

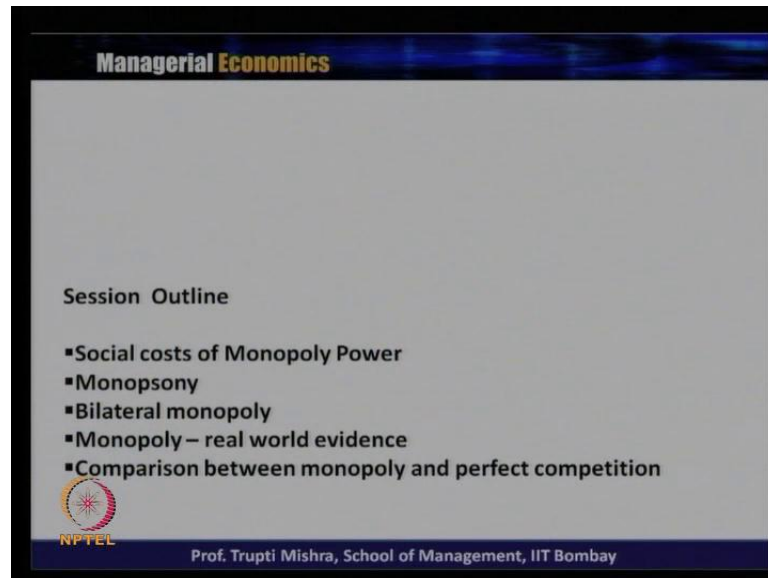
**Managerial Economics**  
**Prof. Trupti Mishra**  
**S.J.M School of Management**  
**Indian Institute of Technology, Bombay**

**Lecture -29**  
**Monopoly (Contd...)**

In today's session, we will continue our discussion on monopoly. So, few more aspect of monopoly we have to cover in this particular segment. So, today our focus will be on that. So, if you quickly remember whatever we discussed last class is it is all about the monopolist supply curve, why there is a absence in the absence of supply curve in the monopoly. Then we discussed about the multi plant monopolization, and in this case generally the monopolist produces the entire outputs to be supplied by firm, in different plants, and all this plants are having a different cost of cost function; some plants they are operating at a lower cost, and some plants they are operating at a higher cost.

And also we discussed that, generally how the price and output decisions are made, using this, in case of typically, in case of a multi plant monopolist, and then we discussed about this, how to measure the monopoly power through different methods; like we have learner index, we have cross elasticity of demand, or we have the market concentration ratio or the so called HSI. And then we discussed about this Roth child styled index, and we will discuss some more about the Roth child index, and then we will move to our next topic. And after discussing this Roth child index, we will focus today on the social cost of the monopoly power. We will take a special case, where there is only buyer, which is just the opposite of a monopoly; that is monopsony.


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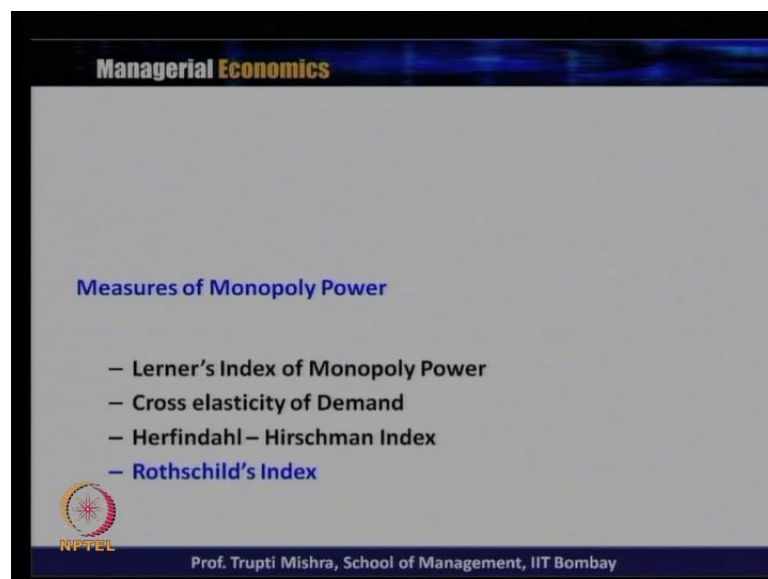
Session Outline

- Social costs of Monopoly Power
- Monopsony
- Bilateral monopoly
- Monopoly – real world evidence
- Comparison between monopoly and perfect competition

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Then we will talk about a bilateral monopoly, where there is one seller and one buyer. Then we will talk about some monopoly, real world evidence, and then comparison between the monopoly and perfect competition.


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Measures of Monopoly Power

- Lerner's Index of Monopoly Power
- Cross elasticity of Demand
- Herfindahl – Hirschman Index
- Rothschild's Index

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So, if you remember in the last class, we discussed the measurement of the monopoly of power. There are the different methods that tells us, and the value of that through the outcome this method, they tells us that what kind of market form it is; whether it is perfect competition, whether its monopoly or whether between the perfect competition

monopoly, the monopolistic competition. So, we discussed about the learner index yesterday, we discussed about the cross elasticity of demand, we discussed about the Herfindahl Hirschman index, and also we just introduced the Roth child index, and today we will have discuss some more about the Roth child index. Generally, how this is if you look at, how this decides, what is the market power of the typical of firm; and on that basis that is decided, whether what kind of market form it is, whether it is a competitive, whether it is monopoly or whether it is between the competitive and monopoly market structure. So, here the entire focus is based on two notion; one, when individual firm change the price, others they are not changing it, so what should be the demand curve?

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**Measure of Monopoly Power: Rothschild's Index**

This index shows how far a particular firm controls the market for a particular good.

**Rothchild's Index = slope of demand curve of firm/slope of demand curve of industry**

In case of pure monopoly – index is equal to unity

In case of perfect competition – index is equal to zero.

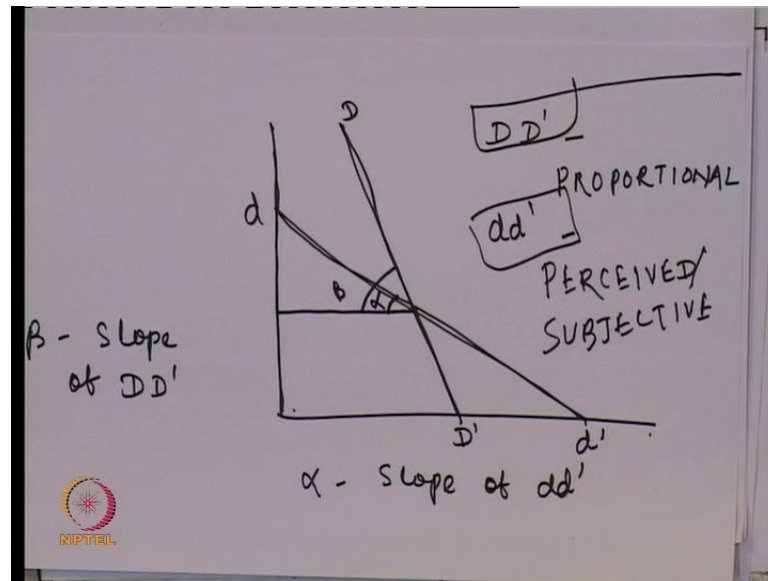
Graphical presentation

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And in the second case, when individual firms they are changing the demand curve, others also they are following it; and on that basis we will find out the value of the index.

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So, we will take two demand curves; one is  $D D$  dash, and second one is capital  $D D$  dash. Now, what is the difference between this capital  $D D$  dash and the small  $D D$  dash? This capital  $D D$  dash generally known as the proportional demand curve, and why this is known as proportional demand curve, because when one firm change the price other firm also change the price, and that is a reason you will find this demand curve is inelastic, because one firm change the price other firm change the price. So, the response to the change in the quantity demanded is generally less to the change in the price. And this demand curve talks about the, case where one firm change the price, and others they are not changing the price. So, generally this demand curve is known as the perceived demand curve or subjective demand curve. So, this is proportional demand curve. This is subjective demand curve. Now the essential difference between this two is; one, where one change one firm change the price other generally follows that, and second when one firm changing others they are not following.

So, when one firm is changing other firm is also changing, we get a proportional demand curve, when one firm changing others they are not changing, we call it is a perceived or subjective demand curve, and why this is more elastic, because, since others they are not following, any small change in the price of this firm, generally effects the quantity demanded in a larger extent. Now, we will get the slope, this is the beta and this is the alpha. Now, what is alpha, alpha is the slope of perceived demand curve, and what is beta. Beta is the slope of proportional demand curve. So, alpha is the slope of the

perceived demand curve, and beta is the slope of the proportional demand curve. So, now we know the basis of this Rothschild index; one we have two kind of demand curve; one demand curve is on the basis of the, one demand curve is on the basis of the, when one firm change the price other reacts to it, they also change the price.

