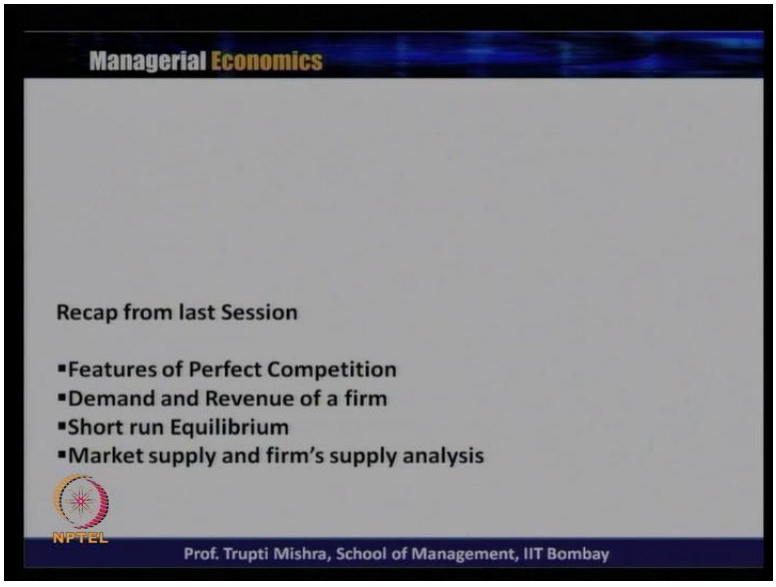
Managerial Economics
Prof. Trupti Mishra
S.J.M School of Management
Indian Institute of Technology, Bombay

Lecture - 26
Perfect Competition (Contd…)

We will continue our discussion on the first form of market that is on Perfect Competition. So, if you remember in the last session we are discussing about the this kind this type of market form that is perfect competition and this is one type of extreme as compared to the monopoly. So, in the last class we discussed about the different characteristic features of perfect competition.

(Refer Slide Time: 00:44)

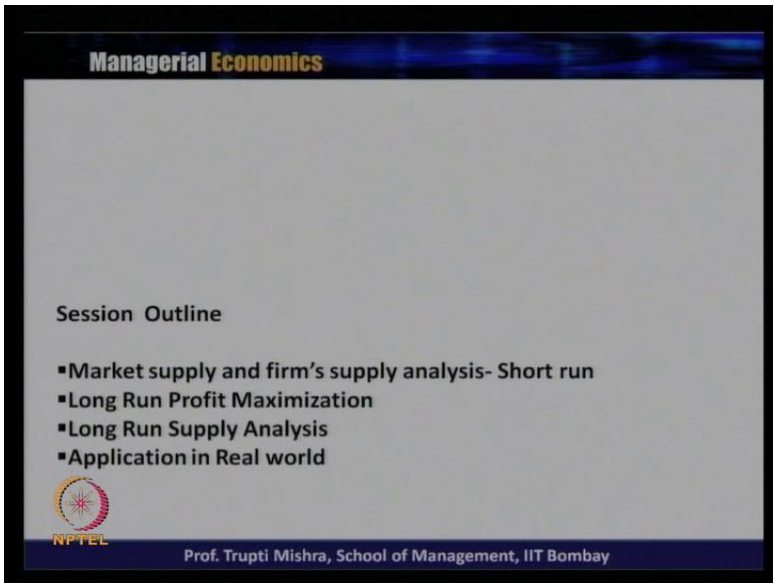


And how it makes as a perfect competitive market structure, then we talked about the demand and revenue of a firm competitive firm and demand and revenue for the industry. Then we talked about the profit maximizing condition that is two condition, one is necessary condition and second one is sufficient condition. Then taking this two profit maximizing condition, we analyzed the short run equilibrium in different situation like a super normal profit, normal profit and super normal loses.

And then we talked about the like, the subnormal profit, what generally the firm gets when they are getting into the shutdown operation, we checked the shutdown condition in which case generally the firm stops the production get out of the market, and when if

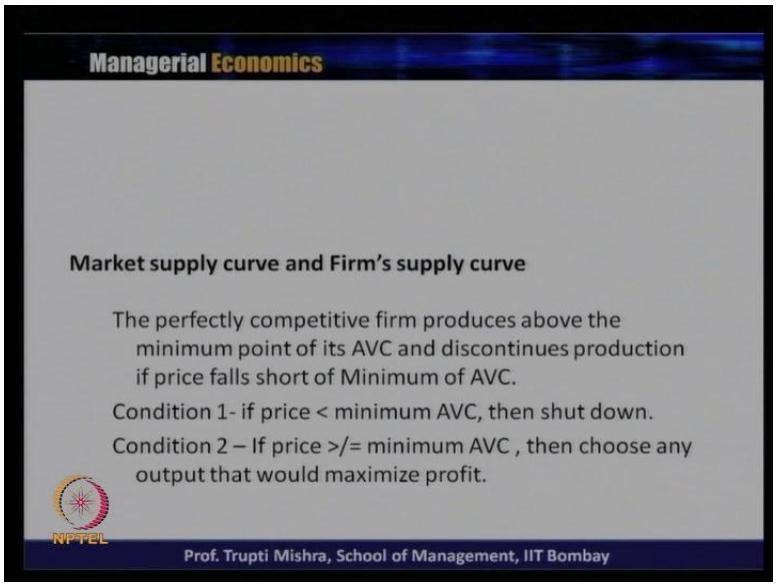
we look at in a typical market the manager has to take two decision either whether to produce, and whether to shutdown. So, we checked the in that context we checked the shutdown condition.

(Refer Slide Time: 01:56)



So, in today's session we will start our discussion with a supply, market supply and firm supply analysis in the short run. Then we will discussion the long run profit maximization, then will talk about the long run supply analysis, then we will see how what is the in what is the imposition of tax. Generally what is the effect of imposition of tax in the theory of typically in the perfect competitive market and then we will see whether there is a relevance of this perfect competitive market structure in the real world.

(Refer Slide Time: 02:54)

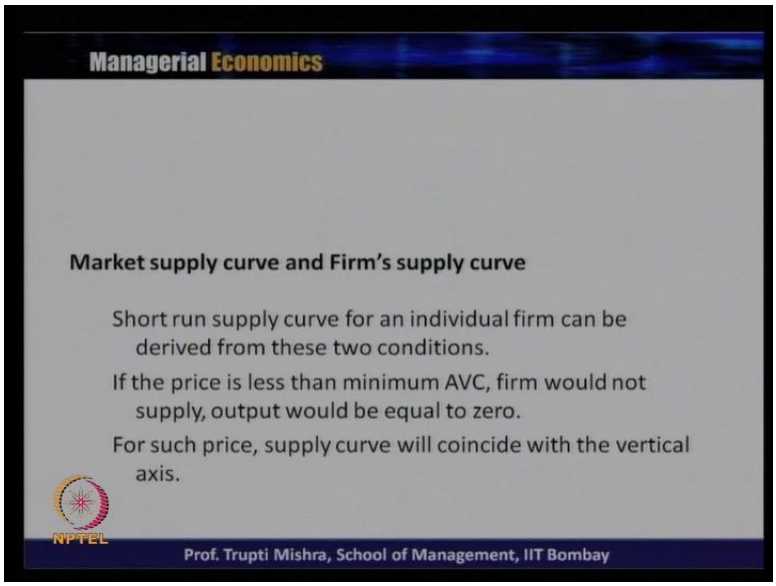


So, to start with the with the short run market supply if you remember we just we just stop our discussion on the in the last session on the shutdown condition. And what is a shutdown condition if the price goes below the minimum of AVC generally the firms shutdown the operation. So, that is the starting point to analyze the short run supply function in case of a perfect competitive market structure. The perfectly competitive firm produces above the minimum point of AVC, because any any level of output below the minimum point of AVC it brings ah there is no profit or no loss. May be it is not loss apart from profit it is not loss even they are not able to cover the variable cost also and discontinues the production if price falls short of minimum of AVC.

So, from this shutdown condition there are two condition immerge, one condition one if price is less than minimum of AVC, then shutdown, condition two if price is greater than or equal to minimum of AVC then choose any output that would maximize the profit. One is the first case is very clear, if it is less than minimum AVC then shutdown, second one if it is greater than or equal to minimum AVC then the firm should go for production.

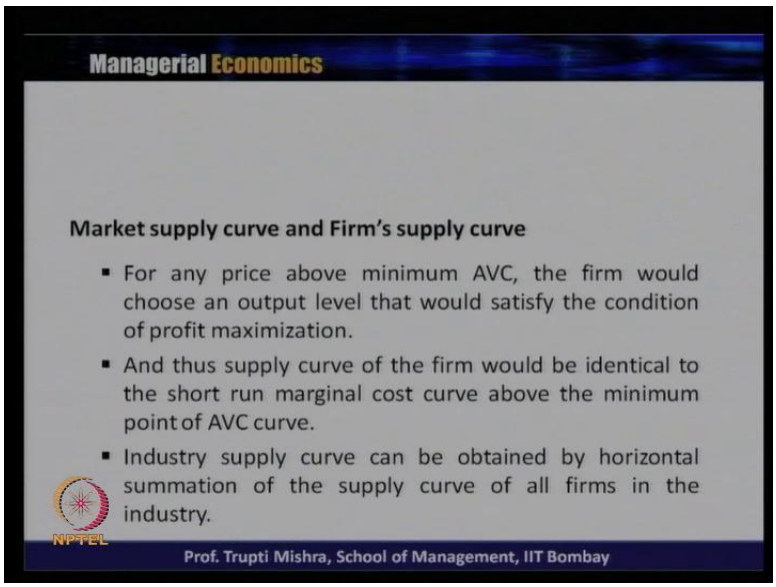
But, there again the he he has to take a call or the manager has to take a call, that what is the output level that would maximize the profit. And to get that level of output again the firm has to go to the profit maximizing condition taking both the both the first order and second order or the, so called necessary and sufficient condition to profit maximization.

