Managerial Economics
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Lecture - 56
Monopoly (Contd…)

Now, we will now we will check what is the effect on the monopoly's equilibrium output, and price when there is a change in the cost of production. And the cost of production has two part one is fixed cost and second one is the variable cost of production. So, in case of increase in the fixed cost; if you look at there is no more change in the equilibrium position or there is no change in the equilibrium position at. Even if it is a short run because fixed cot fixed cost will not affect the marginal cost because it is not variable in nature.

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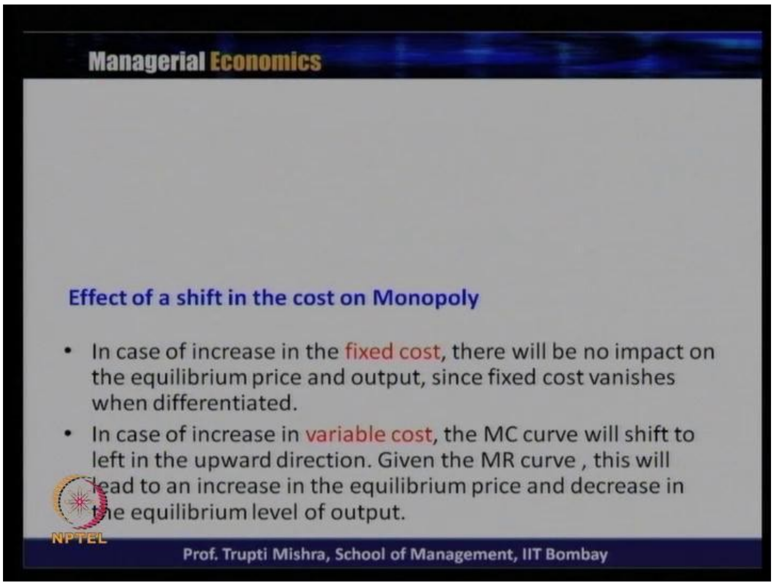

So, in case of increase in the fixed cost there will be no impact on the equilibrium price and output since fixed cost vanishes when differentiated. But in case of variable cost the marginal cost curve will shift to the left in upward direction and given the marginal revenue curve this will lead to an increase in the equilibrium price and decrease in equilibrium level of output. So, in case of variable cost generally the marginal cost curve will shift to the left that is in the upward direction, because increase in variable cost will also leads to change in the marginal cost curve. And that will shift to the left in the upward direction MR curve is given and this will lead to increase in the equilibrium price and decrease in the equilibrium level of output.

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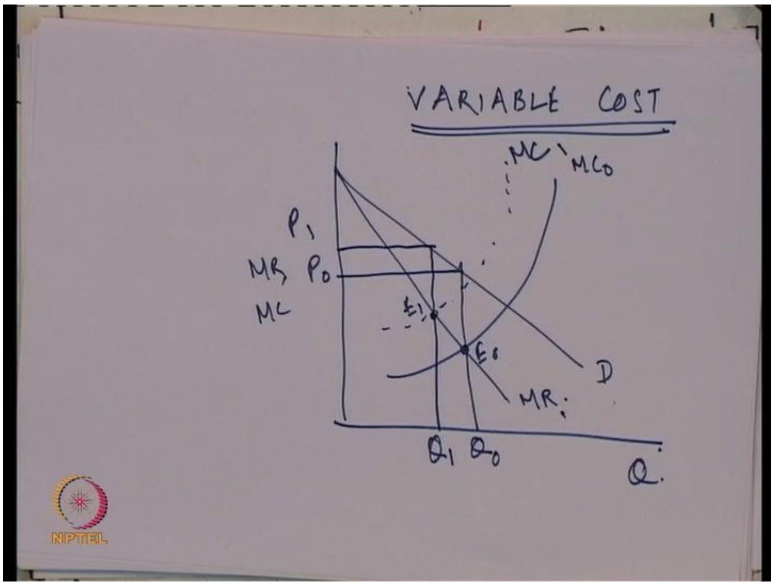

So, we will see graphically how this change in the variable cost is taken care of or how it generally disturb the equilibrium position? So, this is our demand function and corresponding to this we get the output level Q_0. Suppose and this is the price that is P_0.

Now, there is a here we are studying the impact of variable cost. What happens to, what happens to the equilibrium output and equilibrium price when there is a change or when there is a when there is a change or when there is a increase or decrease in the variable cost.

