

[Academic Script]

Monopoly

Subject:

Course:

Paper No. & Title:

Unit No. & Title:

Lecture No. & Title:

Business Economics

B. A. (Hons.), 2nd Semester, Undergraduate

Paper – 201 Microeconomics II

Unit – 1 Market with Imperfect Competition

Lecture – 1 Monopoly

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1. Introduction

So far we have studied about perfect competition. Another form of market is imperfect competition. Monopoly is one of them.

In this chapter we are going to discuss monopoly market structure in detail ie., its price- output determination, its Supply curve, Multiplant firm, Monopoly power, Deadweight loss, Price discrimination, Bundling, Two part tariff.

Monopoly: The word monopoly means "alone to sell". Thus,

"Monopoly" is a market situation of a single seller producing for many buyers. Its product is necessarily extremely differentiated since there are no competing sellers producing near substitute products there are certain examples, such as, postal services, railways etc..

Features of monopoly market:

- 1. Single seller of the product
- 2. Restrictions to entry
- 3. No close substitutes.
- 4. Individual sellers are price makers.
- 5. There is no competition
- 6. Firm and industry are same.
- 7. Profit maximizer.
- 8. Price discrimination.

Sources of Monopoly:

- 1. Patents and copyrights.
- 2. Control over the essential inputs
- 3. Control over natural resources.
- 4. Technological superiority.
- 5. Legal Barrier, etc.

Monopolist Revenue curve:

Revenue curve of a monopolist is downward slopping (ie, slopping from left to right), meaning that it has to reduce the price to increase the sale of its product as we can see in this diagram.



2. Price output determination under monopoly (Firms equilibrium under monopoly):

Short Run equilibrium:

A monopolist has to determine not only output but also price of the product. Since he faces a downward facing demand curve, if he raises price of his product his sales will go down .On the other hand if he wants to improve his sales volume he will have to take lesser price. And will always try to maximize the profit, i.e, he will try to attain the equilibrium level of output. As in perfect competition a monopolist's main aim is to earn profit .But it may either earn profit or incur loss in the short run.

Conditions for the equilibrium:

In this diagram we can see that as long as marginal revenue exceeds marginal cost a monopolist will go on producing additional units of output. This is because of the reason that, here each additional unit of output will lead to increase in revenue and not cost in same proportion. Until firm reaches its maximum profit ie, at the level of output where, MR=MC. Thus, firm will produce OM level of output, and will earn maximum profit therefore, firm will be in equilibrium, when it is producing and selling OM quantity of output. Beyond this level firm will incur loss, as cost will then increase more in proportion to revenue.

As we can see here in diagram that from AR curve equilibrium output OM can be sold at price OP. Further it is observed that at OM (equilibrium point of output) average cost of production is equals to MT. Here profit per unit is TS. Thus TS* OM(area HTSP) gives the total economic profit made by a monopolist.



Three basic points we should know about a monopolist are:

1. Profit maximization rule: MR=MC

2. Revenue maximization rule:

Firm should produce where MR=0 Because as MR= Δ TR/ Δ Q Thus, If MR>0, TR increases If MR<0, TR decreases **3. Price elasticity of demand (PED) for a monopolist:** If MR>1, PED> 1, demand is elastic If MR <1 PED <1, Demand is inelastic.

Long –Run equilibrium: Long–run is a period long enough to allow the monopolist to adjust its plant size or use his existing plant at any level that maximizes his profit. In the absence of competition monopolist can produce at suboptimal scale also. In other words, he need not reach the minimum of LAC curve, he can stop at any place where his profits are maximum. Optimum level or optimum capacity here means that output level where, short run average cost is minimum. *The most important and necessary condition for a monopolist to remain in business is that in any case, he should not make losses in long run*. The size of the plant and extent of utilization of existing plant of a monopolist will always depend on the extent of the market demand.