(Refer Slide Time: 04:10)



So, short run supply curve for any individual firm can be derived from this two condition; that is condition one shut down, condition two produce the profit maximizing level of output. So, if price is less than minimum of AVC, firm would not supply output would be equal to zero. So, any level of price, which is less than minimum AVC firm would not supply. So, obviously, if it is shutdown, then output would be equal to zero for such price, supply curve will coincide with the vertical axis, because at this price if the output is zero the supply curve will coincide with the vertical axis.

(Refer Slide Time: 04:48)

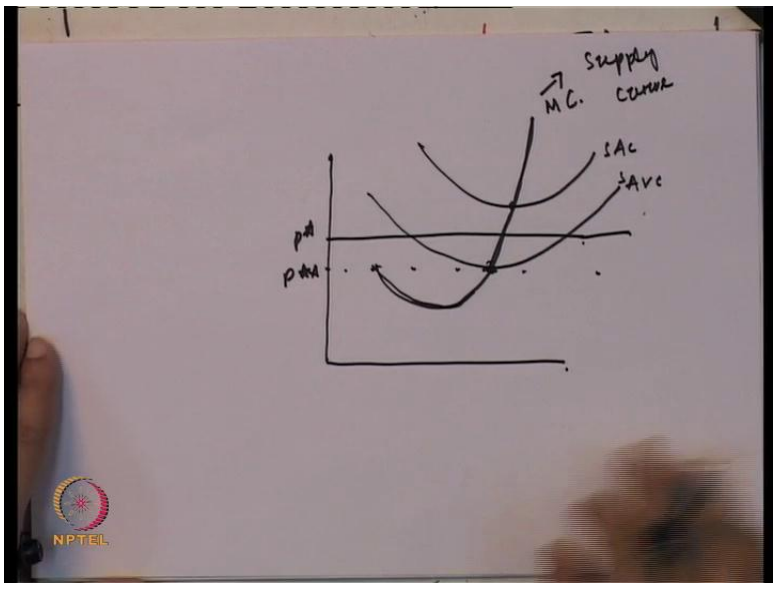


Whereas for any price above minimum of average variable cost the firm would choose an output level that would satisfy the condition of profit maximization. So, supply curve of the firm would be identical with the short run marginal cost curve above the minimum point of average variable cost. And industry supply curve can be obtained by horizontal summation of the supply curve for all the firms in the industry. So, the point here to note that any point in the minimum below the any point any price point below the minimum point of AVC there is a shut down.

So, we can start at a the starting point for the supply, because if the price is at that level then only the output will be produced and the supply will be given to the market. So, that is the starting point and that is why if we look at where AVC is minimum may be AVC is minimum at when its actually the marginal cost curve cuts the AVC at it is minimum point. That is the reason we consider the marginal cost of the marginal cost of the firm in the short run is the supply curve not the entire marginal cost curve, rather the that segment of the marginal cost curve which lies above the minimum point of average variable cost.

That serve as the short run supply curve in the in the perfect competitive market that is for the firm. And if you do a horizontal summation of all supply curve all individual supply curve for all competitive firm, then we reach to the market supply curve.

(Refer Slide Time: 06:20)

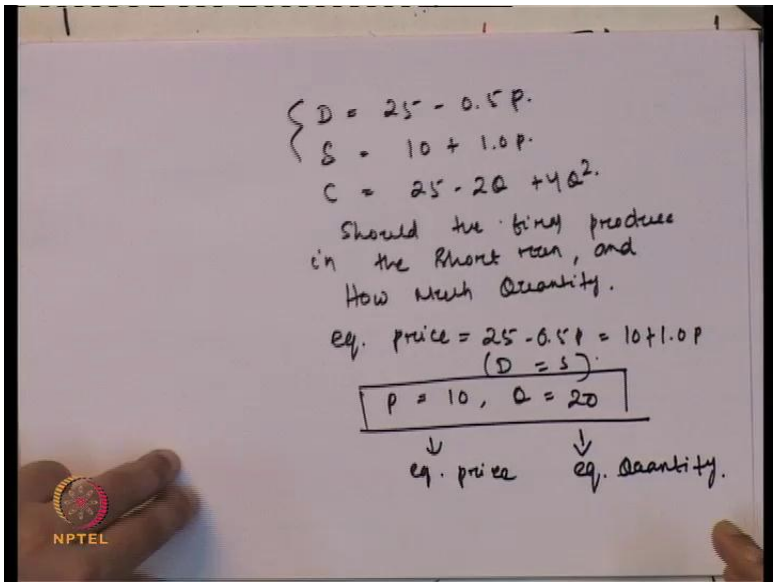


Let us see graphically how we reach to the market supply curve, this is how short run average cost curve this is our average variable cost short run average variable cost and its minimum point marginal cost curve will intersect. So, this is the corresponding to this, this is p star this is our equilibrium price that is p star. So, now how, to identify this supply curve, so p star is the price that is decided on the basis of the market price, any price if it is goes below this p star.

P star to double p star any price if it is goes below that, then the market or the sellers they will not supply in the market. And that is the reason if you look at this is the starting point of the supply curve and the segment marginal curve segment, which is lies above the minimum point of the average variable cost, that becomes the supply curve for the firm.

So, the short run supply curve is the that segment of the marginal cost curve which lies above the minimum point of average variable cost, because if you look at that is the starting point of the supply. If price goes below that generally the generally the supplier they are not supplying the product into the market. Now, we will just take a numerical example to understand in a typically when we take it into the real life case, when we have a cost function given, when we have a demand function given. How to identify what is the shut down condition or how to find out the price below, which the firm generally not supplying any product to the market.

(Refer Slide Time: 08:26)



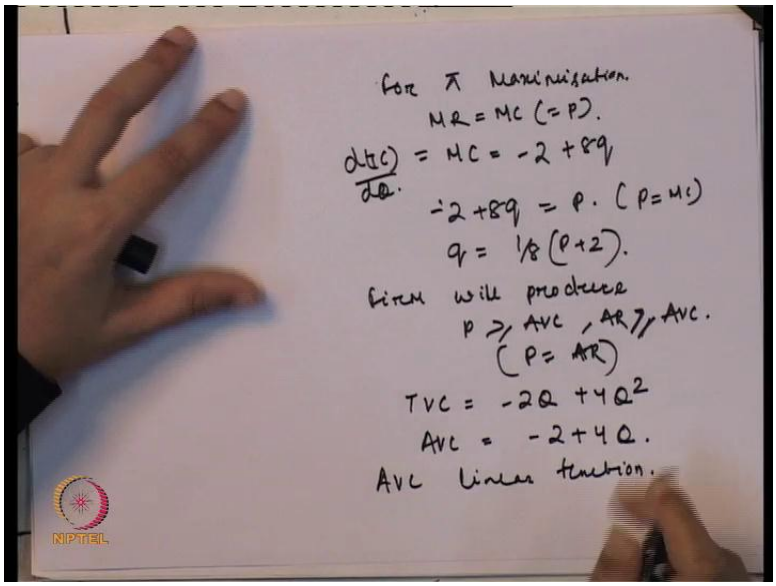
So, we will take the market demand curve that is we will take the market demand curve that is d that is equal to 25 minus 0.5 P and we will take the supply that is 10 plus 1.0 P. So, if we now and the cost function we will take as 25 minus 2 Q plus 4 Q square; now we need to find out should the firm produce in the short run and if they are producing in the short run, how much quantity they should produce.

Now, from the demand and supply function, we will try to find out what is the equilibrium price or what is the market clearing price, where the seller and buyer they will sell and buy whatever they would like to interested. So, the demand curve is 25 minus 0.5 P and the supply curve is 10 plus 1.0 P. So, this is typically the demand is equal to supply, if you solve this then we will get P is equal to 10 and Q is equal to 20.

So, p is equal to 10 is the equilibrium price and Q is equal to 20 is the equilibrium quantity or we can call it market clearing price and market marker quantity market clearing quantity. Now, what is the next task we have to do in order to find out the minimum point, the shut down point we need to find out the profit maximizing level of output. And how to find the profit maximizing level of output that is again through the profit maximizing condition, that is marginal revenue is equal to marginal cost. And the slope of the m c should be greater than the slope of the marginal revenue curve.

So, in the long run if you remember what is the equilibrium condition, the long run before going to the long run long run equilibrium condition is where where the long run average cost curve should be equal to the p, which is equal to m c. Taking the same thing in the short run, because if you look at m c is equal to m r, m r is also equal to p in case of the perfect competitive market structure. So, if it is m r is equal to m c we can also reframe that as a m c is equal to p, because m r and p is equal in case of a perfect competitive market structure.

