in Diagram 5.11, while the VMP curve represents the industrial demand curve for workers. At point A, when supply and demand converge, workers are paid the value of their marginal physical product (VMP), which is the equilibrium pay rate.

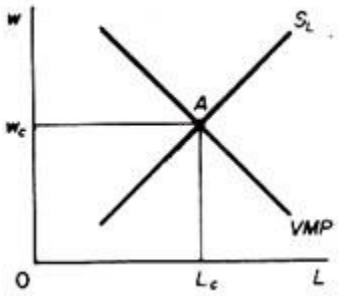

Diagram 5.11 Perfectively Competitive labour Market

Next, suppose that the input market is completely competitive and the commodity market is monopolistic. The MRP curve now represents the market demand for workers. It is the total of fluctuating labour demand curves for each individual. Point B (Diagram 5.12) represents the equilibrium of the employment market.

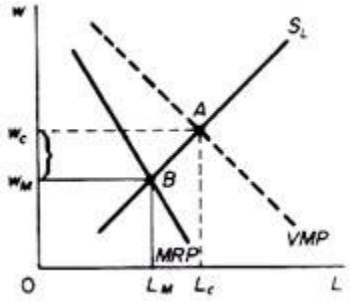

Diagram 5.12 Monopolistic exploitation

The "monopolistic exploitation" is what separates wc from wm. The MRP for each unit of labour is less than the VMP. Due to the monopolistic strength of corporations, the price of the commodity will be greater and its demand lower. Thus, there will be less of a need for work.

Therefore, a lower pay rate and a lower level of employment are the outcomes of "monopolistic exploitation."

The company is a monopsonist in the employment market and a monopolist in the product market, let's conclude. As seen in Diagram 5.13, point c indicates its equilibrium. The company compares its MRP to the ME of labour (point e in Diagram 5.13). The company further cuts employment (Ls) and pays an even lower wage rate (ws) in order to optimize profits. The disparity between the competitive and monopsonistic wages, wc. — ws., is an example of monopsonistic exploitation.

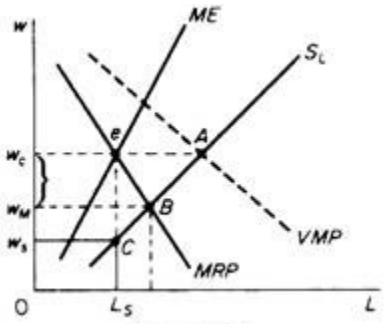

Diagram 5.13

There are two components to this. This portion is not exclusively traceable to monopsonistic features because it is a result of the business's monopolistic power, which would still exist even if the firm were not a labour market monopsonist. However, the firm's monopsonistic strength in the employment market is the reason for the component wswM. The company can pay a salary rate below the labour market rate because to this power.

In conclusion:

(a) The factor receives its VMP in markets with perfect competition.

(b) The factor gets paid its MRP < VMP if the company has monopolistic power in the product market but no power in the input market.

(c) The factor gets paid a price that is even lower than its MRP if the company has both monopolistic power in the input market and monopolistic power in the product market.

This is monopsonistic exploitation's fundamental feature. In order to prevent the factor from receiving its MRP—its contribution to the firm's overall receipts—the input price is calculated using the SL curve.

It was assumed in the aforementioned research that there is no unionisation in the market supply of workers. In the bilateral monopoly paradigm, this presumption will be loosened. Now, let's apply Model B to the situation of a monopsonist who employs many variable components.

(b) A monopsonist's equilibrium when using several variable factors:

When input marketplaces are completely competitive, the company uses the combination of factors at which

$$\frac{MPP_L}{MPP_K} = \frac{w}{r}$$

or

$$\frac{MPP_L}{w} = \frac{MPP_K}{r}$$

Changes in the number of factors used lead to changes in factor pricing if the factor markets are monopsonistic. Consequently, w and r are not provided. The factors' marginal costs must be examined by the monopsonist. It can be demonstrated that a monopsonist who employs multiple variable factors will select the input combination where the mpp to me ratio is the same for each variable input. When the marginal rate of technical substitution (mrtsL.k) is equal to the marginal expense of the input ratio, the least-cost combination is produced. The monopsonist's equilibrium requirement for the two-input scenario might be expressed as follows:

$$MRTS_{L.K} = \frac{MPP_L}{MPP_K} = \frac{ME_L}{ME_K}$$

or

$$\frac{MPP_L}{ME_L} = \frac{MPP_K}{ME_K}$$

The commodities market's structure determines the extent of monopsonistic exploitation. Figure Diagram 5.14, for instance, depicts the situation of a company that sells its goods in a market with perfect competition but is a labour market monopolist. Since there is no "monopolistic exploitation" in this instance, equilibrium is reached at point G, and monopsonistic exploitation equals the sum of wc — wF. As a result, all market organisations (with varying degrees of defects) may use the diagrammatic analysis mentioned above.

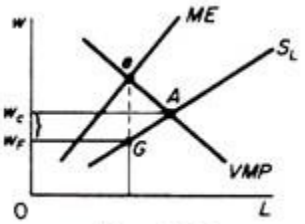

Diagram 5.14

Model C. Bilateral monopoly:

We shall demonstrate that a bilateral monopolistic scenario has a "indeterminate" solution. Only upper and lower bounds are provided by the model; the salary rate will be decided through negotiation. It is impossible to predict for sure how the negotiations will turn out. It will rely on

the ability to negotiate, the businesses' and the labour union's political and economic powers, and a host of other variables.

The demand curve for monopsonists, or solitary buyers, is Db in Diagram 5.15. It is the input's MRPL that is being requested. This curve (Db) shows the monopolist's (labour union) average revenue curve as seen from their perspective. This curve is thus represented by the notation Db — ARS (average revenue curve of seller). The standard graphical method may be used to determine the seller's (union's) MRS curve; the MRS will be below the ARS and will intersect any horizontal line at its midpoint.

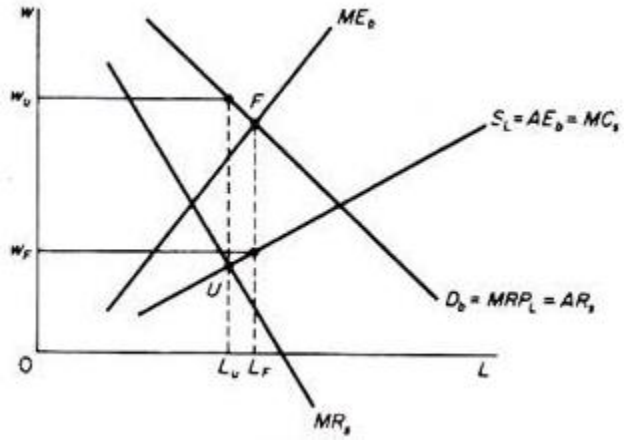

Diagram 5.15

The upward-sloping curve SL represents the labour supply that the monopsonist faces. For the monopsonist, this represents the average cost of labour. The ME curve corresponds to this average cost curve. The curve SL represents its marginal cost as seen from the monopolist's (labour union's) perspective. A supply curve does not exist for a monopolist. However, the mcs curve may be seen as the monopolist's supply curve if it is assumed that he acts as though his price were set by external factors, i.e., as though he were a seller with perfect competition.

We can determine each market participant's equilibrium position using the cost and income curves shown above. When the marginal revenue product of work equals the marginal cost on labour (MEb), the monopsonist (federation of manufacturers or management of a business) maximises his profit at point F. As a result, the monopsonist will want to employ LF units of work and pay wF.

At point u, however, where his marginal cost equals his marginal income, the monopolist (labour union) maximises his profit (gains). Therefore, in order to get a pay equal to wu, the monopolist (union) will wish to give U units of work.

The monopolist (the company's management) wants to set the lowest possible price, which can only be achieved if he can make the monopolist-seller behave like a perfect rival. If he could

make the monopolist-buyer behave like a perfect rival, he could achieve the upper limit price, which is what the monopolist-seller, Wu, wants.

The price and quantity in the bilateral monopoly market are uncertain as the two monopolists' pricing objectives cannot be met. That is, a bilateral monopolistic market cannot be definitively solved by economic research. Determining the price's upper and lower bounds is the only outcome. The players' ability to negotiate and their negotiating strength will determine the final price.

The power of each player is defined by his capacity to cause losses to the opposite party and his ability to endure losses imposed by the opponent. Therefore, the likelihood of a labour strike or a firm lockout, the union's and the company's financial standing, the public's perception of a potential strike or lockout, and other variables all have a significant impact on the two monopolists' negotiating strength.