So, if there is a increase in the variable cost. Then that shift to the marginal cost to the left. That is MC_1 and corresponding to this MC_1we will get a new level of output Q_1 and new level of price that is P_1. So, how we can summarize the impact of variable cost if there is a there is a change in the variable cost? Or there is increase in the variable cost that the leads to the shift in the marginal cost curve in the upward direction. The firm get a new level of equilibrium corresponding to the new level of marginal cost curve and the initial marginal revenue curve. So, if this is E_0, then this is E_1 and corresponding to whatever the output level they are getting that is less than the previous level of output, and whatever the price they are getting that is more than the previous level of price. So, impact of variable cost can be summarized as whenever there is a increase in the variable cost. That reduces the equilibrium level of output and increases the equilibrium price if the monopolist firm.

Then we will look at the imposition of the tax. So, since it is a case of a monopoly firm it may not always possible that the entire tax burden is passed to the buyer because even it is a monopoly firm there is no close substitute. They have some, they have more strength than the buyers when it comes to price output decision on or when they are changing the price still the buyer has to buy the goods. Because there is no other substitute available. But when it comes to imposition of tax or when it comes to effect of tax; it is not that the entire tax is getting transfer in to the transfer in to the account of the consumer. So, we will check three kind of tax and we will see how the imposition of tax is effecting whom whether it is buyer or whether it is the seller.

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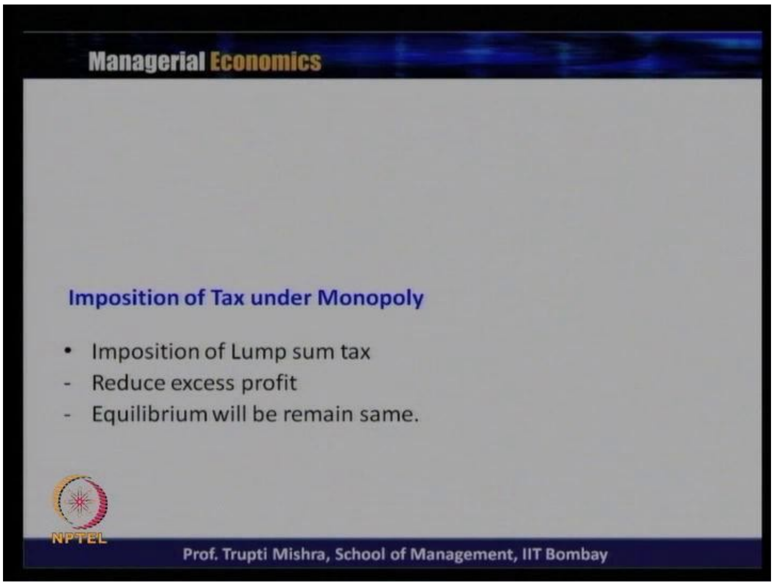

So, imposition of first in case of imposition of lump sum tax and as you know lump sum tax is generally fixed in nature and if it is fixed in nature; it will not affect much the equilibrium output and equilibrium equilibrium output and equilibrium price. So, it is like a effect of fixed cost and when the fixed cost increases because of imposition of lump sum tax. Generally that reduces the excess profit what the firm is getting. So, there is a reduction in the profit. Whenever there is aim position of the lump sum tax and the equilibrium will be remain same there will be no change in the equilibrium price and the equilibrium output.

Then, we take the second category of tax that is profit tax and profit tax if you look at it reduces again. It is a the nature is like the fixed cost and it reduces the abnormal profit. But the equilibrium in the market is not effected as long as the profit tax does not buy it into the normal profit of the monopolist. So, till the time it reduces the abnormal profit, but the equilibrium in the market is not effected till the time profit is not getting into the share of the normal profit. So, the thumb rule is till the time the tax amount is more than the less than the super normal profit; it will not affect the equilibrium position in case of lump sum tax.

And similarly, till the time this profit tax is not taking the share from the normal profit it will not affect the equilibrium position of the monopolist because once it is get into the. If you remember in case of long run also, the monopolist has to always get the normal profit get the normal profit because they are not ready to incur loss. So, if the profit tax is getting into the share of the normal profit and they are incurring into the loss they will always prefer to charge a higher price in order to cover up the effect of tax and that will disturb the equilibrium position.