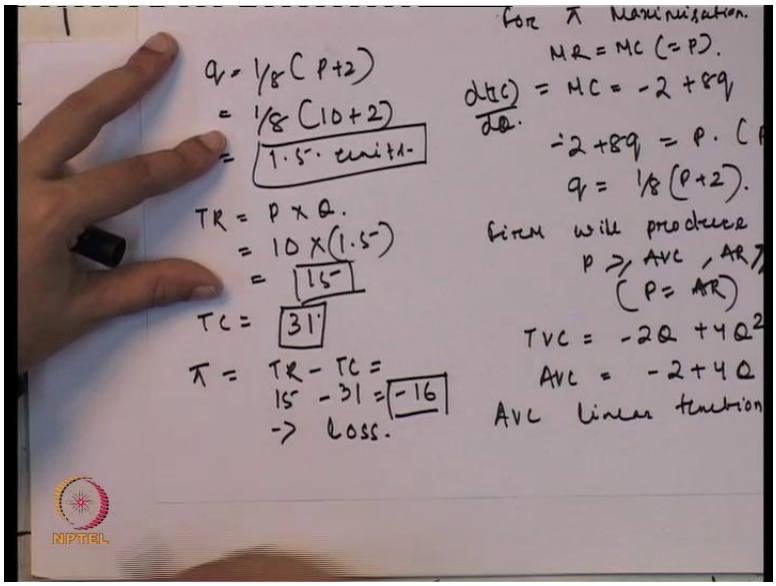
(Refer Slide Time: 11:20)



So, for profit maximization for profit maximization we know that marginal revenue is equal to marginal cost and which is also equal to p, so now what is marginal cost? Marginal cost is minus 2 plus 8 q that is may be how we get this m c we get this M C by taking the derivative of the total cost with respect to q, so minus 2 plus 8 q. Now, this minus 2 plus 8 q has to be equal to be the price as price is equal to marginal cost, now to solve it for q it will come 1 by 8 p plus 2.

Now, we know that firm will produce till the time P is greater than equal to average variable cost or we can say average revenue is greater than equal to average variable cost; as in case of perfect competitive marker structure P is equal to average revenue. So, to find that this P is equal to average revenue, this is how we say that if at any point of time. If A R is greater than equal to AVC or P is greater than equal to AVC firm will continue the production.

(Refer Slide Time: 12:52)

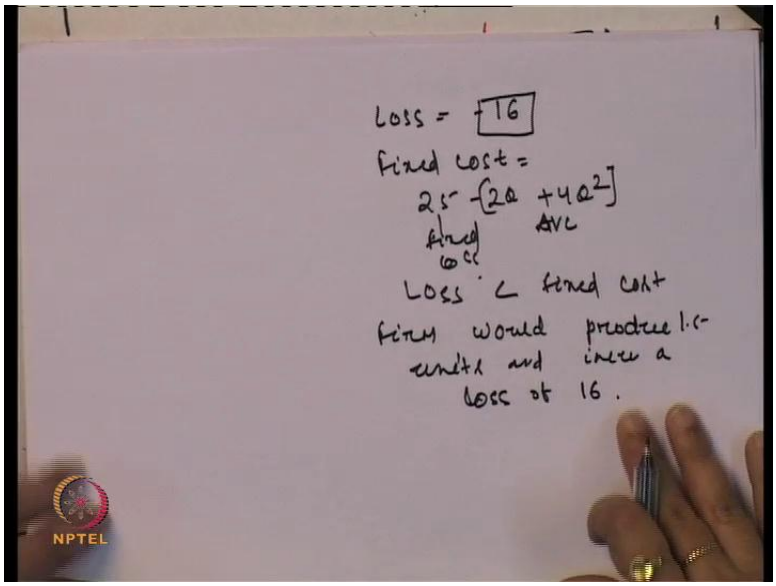


Now, we will find the T total variable cost total variable cost is minus 2 Q plus 4 Q square and through this we can find out the average variable cost and average variable cost is minus 2 plus 4 Q. So, as we know that AVC is a linear function and as it is a linear function it has no minimum. So, the firm would produce the quantity, which is Q is equal to 1 by 8 that is p plus 2. So, that is equal to if you simplify this again 1.8 p is equal to 10 as we have decided the equilibrium price that is 10 plus 2, so this comes to as a 1.5 units, so q is 1.5 units.

Now, what is total revenue total revenue is P multiplied by Q, so P multiplied by is P is equal to 10 q is multiplied by Q is 1.5. So, 10 multiplied by 1.5 it comes to 15, so Q is equal to 1.5 t total revenue is equal to 15. Similarly what is the total cost, total cost we have to put the value of q in the total cost and there we get the total cost is equal to 31.

Now, what is the profit here, profit should be ideally total revenue minus total cost and total revenue minus total cost if it is comes total revenue is 15 and total cost is 31, which is minus 16. So, this cannot be called as profit rather this is loss. So, in this case in this cost function ah if they are operation at a profit maximizing level that is P is equal to m c they are they are not getting the profit rather rather then that they are incurring loss.

(Refer Slide Time: 14:50)



So, now we know that the loss is equal to minus 16 or maybe we can say loss is equal to 16, now what is our fixed cost. So, if you remember you are if you remember your cost function cost function is 25 minus 2 Q plus 4 Q square. So, here this part is average variable cost this part is this part is variable cost and this part is fixed cost; so whatever the loss that is less than the fixed cost that is equal to 16.

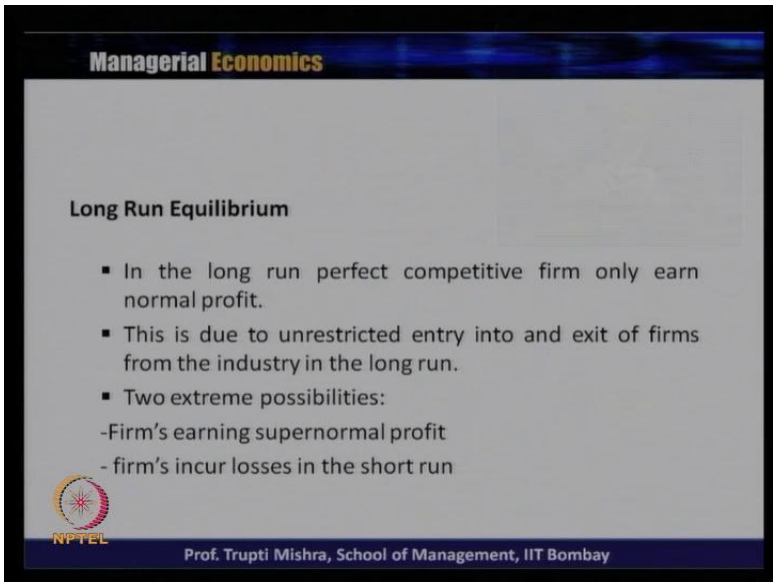
So, the firm what will the what is the thumb rule or what is the decision for the firm now, firm would produce 1.5 unit and incur a loss of 16. But the natural questions comes here that why they should why the firm should produce when they are getting a loss of 16 rupees. Because, if you remember the shut down condition, what we discussed till the time they are covering the variable cost they should produce, because it is still profitable for them, that they are not incurring fixed cost by shutting down the operation point one.

Point two is here if you look at the fixed cost is more than the loss. So, if they are incurring it if they are producing at least they are paying less or they are incurring less loss but if they are just shutting down they have to pay 25 rupees which is equal to the fixed cost. And point two is that since this is a short run of situation the possibility is that even if they are incurring loss now, at least if they are continuing the production, if they are continuing the operation.

At least in the when it goes to the long run scenario at least they will incur a normal profit or they will incur a super normal profit. And short run since the time period is

short always the producer would like to continue the production even if they are incurring the loss with the aspiration with a hope that they are going to at least get the profit at least in the long run. So, now next we will move to the long run equilibrium and how the short run is different from long run. Because, long run is the situation where all the inputs are variable and the output can be increased by changing all the input, there is no fixed cost in the long run.

(Refer Slide Time: 17:27)



So, in the long run the perfect competitive firm only earn the normal profit there is no case of loss, there is no case of supernormal profit. All the firms they earn normal profit in case of a perfect competitive firm, this is due to unrestricted entry into and exit of firms from the industry in the long run.

So, if you remember one of the characteristics, what we discussed in the case of characteristic of perfect competitive economy is the free entry and free exit. And this is the main source of source of this is the main point that why the perfect competitive firm earn the normal profit. Two extreme possibility generally it may happens we can discuss two extreme possibility and then from there we can lead to the fact that, why the firm only they earn the normal profit in the case of the long run.

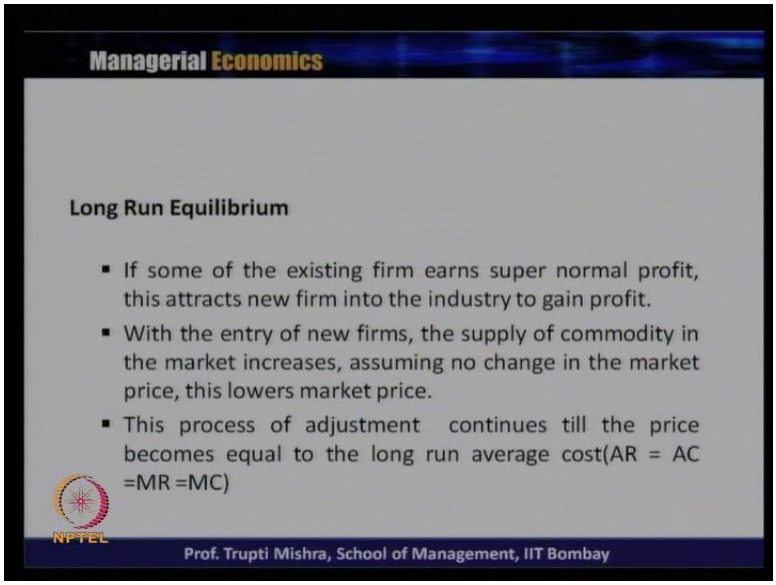
So, one firms earning supernormal profit and second firms incur losses in the short run, even the first case the firm is earning supernormal profit in the long run taking this as a

situation let us see how generally the firms handle a situation where where they just get the normal profit.