And second is on the basis of the proportional demand curve, which is on the basis of that, when one firm change other change it and perceive it one, when one firm change the others they are not changing to it. So, in this case, if you look at two kind of demand curve depends upon the behavior of the rivals in the firm. On that basis we get we got two slope value; one is with respect to the perceived demand curve, and second one with respect to the proportional demand curve, with the help of that slope value, now we will try to construct the index, and through the value of index we need to find out, what is the market power for that typical firm. So, taking that, now we will come to the index, and index talks about a situation, where the value or the index value of index or the outcome index shows, how for a particular firm controls the market for a particular period. So, Rothschild index is the slope of demand curve for the, of firm; that is perceived demand curve, open the slope of the demand curve of the industry; that is the proportional demand curve.

And the value of index, in case of pure monopoly it is equal to 1, in case of perfect monopoly it is equal to 0. So, in case of pure monopoly the Rothschild index is equal to unity, and in case of perfect competition, this index is equal to 0. In between zero to unity, there are number of other firms generally you will find, they are into the value that ranges from 0 to 1. So, zero talks about one extreme in case of perfect competition, one talks about the other extreme in case of the pure monopoly. In between, if the value of the index is in between 0 to 1, that donates some other kind of the market structure, which is not strictly pure monopoly or which is not strictly pure perfect competition. So, generally this method, whether its Rothschild index, whether its learner index, whether it is HSI or whether it is cross elasticity of demand. Generally the main motive to study this is to, identify through a value, identify through a index, what is the market power of that specific firm.

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**The Social Costs of Monopoly Power**

- Monopoly power results in higher prices and lower quantities
- However, does monopoly power make consumers and producers in the aggregate better or worse off?
- We can compare producer and consumer surplus when in a competitive market and in a monopolistic market

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Then, we will move to the next topic; the social cost of monopoly power. We know that all the firms there in the market, monopoly firm when there in the different industry or the different sector; they are getting benefit for themselves. The question comes from the, what is the cost or what is the benefit that comes to the society, because obviously if monopolist, they are not getting profit they will not be there in the market in the long run, but what is the consequence on the society, what is the consequence on the consumer group, what is the benefit that comes to the society if at all they are getting it.

So, monopoly power results in higher prices and lower quantity. It is inelastic, because there is no close substitute and they are the price maker. However, whether monopoly power make the consumer better off or worse off, for both the consumer producer, that we can generally compare to the producer and consumer surplus, when the competitive market or in a monopolistic market. What is the consumer surplus and producer surplus in the monopolistic market, and what is the consumer surplus and produce surplus in the competitive market; that gives us the difference between the, whether the consumer they are better off or worse off, whether the producer they are better off or worse off, in case of a monopoly market structure.

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**The Social Costs of Monopoly Power**

- Perfectly competitive firm will produce where  $MC = D \rightarrow P_C$  and  $Q_C$
- Monopoly produces where  $MR = MC$ , getting their price from the demand curve  $\rightarrow P_M$  and  $Q_M$
- There is a loss in consumer surplus when going from perfect competition to monopoly
- deadweight loss is also created with monopoly

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So, if you look at in case of perfectly competitive firm, the firm they produce at a point where marginal cost is equal to D or marginal cost is equal to the price, and how we get the price; that is from the demand and supply forces of the market. Whereas, monopoly produce where marginal revenue is equal to marginal cost, and getting their price from the demand curve; that is price and the quantity. The loss in the consumer when going to the perfect competition to the monopoly, because in case of monopoly the P is always greater than marginal cost, and this leads to a dead weight loss, which generally created through the monopoly.

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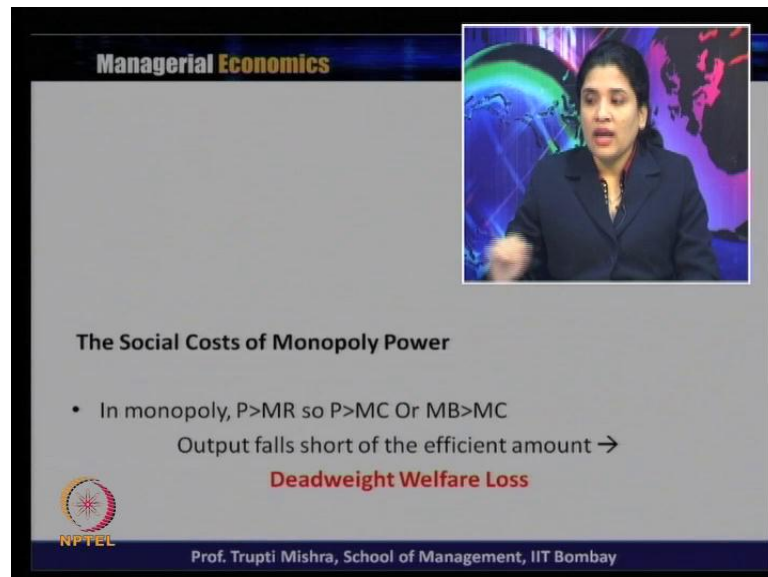
**The Social Costs of Monopoly Power**

- In competitive markets, firms produce where  $P=MC$  And since  $P=MB$ =willingness to buy  
And  $MC$ =willingness to sell  
 $P=MC \rightarrow MB=MC$  or  
**Maximum total surplus**

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So, in competitive market firm produce where  $P$  is equal to  $MC$ , and since  $P$  is equal to  $MB$ ; that is willingness to buy, and  $MC$  is the willingness to sell,  $P$  is equal to  $MC$ , which is also equal to  $MB$  is equal to  $MC$ , and in this case the consumer get the maximum total surplus.

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**The Social Costs of Monopoly Power**

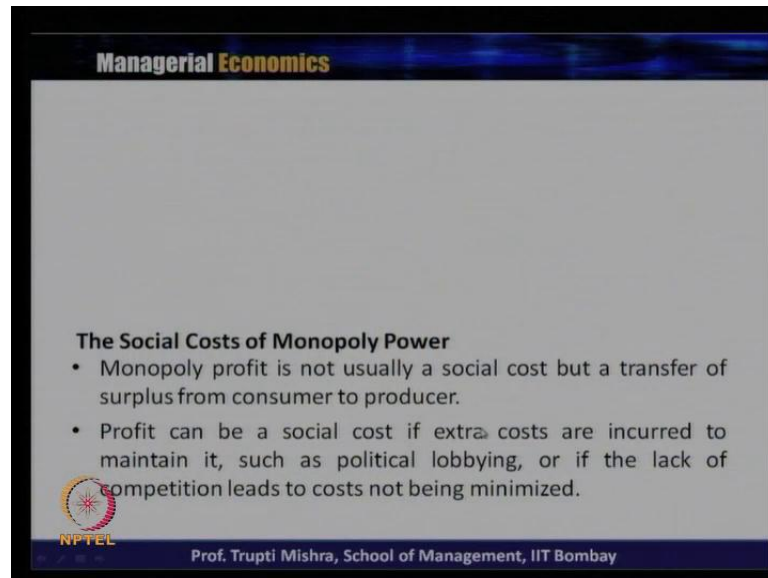
- In monopoly,  $P > MR$  so  $P > MC$  Or  $MB > MC$   
Output falls short of the efficient amount →  
**Deadweight Welfare Loss**

The slide also includes the NPTEL logo and the text "Prof. Trupti Mishra, School of Management, IIT Bombay" at the bottom.

And what happens in case of monopoly, in case of monopoly  $P$  is greater than marginal revenue or  $P$  is greater than marginal cost, or we can say; since we are saying this is also the marginal benefit, the marginal benefit is greater than marginal cost. So, output for short of efficient amount and that leads to the deadweight welfare loss.




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**Managerial Economics**

**The Social Costs of Monopoly Power**

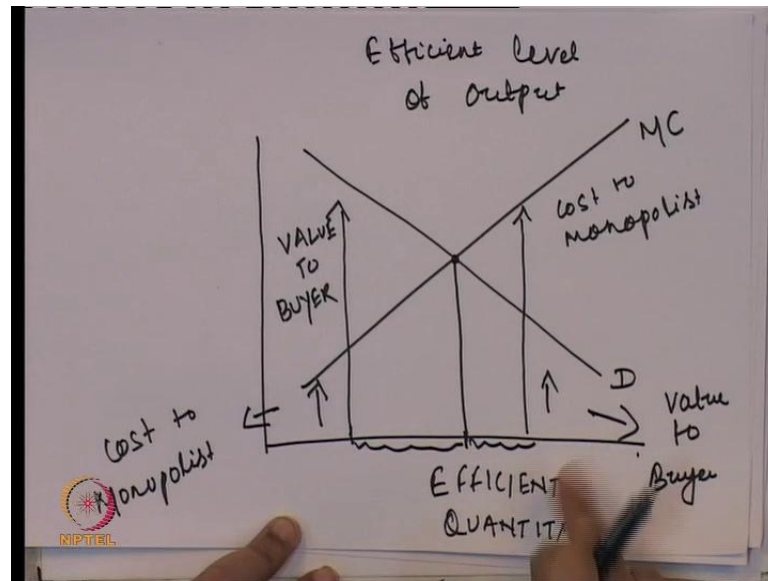
- Monopoly profit is not usually a social cost but a transfer of surplus from consumer to producer.
- Profit can be a social cost if extra costs are incurred to maintain it, such as political lobbying, or if the lack of competition leads to costs not being minimized.