So, till the time the profit tax is lower than the normal profit they will always it will not it will not affect the equilibrium position. But once it is more than that in case of profit tax or more than super normal profit in case of the lump sum tax. Generally the equilibrium position gets changed. So, there is a limit to which the equilibrium position will not change even if there is a change in there the imposition of the lump sum tax and the profit tax.

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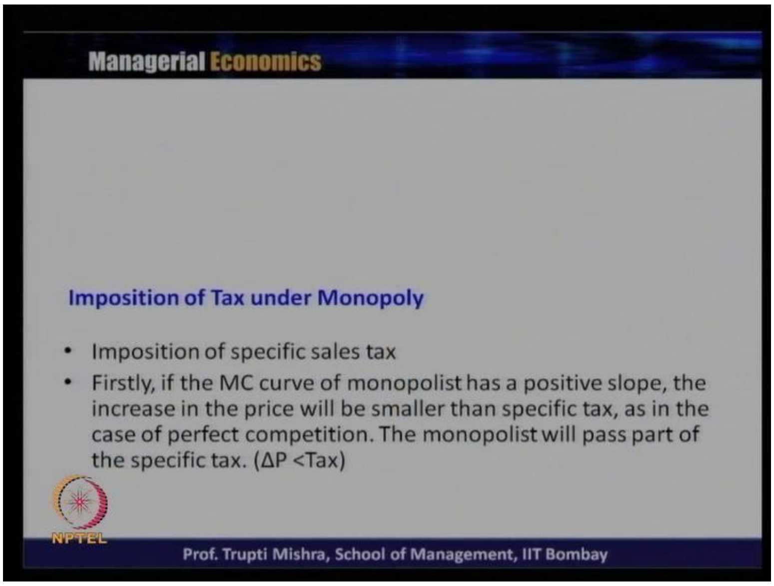

Then we will talk about the third category of tax. That is imposition of specific sales tax. Firstly, if the marginal cost curve of the monopolist has a positive slope. The increase in the price will be smaller than the specific tax and as in the case of perfect competition. But the monopolist will pass part of the specific tax. So, again if we look at the imposition of specific sales tax or the effect of tax again it depends upon that what is the what is the shape of the marginal cost curve. So, in this case if the same if the marginal cost curve is upward sloping. Then the price the increase in the price will be smaller than the specific tax and in this case only part of it is getting transfer it to the buyer rest all is paid by the firm.

So, if the marginal cost is upward sloping; the increase in the price is less than the total amount of specific tax and its generally happen in case of perfect competition also and the monopolist is just passing part of the specific tax to the part of specific tax to the buyers or the consumer and here the change in the price is less than the change in the tax that we will see graphically how this happens actually.

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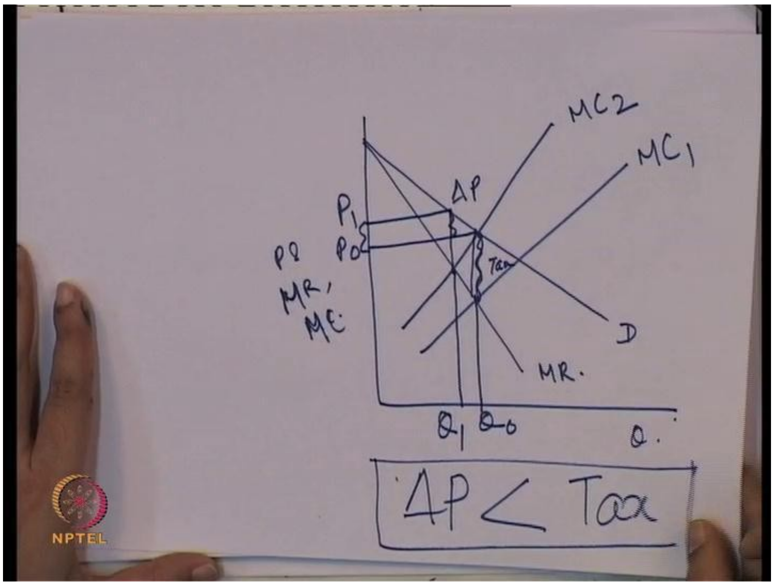

So, here we take the quantity; here we will take the price marginal revenue and marginal cost. This our demand curve, this is the marginal revenue curve. Here we need to assume that the marginal cost curve is having a upward slope. So, this is marginal cost curve 1. Now, there is a imposition of tax and imposition of tax will increase the marginal cost curve from MC_1 to MC_2. Now, what is the amount of tax? The amount of tax is this much and what is the change in the price because of this? So, this is one and this is the new price. So, this is Q_0 this is P_0 this isQ_1 this is P_1. So, this is the increase in the price and this is the total amount of tax this is the increase in the price.