Assuming that if some of the firm they are just earning the supernormal profit in the short run. Now, what is the what will the outcome or what will be the consequence, supernormal profit some of the existing firms they are making profit in the supernormal profit in the market there is free entry. So, that will that will be the incentive for the few more firms to go and operate in the market, because it is profitable market and some of few of the firms they are getting profit over here.

New firm enter into the market there is no restriction and entry, supply increases, because they also go and produce the same product. Because, this is the market where the uniform product or the identity product gets produced, with the entry of new firm supply is of the market increases, we are assuming there is no change in the demand. Because, when the firms get profit that may not profitable for the buyers, so if buyers if it is not profitable may be they are not demanding more in the market.

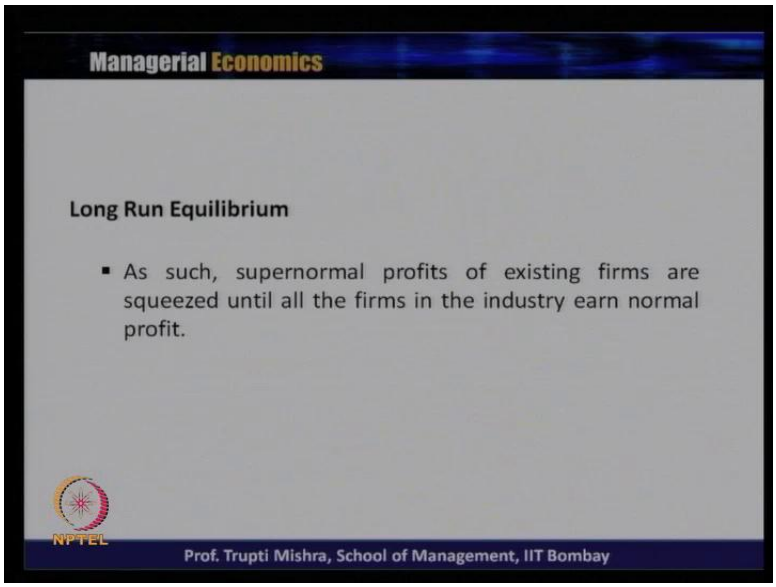
(Refer Slide Time: 20:04)



Existing firm earn supernormal profit, which attracts the new firms to enter into the market, new firm enter into the market, no change in the demand supply increases, this lower the market prices. Because, supply is more and demand is less, the process of adjustment continue till the time price equal to the long run average cost, that is average revenue is equal to average cost which is again equal to the marginal revenue and

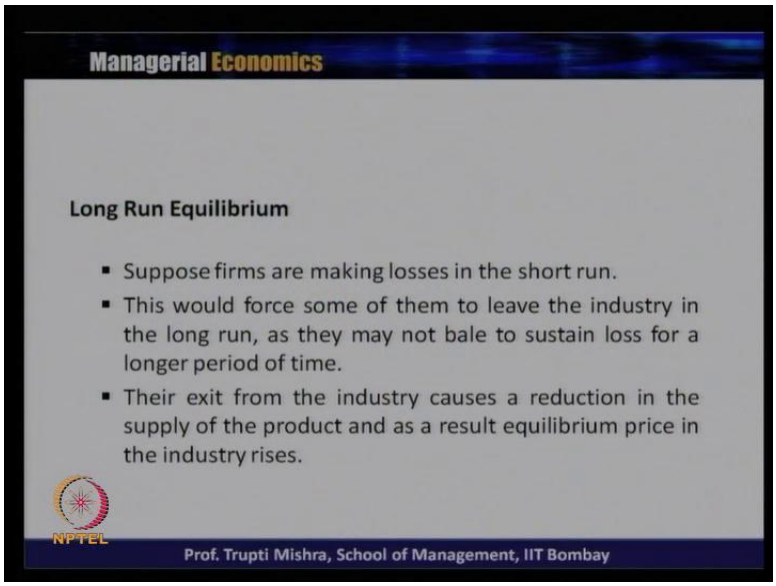
marginal cost. So, in this case it is the case of the normal profit where average revenue is equal to the average cost. So, the entry of the new firm will continue to come till the time at least all the firms they are not getting the normal profit in the market.

(Refer Slide Time: 20:33)



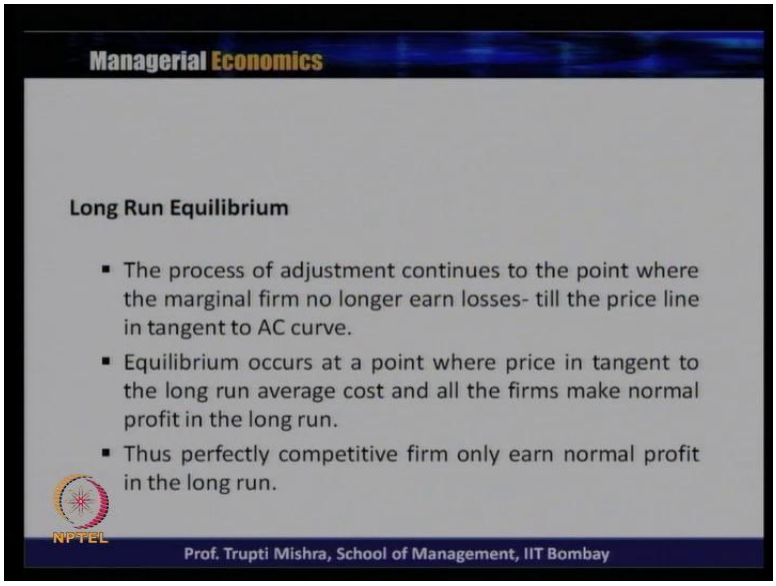
So, if you look at the supernormal profit of the exiting firms are as squished until all the firms in the industry earn the normal profit. Then we will take the second situation where some of the firm or may be existing firms, some of the existing firms they are getting or they are incurring loss. Now, what would be the outcome, since this is long run and they are all they are already incurring loss from the short run onwards.

(Refer Slide Time: 21:06)



This would force, few of the producer or few of the sellers to leave the industry in the longer run, because they are not they may not able to sustain loss for the long period of time. Their exit from the industry cause a reduction in the supply of the product and as a result equilibrium price in the industry increases. So, now there is a decrease in the supply demand remain constant the there is an increase in the equilibrium price of the industry.

(Refer Slide Time: 21:37)

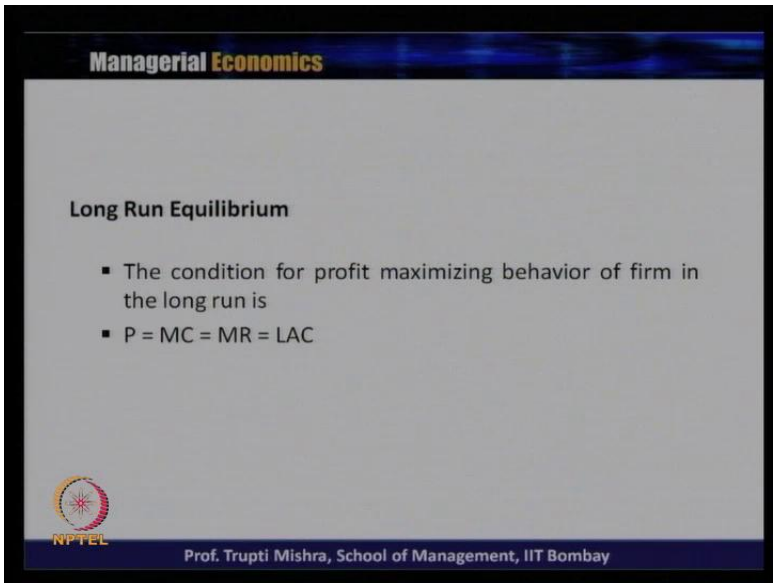


The process of adjustment again continue to the point where the marginal firm no longer earn losses or we can say till the time price, line is tangent to the average cost. So, the process or adjustment continued to the point, where the managerial firm, where the marginal firm no longer earn losses. And till the price the till the time, till the price line tangent to the average cost and if the price line is it tangent to the average cost that is how we get the normal profit. Equilibrium occurs at a point where price is tangent to the long run average cost and all the firms make normal profit in the long run.

So, equilibrium occurs at a point where price is tangent to the long run average cost curve and all the firm they just earn the normal profit. So, whether you take the case of supper normal profit, whether you take the case of the supernormal loss, this is not going to continue in the long run at least in the prefect competitive market structure, which has a significant future as free entry and free exit.

And because of that at the end of the day if you will find all perfectly competitive firm they are just getting the normal profit even, if they are getting a supernormal profit or the incurring loss. Generally that in a in a time period, generally they again come back to a situation where all the firm they are just getting the normal profit.

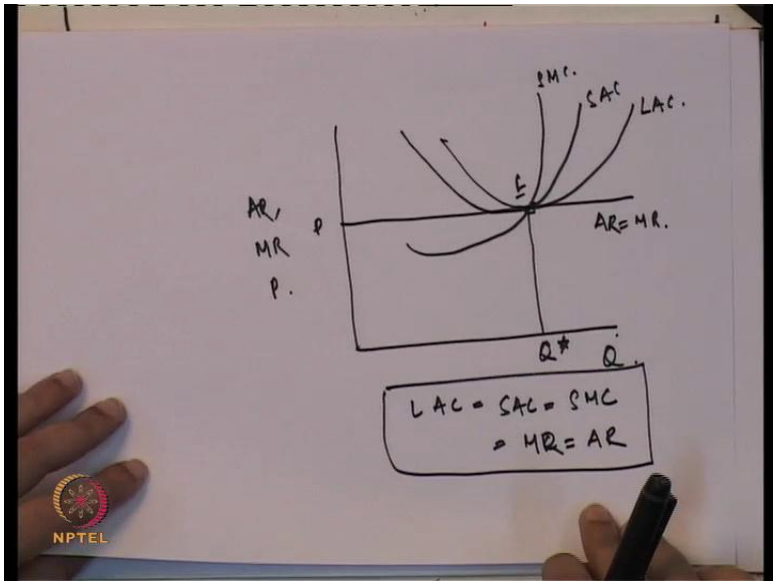
(Refer Slide Time: 22:59)



So, the condition from the profit maximizing behavior of the firm in the long run immerse from here, that is P is equal to marginal cost is equal marginal revenue, which is

equal to the long run average cost curve. So, we will just see the graphical representation that how graphically we can reach to a long run equilibrium.