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So, we need to know now, whether if either charging a price, which is more than, which is more than the charging price, which is more than the marginal cost, whether the consumer at all getting a consumer surplus or the. Because of the increase in the price the quantity demanded decreases, and neither that goes to the consumer pocket or not that goes to the producer pocket, and in general that goes to a deadweight loss, whether rather it is a rather it is a part of the profit of the consumer or part of the profit of the producer. So, now we will understand this graphically what is the deadweight loss, and where generally the efficiency of the monopoly comes, because if it is getting deadweight loss; obviously, the monopoly is not efficient, at least from the societal point of view. And if the inefficiency comes; inefficiency come basically from the deadweight loss. So, we will say, what should be the ideal condition for efficiency in case of a monopoly market, and also we will see inefficiency that is through the deadweight loss.

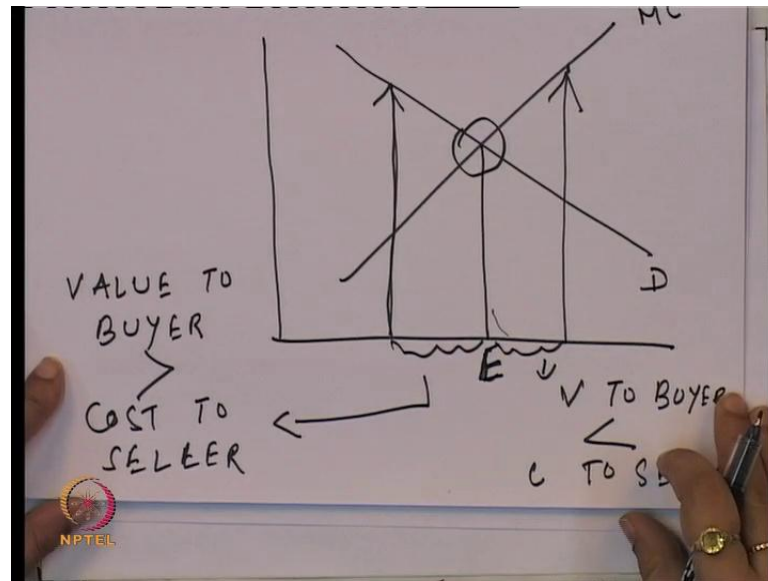
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So, to understand this efficient level of output, or what is the efficiency of the monopoly? We will take the help of the marginal cost and demand. We have demand curve, and what is this demand curve? This is generally the benefit or the value to the buyer; this is the marginal cost, this is the ideally this should be the efficient quantity what the monopolist should produce, or the monopolist should sell to the buyers. Now, if you look at this MC is nothing but the, from here to here, if you look at, this is nothing but the cost to monopolist, and here if you look at, this is nothing but the value to buyer. Corresponding to this, what is this, this is cost.

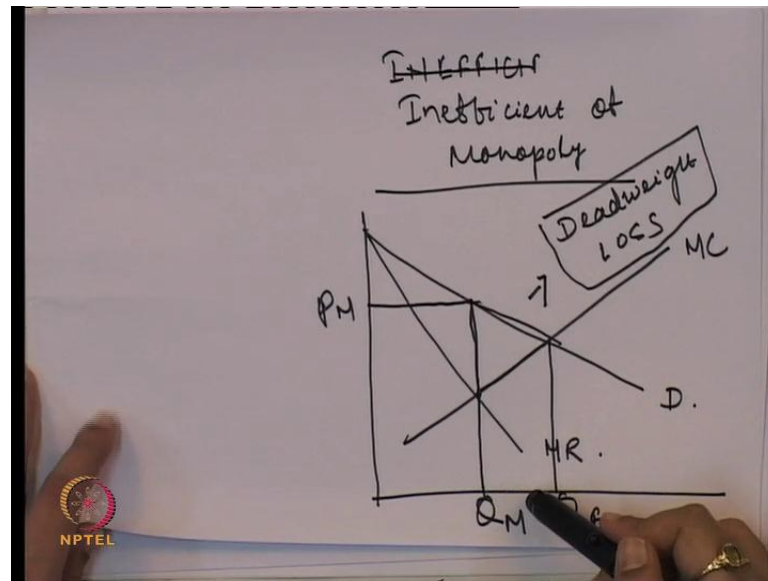
Again this we can say as the, cost to monopolist, and here we can say again, this is value to buyer. And how we are identifying this value to buyer, and cost to monopolist, that is, on the basis of the marginal cost, and on the basis of the demand curve. Now, in this segment, we have two segments now; this should be the efficient quantity, and we have two segments with respect to this; one, which is before the efficient quantity, and one, which is beyond the efficient quantity.

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Now, what happens in case of both this situation? So, if you take this graph again, this is our demand curve, this is the value to the buyer, this is the marginal cost, this is nothing but the cost to the monopolist. So, we can say that this is the efficient quantity, and here this segment if you look at now what is the significance of this segment. The value to buyer is greater than cost to seller, because the demand curve is lying above the marginal cost curve. And what happens in this segment? In this segment, the value to buyer is less than cost to seller. So, efficient quantity is this, before this efficient quantity the value to buyer is greater than cost to seller, so obviously, monopolist is not going to operate here. Here the value to buyer is less than cost to seller. So, if you look at, this is the profitable point for the monopolist, but ideally, what is the efficient quantity? The efficient quantity or the efficient level of the output, where the marginal cost, is intersecting the demand curve.

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But what happens in practice, does the monopolist generally follow a efficient level of output or not. That we will see, because there is always a debate, because efficiency, there is a inefficiency in the level of output, and that is how the firm get the deadweight loss. So, next we will see what is the inefficient of monopoly, or how generally they get the deadweight loss. And how we will find out this inefficiency of the monopoly or inefficient of the monopoly output. Again we will take the help of the demand curve and the MC curve. So, this is our demand curve, this is our marginal revenue curve. This is the marginal cost curve. Now, what is the monopoly quantity, monopoly quantity is this, because this is. We follow a marginal list principle to, generally find out the monopoly output; that is MC is equal to MR, and corresponding to that we get the output level, which is the monopoly output level, and this is the monopoly price.

Now, what is the efficient quantity? Efficient quantity is ideally corresponding to the demand curve and the marginal cost curve. So, this is efficient quantity, this is monopoly quantity. So, the difference between this monopoly quantity and the efficient quantity is generally known as the deadweight loss, and this is the cost to the society, in the form of the deadweight loss. Monopolist are not operating at the efficient level of output, and that leads to the fact that, there is a cost to the society, and what is the cost to the society. The cost to the society is in the form of the deadweight loss. And why the deadweight loss comes into picture, or why there is an evidence of deadweight loss in case of

monopoly, because the difference between the efficient quantity and the monopoly quantity.

And monopoly quantity if you look at, it is always the lower quantity and higher price, and efficiency quantity is one, when there is a higher quantity at a lower price. So, some amount of inefficiency is there or some amount of inefficient with respect to output, with respect to price is there, and that generally brings a social cost, and that generally impose a cost on the society. So, if you look at the profit, it is not strictly the social cost, because firms they are operating the market. They use to get some amount of profit at least in order to survive in the market, in order to produce the product and sell it in the market or cater the need of the consumer. Then from where generally the social cost comes, whether it is strictly from the profit of the monopolist or from the any other sources. So, monopolist profit is not usually a social cost, but transfer of surplus from consumer to producer.

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**The Social Costs of Monopoly Power**

- Monopoly profit is not usually a social cost but a transfer of surplus from consumer to producer.
- Profit can be a social cost if extra costs are incurred to maintain it, such as political lobbying, or if the lack of competition leads to costs not being minimized.