Graphically, we can see the optimal utilization of plant by producing at the least cost point of the short run average cost curve. In this figure MR is marginal revenue curve, AR is average revenue curve, SMC & SAC are short - run marginal cost curve and short run average cost curve respectively. LMC & LAC are long run marginal cost curve and long run average cost curve respectively. The point where MR meets SMC, LMC is the point of equilibrium 'E'.

There are three different conditions :

1. Monopolist is operating at sub-optimal size, and is underutilizing its plants capacity.

Here LAC is minimum at L, but optimal use of the existing plant is at 'K', and actual utilization is at 'A' .Point of equilibrium 'E' is on the left of the least cost point on SAC, thus underutilizing the existing land.

2. Monopolist is operating its optimal size, and utilizing its plant at its full capacity.

Here the point of equilibrium is at the minimum point of SAC curve, which corresponds to the minimum point of LAC curve. Thus point where all SMC, SAC, LMC, LAC curve meets is the point of equilibrium.

3. Monopolist is operating above its optimal size, and is overutilizing its plants capacity.

Here SAC is tangent to LAC on the right of the minimum point of the LAC curve and the equilibrium level of output 'E' is to the right of minimum point of SAC curve.





- 3. Monopoly Supply Curve
- Is there any supply curve in monopolistic market?

The answer is **No, because** by the definition itself supply is a unique relationship between price and output ie, against a given price there is a particular output to sell in the market.

But here this concept of supply curve is irrelevant as, a monopolist is a price maker (full control of firm).

It chooses its profit-maximizing combination from the among possible market demand curves.

Here, in monopoly demand curve slopes downwards and Marginal curve lies below it. Also as per the condition of equilibrium (MR=MC), Thus even with shift in demand curve,

there will not be any price output relationship in the market. Hence there is no supply curve in monopoly.

Fig.



Multiplant monopoly firm.

Multiplant monopoly refers to the situation in which a monopolist has two or more plants for the production of a good.

The basic law behind multiplant monopoly is that "the firm should keep on transferring output out of the higher cost plant into the lower cost plant, until the marginal cost of all the plants are equalized". **Meaning,** If MCA> MCB, then output is reduced in plant A and increased in plant B. While, if MCA< MCB, the output will be transferred from plant B to plant A, This process will continue until MCA=MCB.

The combined marginal cost curve of plant A and B can be found by horizontal summation of MCA and MCB. Thus to calculate profit the condition for equilibrium is MCA+B=OQA+B Thus, at equilibrium the firm produces OQA+B level of output and sells at OP price. This implies equalization of marginal cost (MC) of boththe plants which is achieved when plant A and B produce OQA and OQB respectively.



4. Price Discrimination

Price discrimination occurs when a producer sells a specific commodity or service to different buyers at two or more different prices for reasons not associated with difference in cost.

Let us see different types of Price Discrimination:

1. Personal

- 2. Local discrimination (eg. Dumping)
- 3. Discriminating according to use of trade.
- 4. Product discrimination
- 5. Age discrimination
- 6. Gender discrimination
- 7. Size discrimination
- 8. Brand or quality variation discrimination

For example: 1. Doctor charges different fee from different patients based on their income categories.

2. Prices of fruits and vegetables differ from posh localites and other localities.

3. Lawyer charges different fees from different clients based on the situation. And so many ...

Conditions for price discrimination:

There are basically three main conditions required for price discrimination to take place

• Monopoly power of price setting power

• **Separation of the market**- into different groups of consumers.

• Elasticity of demand –differs from each group of consumers.

There are different types of price discriminations in monopoly based on degrees:

 1st degree price discrimination – charging the maximum price consumers are willing to pay.



• 2nd degree price discrimination – charging different prices depending on the quantity consumed.



 3rd degree price discrimination – charging different prices depending on a particular market segment, e.g. age profile, income group, time of use.

 4th degree price discrimination – when prices to consumers are same, but the producer faces different costs. Also known as reverse price discrimination.

• Determination of equilibrium level in price discrimination.