(Refer Slide Time: 23:16)



This is P which is also equal to average revenue and marginal revenue, here we take the quantity where we take the average revenue marginal revenue and price. And this is the long run average cost curve, this is the short run average cost curve this is the short run marginal cost curve and this is the equilibrium point and this is the equilibrium level of output.

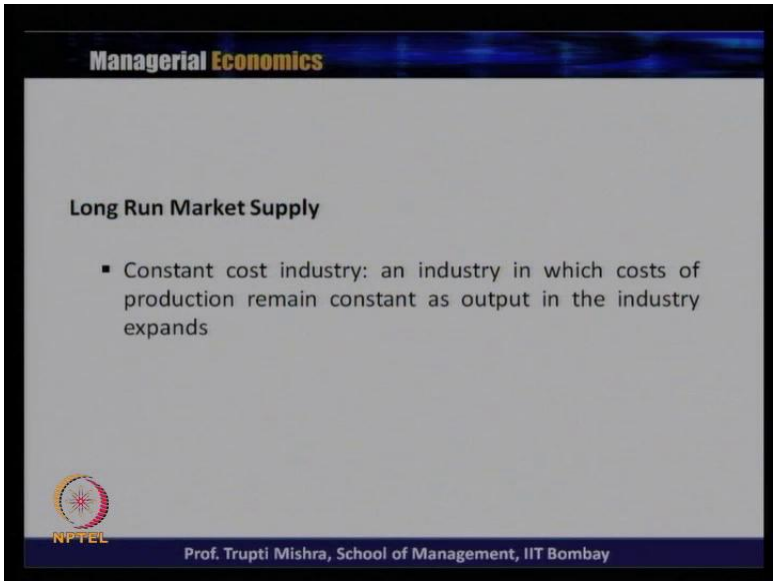
So, what is the profit maximizing condition in case of long run, that is long run average cost curve is equal to the short run average cost curve equal to the short run marginal cost curve equal to the marginal equal to the marginal revenue and equal to the average revenue. So, the equality of long run average cost curve, short run average cost curve, short run marginal cost curve, marginal revenue and average revenue that leads to the long run equilibrium, long run profit maximization.

Then we will see the supply curve in case of the long run market supply and long run individual firm supply. In case of three different type of industry that is constant cost industry increasing cost industry and decreasing cost industry. So, if you remember the in case of short run the market supply is horizontal summation of the individual firm supply curve.

And how we get the individual firm supply curve individual firm supply curve which that segment of the marginal cost curve, which lies above the average variable cost, but that is that cannot be done in case of the long run. Because, in the long run at least we are not checking the shut down condition its actually exit from the market.

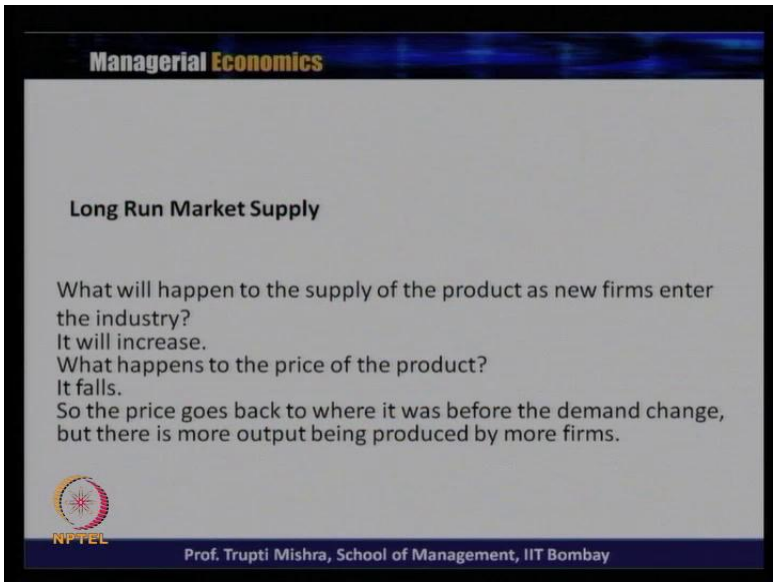
So, in the long run we will see that whenever there is a changes in the price, whenever there is a changes in the factor of production. It is not only due to change in the price also due to the change in the factor of production the increase or decrease in the prices of the factor, that also lead to the change in the supply. So, that we will analyze through the three different industry, that is constant cost industry, increasing cost industry and decreasing cost industry.

(Refer Slide Time: 25:42)



To start with we will first analyze the constant cost industry, constant cost industry is an industry in which cost of production remain constant as output in the industry expand. Means the scale of output is increasing at the cost on cost of production, there is no increase cost of production.

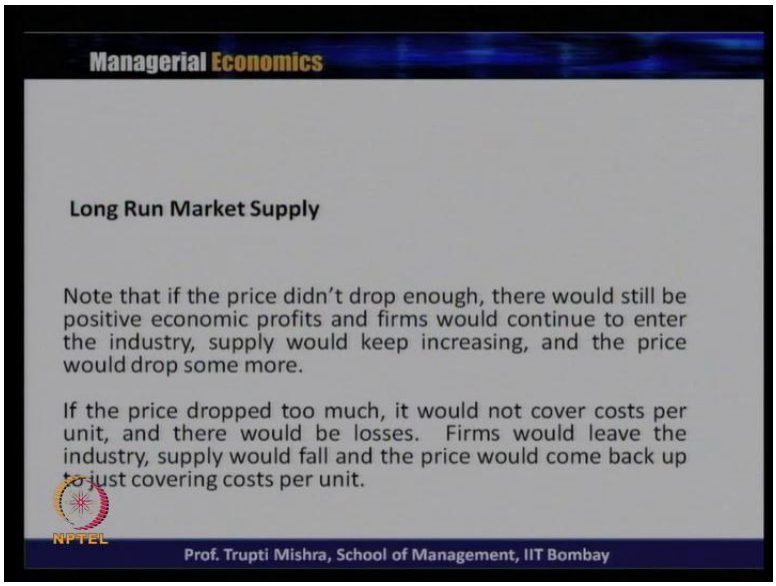
(Refer Slide Time: 26:11)



Now, we know that whenever there is a supernormal profit, new firms enter into the market, what will happen to the supply of the product as new firms enter into the industry. Obviously, supply will increase, because new firm they have entered into the industry, what happen to the price of the product price is decreases, because given the demand then supply is more and demand is constant supply is increase. So, now supply is more than demand and that leads to decrease in the price.

So, price goes back to where it was before the demand change, but there is no more output being produced by more firm. So, if… So, the price goes back, where it was before the demand changes, but there is no more output is being produced by more firm. Because, they know that if they are increasing the supply that leads to decrease in the market price, then it is no more profitable for the existing firm at least.

(Refer Slide Time: 27:7)

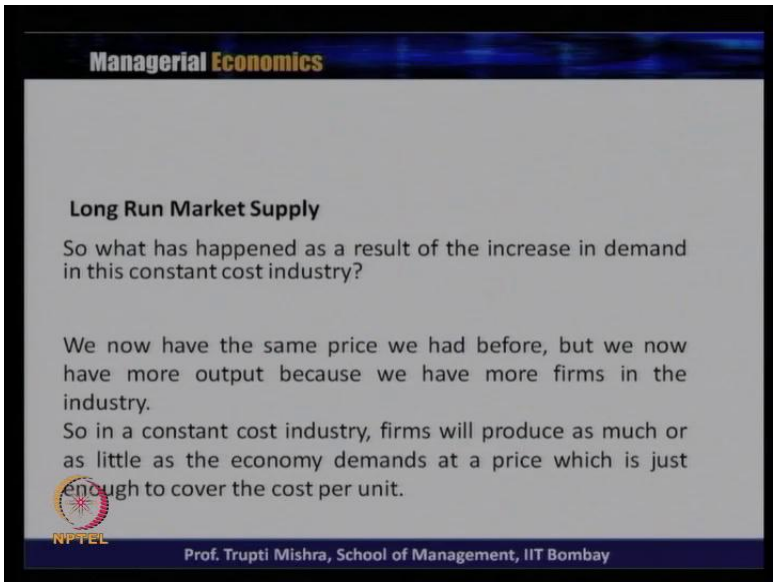


Note that, if price did not drop enough there would be still the positive economic profit and firm would continue to enter the industry. So, if price is not decreasing significantly sill there will be some amount of the economic profit and which will again act as a incentive for the firm to enter into the industry. The firms should continue to enter in the industry supply would keep increasing and the price would drop some more, because since there is a new firms still entering, still supply will increase and price will again decrease more.

The second one is if the price drop too much it would not cover cost per unit, there would be losses. So, at least they are not getting only the super normal profit also they are not getting the normal profit, rather they are incurring loss; firm would leave the industry supply would fall and the price would come back just covering the cost of price would come back of just covering cost per unit.