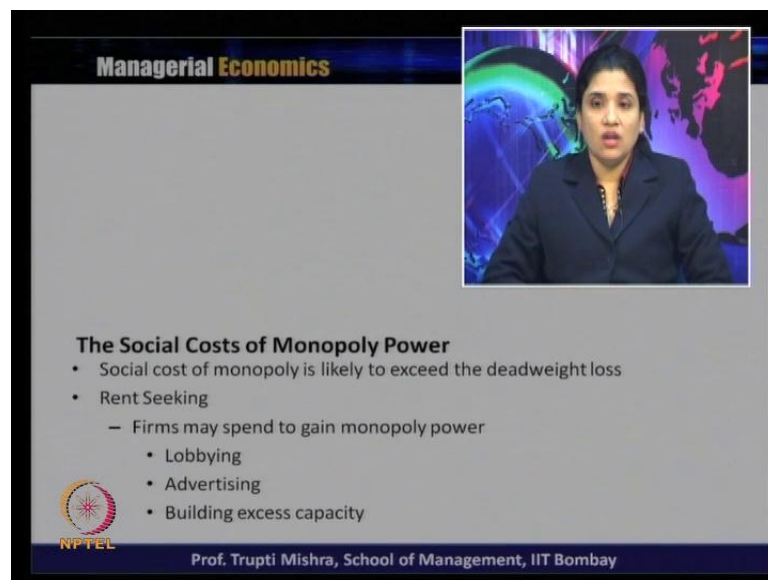
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So, if you remember in case of consumer surplus, whenever there is a increase in the price, whatever the loss in the consumers part goes to the producer. So, in this case, it is not directly coming to the social cost, is not directly coming from the monopoly profit, or the profit is not usually a social cost, but a transfer of surplus from consumer to producer, generally a social cost, because it takes out the surplus from the consumer and goes to the producer account. Profit can be a social cost, if extra cost are incurred to

maintain it, such as; political lobbying or if the lack of competition lead to cost on not being minimize. So, whether it is a political lobbying or if it is a lack of competition, for that if there is some extra cost are incur, then only profit is generally consider as the social cost, because to get profit there is some amount of extra cost involve over here.

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**The Social Costs of Monopoly Power**

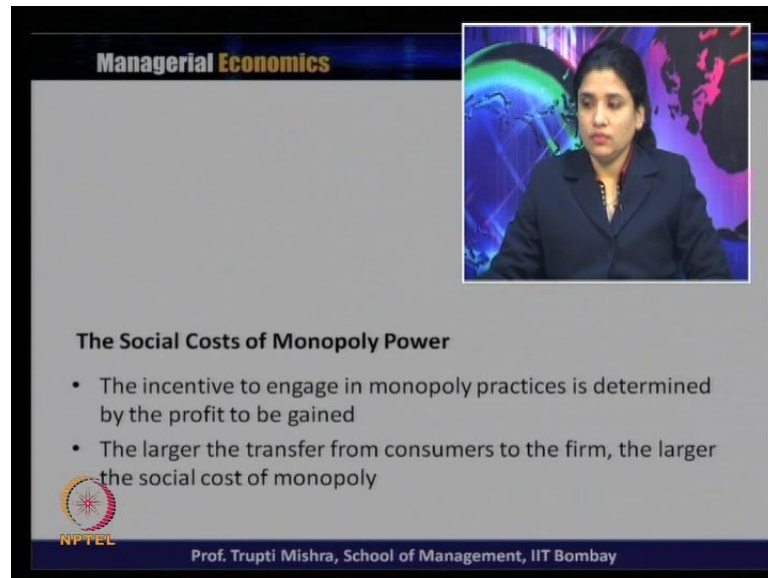
- Social cost of monopoly is likely to exceed the deadweight loss
- Rent Seeking
  - Firms may spend to gain monopoly power
    - Lobbying
    - Advertising
    - Building excess capacity

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So, social cost of monopoly is; so if you look at, it is always likely to exceed the deadweight loss, and why this generally exceed the deadweight loss; may be rent seeking, because firm may spend to gain monopoly power as we discussed in the previous slide, because the there is some additional cost involve, in order to get the profit, and that is the reason the social cost may be exceeding the deadweight loss. So, firm may spend to gain monopoly power through lobbying, through advertising, and through building the excess capacity.

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**The Social Costs of Monopoly Power**

- The incentive to engage in monopoly practices is determined by the profit to be gained
- The larger the transfer from consumers to the firm, the larger the social cost of monopoly

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So, the incentive to engage in monopoly practices is determined by the profit to be gained. So, more profit, may be the incentive is more, and to get engage in the monopoly practices, but the larger the transfer from consumer to the firm, the larger the social cost of monopoly. So, its two dimension; one, more is the profit, the firm gets into more kind of practice to become the monopolist, or the so called the monopolization, or the act of monopoly through which generally they try to get the market power. And second, how they get more profit, when the transfer get produced from the transfer gets from the consumer surplus to producer surplus, and this is nothing, but that whenever the consumer surplus get transfer into the producer surplus, there is a amount of cost on the society. So, the larger the transfer from the consumer to the firm, the larger the social cost of the monopoly.

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**Regulation of Monopoly Power**

- Attempts to increase competition through anti-trust legislation

Price Regulation : eliminate deadweight loss with monopoly

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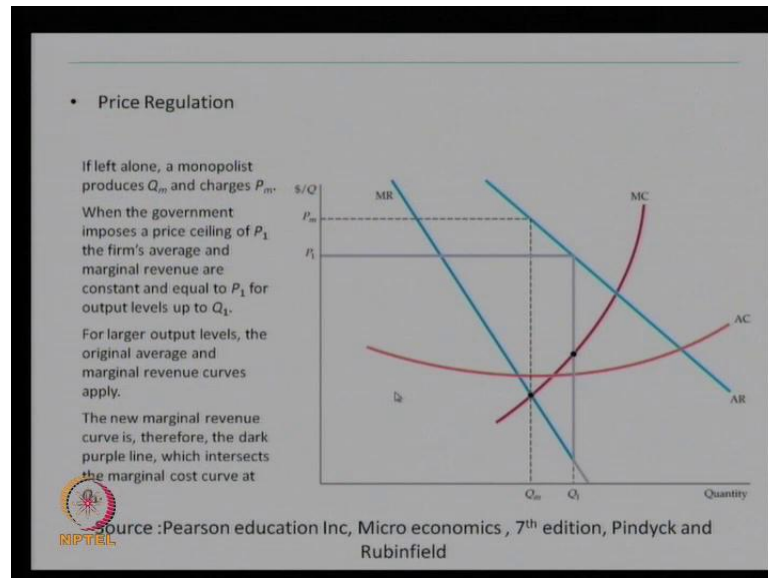
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Now, what is the regulation of monopoly power, may be the regulations are many, but if you look at, there is antitrust legislation, which is generally for the firm which getting into the act of the monopolization. Now, since we know that monopoly power is something, which is imposing a cost on the society, there the public police come into picture. To up to how much quantity or up to how much limit, at least the monopoly power of the firm can get control. So, generally through one of it is generally the antitrust legislation or antitrust law, which attempts to increase the competition through the legislation. And whenever there is an increase in the competition, generally it takes away the monopoly power or market power from the firm.

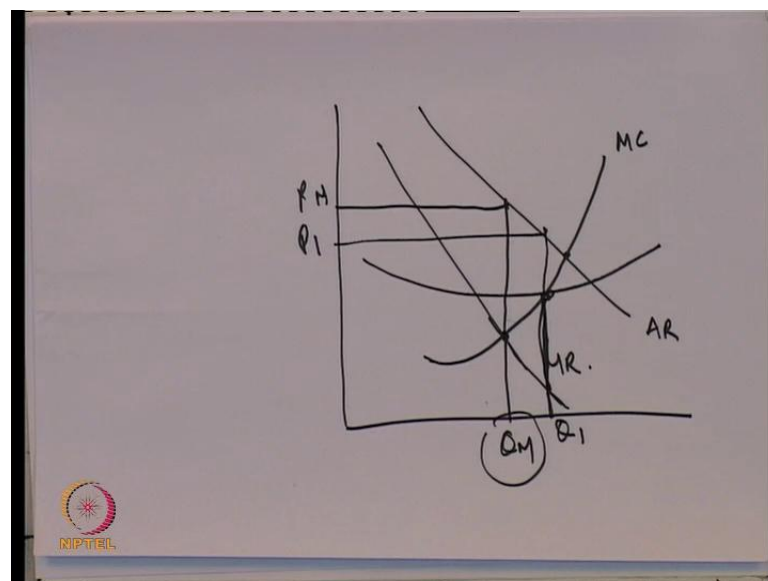
Then we have the price regulation, and in price regulation the focus is to eliminate the deadweight loss with the monopoly, and why the deadweight loss takes place, because monopoly charges a higher price, which reduces the demand from the consumer. And when it reduces the demand from the consumer, generally some unused, there is a difference between the efficient and the efficient and the monopoly output, which leads to deadweight loss. So, the role of the price regulation is to charge a price, or to do a price sealing, which eliminate the deadweight loss with the monopoly. So, then we will try to understand this price regulation through this graph.