Examining how unions and businesses engage in collective bargaining is outside the purview of this textbook. It necessitates a thorough analysis of the vast corpus of literature on collective bargaining as well as a thorough understanding of the institutional framework that governs the operations of labour unions and corporate management.

Model D. Competitive buyer-firm versus monopoly union:

It is assumed in this model that businesses do not possess monopolistic or monopsonistic power. However, the work force acts like a monopoly and is unionised. In Diagram 5.16, the scenario is displayed. The marginal cost of labour supply to the union (as in the case of the bilateral monopoly) is displayed by the SL curve. The aggregate VMPL curve, which is obtained by adding the demand curves of the various enterprises, is the market demand for labour curve, or DL. This curve also serves as the union's average revenue curve, from which the standard procedure is used to construct the union's marginal revenue curve, or MRS. The market wage is determined by the union's objective. We'll look at three of the most popular objectives that labour union seeks.

The Maximisation of Employment:

When the supply and demand curves cross, the greatest level of employment is reached. Therefore, as shown in Diagram 5.16, the union will seek a wage rate equal to w. The companies will optimize their profit by equating w to the VMPL as they are price takers. Consequently, the overall employment will be OL.

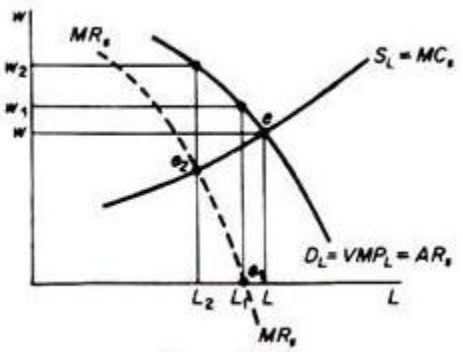

Diagram 5.16

(b) The Maximisation of the Total Wage Bill:

The union must try to set the pay at the point where the marginal revenue (to the union), or MRS, is zero if it wants to maximise overall wage receipts. In this instance, the union's equilibrium is located at point e1 (Diagram 5.16). The level of employment will be L1, and the union will establish a pay equal to W1.

(c) The Maximisation of the Total Gains to the Union as a Whole:

The union must establish the pay at a level that corresponds to the equality of the union's marginal cost and marginal revenue in order to achieve this aim. Point e2 (in Diagram 5.16) is where the union is in equilibrium. W2 will be the salary rate, and L2 will be the employment level.

In conclusion, the union's objective determines the pay rate and employment level in the absence of monopsonistic power among the employers. The question of whether labour unions benefit their members is an intriguing one. The general consensus is that they are. Specifically, whether or not the businesses have monopsonistic power and the elasticity of the labour demand determine the impact of union action.

1. **Competitive Buyer-Firm versus Labour Union:**

We showed in the previous paragraph that the union can achieve a number of objectives. Next, we'll look at whether these objectives improve the lives of union members.
The equilibrium of a labour market with perfect competition is shown in Diagram 5.17. The total VMPL represents the market demand for work, while the labour supply slopes upward. The level of employment is L, and the equilibrium wage rate is wc. In light of businesses' profit-maximizing practices, this is the maximum employment.

Let's assume that the workforce is now unionised. How may members benefit from the union? It appears that the union is unable to raise employment levels. Therefore, asking for a salary rate rise is the only other course of action. The higher pay rate may be the rate that maximises overall

gains, the rate that maximises income, or any other compromise that combines a higher salary with fewer jobs.

Suppose that the pay rate is increased to w' by the union. In Diagram 5.17, the supply curve transforms into the kinked curve with ASL. In other words, until the horizontal line hits the beginning supply curve, the union can make the labour supply curve a horizontal line at the salary level it chooses. In Diagram 5.18, where w' = VMPL, the firm's new equilibrium is located at e'.

As a result, every company will lower its workforce requirement. The new intersection point E1 (Diagram 5.18) of the demand and supply curves represents the market equilibrium. At the new pay rate, there are E1 A jobless units of labour overall, and employment has dropped by LL1.

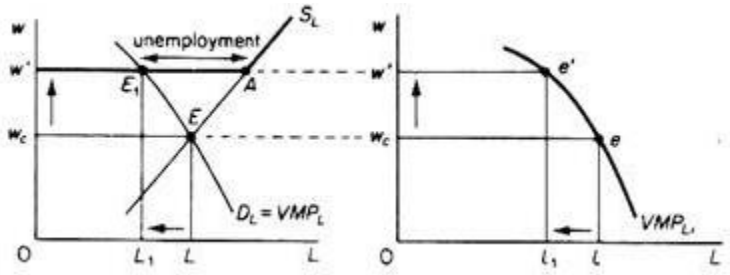

Diagram 5.17 Labour Market **Diagram 5.18 Firm's Demand for L**

In conclusion, a decrease in employment is the result of the pay rate increase. Unless the overall pay cost has gone up and the union divides it evenly among all of its members (employed and jobless), the union members who lost their employment are in a worse situation. The elasticity of demand for labour determines whether the wage bill will rise in response to the wage rate increase.

The power of the union to raise the wage rate will result in an increase in the total wage receipts (wage bill) for the employed members if the demand is inelastic. It is obvious that the union's activity is advantageous if it redistributes these higher earnings to all of its members.

The union members as a whole will suffer if the demand for labour is elastic, but those who do not lose their jobs will benefit from the higher salary that the union has won. This is because both the overall employment and the total wage bill would decrease. Therefore, the impacts of union operations are not always advantageous to its members when the businesses lack monopsonistic strength.

2. Monopsonistic Firm-Buyer versus Labour Union:

A union can eradicate the part of the overall monopsonistic exploitation that can be directly attributed to the firm-buyers' monopsonistic power in the labour market if the businesses have it. Additionally, a union can raise the overall wage bill by raising the wage rate (but not above the point at which labour demand is inelastic), raising employment, or doing both. Let's take a closer look at these consequences of union engagement.

For the sake of simplicity, assume that the labour market has a single firm-buyer (monopsony). We have the situation of a bilateral monopoly as the worker is unionised. But let's assume that the union doesn't want to optimise its profits. Rather, we will look at two different objectives that the unions are supposed to be able to achieve without making the pure bilateral monopoly model indeterminate.

The equilibrium is reached at point e in Diagram 5.19, where the MRPL equals the marginal cost of labour, assuming that the labour is originally not unionised. The equilibrium employment is L, and the equilibrium pay is vv.

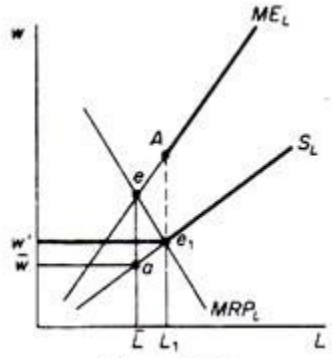

Diagram 5.19

Next, suppose that a labour union is formed by the employees.

a. The union wants to increase employment as much as possible. The union sets the salary rate at level w' in order to achieve this aim (Diagram 5.19). The marginal expenditure curve is made up of two discontinuous segments, w'e1 and AMEL, while the labour supply is now represented by the kinked curve, w'e1SL. Where MRPL = MEL, the company is in equilibrium at e1.

   Employment rises to L1 as a result. The total wage bill rises since the wage rate and employment level both rise (0w'e1 L1 > 0waL). Since each employee gets paid according to their MRPL, the union's action eradicates the exploitation specifically linked to monopsony. But there is still "monopolistic exploitation" in place.

b. The union's objective is to secure the highest possible salary for the first level of employment. The union determines the pay for this at level w" (Diagram 5.20). The two

discontinuous parts w"eB' and BMEL make up the matching MEL, whereas the supply curve becomes the kinked curve w"eB'SL." At the starting point e, where the new MEL equals the MRPL, the company is in equilibrium. As in the pre-union era, it employs L units of labour and pays W as the wage rate.

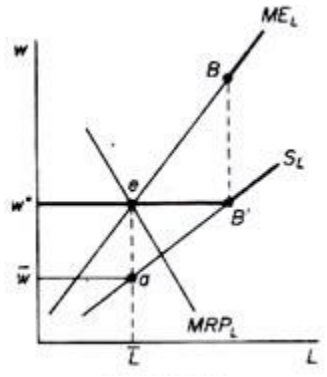

Diagram 5.20

Us w" is the highest pay rate that may be achieved without lowering the starting level of employment (L). It is clear that the wage bill has gone up (0w"eL > 0WaL). Additionally, since w" = MRPL, the part of monopsonistic exploitation that can be solely attributed to the firm's monopsony power is erased. The "monopolistic exploitation" that results from the firm's monopolistic control in the product market is still there, though.

c. Employment will be cut if the union tries to set a wage rate greater than W. The overall wage bill will be determined by how elastic the demand for labour is. The overall wage bill will go down if the MRPL curve is elastic, and it will go up if the demand for labour is inelastic.
d. The union may choose intermediate strategies between the two extreme scenarios (a) and (b), which might lead to different increases in employment and the pay rate.