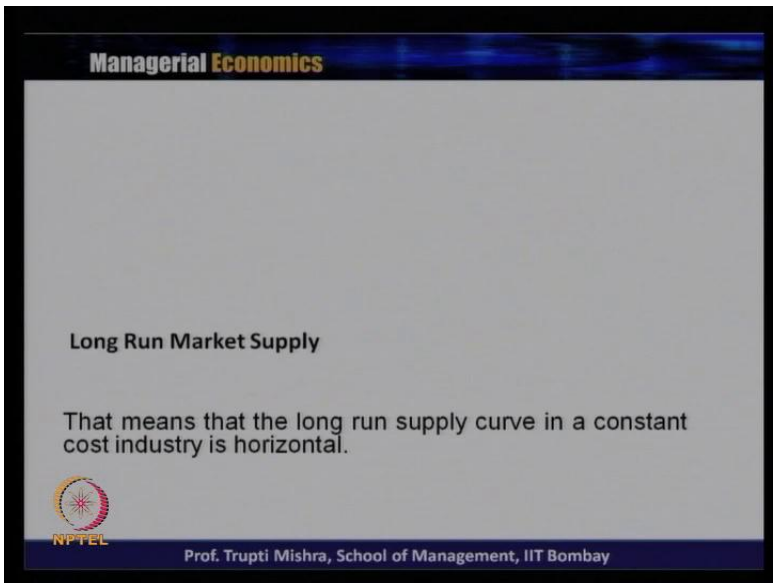
So, either if it is just dropping a bit again new firm will continue to come, because still there is some amount of profit. But if it is drops too much the existing firm they incur loss and when they are not covering of their cost per unit, they prefer to exit the market, which will reduce the supply and the price would come back of just covering the cost per unit.

(Refer Slide Time: 28:40)



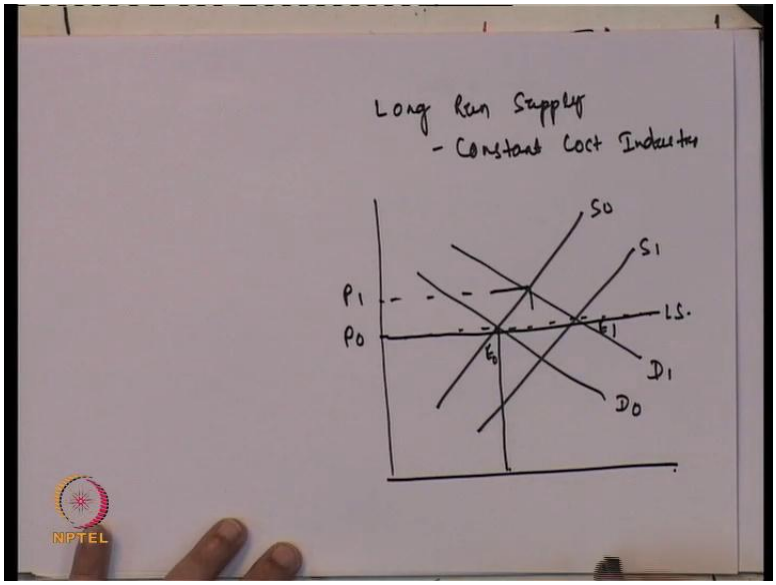
So, what is happened as a result of increase in the demand in the constant cost industry we now at the same price we had before, but but we now have more output, because we have more firms in the industry. So, in a constant cost industry firm will produce as much or as little as the economic demands at a price it is just enough to cover the cost per unit, they will not produce more than that, because it is a constant cost industry. Firm will produce only whatever is the requirement on the basis of the demand at a price, which is just enough to cover the cost per unit.

(Refer Slide Time: 29:03)



It means the long run supply curve in a constant cost industry is horizontal, because price is fixed and the supply they increase on the basis of the demand, whenever there is a increase in the demand they just cover up that at the typical price. Now, we will see what is the how is the graphical representation of the long run supply curve in case of constant cost industry.

(Refer Slide Time: 29:31)



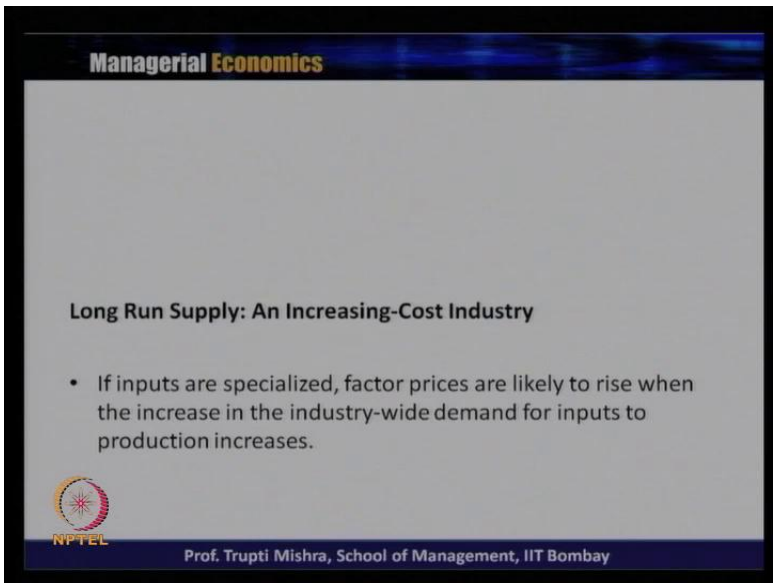
So, this is our demand curve, this the demand curve this is S 1, this is S 0. So, this is a D 0 and this is S 0, so this is our P 0 and at the same price we will continue to supply more. So, that is why this is our long run supply curve and this the this the price that is P 1, this is one equilibrium point, this is another equilibrium point. So, the long run supply curve is constant, because they are not producing more they are just increasing the supply just on the basis of the demand that is comes from the consumer.

So, this is the long run supply curve in case of constant cost industry, which is just a straight line and its parallel to the x axis. Then we will take this case in case of the increasing cost industry and decreasing cost industry.

(Refer Slide Time: 31:09)

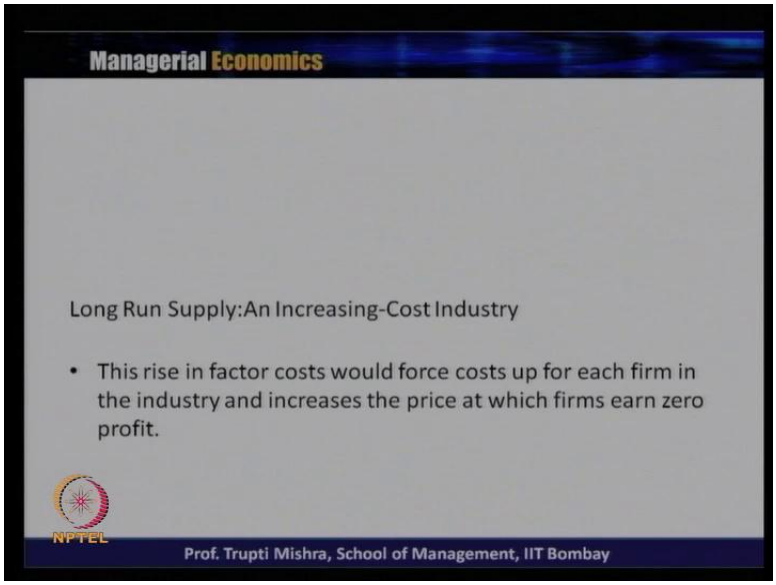
Now, what is a increasing cost industry increasing, cost industry is when they increase the scale of output the cost of production also increases. So, in case of in case of increasing cost industry factor prices raise as the new firms enter into the market and existing firm expand the capacity. Because, new firm enter into the market they require input they require factors and also the existing firm they enter they expand their capacity they also need the factor. And as usual the demand is increasing the factor price also increasing given the supplier that same level.

(Refer Slide Time: 31:58)



So, if the inputs are specialized factor prices are likely to raise when the increase in the industry wide demand for inputs to products increases. So, demand remain if you look at if demand is the new firms enter into the market, existing firm expand the expand the production capacity that leads to increase in the industry wide demand for inputs. And if the inputs are specialized again the factor prices are likely to increase.

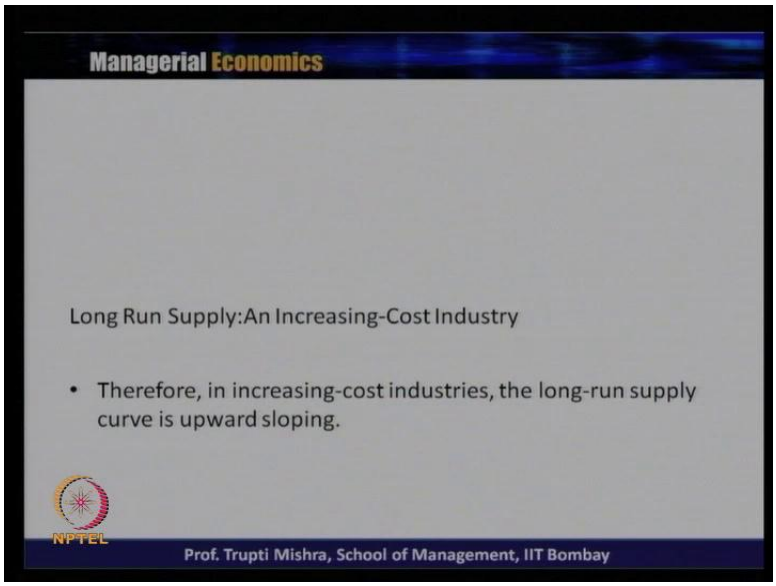
(Refer Slide Time: 32:26)



The raise in the factor cost or the increase in the factor cost would force the cost for each firm in the industry and increase the price at which firms earn the zero profit. So, when there is a increase in the factor cost that also lead to increase in the cost of the each firm, because now, they are spending more on the incurring the incurring the expense in the factors and the inputs.