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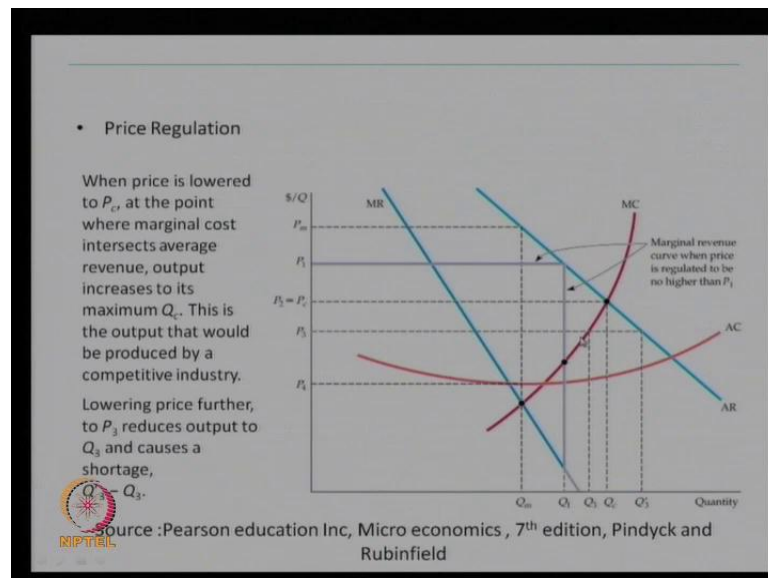


So, if you look at here, there are the typical monopoly understandings; like we have a average revenue curve, we have a marginal revenue curve, and we have average cost curve, and we have marginal cost curve. So, now if you look at the graph, there are two level of output; one level of output is with respect to, marginal cost and marginal revenue. And other level of output if you look at, its  $Q_1$ ; that is on the basis of, mainly on the basis of the, may be you can call it mainly on the basis of the price sealing, and when the price sealing is done, that gives into the another quantity. So, if you look at the graph now, the monopolists produces  $Q_m$ , and charges the price  $P_m$ . When then come

and impose a price ceiling of  $P_1$ , the firm's average and marginal revenue are constant and equal for  $P_1$  at the output level  $Q_1$ .

For larger output level the original average and marginal revenue curve applies, and new marginal revenue curve is, therefore a dark purple line, if you look at, and which intersect the marginal cost curve at the point  $Q_1$ . So, corresponding to  $P_1$  if you look at what is the new marginal revenue curve. The new marginal revenue curve, comes from the price ceiling; that is from  $P_1$ , and which intersect the marginal cost curve at the point  $Q_1$ , so what is the marginal cost curve. So, marginal cost curve is this, and this is at  $Q_1$ , so this part can be called as the new marginal revenue curve. So, monopolist produce always  $Q_M$ , and the charges  $P_M$ ; that is the price, monopoly price, and the output level is  $Q_M$ , but when the price ceiling is imposed, the price ceiling if it is imposed, you will find that the quantity is  $Q_1$  and the price is  $P_1$ . And for the larger output level, the original and original average and marginal revenue curve apply, but for the new marginal revenue curve is therefore, a dark purple line, typically this line, this line which intersect the marginal cost curve at  $Q_1$ .

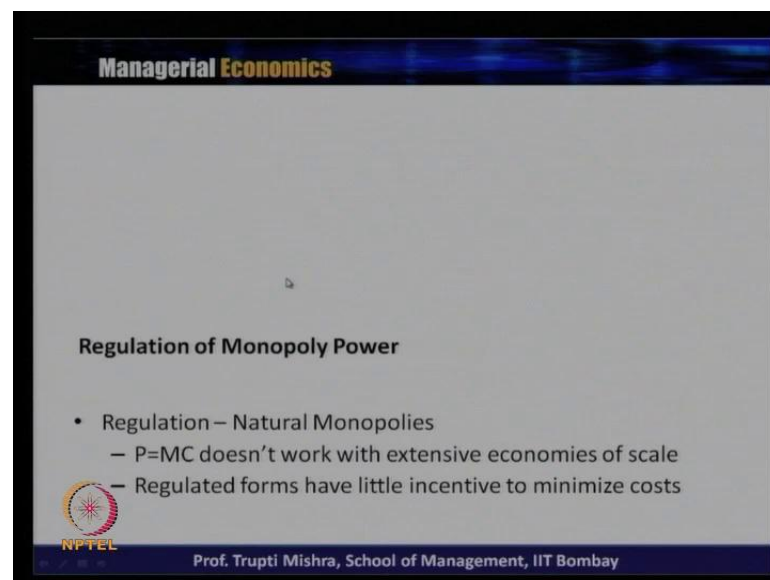
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So, now if the price is lowered, so this is the  $P_M$  is the price of monopoly price,  $P_1$  is the ceiling price. When price is lower to  $P_C$  at the point, where marginal cost intersect the average revenue, and marginal cost intersect the average revenue here corresponding to we get a price; that is  $P_C$ , and output increase to its maximum that is  $Q_C$ . This is the

output that would be produced by the competitive industry, because this level of output is generally through the competitive industry, and competitive industry is one, where you follow the, when we find out what is the equilibrium price and quantity. We follow a principle where  $P$  is equal to  $M C$ , and at this point  $P$  is equal to  $M C$ , corresponding to the that we get the  $Q C$  level of output, and we get the price which is  $P C$ ; that is our, we can alternately call it as a  $P 2$ . Lowering the price further, that is  $P 3$ , it reduces the output to  $Q 3$  and causes a shortage. So, again if you reduces the price to  $P 3$ ; that will cause a shortage to the shortage, that is  $Q 3$  by  $Q 3$  dash, and marginal revenue curve when price is regulated to be no higher than  $P 1$ .

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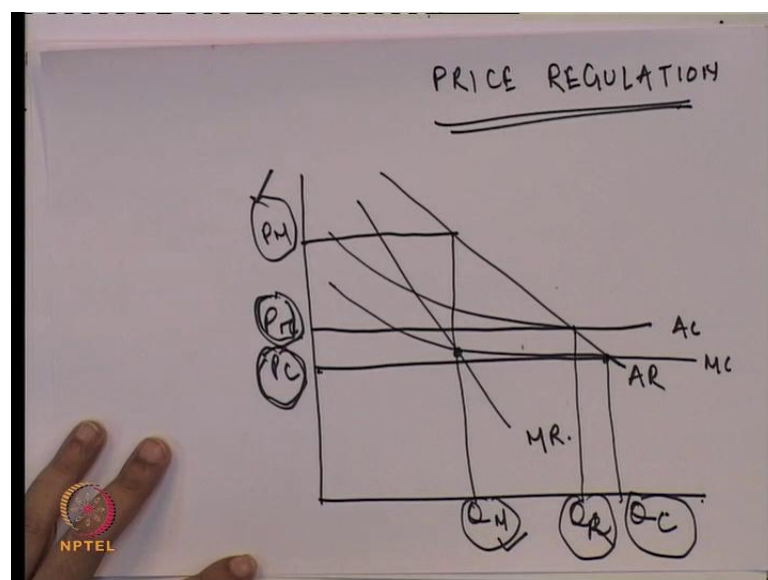


Now, what is the regulation over here, if you look at, the regulation here is that, when we are going on decreasing the price, when we are going on decreasing the price; one is monopoly price, then the sealing price is impose that again increase the output level from  $Q M$  to  $Q 1$ , and the price is from  $P M$  to  $P 1$ . But the ideal is still there is some amount of the gap between the competitive price and the sealing price. So, still that amount of deadweight loss is still there with the monopoly. If the price reduces below this competitive price, generally this reduces the output to  $Q 3$  and causes a shortage; that is  $Q 3$  by  $Q 3$  dash. So, this is again not profitable for the monopolist through regulation, if you are reducing the price which is even lower than the competitive price. So, here regulation works in the form of a sealing price; that somehow increases the output, beyond the monopoly output and reduces the price below the monopoly price. So, that

somehow, some amount of the deadweight loss can be control through the regulation. Now, we will see how the regulation work in case of a natural monopoly, and what is natural monopoly here.

Natural monopoly is here, where the one firm generally they have generated a economies of scale, and they are producing in such a cost effective manner or at a lower a average cost of production; that reduces the scope for the other firms to enter into the market and operate. So, regulation, when it comes to regulation in the case of the natural monopolies, generally this P M C does not work with the extensive economies of scale, so regulated firms of very little incentive to minimize the cost. Now what is this P by M C, P by M C whenever. P is equal to M C, whenever we talk about this; this is the case of a competitive economy. So, since, when it comes to regulation in the natural monopoly, this P is equal to M C does not work with the extensive economies of scale, and natural monopoly is a market, where there is more economies of scale, and that generally creates a barrier for the other firms to enter. But when it comes to regulation, still regulated firms are very little incentive to minimize the cost, and but when your incentive to minimize the cost, at least some amount of the output can be controlled, when it comes to the regulation.