Suppose there are two markets to which a price discriminating monopolist has to sell his product i.e, market A and market B .Both markets have different price elastic ties or demand is more elastic in market B than in market A Fig.

This figure shows Da and Db as the average revenue curves for the respective markets .MRa and MRb are the corresponding marginal revenue curves. Since all his output is under one organization ,there is only one marginal cost curve. Which is lateral summation of the two curves MRa and MRb.

Conditions for equilibrium :

1. MC = AMR as, like other monopolist main motive of the producer is to earn profit .

2. MC = MRa=MRb as, here in discriminating monopoly producer has not only to decide how much

to produce but has to distribute the output in two different submarkets in such a way and at such a price, that he maximizes his profits. And the profit in each market is maximized by equating MC to the corresponding MR.

In this figure we can see that MC and AMR each intersect at point E and OM is therefore total output of the monopolist, the line EM is the line of equal marginal revenue. It indicates that OM1 will be sold in market A at price P1M1 and OM2 is sold in market B is at price P2M2. under this arrangement the marginal cost of the total output is equals to marginal revenue in each separate market .

Thus we can see that discriminating monopolist charges a higher price from the market which has relatively inelastic demand. The market which is highly responsive is charged less. On the whole, the monopolist benefits from both the markets.



5. Bundling

Bundling is a practice of selling two or more products together as a package. Industries engaged in this practice include telecommunication, financial services, health care and information, food industry etc. for example in food industry different food items are combined to form a complete meal, or loan and insurance are sold together etc.

Bundling is possible only in two situations:

- 1. Consumers have heterogeneous demand.
- 2. The firm cannot practice price discrimination.

When the shops are located in different areas, they may serve different groups based on age, sex ,education level, occupation etc. of consumers which have different relative preferences for these two varieties . This customer heterogeneity is used by the firm for his benefit.

Deadweight Loss:

Definition: It is loss of economic efficiency in terms of utility for consumers or producers such that the optimal or allocative efficiency is not achieved. The necessary conditions for a total societal welfare to be maximized are:

- 1. Perfectly competitive markets
- 2. No externalities in the market
- 3. No Government interventions;

Before we proceed let us understand certain concepts:

Consumer surplus: meaning surplus of price which consumers are willing to pay rather than go without it.

Producer surplus: meaning the difference between the amount that a producer of a good receives and the minimum amount that he would be willing to accept for the good.

Let us understand Deadweight losses of monopoly by illustrating the <u>consumer and producer surplus</u> on a graph.



This diagram considers the case where the firm is in a perfectly competitive market with an infinite number of identical firms, or has a monopoly on the market.

In case of perfect competition, the firm will simply produce at the competitive price, Pc, where the supply and demand curves interact. All firms are identical so will face identical supply curves – if this firm's supply curve (marginal cost curve) was higher and

it was unable to profitably produce at Pc then it would have gone out of business, and if its supply curve was lower and it was able to make profits then other firms would enter the market until all firms were making zero profits. Thus the firm produces at price Pc and supply quantity Qc.

When it has a monopoly, it will produce at the point where MR = MC, ie where the marginal revenue curve cuts the supply curve. This is quantity Qm which will sell for price Pm.

Now first consider the consumer and producer surplus in the case of perfect competition.

In the Perfect competition case:

Consumer surplus = a + b + c

Producer surplus = d + e

Now consider the consumer and producer surplus in the case of monopoly.

In the monopoly case:

Consumer surplus = a

Producer surplus = b + d

Deadweight loss = c + e

The effect of going from perfect competition to monopoly is **bad for consumers**. Consumer surplus has been reduced by (b + c). Area b has gone from consumers to producers, so this is not an overall welfare loss, it is just a distributional change from consumers to producers. However the monopoly is **good for producers**. Producer surplus has increased by (b - e) and as b is a larger area than e this is a net gain.

Areas c and e are **deadweight loss**. Consumers have lost c and producers have lost e, this is because now the quantity is decreased from Qc to Qm.