The broad conclusions are drawn.

Initially: Labour unions can achieve a pay rate increase at the price of fewer jobs if the firm-buyers do not have monopsonistic power. Depending on the union's distribution practices and the elasticity of labour demand, this outcome may or may not be advantageous to all union members.

Secondly: One aspect of monopsonistic exploitation that can be eliminated by the union's efforts is the portion that can be directly attributed to the businesses' monopsonistic power if the firm-buyers possess it. Trade union action, however, is unable to eradicate the other aspect of monopsonistic exploitation, which is caused by the monopolistic power of companies in the product market.

Thirdly: Trade unions may often raise the overall pay bill by raising employment, the wage rate, or both if the firm-buyers have monopsonistic power. The union can only injure its members if the labour market is elastic and the wage rate is higher than what would be expected at the beginning (pre-union) level of employment.

5.5 Wage Determination in the Presence of Imperfect Competition

In the actual world, imperfect competition predominates over perfect competition. Thus, in the context of imperfect competition, Mrs. Joan Robinson and Prof. Pigou determined the pay rate. Less than two heads can be used to demonstrate how the pay rate is determined:

a. Monopsony in the labour market and perfect competition in the product market.
b. Monopoly in the labour market as well as in the product market.

a. Monopsony in the labour market and perfect competition in the product market:

Monopsony is the term used to describe a labour market when there is just one buyer of work. The pay rate will follow the same trajectory if monopolists' demand for labour increases, which tends to raise both the average and marginal wage rates. A diagram can be used to demonstrate it.

Diagram 5.21 shows salaries on the Y-axis and labour units on the X-axis. The average and marginal revenue product curves are known as ARP and MRP, respectively. The upward-sloping average wage and marginal wage curves, or AW and MW, show that the monopolist must give the higher wage rate if he wants to hire an increasing number of workers.

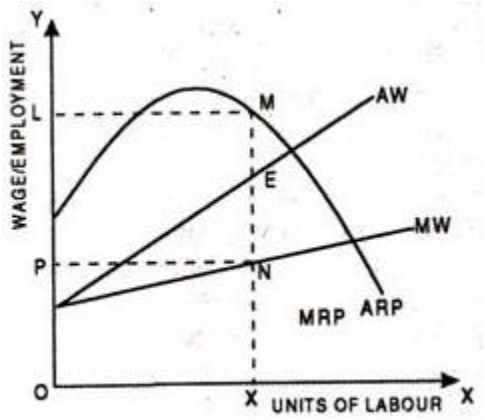

Diagram 5.21

At point E, the monopolistic enterprise is in equilibrium. Both of the equilibrium requirements—that is, that the marginal wage and the marginal revenue product should be equal—are met at point E. The marginal revenue product curve must cut the marginal wage curve from above and subsequently rest below it. He will thus use OX units of labour at this equilibrium level, and the OP wage rate will be established.

The monopolist exploits workers since salaries are lower than marginal revenue production. As a result, the monopolist in this equilibrium makes supernormal profits equivalent to the area PLMN. Thus, it may be said that worker exploitation is a byproduct of the labour market's imperfect competitiveness.

b. Product Market Monopoly In the labour market, Monopsony

The gap between the value of the marginal product and the marginal revenue product occurs when there is a monopoly in the labour market and a monopoly in the product market. The product of MPP and the commodity's price is known as the value of marginal product. A figure may be used to assist explain it.

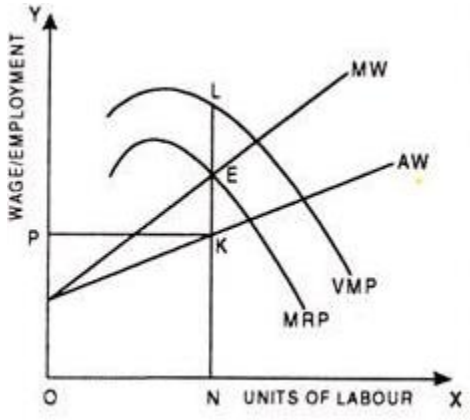

Diagram 5.22

The marginal revenue product curve (MRP) and the marginal product curve value (VMP) are shown in Diagram 5.22. Above the MRP curve is the VMP curve. At point E, the monopsonist is in balance. The market determines the pay rate OP, and the monopsonist uses ON units of labour.

Double exploitation of labour, or monopolistic and monopsonistic exploitation, results from monopoly in the product market and monopsony in the factor market. Monopsonistic exploitation is equal to EK at this equilibrium level, but monopolistic exploitation is equal to EL.

5.6 Trade Unions and Raising Wages for Workers

Trade (labour) unions are groups of workers that were formed to negotiate pay, housing, and working conditions with employers. Improving the economic circumstances of its members is the main goal of unions, which are democratic institutions. In the majority of democracies, unions serve as a foundation for giving employees a voice and a way to choose their pay and working circumstances.

It is generally accepted that unions have a tendency to increase their members' earnings. Some economists, however, contest unions' capacity to increase worker pay beyond levels of general market equilibrium.

By giving the many workers a collective voice and, therefore, an effective means of negotiating with the few employers on issues like safety, vacations, and non-wage benefits, trade unions serve to safeguard the interests of its members. The amount of salaries and other compensation given to its members is the main issue of a trade union.

A trade union, which is a collection of workers who band together to defend their interests, must bargain with and exert pressure on employers in order to boost wages. Workers may start to equal the power that bosses have over them by banding together to form unions. An effort is made to change the balance of power in the worker-employer relationship via collective bargaining, in which a group of workers designate representatives to negotiate with the representatives of employers.

The goal of trade unions is to enhance its members' working conditions and pay. They use their market power to do this. According to Paul Samuelson, "Unions obtain a legal monopoly on the provision of labour services to a particular firm or industry, which gives them market power." They use this monopoly to force businesses to provide better pay, benefits, and working conditions than their competitors. For instance, a union may negotiate with a big construction company to set the hourly rate for its plumbers at Rs 15 if non-union plumbers in Calcutta are paid Rs 10.

However, this argument won't hold up until the company's access to other employment sources is limited. Accordingly, "firms agree not to hire non-union plumbers, not to contract out plumbing services, and not to sub-contract to non-union firms" under a standard collective bargaining agreement. Each of these clauses works to keep the union's monopolistic hold on the company's plumbing supply from eroding.

Unions also attempt to unionise the whole industry in certain sectors, such as steel and automobiles, so that the unionised employees of company A are not forced to compete with the non-union employees of company B. To preserve high union pay rates, all of these actions are required.

Unions have an impact on employment and pay. Depending on whether labour is employed in a monopolistic or competitive manner, we may make reference to one of two situations here.

1. **Monopsony (one purchaser):**

Let's say a trade union joins a competitive labour market and increases wages to a level that is roughly equal to the equilibrium. This establishes a minimum wage that no one will labour below. The labour supply curve is altered by this very reality. As many people as are willing to work at this union-set pay may be hired by the industry, but no one may be paid less. Consequently, there are two parts of the labour supply curve that the industry (and every company) must deal with. Up to the number of workers willing to work for that rate, it is horizontal at the union wage level and then slopes higher. If the government raises the minimum wage over the level of equilibrium, the same thing will occur.

A trade union that deals with several labour purchasers may boost salaries beyond the level of competition, as seen in Diagram 5.23. Point E represents the competitive equilibrium. The labor-supply curve becomes fully elastic up to quantity Z2, or the amount of labour willing to work at the pay w1, when the union sets a standard wage w1 (above the equilibrium level).

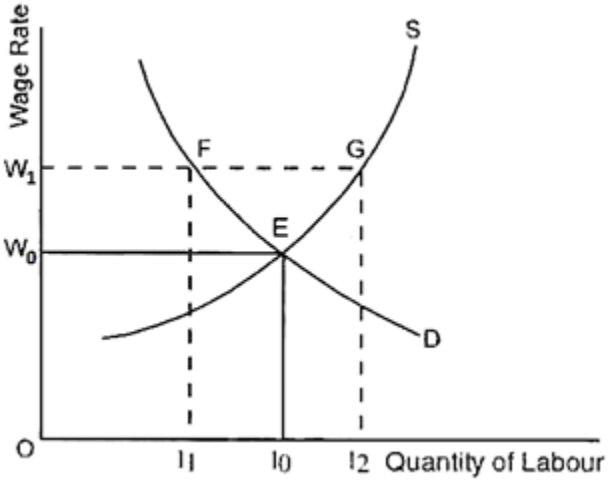

Diagram 5.23 Wage Determination by a single Union facing Many Employers

Up to point G, or w1FG, the new labour supply curve is fully elastic (horizontal), after which it increases upward (GS). With l2 workers employed and l2–l1 ready to work at the current pay rate but still able to obtain employment, equilibrium is at F.