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So, next we will see how the regulation work in case, or how the price regulation in case of the natural monopoly, and whether it affect the deadweight loss, or whether it also

reduces the social cost of the production. So, we have average revenue curve, we have marginal revenue curve, then we have average cost. And why the shape of average cost is like this, because this is a case of natural monopoly and the firm is operating at the lower average cost, and we have marginal cost. Corresponding to this point; that is  $M C$  and  $M R$ , we get the quantity and price. So, price is  $P M$ , quantity is  $Q M$ . And what is the sealing price here, if you want to make it some, if you want to make or if the policy wants to do some regulation with that, then support a price where  $P$  is equal to  $A C$ , or  $A R$  is equal to  $A C$ . And if you do this, then we get a price; that is  $P R$  that is the regulated price.

And what is our competitive price; competitive price is that point, where  $A R$  is equal to  $M C$ . So,  $A R$  is equal to  $M C$  is perfectly competitive price. So, we have three level of output, three level of price; we have monopoly output, we have regulated output, and we have competitive output, we have a monopoly price, we have a regulatory price, and we have competitive price. So, if it is unregulated if there is no regulation, then the monopolist should produce  $Q M$  and charge  $P M$ , if the price were to regulate and be the price that is the firm would lose money and go out of the business, cannot cover the average cost. So, if you can ask the monopoly to produce at the price,  $P C$  which is competitive price, and produce the level  $Q C$ . Generally monopoly would go out of the business, because they will lose money, and it will not cover the average cost also.

So, as a regulator, generally the regulator will fix the price at  $P R$ , giving profit as large as possible without going out of the business, and that also reduces the deadweight loss associated with the monopoly. So, what is the motive behind this price regulation in case of natural monopoly? Even if the regulator is not forcing the monopolist to use the competitive price or competitive level of output, at least they are giving a regulated price, which is above the competitive price and below the monopoly price. And if the monopolist through regulation if they have to follow it, still they are getting some amount of profit; and they are not out of the business. And in other way it also control the deadweight lost and brings down or reduces down the, social cost associated with the monopoly power, or social cost associated with the monopolist profit.

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**Managerial Economics**

**Regulation of Monopoly Power**

- Difficulties in estimate the firm's cost and demand functions because they change with evolving market conditions - alternative pricing technique – **rate-of-return regulation** allows the firms to set a maximum price based on the expected rate or return that the firm will earn

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Now, what is the difficulty when it comes to regulation, till the time there is a good estimation of demand and cost; that generally helps in regulating the price. But there is always a difficulty in estimate the firms cost and demand function, because they change with evolving market condition. It is not that the cost and demand function is constant; generally they change with evolving the market condition. So, that leads to the need of a alternative pricing technique, and what is the alternative pricing technique. The rate of return regulation allows the firm to set a maximum price based on the expected rate of return; that the firm will earn.

So, the rate of return regulation is the alternative pricing technique, in order to capture the dynamics in the demand and cost function. And it allows the firm to set a maximum price based on the expected rate of return; that the firm will earn. So, here the firm is, they can do a prediction that what is the rate of return they will earn, once they fixed up the price at this level, and here the rate of return method generally the firm is allowed to choose a higher price which will give them the maximum profit. But here if you look at its still not the free of challenges, still there is challenges in this method also, this rate of return, but still it has emerged as a alternative pricing technique, looking into the change in the demand and cost function.

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**Managerial Economics**

**Regulation of Monopoly Power**

- Government may also set price caps based on firm's variable costs, past prices, and possibly inflation and productivity growth
- A firm is typically allowed to raise its price each year without approval from regulatory agency by amount equal to inflation minus expected productivity growth

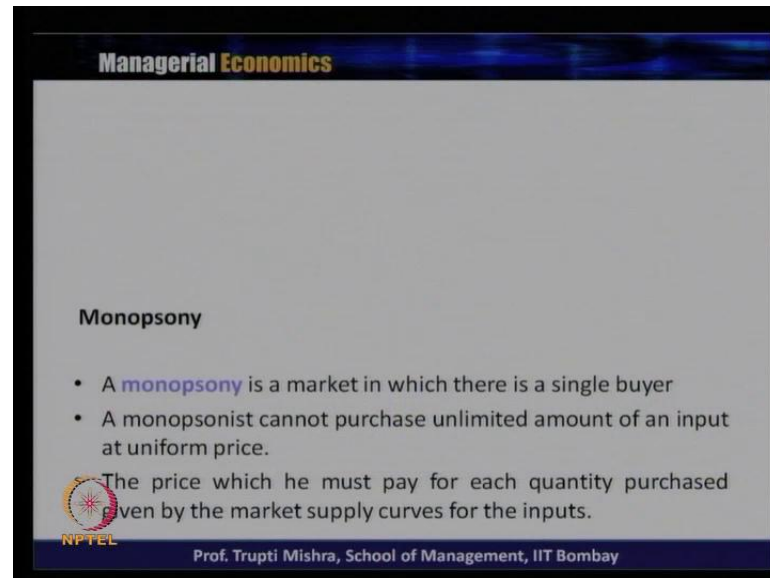
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So, apart from this rate of rate of return techniques, government can also setup a price cap; typically the sealing price, like we discussed just now, based on firms variable cost, past prices possible inflation and productivity growth. So, here when the government is setting a price cap or they are doing a price sealing. It is not may be on the basis of the competitive price or the monopoly price rather here, some other variable is taken into consideration; like what is the firms variable cost, like what is the average variable cost at what rate the scale of operation is increasing. Their previous what is the price records, the possible inflation and the productivity growth. And a firm is typically allowed to raise its price each year without the approval of regulatory agency, by amount equal to the inflation minus expected productivity growth.

So, even if the regulation is there still there is some amount of freedom to the firm, when it comes to increase in the price, and they can increase the price each year, with the approval from the regulatory agency, by amount equal to the inflation minus the expected productivity growth. So, the gap between the inflation and the expected productivity growth; that is the amount what they can raise through the increase in the price; that is each year, and for that they do not need the regulators' approval. Then we will start a new kind of market where it is. So, till now if you look at, it is about how many sellers or how many buyers. So, here we will specifically talk only about the more from the buyer perspective, because this is a market structure or this is a form of market,

which is a subset of the monopoly or kind of monopoly, where its market with a single buyer.

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The slide is titled "Managerial Economics" in a blue header. Below the title, the word "Monopsony" is written in bold. There are two bullet points: the first states that a monopsony is a market with a single buyer, and the second states that a monopsonist cannot purchase unlimited amounts of an input at a uniform price. A third line of text explains that the price paid for each quantity is determined by the market supply curves for the inputs. The slide includes the NPTEL logo and the name of the professor, Prof. Trupti Mishra, from the School of Management at IIT Bombay.

**Managerial Economics**

**Monopsony**

- A **monopsony** is a market in which there is a single buyer
- A monopsonist cannot purchase unlimited amount of an input at uniform price.

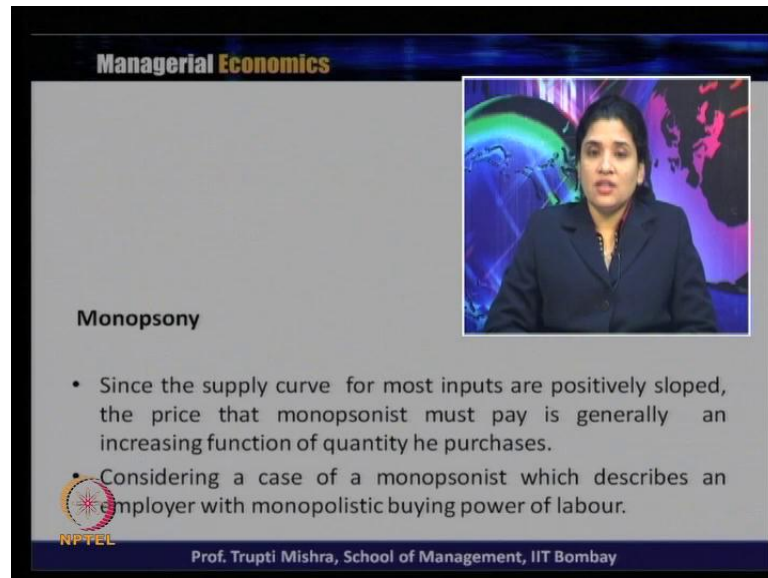
The price which he must pay for each quantity purchased given by the market supply curves for the inputs.

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So, till the time we have the understanding that monopoly is the market, where there is only single seller, but monopsony is a market, in which there is a single buyer, and a monopsonist cannot purchase unlimited amount of an input at uniform price, even if it is the single buyer. And here the monopsony market is more into the input pricing rather than the product pricing, and this monopsony; the evidence of monopsony can be found more in the input market rather than the product market. So, this is a market, with a single buyer. It cannot purchase unlimited amount of an input in uniform price. The price which the monopsonist must pay each quantity purchase given by the market supply curve for the inputs.