So, if you look at the change in the price is less than tax and in this case we can say that the producer is just passing the the producer is just passing the part of this tax or part of the burden of tax to the consumer. Not the entire tax burden. Then we will check a another case where the marginal cost of monopolist is horizontal.

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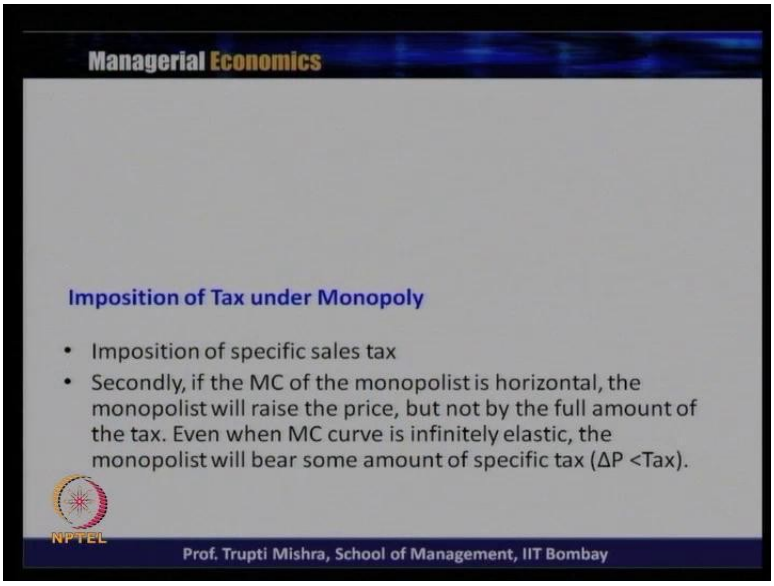
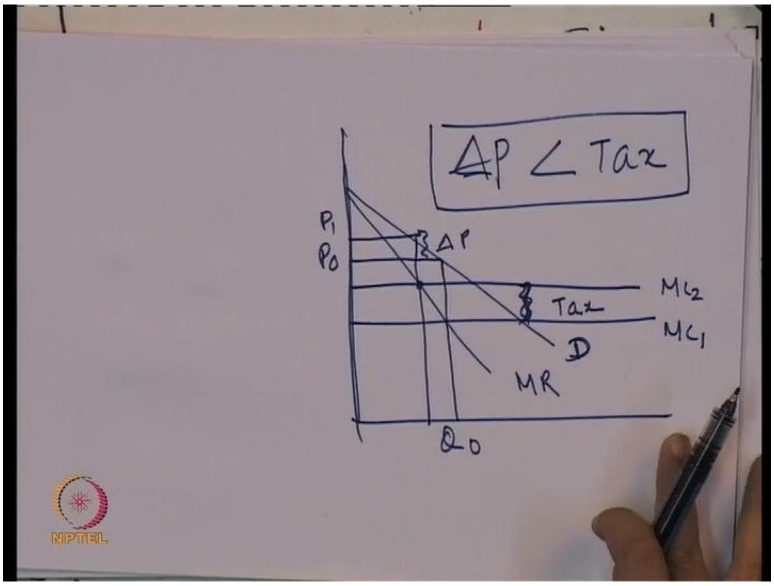


And if you look at this is parallel to X axis and the monopolist will raise the price, but not by the full amount of the tax. Even if the marginal cost curve is infinitely elastic; the monopolist will bear some amount of the specific tax and here again the change in the price is less than the tax. (Refer Slide Time: 41:20)



So, even if if we look at if MC curve is it is perfectly may be elastic or we can say if it a horizontal still the monopolist is not passing all the tax burden to the all the tax burden to the consumer still they are having a part of it. So, this our marginal cost curve 1. This our marginal cost curve 2. This is the total amount of tax the difference between the marginal cost 1 and marginal cost 2. This is the total amount of the tax. Now, this is the demand curve this is the marginal revenue curve.