Therefore, there will be an imbalance in the labour market if this wage-raising strategy is implemented. There will be many employees who would prefer to work for less money, but the trade unions will not allow them to.

If the union wants to represent all workers in the industry or profession, this very reality presents a challenge. Therefore, a conflict of interest between the union's working members and its unemployed members is likely to arise.

Pressure to lower the pay rate will likely arise from the extra labour supply, but if the union wants to preserve its goal—the higher wage—over time, it must be resolute and strong enough to withstand this pressure. "A union may raise wages above the level of the competitive market, but only at the expense of reducing employment and creating an excess supply of labour with its consequent pressure for wage-cutting," Lipsey said.

2. Bilateral Monopoly — a Monopsonist facing a Monopolist:

We can now think about a new kind of scenario. Here, we examine what happens when a union is introduced into a monopsonistic employment market.

Since the monopsonistic employer's organization is now facing monopoly unionism, collective bargaining will be required to resolve the pay dispute between the two parties. The goal that each party sets and their respective levels of ability in negotiating for that goal will determine how this negotiation process turns out. The employer's organisation will choose the monopsonistic pay on its own.

The issue now is: when the union enters the market, what range may the salary be established over? We need to know what the union would do if it had the authority to unilaterally fix wages in order to respond to this issue. The outcome will make the union's goals in the real collective bargaining process quite evident.

Assume for the moment that the union is able to establish a minimum salary that will be acceptable to its members. Employers no longer stand to benefit from choosing not to recruit more workers out of concern that wages will rise or from lowering the number of workers they hire (or the amount of labour they require) in an effort to lower wages.
Thus, the union shows the employer a competitive elastic labor-supply curve (up to the maximum number of workers ready to accept employment at the union rate), just as it would in a market with a wage-setting union. The union may increase wages and employment beyond the monopsonistic level by offering the monopsonist a fixed wage, as seen in Diagram 5.24.

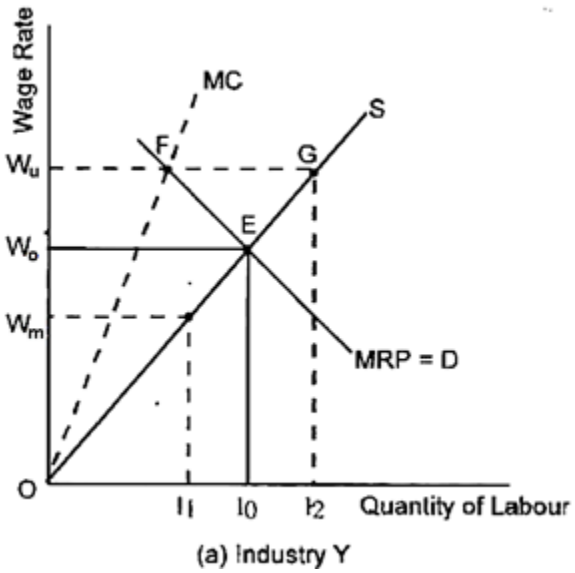

Diagram 5.24 Wage Determination by Collective Bargaining

L3 workers are paid wm in a monopsony scenario, in which labour is provided competitively. The supply curve increases along line S after following the horizontal line from w0 to E if a union now sets its pay at w0. Therefore, the amount of employment is l0 and equilibrium is at point E.

The union must accept a lower level of employment than l0 if it sets a pay higher than w0. For instance, the labour supply curve is wuFGS at a wage of wu. At the much higher pay of wu, this results in the same amount of employment, l1, as when the monopsonist controlled the market. The number of jobless workers at such pay rate would be between l1 and l2. These individuals are eager to labour for less money, but the union forbids them from doing so. According to Lipsey, "The union can prevent a firm from exercising its monopsony power and raise both wages and employment to the competitive level because it turns the firm into a price-taker in the labour market."

Therefore, in practice, collective bargaining between the employer and the trade union determines salaries rather than the forces of supply and demand in the market. Additionally, one instance of a bilateral monopoly is collective bargaining in the employment market. The union does not desire a salary that is lower than the competitive level, while the company wants to set the monopsonistic rate.

By compromising its employment goal (i.e., by accepting more unemployment), the union may try to increase salaries even more. The union may aim for a pay much higher than the free market wage if it is content with the amount of employment as low as would occur at the monopsonistic rate. However, factors including "what target wage the two sides actually set for

themselves, their relative bargaining skills, how each side assesses the cost of concessions, and how serious a strike would be for each" determine how collective bargaining actually turns out.

Supply Restriction:

As seen in Diagram 5.25, trade unions may also increase salaries by limiting the workforce supply. Trade unions may sustain any goal pay by using this strategy without creating a pool of people who are willing to work at the going wage rate but are unable to obtain employment.

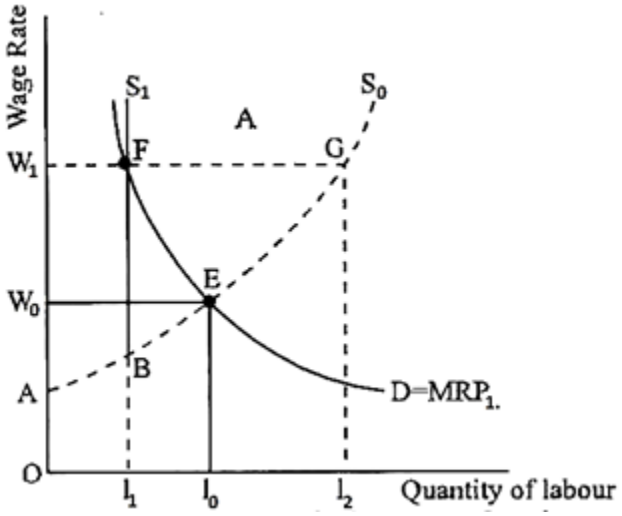

Diagram 5.25 Raising Wages by Restricting Supply

The supply curve S0 and the demand curve D cross at point E when there is free entry into the profession, resulting in an equilibrium pay of w0 and employment of Z0. The supply curve is ABS1 if entrance is limited to amount h. At point F, the labour market finds equilibrium, and w1 is the new equilibrium pay rate. At point F, there is no surplus supply. Instead, there would have been an excess supply of labour of l2-l1 if the wage had been set at w1 without regulating entrance. These individuals are enticed to work for less than the union salary because they are prepared to work for less but are not allowed to do so by the trade union. As a result, they may make it more difficult for the union to maintain a high wage rate. The impact of raising the standard salary above the equilibrium (market-clearing) level by some agreement is seen in Diagram 5.26. At F, where the horizontal labour supply curve crosses the employers' demand curves, there is new equilibrium.

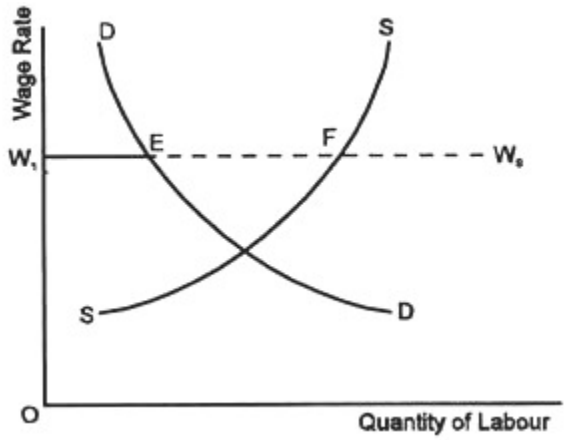

Diagram 5.26 High Standard Wage and Employment

The amount of employment in the unionised labour market decreases if the standard wage is set at WSWs. It should be mentioned that when the union establishes high standard pay rates, it does not immediately restrict supply. Employment is constrained by the enterprises' need for workers at this high pay rate, which is higher than the market clearing level. By distance EF, there are more job applicants than there are open positions. These surplus employees may be jobless or awaiting openings in the lucrative union industry, or they may experience mental depression and seek employment elsewhere. As if the union had directly restricted admittance, the employees from E to F are essentially shut out of employment. Businesses will want E and workers will offer F if unions boost salaries to a very high level for the whole economy. The degree of classical (real-wage) unemployment is therefore measured by the distance EF.