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**Managerial Economics**

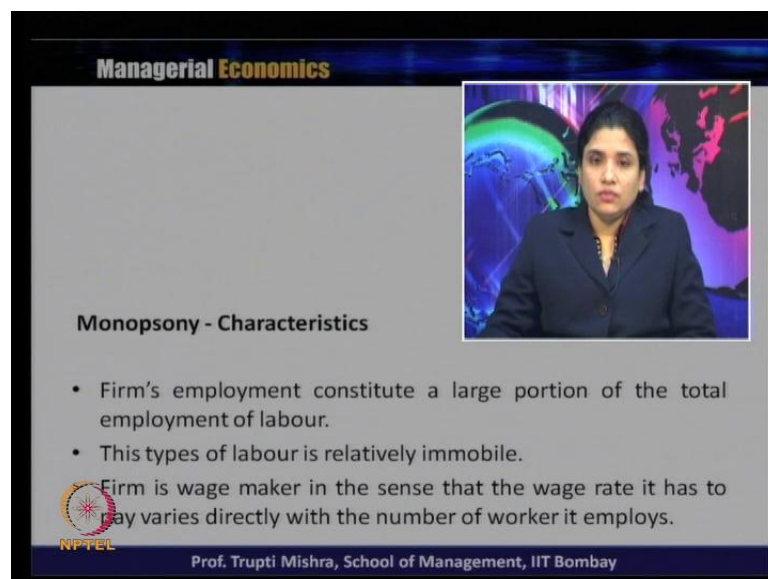
**Monopsony**

- Since the supply curve for most inputs are positively sloped, the price that monopsonist must pay is generally an increasing function of quantity he purchases.
- Considering a case of a monopsonist which describes an employer with monopolistic buying power of labour.

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So, whatever the price he pays for each quantity, it has to be the market, on the basis of the market supply curve for the inputs. And since, the market supply curves for the most inputs are positively slope. The price that monopsonist must pay is generally an increasing function of quantity he purchase. So, since the supply curve is positively slope, the price what he is paying that is also an increasing function of quantity he purchases. And generally, we take a case of the monopsonist, which describe an employer with a monopolist buying power of the labor.

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**Managerial Economics**

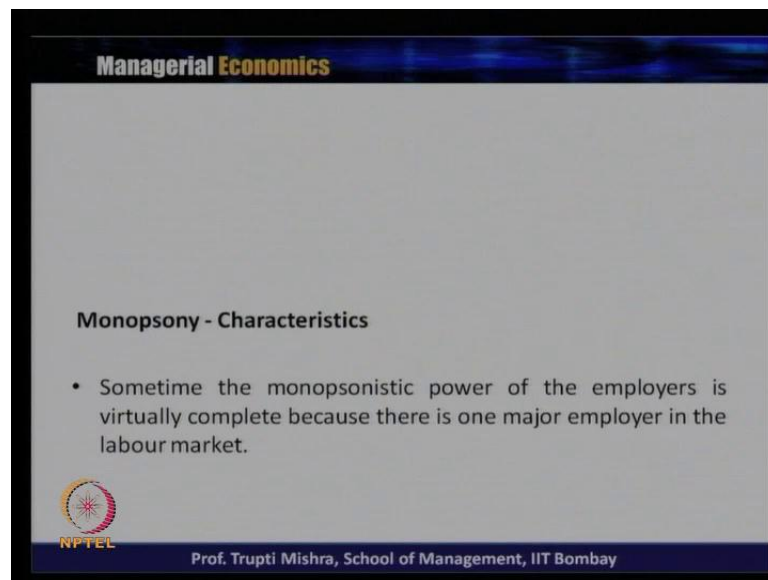
**Monopsony - Characteristics**

- Firm's employment constitute a large portion of the total employment of labour.
- This types of labour is relatively immobile.
- Firm is wage maker in the sense that the wage rate it has to pay varies directly with the number of worker it employs.

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So, here the firm's employment constitutes a large portion of the total employment of labor, and we assume that, that this type of labor is relatively immobile. Firm is the wage maker in the sense that wage rate it has to pay very directly with the number of worker its employ. So, they are not the wage taker, they are the wage maker, and whatever the wage rate they are paying to the labor; that generally varies with the number of worker its employ. And the employment constitutes a large portion of the total employment of the labor, then only they can influence it. So, even if they are the single buyer, at least their capturing majority share of the labor market, then only they can consider as the single buyer or they can consider as the monopsonist.

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So, sometimes this monopsonic power of the employee is virtually complete, because there is one major employer in the labor market. And in this case, they generally enjoy the maximum monopsonic power, because they are the single buyer, or they are also capture in the majority market share of the typical input. So, suppose if you look at, we take an example that how generally this cost changes in case of a monopsony and how we get the equilibrium, in case of a monopsony market. We will just take a small example to understand this.

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**Managerial Economics**

**Monopsony -Equilibrium**

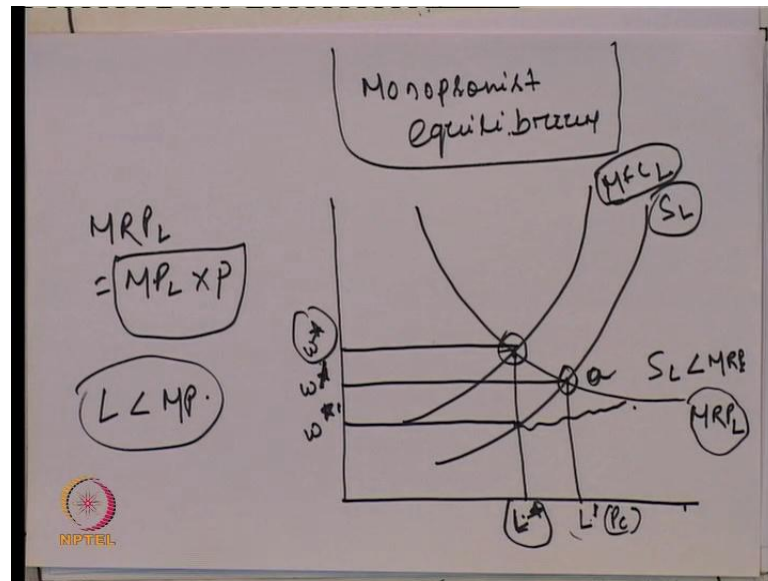
- Suppose the firm is using 3 units of labour at a wage rate of Rs 60 per head – total factor cost Rs 180 .
- If addition unit of labour is required, the firm has to pay a higher price for 4<sup>th</sup> unit, Rs 80 – which increases the total factor cost to Rs 320.

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Suppose a firm is using 3 units of labor at the wage rate of 60 per head, and how much total factor when they are hiring 3 unit of labor with a wage rate of 60; that comes to 180. If additional unit of labor is required, the firm has to pay higher price for forth unit; that is rupees eighty, because all the inputs or all the units of input cannot be charge in a single wage rate, and up to 3 units of wage rate, they are charging 60 per head, so the total factor cost is 180. When forth unit is required, he is charging 80, and it is not only 80 to the forth unit, also 80 to the rest of the units also, rests the units of labor; that increases the total cost from 20 each for each unit of labor, which increases the total factor cost to rupees 320, because this is now 80 rupees plus 4 unit. So, that comes to rupees 320, for the total factor cost.

Now, what is the marginal factor cost? The marginal factor cost if you look at here, it exceeds the price of labor, because price of labor is 60, and marginal factor cost at this stage is, from third unit to forth unit, is more than the price of the labor. So, now we will see how we take this example, with the help of this total factor cost, marginal factor cost with the graphical explanation, and how generally monopsony reach the equilibrium.