Now, what is the difference here? The question we need to address that whether this this all the amount of the tax is getting transfer into the consumer in term of increase in the price. The answer is again no, Even if it is horizontal still the increase in the price is not covering the entire tax amount. But; obviously, here whatever the change in the price is more than the change in the price in the previous case, because if you look at since it is a case of case of horizontal marginal cost curve part of it is still taken care of the monopolist part of tax of amount is still bourn by the monopolist.

So, this is the first case this is the price and incase of second one that is MC 2 and MR this is the price. So, this is the change in the price, this is the change in the tax and still the change in the price is less than the tax amount which implies that part of it is always paid by the monopolist. Whatever may be the shape of the, whatever may be the shape of the marginal cost curve whether its horizontal, whether its upward sloping the part of the part of the tax is always paid by the monopolist.

So, if you remember in the previous class when we were discussing this case about the competitive firm its more about more dependent on the elasticity of supply. And what is how the how the elasticity of supply plays a role here? Because if elasticity of supply is more, the more part of the tax goes to the buyers and less by the competitive firm. And if elasticity is less if it is less elastic then more by the firm and less by the buyers. But here since we have a absence of the supply curve. We cannot analyze this with the help of the elasticity of supply and that is how we are just analyzing through it the shape of the marginal cost curve. And if you look at in the first case when marginal cost is upward slopping and when marginal cost is horizontal. In both the cases the part of it is always paid by the monopolist. The entire tax is not passed to the buyers whatever may be the shape of the marginal cost curve.

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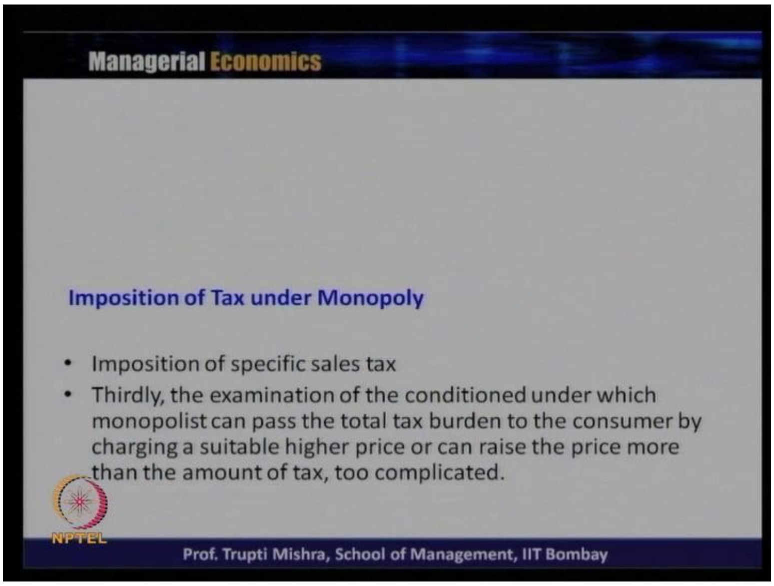

There is again there is a third third dimension to it the examination of the condition under which the monopolist can pass the total tax burden to the consumer by changing a suitable higher price or can raise the price more than the amount of tax is too complicated. So, till the time we have not attempted or may be none of the text book; you will find the evidence of this that in which case generally the monopolist pass the entire tax burden to the consumer. And how to represent that through the demand marginal revenue curve or the marginal cost curve? And how what should be the change in the price? How high it should be or how much how high it should be? That it is more than the tax amount and still it at least still it transfer the entire tax burden to the consumer.

So, that is too complicated, difficult different difficult to attempt here and again here there is one more case is that if it is higher price what is the monopolist even if they want to just pass the tax amount. And that is the reason they are charging a high price. There is one more point over here is that whenever they charge a high price it becomes the incentive for the new firm to enter and operate in the market and high price is always high in the high price. It is easy for the new entered firm to survive in the market and that leads to competition, and that kills monopoly and that is the reason the monopolist cannot charge a extremely high price which is more than tax amount and that is the reason they cannot transfer the entire tax burden to the consumer.