Over the years, this approach has been widely used in the majority of non-socialist nations. However, Lipsey has said that the most important need is "the ability to control the supply of people offering themselves for employment." Unions may do this by limiting membership and enforcing closed-shop agreements that exclude non-members from working. Professional groups that provide licenses to people who are permitted to practice the profession may also do this; by increasing entrance requirements, entry can be decreased. Only union employees are permitted to work in a closed shop.

Indeterminacy:

Wages may often be set across a wide range in collective bargaining between unions and businesses. Diagram 5.27 illustrates such a scenario. The picture illustrates how the negotiation process often results in many outcomes that are mutually acceptable.

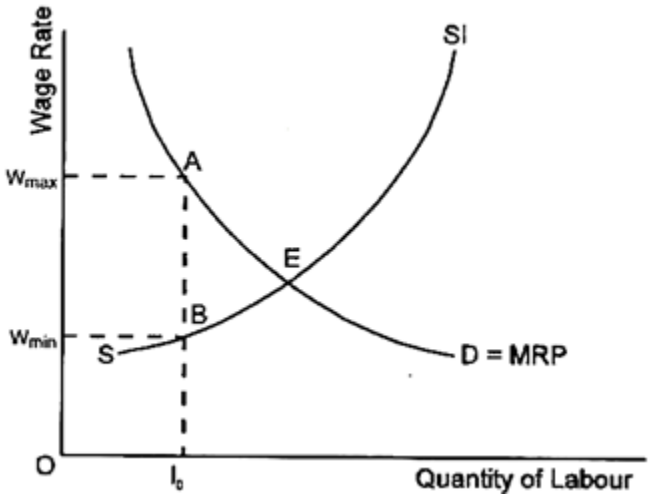

Diagram 5.27 Collective Bargaining between the Union and One employer

Sl provides the supply curve of people who want to work in the industry in question, but it is believed that the union has limited access to l0. For this labour, the single employer—a single company or an employers' association—has an MRP curve. According to the supply curve, l0 workers could be open to working with WMIN. The company would be prepared to hire l0 workers at any pay up to wmax, according to the MRP curve. Any pay between WMIN and Wmax would be preferred by both parties over no agreement at all.

5.7 Theoretical Indeterminacy of Collective Bargaining:

In the majority of collective bargaining agreements, management aims to maintain low pay and compensation while the workers want increased earnings. Bilateral monopoly is the term for a scenario in which there is only one vendor and one customer. It is impossible to forecast the ultimate result of collective bargaining based just on demands and expenses. Here, politics, psychology, and a host of other non-economic factors are involved.

According to Lipsey, "the size of the industry's profits and the firm's current market conditions will both have an impact on the union's ability to raise the wage rate and increase the employment of its members." The relationship between the anticipated losses from a strike and the losses from employing more workers than intended at the agreed-upon pay rate will depend on the state of the market.

Businesses may have a significant motivation to create new technology that will replace the employment of the unnecessary people with robots during a recession, when expenses are high and revenues are low.

5.8 Theories of Interest

1. Productivity Theory of Interest:

J. B. Clark and F. H. Knight developed this theory of interest. This idea was further reinforced by Marshall, J. B. Say, and Von-Thunen.

This idea states that interest develops as a result of capital's production. It is typically true that labour can create more when it is assisted by capital goods than when it works alone. Those that employ machinery and equipment always see an increase in their income. For this reason, specific employers want them.

Furthermore, according to some traditional economists, interest is the compensation given to capital for its productivity. In actuality, interest is paid from capital production. Overall productivity increases as more capital is used in addition to labour and other resources. When the borrower (entrepreneur) uses capital to increase production, he should provide the capital owner a portion of this increased output in the form of interest. According to the hypothesis, capital is in high demand due to its productivity. Additionally, since it is productive, interest must be paid.

2. Waiting or Abstinence theory of Interest:

Renowned economist N. W. Senior developed this idea in the 18th century. "Capital is the result of saving," he said. As the first economist to do so, he pointed out that saving, which was subsequently represented by capital goods, required sacrifice, or what he termed "abstinence." People may consume current items with all of their money. However, they "abstain" from current consumption while they save. Abstinence like this is unacceptable. Therefore, we must provide some incentive as payment for their sacrifice in order to persuade them to save. Therefore, interest serves as payment for abstention.

Marshall replaced abstinence with the term "waiting." Saving implies waiting; a person does not permanently abstain from consuming when he sets aside a portion of his income. He just postpones his consumption for a certain amount of time, that is, until the benefits of his savings start to trickle in.

He has to wait in the meantime, and people generally dislike waiting. Waiting is a necessary part of all productive activities, not only conserving. After planting his crops, a farmer must wait for them to be harvested. When a gardener plants a seed, they have to wait for it to develop into a tree and start producing fruit.

Therefore, waiting is a prerequisite for manufacturing. As such, it may be used in place of other factors and is a distinct component of production. The marginal analysis will identify the price of waiting since it is a component of production. In other words, the interest rate tends to be equal to the incentive required to trigger a marginal increase in saving.

3. **Bohm-Bawerk's "The Time-Preference Theory," often known as the Austrian or Agio Theory of Interest:**

In 1834, John Rae developed this hypothesis further. Bohm Bawerk went on to explore this hypothesis in great detail. The primary proponent of this theory, which aims to explain interest based on temporal preference, is the Austrian economist Bohm-Bawerk.
This theory states that interest, or time preference, is the cost of agio's period of reward. Man typically chooses current income above future income and spending, according to several arguments. Present consumption has a premium, or "agio," over future consumption. Because future gratification is discounted when seen from the present, people choose to appreciate current things over future ones. This discount, known as interest, is required to entice individuals to lend money and, in turn, defer current gratification to a later time. Therefore, the incentive offered for persuading individuals to shift their temporal preferences from the present to the future is interest.

Bohm-Bawerk states that the following factors may be responsible for people's favourable temporal preferences:

a. People experience current desires more strongly than they do distant or future wants.
b. People often underestimate their future desires for a variety of reasons, such as a lack of willpower to resist temptation, a lack of creativity, or uncertainty about whether they will be able to experience them in the future.
c. Because current commodities may be promptly invested in and reinvested in, they seem to have a technological advantage over future goods under a capitalist form of production. More commodities can be acquired in the near future due to the increased productivity of capital, whereas future goods can only be invested and reinvested in the far future.

4. **Professor Fisher's Time Preference Theory:**

This theory is a modified version of Bohm-Bawerk's theory. Bohm-Bawerk's theory of interest serves as the foundation for this idea. According to Professor Fisher, time preference theory emphasises that the availability of loans is based on the reality that most individuals would rather have a certain amount of money now than later.

Future products are often valued less by people than current ones. People are willing to spend their money on current consumption because they have a temporal preference, which means they favour the now over the future. Consequently, when someone loans money to someone else, he must give up his current spending.

Only until a reward of some kind is presented to him can he be persuaded to stop his current intake. Interest is this prize. The interest rate will rise in proportion to the desire to spend on current consumption. Interest rates are thus influenced by temporal preferences or the desire to use money for immediate spending.

Interest is really "an index of the community's preference for a dollar of present income over a dollar of future income," according to Fisher. As he has said, a variety of subjective and objective variables influence how strongly individuals enjoy their current salary. These have been categorised as

(i) opportunity and

(ii) Willingness.

Fisher therefore founded his theory of interest on two tenets: the investment opportunity principle and the impatience or willingness principle.

He established that the willingness principle and the investment opportunity concept govern interest, which is based on people's desire for now income over future revenue.

(a) The principles of impatience or willingness:

This is dependent on a number of elements, including:

(i) income size;

(ii) income composition;

(iii) income distribution;

(iv) the element of uncertainty in future earnings; and

(v) personal qualities like prudence, foresight, etc.

While some of these things make individuals impatient, others make them more patient. For instance, individuals will be more pleased with their present needs and discount the future less often when their income is sufficient. The rate of impatience will often be high if future uncertainty is strongly estimated.

A person will be willing to accept his income and hope to make more in the future if the rate of willingness is lower than the market rate of interest. However, the individual would prefer to

borrow money and use it for present consumption if the market interest rate is lower than the willingness rate.

(b) The principle of investing opportunity:

The rate of interest is also determined by this concept. In a particular context, this concept relates to the rate of return over cost. Let's say that a person is presented with different investment recommendations that provide two income streams that are replacements in order to understand this phenomena. Therefore, when he takes money out of one source of income to replace it with another, the "cost" is the loss incurred during the withdrawal, and the "return" is the profit from the new source of income that is accepted.