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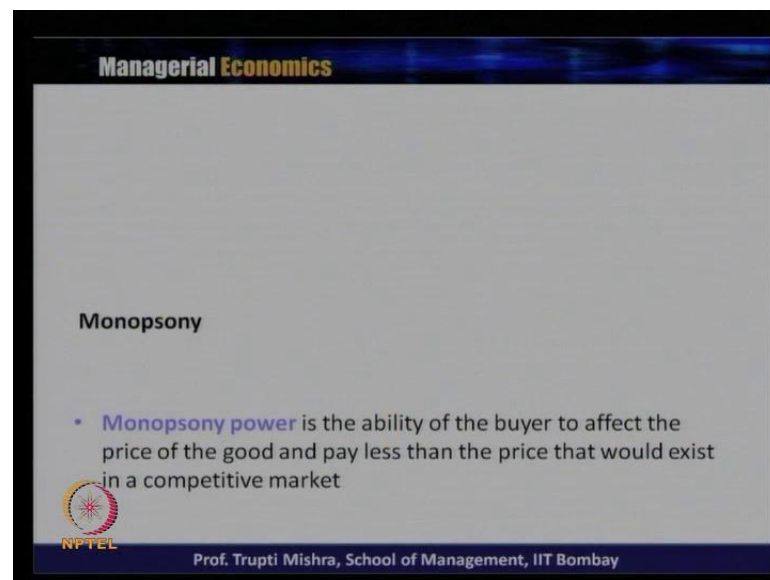
So, this is the marginal factor cost for labor, this is supply for labor, this is marginal revenue product for labor. Corresponding to this we get number of laborer, here we get another laborer; that is according to the perfect competitive. We get a wage rate; that is with respect to a; that is, this is w star, this is, yes this is w star, this is w dash, and this is w star. Now, what is marginal factor cost for labor here? This is each increase in the quantity of the factor, the firm use, because this is the marginal factor cost with respect to the labor. Now what is M R P L. M R P L is the demand curve for the labor, and how we get the marginal product for labor; that is M P L multiplied by price, that gives us the marginal revenue product for labor. Supply curve is the, supply curve for the labor. Now, what is the profit maximizing quantity? Profit maximizing quantity is the, intersection of the marginal revenue product and marginal factor cost for labor.

So, that gives us L star worker, and pay wage rate that is W star. Now, labor receives a wage, which is less than the marginal product. So, labor receives a wage, which is less than the marginal product, and how we find this equilibrium. We find this equilibrium through, this wage rate; that is w star, and labor that is L star. Now, what is this L dash? L dash is ideally, what is through perfect competitive, it is a case of a perfect competitive. Then the equilibrium can be found, with the help of supply of labor and demand for labor. So, corresponding to that we get a level that is a, which is w dash is the wage rate, and l dash is the amount of labor. So, if it is a case of a perfect competitive market, then ideally this should be the total amount of labor, and this should be the wage

rate. Any wage rate below this will generally bring the difference in the supply and demand for labor.

Then the supply of labor will be less, because this wage rate is not profitable or not beneficial from them, and that is the reason if you look at the supply of labor is less than demand for labor, if any wage rate below this. So, this can be called as  $w^*$  or simply  $W$ , which is the wage rate, which is less than the  $W^*$  which is the monopsonist wage rate, and this is the perfect competitive wage rate. Any wage rate below that, will generally brings down the labor supply, and there is a gap between the labor demand and labor supply. So, in case of monopsony equilibrium you find the equilibrium at this point, where  $MFC = L$ . Generally the marginal factor cost of labor is intersecting the marginal revenue product for the labor, and we get the output; that is,  $L^*$  is the labor output, and  $w^*$  is the wage that is given to them. And generally labor receives a wage, which is less than the marginal product for the labor. Now, we will see, what is the monopsony power, like the way we analyze, there is a market power for the monopolist, whether there is any market power for the monopsonist.

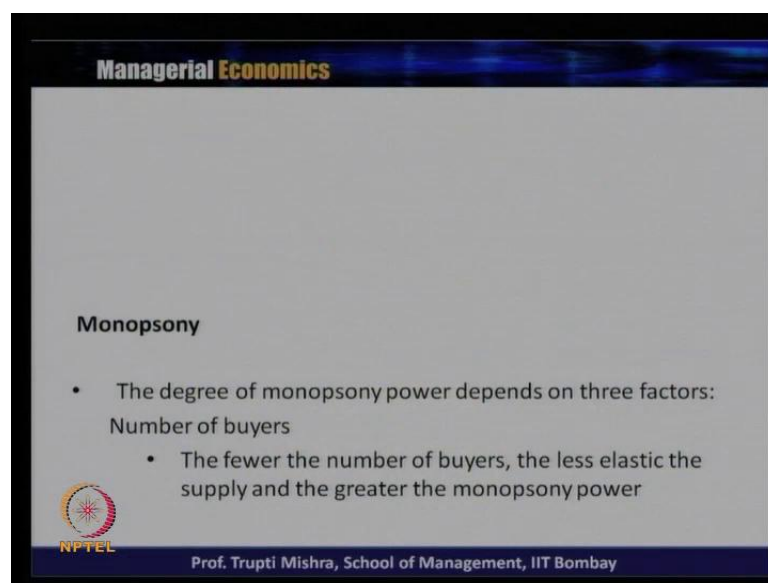
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So, monopsony power is the ability of the buyers to affect the price of the good, and pay less than the price that would exist in a competitive market. So, this is again a power to give a lower price, then whatever existing in the market. So, through this; and when this will happen? When suppose, you take a case of a place, where there is only one industry

existing, and they are considered to be the largest employer in this particular locality. So, whatever the price they are charging, the labor, they have to accept it, otherwise there is no other way out to get the employment. So, this is the case where the firm or where the plants they have a market share, because they can influence the price, and they can pay wage rate, which is lower than the existing wage rate in the market. So, monopsony power is the ability of the buyers to affect the price of the good, and pay less the price that would exist in a competitive market. Now, what are the factors on which the degree of monopsony power generally depends?


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**Managerial Economics**

**Monopsony**

- The degree of monopsony power depends on three factors:
  - Number of buyers
    - The fewer the number of buyers, the less elastic the supply and the greater the monopsony power


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First one is the number of buyers; the fewer the number of buyers, the less elastic the supply, and the greater is the monopsony power.

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**Managerial Economics**



**Degree of Monopsony Power**

Interaction Among Buyers

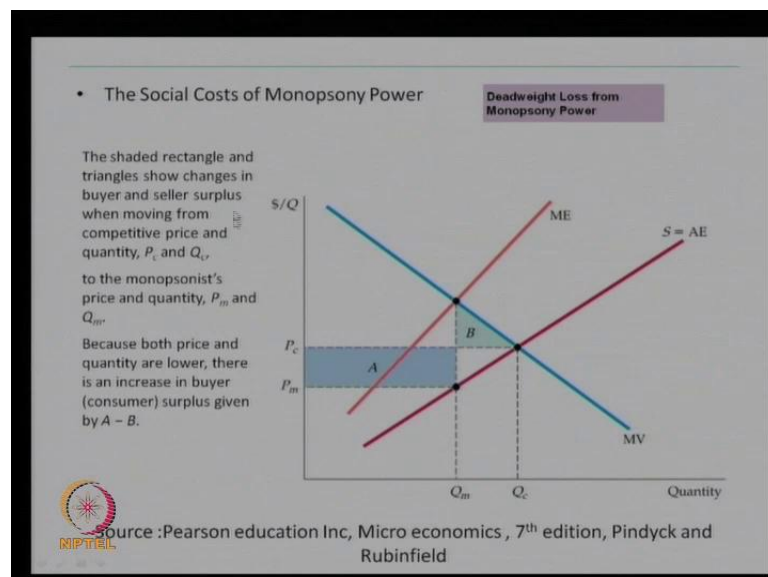
- The less the buyers compete, the greater the monopsony power

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Interaction among the buyers, the less the buyers compete, the greater the monopsony power. And elasticity of market supply extent to which the price is marked down, below the  $MV$ , depends upon the elasticity of supply facing buyer. And if the supply is very elastic mark down will be small. The more inelastic the supply, the more is the monopsony power.

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Now, if you look at what is the social cost of the monopoly power. Here if you look at, again we have one to understand the demand, another to understand the supply. Here if

you look at the shaded rectangle and the triangle shows, change in the buyers and sellers surplus, when moving from competitive price to the competitive price and quantity. So, this is what this triangle B is nothing but the change in the buyers and seller surplus, or we can call it this is the deadweight loss, because this neither goes to the buyers nor goes to the sellers. And why we get this amount, this triangle as the deadweight loss, because of the competitive price; that is P C and the Q C, to the monopsony price and quantity that is P M and Q M.

So, the difference between the P M; that is the monopolist price, and competitive price P C, and the quantity; that is quantity of monopsonist, and quantity of perfect competitive that gives us the deadweight loss, and because both price and quantity are lower, there is an increase in the buyer surplus given the amount A by B. So, some amount of buyer surplus is there, but still it is not going to the society, rather its coming to the as a deadweight loss, because part of its going to buyer, and some amount is still consider as the deadweight loss. So, what is the social cost of monopsony? The producer surplus fall by A plus C, and there is a deadweight loss given by the triangle B C, and it is more, if you look at it is not B is the deadweight loss, also the B plus C is the deadweight loss, because of the monopsony power.

So, we will continue our discussion on monopoly, few more kind of monopoly, like a typical example of bilateral monopoly. Then we will do a comparative assessment between the monopoly and perfect competition, and we will talk about a monopolistic form of a market, which is an ideal mix of both the perfect competitive market structure and monopoly, somewhere lie between the monopolist, monopoly market structure and the perfect competitive market structure in the next session.