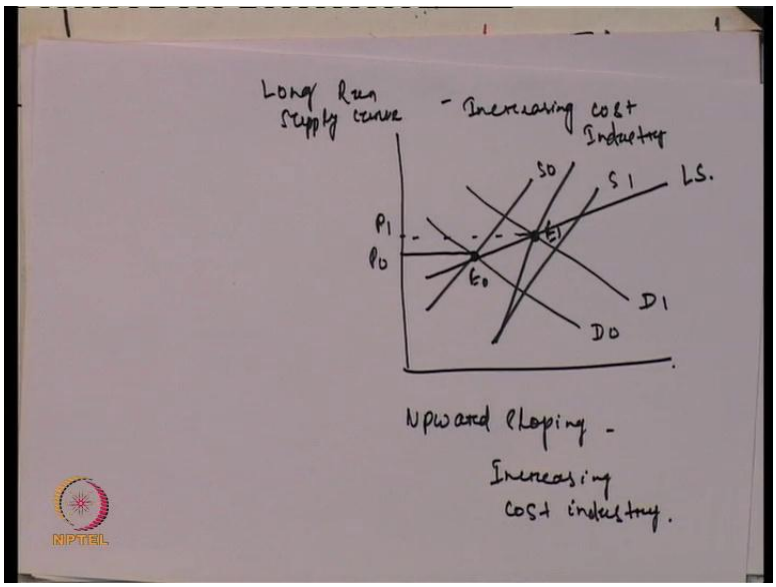
And increase the price, because if input cost is more; obviously, the market price has to a more, because that is if the price is not covering the input cost, the firm will prefer to leave the market if they are not getting the profit. Since, it is a long run at least they should get the normal profit. So, increase in the factor price would force the cost of the firms to increasing and also the increase in the price, because at least they feel that the unit cost should at least earn, which the firms earn zero profit.

(Refer Slide Time: 33:25)



Therefore, in case of increasing cost industry the long run supply curve is upward slopping, because increase in the new firms enter into the market existing firm expand the size. Demand for input increases and sometimes there is also special demand for specialized input that leads to increase in the cost of production for the firms, that leads to increase in the market price. And that is the reason in case of in case of increasing cost industry we get a upward slopping supply curve, and that we will check graphically that how we get a upward slopping curve in case of increasing cost industry.

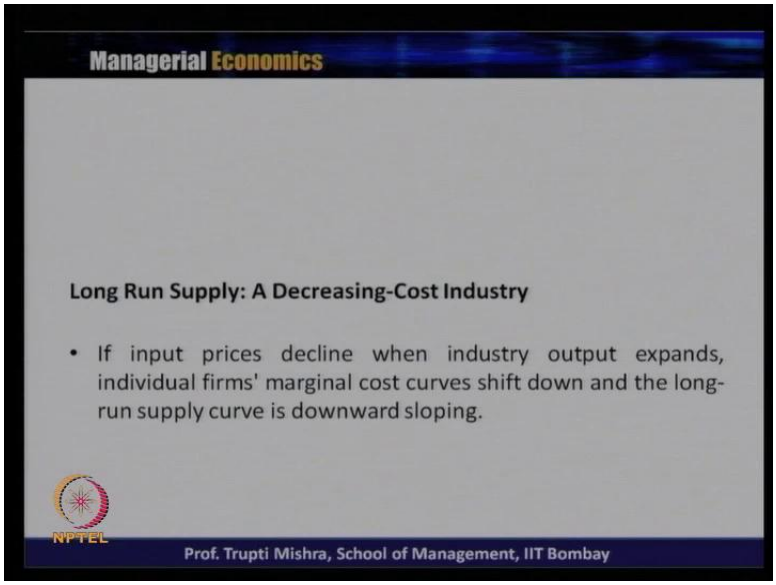
(Refer Slide Time: 34:06)



So, this is increasing cost industry, we are finding out the long run supply curve. So, we have D 0, we have D 1 then we have S 0 and then we have S 1 . So, this is E 0 this is E 1 and corresponding to this we have P 0 we have P 1 and if you join this 2 point E 0 to E 1 we get a long run supply curve. So, it is upward slopping, slopping in case of increasing cost industry.

And why it is upward slopping, because the factor price increases which leads to the increase in the, which leads to the increase in the cost of production for the firm. And also which leads to the increase in the market price market price and that force the, in fact, that force the firms to charge a higher price. Because, they have to at least cover up the unit cost what they are what they are incurring to produce the product.

(Refer Slide Time: 35:57)

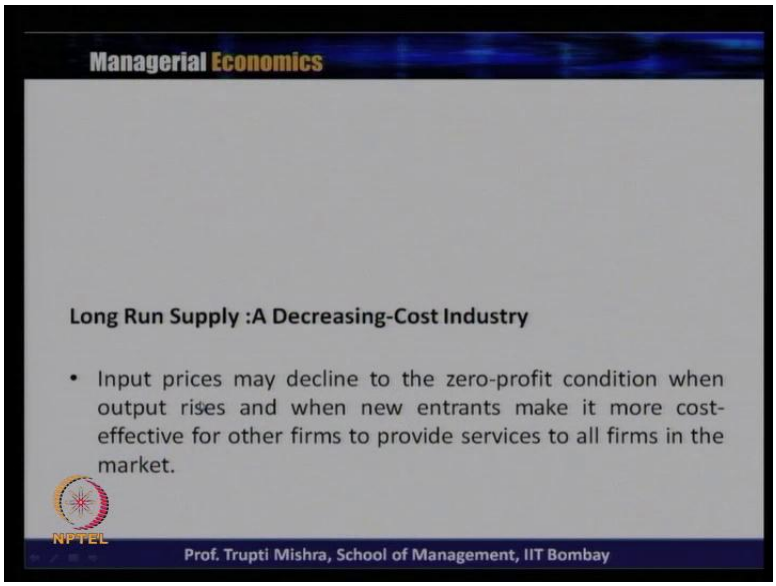


Now, we will check the decreasing cost industry. So, in case of decreasing cost industry if input price declines, when the industry output expand, individual firms marginal cost curve shift down and the long run supply curve is down ward slopping. So, since in case of decreasing cost industry, when the scale of operation increases it increases with a decreasing cost of production. So, that has to give an reason that if, because of the decrease in the input price.

So, if input price declines, when the industry output expand individual firms marginal cost curve shift down, because the per unit cost decreases and the long run supply curve is downward slopping. So, it is a case of decreasing cost industry where the scale of

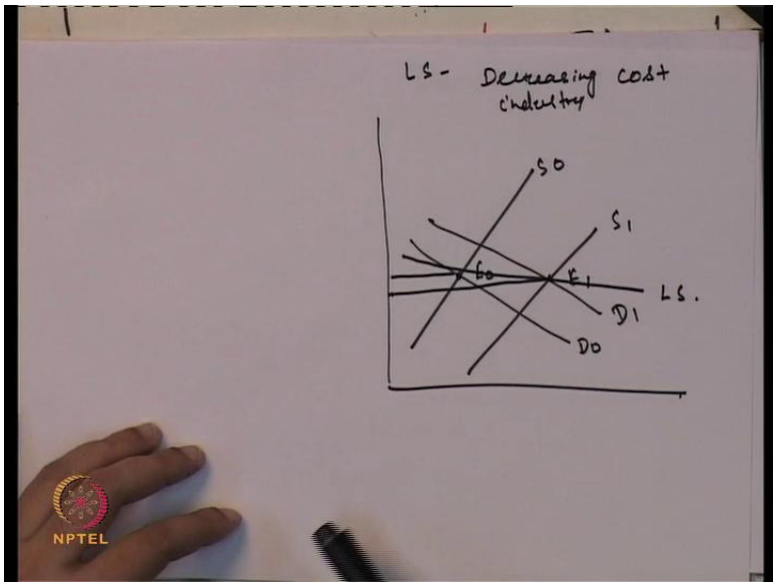
operation increases cost of production decreases, because of less in put price, which leads to decrease in the marginal cost marginal cost shift down. And that lead to decrease in the long run supply curve, in case of a perfective competitive market structure typically in case of decreasing cost industry.

(Refer Slide Time: 36:57)



So, input price may decline to the zero profit condition, when output increases and when new entrants make it more cost effective of for other firms to provide services to all firms in the market. So, input price may decline to the zero profit condition, when output increases and when new entrants make it more cost effective for the other firm services for the all firms in the market.

(Refer Slide Time: 37:36)

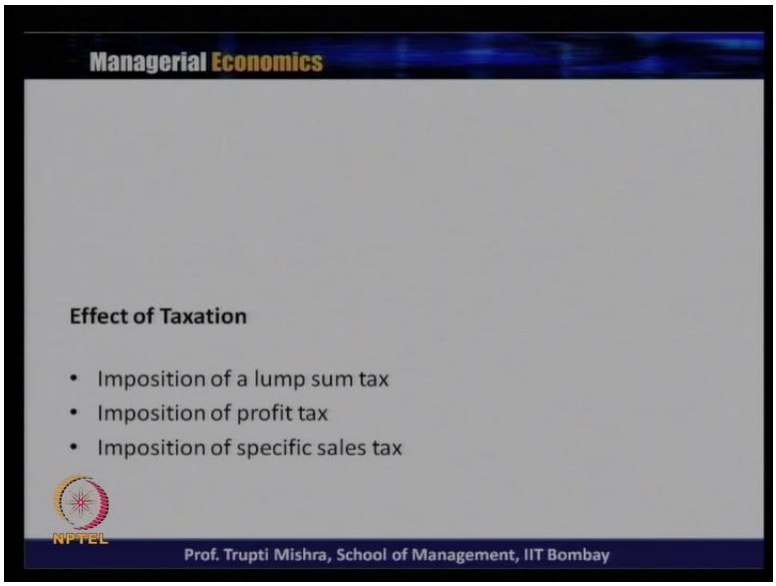


So, we will see the graphical representation of the decreasing cost industry. So, this is long run supply, in case of decreasing cost industry D 0, then we have then we have D 1, S 0 we have S 1. So, we have E 0, we have E 1, so this is the first equilibrium, this is the second equilibrium and if you do this then this is our long run supply curve. Because, this is decreasing cost industry expansion is at a decreasing cost per unit and that is the reason we get a downward slopping long run supply curve in case of the decreasing cost industry.