The rate of discount, which equalises the current net values of the investment possibilities, is the rate of return over cost. The interest rate is taken into consideration while assessing various investment opportunities.

One of the two other plans will be abandoned if the discount rate exceeds the market interest rate. An investment opportunity with a greater rate of return than cost will be approved, whereas one with a lower rate of return will be turned down.

In summary, people's choice for now income over future income is determined by their willingness and marginal return over cost rates, which combined also define the interest rate since interest is the cost of this preference. In this sense, Fisher's Theory views time preference as the only important factor influencing the capital supply and interest rate.

5. The Demand and Supply of Capital or the Classical Theory of Interest Theory of Interest:

Prominent economists including Professor Pigou, Professor Marshall, Walras, Knight, and others have elaborated on this notion. This theory states that interest, which is equivalent to the marginal productivity of physical capital, is the incentive for using capital productively. Thus, according to economists who subscribe to the classical school of thought, "the supply and demand of capital determine the rate of interest." Time preference controls the supply of capital, whereas predicted productivity of capital controls the demand for capital. Waiting or saving is necessary for both time preference and capital productivity. As a result, another name for the idea is the supply and demand theory of saving or waiting.

Demand for Capital:

The need for savings is implied by the need for capital. Because the capital projects that will be carried out with the help of these funds will be so productive that the realised returns on

investment will exceed the cost of borrowing, or interest, investors agree to pay interest on these savings.

To put it simply, the reason capital is sought after is because it is productive, meaning it can generate money even after paying interest. Thus, the demand curve for capital is determined by the capital's marginal productivity curve. The curve that follows a point slopes downhill. However, the entrepreneur weighs the current market rate of interest against the marginal productivity of capital when making an investment decision.

The product's price multiplied by the marginal physical product of capital is the product's marginal productivity.

The entrepreneur will be encouraged to make more investments as the interest rate declines until the marginal productivity of capital equals the interest rate. As a result, the demand for investments increases when interest rates fall and decreases when they increase. As a result, the demand for investments is seen to be the inverse function of the interest rate.

Capital Supply:

The availability of savings in the economy is essentially what determines the supply of capital. People's willingness and ability to save money leads to savings. Some traditional economics, like as Senior, believe that conserving money requires refraining from spending, other economists like Fisher disagree. Emphasise that the primary factor influencing those who save is their choice for time.

The interest rate is a significant factor in determining savings in both perspectives. Chemical economists generally believe that the rate of interest directly affects the rate of saving. In other words, savings increase as the interest rate rises and decrease as the interest rate decreases. It should be mentioned that the supply of savings curve, also known as the saving-function, slopes upward.

Equilibrium Interest Rate:

The point at which the supply and demand of capital are equal is known as the equilibrium rate of interest. Stated differently, the equilibrium rate of interest is established at the point when investment equals savings.

The following figure illustrates this:

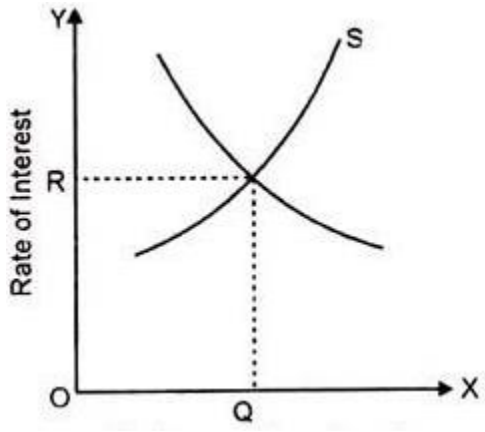

Diagram 5.28 Saving and Investment

The equilibrium rate of interest, or OR, is shown in this picture. It is calculated at the intersection of the investment demand curve and the savings supply curve, ensuring that the OQ amount of savings is both invested and provided. This suggests that, at the equilibrium rate of interest OR, the supply and demand for capital OQ are equal.

In fact, both the supply and the productivity of capital have an impact on the demand for capital. In turn, the community's frugal practices influence savings. Therefore, according to the classical theory of interest, the primary factors influencing the rate of interest are the economy's real factor, thrift, and productivity.

6. The Fund for Loan-Able Theory of Interest:

The well-known Swedish economist Knot Wicksell developed the Neo-classical or Loan-able Fund Theory. Ohlin, Roberson, Pigou, and other new-classical economists went on to develop this idea. This theory aims to enhance the traditional theory of interest. This theory states that the price of credit, which is influenced by the supply and demand for loanable money, is the interest rate.

Demand for Funds That Are Loanable:

There are three main sources of demand for loanable funds:

(i) The government,

(ii) entrepreneurs, and

(iii) consumers who need them for consumption, hoarding, and investment.

The government borrows money to build public works projects, prepare for war, or provide for the general population's needs (such as administration, justice, education, health, entertainment, and maintaining law and order). to invest in and for other development goals, or to make up for a budget deficit during a slump. In general, interest rates have little effect on the government's need for loanable cash.

Businessmen take out loans to launch investment initiatives and buy capital goods. To operate or grow their output, businesspeople and companies need a variety of capital goods. The businesses take out loans if they don't have enough cash on hand to buy these capital items. The demand for loanable cash from businessmen is based on the volume of their output. In general, there is an inverse connection between interest rates and the firm's investment need for loanable money. It indicates that demand for lower interest rates will increase and demand for higher interest rates will decrease.

Loans are taken out by customers for their own use. They desire to consume now, and they take out loans to buy more items and consuming than their current income permits. They mostly use loans to buy two categories of consumer items.

First, they buy durable products, and then they buy everyday consumer goods. They usually create an account with the merchant and continue buying things on credit. In addition to this, they also take out loans for speculation or investment. They have a commercial motivation behind this.

Supply to Loanable Funds:

Bank credit, savings, and dis-hoardings provide the loanable cash. The primary source of savings is private savings, both corporate and individual. Even though personal savings are dependent on income, they are considered interest elastic when income is taken as a given. The incentive to save will increase with the interest rate, and vice versa.

Interest rates and the amount of loanable cash are positively correlated. It indicates that loanable money will be more readily available at higher interest rates and less readily available at lower interest rates. As a result, the loanable money supply curve will slope higher from left to right.

Calculating the Interest Rate:

The market rate of interest is determined by the equilibrium between the supply and demand for loanable funds, or the point where the loanable funds supply and demand curves cross. It is shown in the diagram provided above.

The supply and demand curves for loanable money (SL and DL) in the figure converge at point E. Consequently, OR will be the equilibrium rate of interest and E will be the equilibrium point. Both the supply and demand for loanable money are equal to OL at this interest rate.

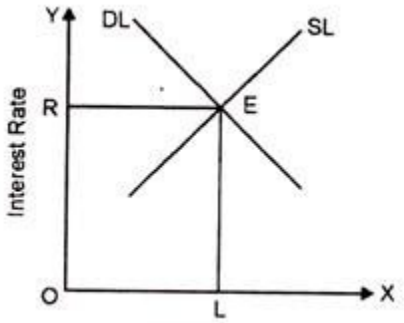

Diagram 5.29

Given the availability of loanable funds, the interest rate will increase in response to a rise in demand and decrease in response to a decline in demand. In a similar vein, given the demand for loanable funds, interest rates will increase as the supply of loanable funds declines and decrease as the supply increases. Thus, when SL = DL, the equilibrium rate of interest is found.

7. **Keynes' Preference for Liquidity Interest as a Purely Monetary Phenomenon or Theory of Interest:**

Keynes asserts that interest is only a monetary phenomena. It is the incentive for giving up liquidity for the designated time period rather than for hoarding. The need for resources to invest and the willingness to refrain from consuming are not balanced by "price." The desire to retain money in the form of cash and the amount of cash that is accessible are balanced by the "Price." Here The supply and demand for money determine the liquidity preference theory. The government and banks provide the money supply. Conversely, the need for liquidity is the want for money. Keynes believed that since money has liquidity, individuals choose to keep it. As a result, lending requires a sacrifice of liquidity. Interest is a reward that is given to him in order to get him ready to give up liquidity. According to Keynes, interest is the compensation for giving up liquidity for a certain amount of time.

Preference for Liquidity or Money Demand:

Demand for cash or money is referred to as liquidity preference. People would rather keep their assets "liquid." This is the reason why money is the most liquid asset among all the others. It is simple and fast to shift money in whatever way we want. Let's say you have 10 rupee notes. You may convert them into wheat, rice, sugar, milk, books, or anything else you choose. People often prefer to have cash money because of this aspect of money's liquidity.