So overall society loses out – there is a **net welfare loss** when the aggregate welfare of consumers and producers is taken into account. From an economic point of view, here there is

an **efficiency loss** caused by going from perfect competition to monopoly.

Consumer surplus = a Producer surplus = b + d

Deadweight loss = c + e

The effect of going from perfect competition to monopoly is **bad for consumers**. Consumer surplus has been reduced by (b + c). Area b has gone from consumers to producers, so this is not an overall welfare loss, just a distributional change from consumers to producers.

Monopoly Power: It is the discretion power of a producer or a seller for setting up of price and output policy. It determines the actual degree of control of a producer or a seller over the market. There are different methods of determining the monopoly power. Let us discuss one by one.

1.Elasticity of demand as degree of monopoly. The extent to which a monopolist exercises control over the price and output determination depends upon the elasticity of demand.

Measure of monopoly power is given by the inverse of elasticity of demand.

Degree of monopoly power = $1/e_p$

Where, e_p is absolute value of price elasticity.

But as elasticity of demand is different for different points of the demand curve, thus elasticity of demand fails to measure monopoly power and leads to misleading results in some cases. Another measure is:

2. Learner's measure of monopoly power. As per prof. A.P Lerner pure or perfect competition is the state of social optimum or maximum welfare and any departure from it would indicate presence of monopoly power leading to improper allocation of resources or a state of less than social optimum. Based on this, Index of monopoly power = (P-MC)/P.

Thus, greater the value of index (P-MC/P), greater will be the degree of monopoly power.

There are certain causes of monopoly power, these are:

- Barriers to entry
- Number of competitors
- Advertising
- Degree of product differentiation
- The larger and more expensive the barriers to entry the greater the monopoly power

• The smaller the number of competitors in the market the greater the monopoly power

• The greater the advertising spend and more recognisable the brand name the greater the monopoly power

• The larger the degree of product differentiation the greater the extent of the monopoly power

<u>Two Part Tariff</u>

A two-part tariff is a pricing scheme according to which the buyer pays to the seller a fixed fee and a constant charge for each unit purchased. When it is used, the average price paid decreases as more units are purchased. Further, it is the marginal charge and not the fixed fee that determines how many units will be purchased. Therefore, a two-part tariff can be used as a vehicle for price discrimination and also for manipulating the incentives given to the buyers, allowing also the sellers to capture part of the residual surplus through an appropriately chosen fixed fee'

There are two key implications when a two-part tariff is used. The first is that the average price paid decreases as more units are purchased. Therefore larger buyers pay less per unit than smaller buyers. Second, for the buyer who trades according to a two-part tariff, the fixed fee represents a fixed cost. Hence the fixed fee does not determine how many units the buyer will purchase, but only whether the buyer will enter into this trading transaction or not. The volume purchased will depend only on the marginal price. These two features of a two-part tariff represent the main reasons why such a pricing arrangement can be used. First, since the average price differs among buyers according to their usage, a two-part tariff can be used as a vehicle for price discrimination, in particular when these buyers will have to self-select. Second, since a two-part tariff essentially allows the simultaneous use of two independent instruments, it could imply a more efficient trading transaction than linear pricing: the fixed fee may be used to transfer money from the buyer to the seller in a lump sum (and, hence, less distorting) way, while the marginal price may be set independently to determine the optimal quantity traded.

6. Summary

Thus we can conclude as a Monopoly is a firm which is sole selling in his market. It has a downward slopping demand curve for its product. Its marginal revenue curve is always below the price of its good. A monopolist maximizes its profit by producing the quantity at which marginal cost is equals to marginal revenue. Hence as its price exceeds its marginal revenue, so it also exceeds marginal cost. He may cause deadweight loss. A monopolist can also raise their profit by selling at different prices based on willingness to pay, or we can say it can discriminate the price to increase economic welfare, and can hence reduce deadweight loss.

In this chapter we have learnt the basic concepts of monopoly. We have also discussed its equilibrium ie, profit maximization of firm. And various other related topics.