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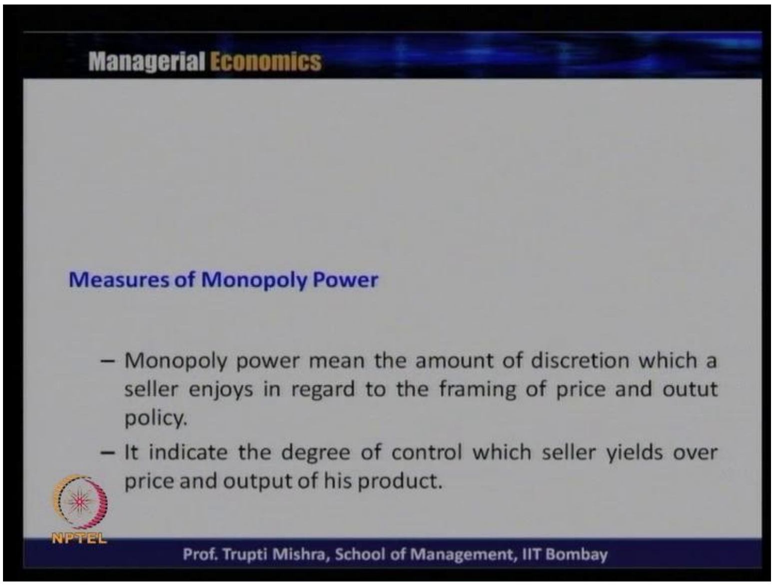

Then, we will look at the what how to measures the monopoly power and before that we will define what is the monopoly power. So, monopoly power means the amount of discretion which a seller enjoy in regard to framing the price and output policy. So, in a simple way we can say it indicate the degree of control which sellers yields over the price and output his product because incase of perfect competitive market. If you look at the firms are price taker they are not the price maker. But in case of monopolist firm there are the price maker because it is a single product sole seller. So, they generally decides what is the price and the here typically the market power comes into picture, because the seller has the monopoly power or the seller has the market power to fix the price or to decide how much output they are going to produce which is not possible in case of a perfect competitive market structure. But incase because incase of perfect competitive market structure; the more there is no control because there are large number of buyers and seller there is no control of a specific seller or specific buyer or the specific seller or specific seller cannot influence the price and output decision of a firm or the industry.

So, basically it is a degree of control which a seller yield over the price and output of his product. There are different methods to measure the market power or the monopoly power.

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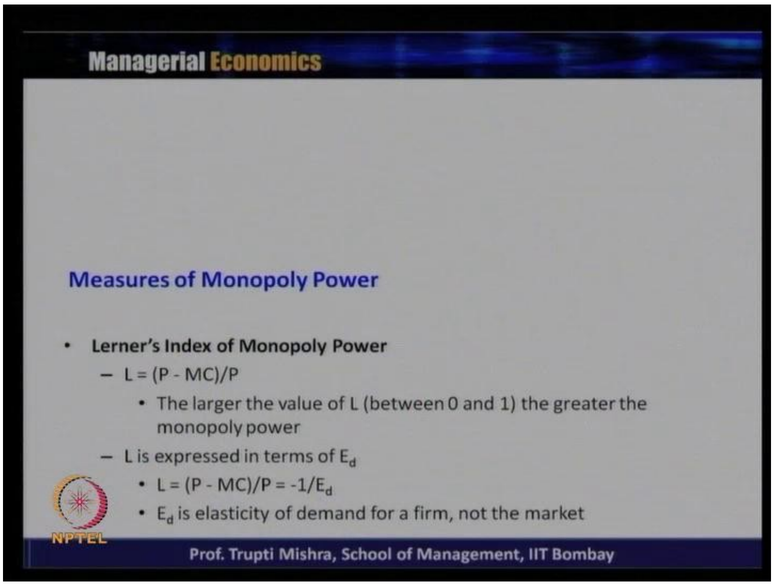

The first one is the Lerner's index of monopoly power and what is Lerner index of monopoly power here? Be the index of the value of index we find through the price and the marginal cost of the firm. So, the larger the value of L that is the larger the value of index the greater is the monopoly power and the range is between 0 to 1, 0 is on a lower side and one is on a higher side.

So, Lerner index of monopoly power can be calculated through the price price decided by the firm and the marginal cost from the cost of production of the firm. So, this is $L=\frac{P-MC}{P}$ P and the larger the value of L greater is the monopoly power. So, if it is one ideally it has to be the monopoly. If it is 0 then it is perfect competitive market structure. So, l is expressed in term of elasticity of demand. So, if you simplify this; this is $L=\frac{P-MC}{P}=\frac{-1}{E_d}$. And E d is the elasticity of demand for a firm. Not the market because ideally we are not discussing the market power of the industry as a whole rather we are talking about the market power of a specific firm.