Three factors contribute to the demand for liquidity:

The three motives are

(i) Transactional,

(ii) Precautionary, and

(iii) Speculative.

(i) Transaction Motive: "The need of cash for the current transactions of personal and business exchanges" is the motivation behind transactions. It is further separated into business motivations and revenue. In the same way that the business motivation is defined as "the interval between the time of incurring business costs and that of receiving the sale proceeds," the income motive is intended to "bridge the interval between the receipt of income and its disbursement." People will hold less cash for current transactions if there is a short period of time between incurring expenses and receiving revenue, and vice versa.

(ii) Precautionary motivation: This motivation is associated with "the drive to account for unforeseen opportunities of advantageous purchases and for contingencies requiring sudden expenditures." Cash reserves are kept by both individuals and company owners to cover unforeseen expenses. People keep some cash on hand to cover unexpected expenses like sickness, accidents, and unemployment. Likewise, entrepreneurs have cash on hand to weather bad times or to profit from unforeseen opportunities.

(iii) Money retained for speculative purposes is done so in order to "secure profit from knowing better than market what the future will bring forth." After setting aside enough money for transactions and safety measures, people and businesspeople choose to invest in bonds in order to increase their profits. Speculative funds are a liquid store of wealth that may be invested in interest-bearing assets or bonds at the right time. Interest rates and money demand are inversely correlated; that is, there are more requests for money with lower interest rates and less demands at higher interest rates. As a result, the liquidity preferences curve slopes downward.

Money Supply:

The entire amount of money in the nation for all uses at any one moment is referred to as the money supply. Although the money supply is somewhat influenced by the interest rate, the money supply curve is regarded as totally inelastic and is set by the monetary authority. The government's and the nation's central bank's policies influence the amount of money in an economy. Coins, bank deposits, and currency notes make up this category. Since the interest rate has no effect on the money supply, it stays constant for a brief length of time.

Calculating the Interest Rate:

The Liquidity-Preference Theory states that the equilibrium rate of interest is established by the interplay between the supply and demand for money, or the liquidity preference function, as seen in the picture below:

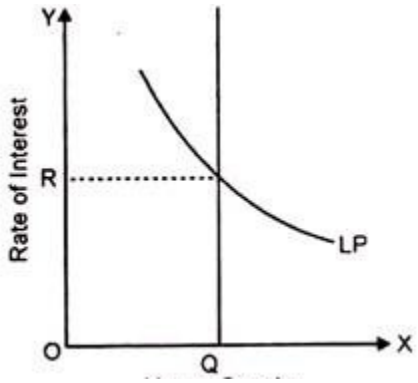

Diagram 5.30 Money Supply OR Equilibrium rate of interest

The equilibrium rate of interest is denoted by OR. The theory goes on to say that any alteration in the money supply, the liquidity preferences function (LP), or both will result in changes in the interest rate. Consequently, as seen in the figure below, the money supply causes the liquidity preference curve (LP) to move from LP1 to LP2, suggesting a rise in the demand for money. The equilibrium rate of interest likewise increases from R%.

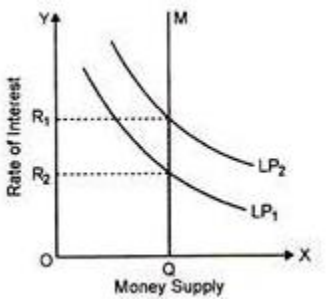

Diagram 5.31

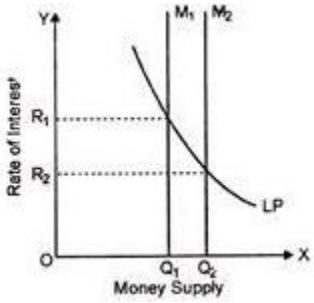

Diagram 5.32

Assuming a certain liquidity preference function (LP), as shown in Diagram 5.32, the rate of interest decreases from R1 to R2 as the money supply rises from M1.

5.9 Profit Theories

1. **The Rent Theory of Profit**

Walker, an American economist, was the first to propose this hypothesis. It is founded on the concepts of J.S. and Senior. Mill. Mill asserts that "any producer's additional profits from superior business skills or superior business arrangements are very much of a kind similar to rent." "Profits are of the same genus as rent," according to Walker. According to his theory of

profits, a better entrepreneur's profit is equal to the marginal profit of a less successful entrepreneur.

They were economists who believed that profit and rent were very comparable. While a profit was the incentive for the entrepreneur's skill, rent was the compensation for using the land. The skill of entrepreneurs varies, just as the fertility of different types of soil varies. The difference in productivity between marginal and super marginal land determines the rent of superior land, and the same is true for the profits made by marginal and super marginal businesses.

To put it simply, intra-marginal lands generate more revenue than marginal lands. Additionally, intra-marginal business owners make more money than marginal business owners. The marginal entrepreneur exists in the same way as the marginal land. Since marginal land doesn't generate any revenue, marginal entrepreneurs likewise don't make any money.

The marginal entrepreneur makes no money when he sells his goods at cost. He simply protects management's pay, not the bottom line. Profit, therefore, is not included in manufacturing costs. Profit is not included into pricing, just as rent is. So, profit is a surplus.

2. **The Wage Theory of Profit**

The American economist Taussig was the one who first proposed this notion. This notion states that profit is a kind of compensation that the business owner receives for the services he provides. "Profit is the wage of the entrepreneur which accrues to him on account of his ability," according to Taussig.

Similar to how a worker is paid for his labour, an entrepreneur who puts in a lot of effort earns money for his contribution to the production. The only distinction is that an entrepreneur invests cerebral energy, whilst a worker provides tangible services. Thus, an entrepreneur does mental labour much as a doctor, lawyer, teacher, etc. Therefore, profit is a kind of pay.

3. **Profit Theory of Risk:**

Hawley, an American economist, is linked to this hypothesis. Profit, in his opinion, is the result of taking business risks. The primary role of an entrepreneur is seen to be taking risks. There is risk associated with any production that is started in advance of demand. There are four types of risk, according to Drucker. They are uncertainty, risk proper, obsolescence, and replacement.

Since the first two are computed, they are covered by insurance. However, the other two dangers are unknown and unexpected. The entrepreneur receives payment for taking on this kind of risk. If an entrepreneur simply receives the typical return, he will not be ready to take risks.

As a result, taking a risk must have a greater payoff than the risk itself. The entrepreneur won't be willing to take the risk if he doesn't get the benefit. Therefore, the likelihood of profit increases with risk.

Hawley claims that in exchange for a certain sum to the insurance provider, the business owner may avoid some dangers. However, insurance cannot eliminate all dangers. He is not an entrepreneur if he does this, and he will only get management salaries rather than profits.

4. **The Theory of Dynamic Profit:**

In 1900, Professor J.B. Clark introduced the dynamic theory of profit. According to him, profit is the difference between the commodity's price and manufacturing costs. Progressive transformation in an organised society leads to profit.

It is only in a dynamic condition that the gradual transformation is feasible. Clark claims that organised and unorganised societies make up the whole of economic society. Static and dynamic states are additional divisions of organised society. Profit only occurs in a dynamic condition.

A static state is one in which none of the five general changes—population size, technical knowledge, capital, firm production methods, industry size, and public desires—occur; everything remains unchanged. Uncertainty and the element of time are nonexistent. Year after year, the same economic characteristics are seen.

Thus, the entrepreneur is not at danger in any way. The cost of manufacture will be reflected in the product's pricing. As a result, no profit is made. In addition to interest on his money, the entrepreneur would get compensation for his efforts. If the commodity's price exceeds its cost of production, competition would drive the price down to the cost of production once again, eliminating profit.

Perfect competition removes supernormal profit by bringing the price down to the cost of production. Knight therefore notes that "there can be no profit beyond wages for the routine work of supervision since costs and selling prices are always equal."

The society has always been dynamic, as is widely known. A dynamic society is undergoing a number of changes.

According to Clark, a civilisation is undergoing five significant changes at all times. They are:

a. Variations in the population's size,
b. Modifications to the capital supply,
c. Modifications to manufacturing methods,
d. Modifications to industrial organisational forms, and
e. A shift in human desires.

Profit arises as a result of these dynamic shifts in the supply and demand for goods. Dynamic adjustments may sometimes be introduced by specific companies. A company may, for instance, enhance its manufacturing method, lower costs, and boost profits. An innovation is a typical dynamic shift. Profit arises as a result of the entrepreneur's increased production and cost reduction.