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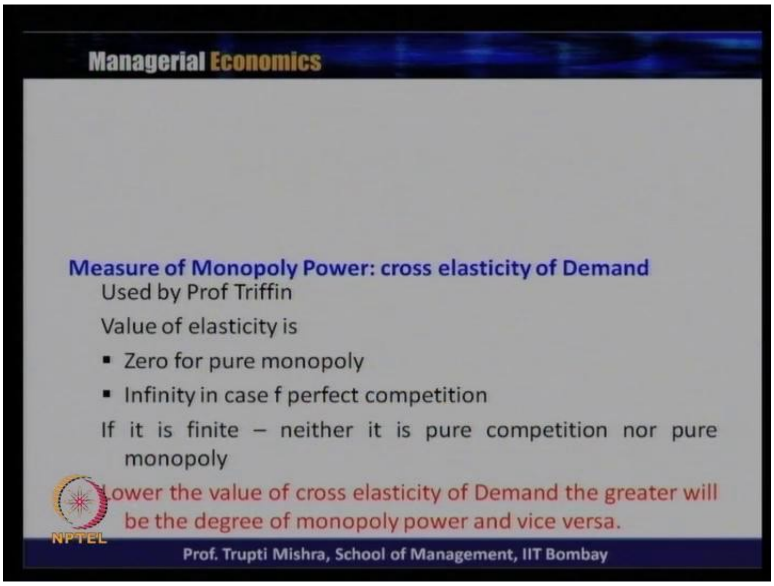

So, in in that case if it is in case of Lerner index its 0 for perfect competitive firm and one for a one for a monopoly. And in between this 0 and 1 there are number of other market structure whether we can take the case of oligopoly or the monopolistic. The second measure of monopoly power is cross elasticity of demand this used by professor Triffin and the here the value of elasticity is zero for a pure monopoly and infinity incase of perfect competition. So, if it is 0; then it is pure monopoly because the value of elasticity is 0 and if it is infinite it is a case of the perfect competition.

Here, cross elasticity of demand decides what is the major of monopoly power if cross elasticity of demand is 0. Means; obviously, there is no close substitute at all and if it is infinite then the all the all the all the products get produced in the market are close substitute to each other. If it is finite; neither it is a pure competition nor pure monopoly and so its its between this 2 extreme that is monopoly and perfect competition. Lower the value of cross elasticity of demand greater will be the degree of monopoly power and vice versa. So, lower the value of cross elasticity; greater the market market power. If it is 0; it is pure monopoly. More it is its more in the nature of perfect competitive market structure and market power is generally less.

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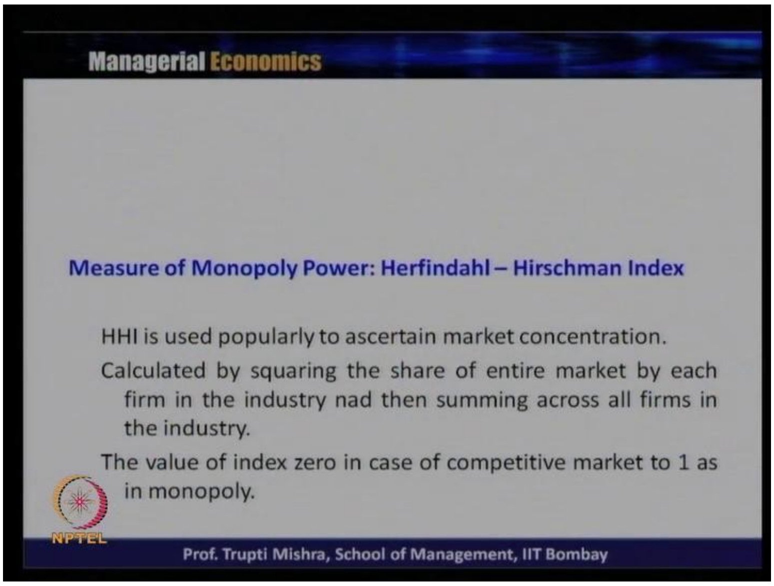

Then, we will take the third measure of monopoly power and third measure of monopoly power is popularly known as the HHI index. That is her find HHI man index and HHI is used popularly to ascend the market concentration. It calculated by squaring the share of entire market by each firm in the industry, and then summing across all firms in the industry the value of index 0 in case of competitive market to one in case of monopoly.