5. **The Innovation Theory of Schumpeter:**

Schumpeter was the one who first proposed this hypothesis. This hypothesis and Clark's theory are somewhat comparable. Schumpeter describes the shift brought about by advancements in the industrial process in place of the five modifications Clark outlined. This hypothesis states that the incentive for inventions is profit. He uses the word "innovation" in a broader meaning than the developments Clark highlighted.

Innovation is the term used to describe any modifications made to the manufacturing process with the intention of lowering the cost of the commodity in order to close the gap between its current price and its new cost. Innovation may take many different forms, such as the introduction of a new plant or process, a change in the firm's internal structure or organisational setup, a change in the quality of raw materials, a new energy source, an improved sales strategy, etc.

Innovation and invention are two different things, according to Schumpeter. Innovation is a cost-cutting tool that is mostly used to lower manufacturing costs. The incentive for this strategic function is profit. Not all entrepreneurs are able to innovate. Innovation is only possible for outstanding entrepreneurs. They can lower manufacturing costs and access new resources and technological know-how. Therefore, the desire to make money is the primary driver behind invention. Thus, innovation is a result of profit.

The profits are short-term. For a little time, the pioneer who innovates makes abnormal profits. Soon, other business owners "swarm in clusters" and fight for the same profits. Another invention will be made by the pioneer. Innovation in one discipline may lead to additional inventions in adjacent fields in a dynamic environment.

The rise of the motor vehicle sector may also encourage additional investments in petroleum products, rubber, tires, and highway development. Thus, innovation is both caused and impacted by profits. Entrepreneurs innovate because they want to make money, and innovation generates profit. Profit thus has a propensity to come and go.

Innovation creates profits, while copying eliminates them. According to Schumpeter, innovative profit is thus never permanent. As a result, it differs from other sources of income including

interest, rent, and salaries. These are consistent, long-term revenues that arrive in any situation. Contrarily, profit is a transient excess brought about by innovation.

Professor Schumpeter also discussed his opinions on the roles that entrepreneurs should play. The company is organised and the many sources of production are combined by the entrepreneur. However, this is not his primary role, and it will not benefit him financially. Bringing innovations to the business world is the entrepreneur's true role. Innovations are what make him money.

6. **The Theory of Profit Under Uncertainty:**

Professor Frank H. Knight, an American economist, developed this idea. Hawley's risk-bearing theory serves as the basis for this hypothesis. Knight concurs with Hawley that taking risks pays off in the form of profit. Two categories of dangers exist, namely. two types of risk: predictable and unpredictable. Knight refers to unpredictable danger as "uncertainty beaming."

According to Knight, profit is the compensation for taking on risks and uncertainties that cannot be insured. He makes a distinction between risks that are insurable and those that are not. Some hazards may be quantified, and statistical calculations can be used to determine the likelihood that they will materialise. The hazards of flood, fire, theft, and accidental death are covered by insurance. The insurance company bears these risks.

The cost of manufacturing includes the insurance premium paid. Knight argues that these anticipated hazards are not real economic concerns that qualify for any kind of profit-sharing. To put it another way, profit is not generated by insurable risk.

Knight claims that unforeseen or non-insurable risk is the cause of profit.

The following are a few examples of non-insurable hazards that occur in contemporary business:

a) **Risk of competition:** Unexpectedly, some new businesses join the market. They may pose a significant threat to the current businesses. This will unavoidably result in a decrease in the businesses' earnings.

b) **Risk related to technology:** This danger results from the potential for equipment to become outdated when new processes are discovered. Losses may result from the current company's inability to implement these changes into its structure.

c) **The possibility of governmental interference:** Over time, the government meddles in business matters including taxation, import and export regulations, and pricing control, which may lower the company's earnings.

d) **Risk cyclical:** Business cycles are the source of this risk. A business recession or depression lowers customer spending power, which in turn lowers demand for the company's goods.

e) **Demand risk:** This is produced by a change in the market's demand.

According to Prof. Knight, these risks are "uncertainties," and "profit in the proper sense of the word is explained by uncertainties in this sense." Since these risks are impossible to predict and quantify, they are not insurable, and the entrepreneur is responsible for bearing the associated uncertainties. Profit and uncertainty bearing are directly related, according to this idea.

The greater the degree of profit, the more uncertainty there is. In today's corporate world, uncertainty beaming has become so significant that it is now regarded as a distinct element of production. It has a supply price, much like other aspects, and entrepreneurs take on risk in the hopes of making a certain amount of money. Therefore, the payoff for taking on uncertainty is profit.

Nowadays, manufacturing has to happen before consumption does. The future is unclear and unpredictable, and the producers must contend with their competing producers. These are unknowns. Because they can see it more clearly than others, certain businesses are able to make a profit.

7. **Theory of Profit from Marginal Productivity:**

The entrepreneur factor is also examined using the general theory of distribution. Profits, according to Prof. Chapman, are based on the entrepreneur's marginal productivity and are equivalent to their marginal value. Profits will be high when marginal productivity is high.

The marginal revenue productivity curve of an entrepreneur is the demand curve of an entrepreneur, just as the marginal revenue productivity of any other component is the demand curve of a factor. The marginal revenue productivity (MRP) of entrepreneurship declines as more businesses join the market. The MRP curve will have a negative slope. Under perfect competition, the entrepreneur's supply curve will be fully elastic.

8. **The Theory of Monopoly Power in Profit:**

Since a lack of rivalry in the markets offers chances for profit, many economists believe that there can be no profit if there is perfect competition in the markets. As is well known, in a market with perfect competition, both buyers and sellers are presumed to be fully aware of the circumstances that exist there.

Because of this, if businesses in a given industry happen to make more money than usual in the short term, the number of businesses and the supply of the product will grow over time, and the

price of the product will decrease until all of the current businesses are making just the usual amount of profit. One of many businesses is a company operating in perfect competition.

Because of this, it is able to sell a largely arbitrary quantity of its goods at the price set by the market. In this situation, the entrepreneur does not have to act alone to boost sales and demand for his product. Thus, the business owner carries out his regular tasks here and receives no more than the typical profit.

On the other hand, the entrepreneur would need to take personal effort to provide leadership in the market if he had monopolistic power. He would now need to make the required measures in order to preserve and expand his monopolistic power.

Here, the entrepreneur must face risk and uncertainty while attempting to increase his company's market dominance via innovation. The entrepreneur may raise the demand for his goods and get a greater price if he can carry out his duties effectively. The amount of pure profit he makes may thus rise.

9. **Theory of Profit from Labour Exploitation:**

Karl Marx, the renowned philosopher and classical economist who lived from 1818 to 1883, believed that the only component of production that could generate surplus value was labour. By taking this excess value, the capitalists make money. According to Marx, the sole productive component is labour.

The pay that labour receives is much less than the net value that it produces with the aid of machinery, raw materials, etc. The gap between the net value that labour produces and what it actually receives as compensation is known as the surplus value.

The entrepreneur who represents the capitalists makes money off of this excess value. Converting this profit into capital and reinvesting it would boost labour productivity since the work force would be able to employ more capital products or machinery.

When labour productivity rises, so does the surplus value produced by labour, even if worker wages often either do not grow at all or increase at a considerably slower pace. As a result, worker exploitation continues to rise at an accelerating pace, while the capital stock rises in tandem.

5.10 Summary

Income distribution can be studied through personal distribution, which examines how national income is shared by people, and functional distribution, which examines how different factors of production are rewarded. Classical economists developed specific theories for different factors of production, such as rent, wages, interest, and profit. Ricardo's rent theory states that rent is paid

to landlords for the original and indestructible powers of the soil. Two theories of wages are the subsistence theory of wages and the wages fund theory. Interest is determined by the demand for and supply of capital, while profit is earned by capitalists. These theories have not gained support.

The marginal productivity theory, developed by J.B. Clark, suggests that reward to each factor of production is determined by its marginal revenue productivity. When remuneration equals both marginal and average revenue productivity and marginal factor price, both the firm employing the factor and the industry are considered in equilibrium. However, the theory is based on questionable assumptions and explains the demand for a factor rather than its price.

5.11 Check Your Progress

1) Differentiate between average physical productivity and marginal physical productivity
2) What do you mean by marginal revenue productivity?
3) Define functional distribution and distinguish it from personal distribution.
4) How did classical economists explain distribution of income among various factors of production?
5) Distinguish between interest and profit. Is it not correct to say that both are earned by the capitalists for the capital they invest in the production process?
6) How did classical economists explain determination of wages?
7) Explain the marginal productivity theory of distribution. Also state its assumptions.
8) Why is the marginal productivity theory not considered a satisfactory theory of distribution?
9) Explain Loanable funds theory.
10) Explain Time preference theory
11) What are the main functions of an entrepreneur?

5.12 References

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