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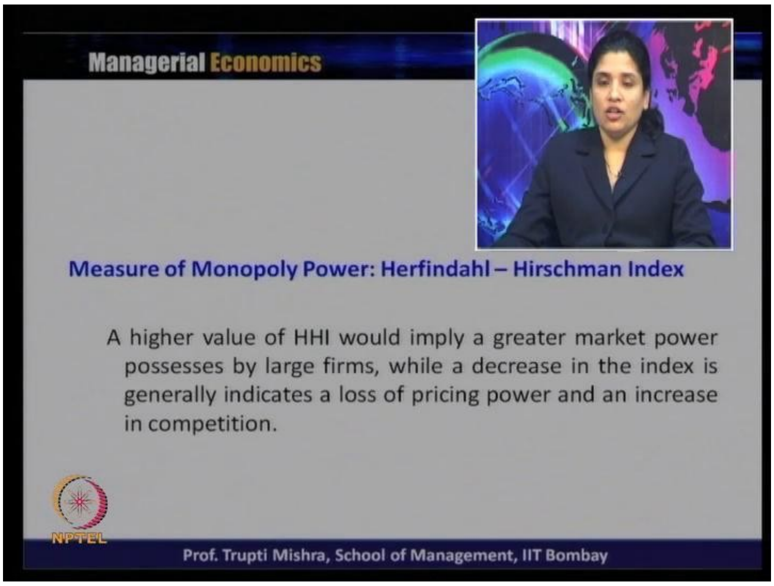

So, if it is no concentration at all; its monopoly if it is entirely concentrated, this is perfectly competitive higher value of HHI would imply a greater market power possess by large firm. While the decrease in the index is generally indicates a loss of pricing power and increase in the competition.

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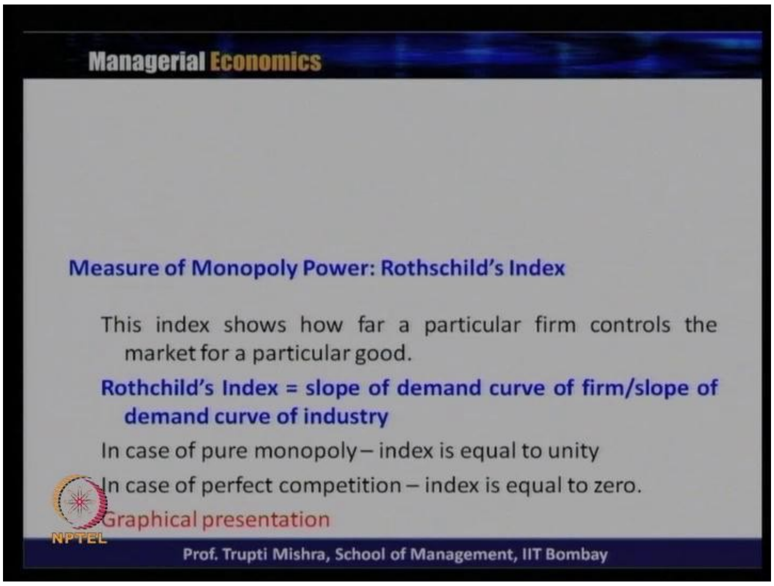

Then, we have one more index that is Rothschild's index to measure the monopoly power and here this index shows how far a particular firm control the market for a particular good. And how to find out this index this is the slope of the demand curve of firm and slope of the demand curve for the industry, and incase of pure monopoly index is equal to unity and in case of perfect competition index is equal to 0.

So, we talked about the Lerner index; we talk about this HHI. We talk about the cross elasticity of demand as a measure of monopoly power and we will continue the graphical presentation of this Rothschild's Rothschild index. In the next session, but before that if we can summarize, whatever we discussed today, we discussed about the supply curve of the monopolist and how it is absence in the monopoly market structure. Then we talked about the imposition of tax and imposition of the imposition of tax, different kind of tax. How it effects the equilibrium price. Then we talked about what happens when there is a change in the demand, when there is a change in the cost. How it effects the equilibrium price quantity of the monopolist firm.

Then we took a case of a multi plant monopolist where the entire output get produced in different plants and how the price output decisions are being made. So, we will continue our discussion on measurement of monopoly power. Then what is the social cost involved in the monopoly power. We talk about the monopsony. We talk about the bilateral monopoly, and we will do a comparative assessment between the perfect competitive market structure and monopoly in the next class.