So, in case of constant cost industry, the long run supply curve is a straight line, horizontal. In case of increasing cost industry, the long run supply curve is upward slopping because of cost of production increases, when in when the scale of operations expand or when new firms enter into the market. And in case of decreasing cost industry the long run supply curve is downward slopping, because the cost of production decreases, when the firm or may be the scale of operation increases at a decreasing cost per unit of production.

Then we will see that what is the effect of tax or how how the consumer, how the buyers and sellers, they bourn the tax imposition of the tax or they bourn the burden of the tax in case of a perfect competitive market structure.

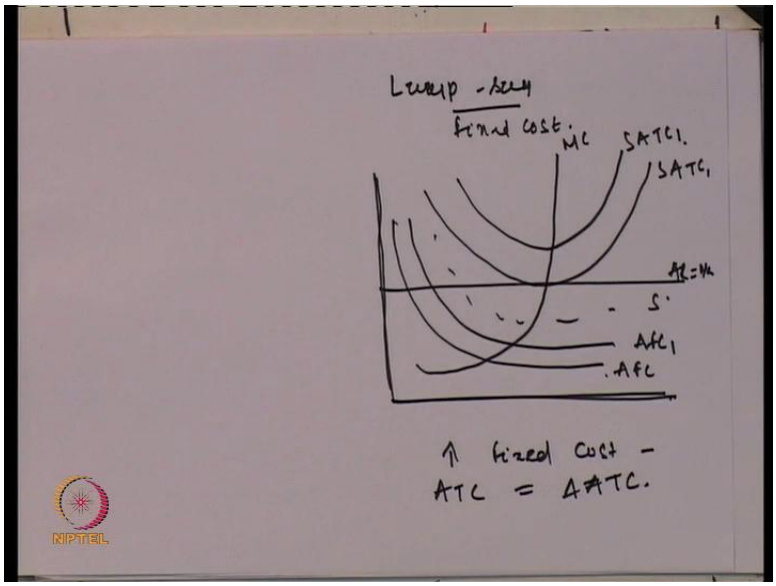
(Refer Slide Time: 39:28)



So, we will talk about typically three type of tax, one imposition of a lump sum tax, second imposition of a profit tax and finally, the imposition of a specific sales tax. So, if you look at the lump sum tax, it is a the effect of lump sum tax is like a effect of the fixed cost. Because, it is on it is the effect is on the fixed cost and if you look at the in the short run, if there is a change in the fixed cost it is not going to change the it is not going to change the equilibrium position.

Because, till the time it is not effecting the marginal cost it is not going to change the equilibrium position. And in case of similarly in case of profit tax again it is a the effect is like a fixed cost, but in the long run the possibility is that that supply will shift, but in case of specific sale tax the imposition of tax is dealt through the elasticity of supply. And that talks about that how much is the sensitivity of the supplier with respect to change in the price. So, we will start our start our explanation for the imposition of the tax from the lump sum tax.

(Refer Slide Time: 40:40)



And lump sum tax is like it is one time lump sum. So, it is the effect is like fixed cost at least in the short turn there is no if no effect, but when it comes to long run may be there is some effect because there may be a decrease in the output. So, this the average revenue, that is marginal revenue here we get the short run total cost curve and this the average fixed cost. Then there is a increase in the average fixed cost after the imposition of the tax, that is why this is average fixed cost change in that average fixed cost.

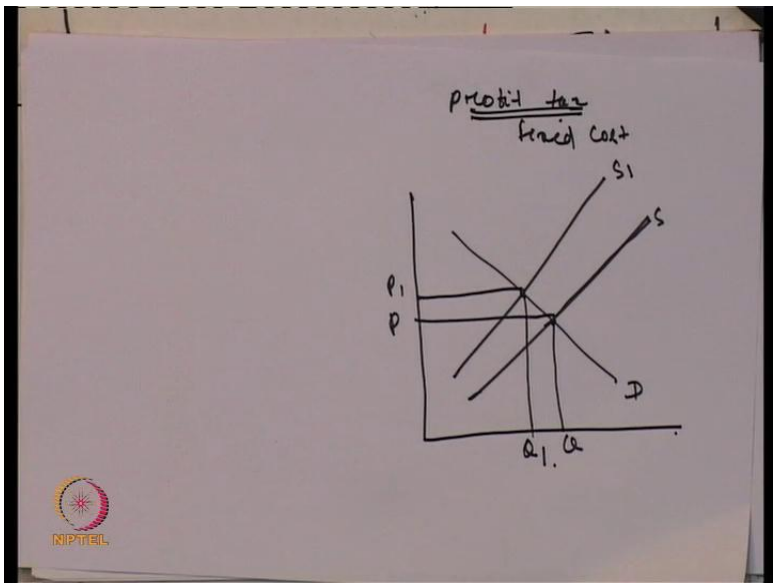
And with the change in the average fixed cost, the short run average cost curve is increasing that is SATC 1 and marginal cost generally intersect the average variable cost and average cost at it is minimum. So, if you look at in case of lump sum tax only there is a increase in the fixed cost and that shift the average total cost curve, there are there is a change in the average total cost curve.

Otherwise there is no much effect at least in the short run, but in the long run at least to the some level of output, it is going to influence. But if you look at if it is short run someone is just earning the normal profit, then in the long run he has to incur loss because of the lump sum tax. But in the short run if someone is getting super normal profit at least after imposition of tax, he will get only only the normal profit or there is some reduction in the amount of profit, but at least he is not incurring loss.

So, in this situation at least they are getting affected through the lump sum tax, because they are moving from one possibility to another possibility, that is either from super

normal profit to normal profit or from normal profit to loss. Then we will take the effect of the profit tax.

(Refer Slide Time: 43:02)



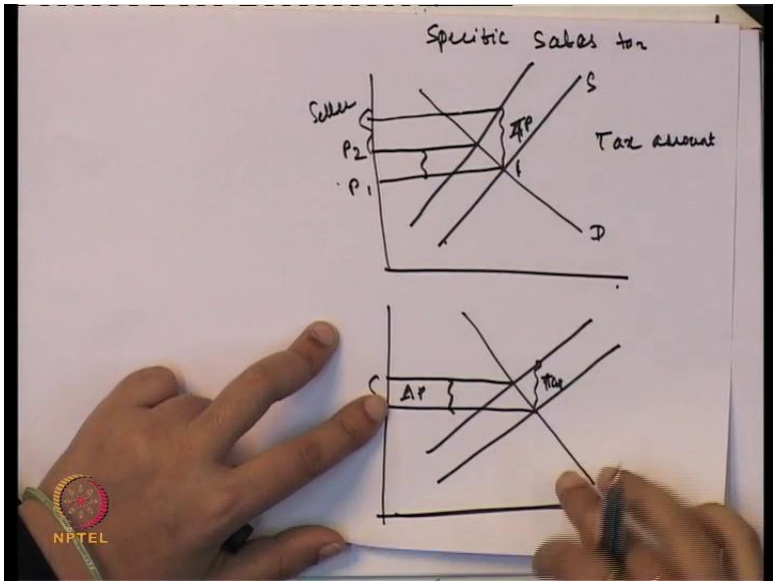
So, profit tax is also somehow in the same category that this is the the effect of like change in the fixed cost, but sometimes due to this the supply changes at least in the long run and it has it leads to increase in the price. So, this is the demand curve, this is the supply curve, this is the equilibrium quantity this the equilibrium price.

So, at least in the short run it is not much of change, but it when it takes to the long run it is generally shift the supply to the up and that leads to increase in the price and decrease in the quantity demanded. So, the effect of the profit tax if you will see if it is much felt in the long run rather than the short run, because short run it has nothing more to do or the effect is not much.

But, in case of long run that leads to decrease in the supply, because there is a imposition profit tax that leads to decrease in that leads to increase in the supply, which leads to increase in the price and decrease in the quantity demanded. And what is the specific effect of on firm, because of this profit tax again the same explanation if they are earning supernormal profit in the short run at least it is not much because they will just there will be some reduction in the profit. But if there is a just getting the normal profit the possibility that they may land into incurring loss at least in the long run with the imposition of the profit tax.

Now, we will analyze the case of specific sales tax and this effect of this specific sale tax is more on, what is the elasticity of supply. If the elasticity of supply is more generally the firms pay less for the tax and if it is less, then the firm has to pay more for the tax. So, it is all about the elasticity of supply curve that decides that what is the effect of specific sales tax on buyers and what is the effect of specific sales tax on the seller.

(Refer Slide Time: 45:13)



So, if you we will take different scenario, and we will see how the imposition of specific sale text effecting the buyers and seller. So, if you take a regular demand curve and the supply curve, then this is the demand curve this is the supply curve and when there is aim position of tax that is shown through the change in the supply. In this case, this is the this is the tax and this the change in the price after imposition of text.

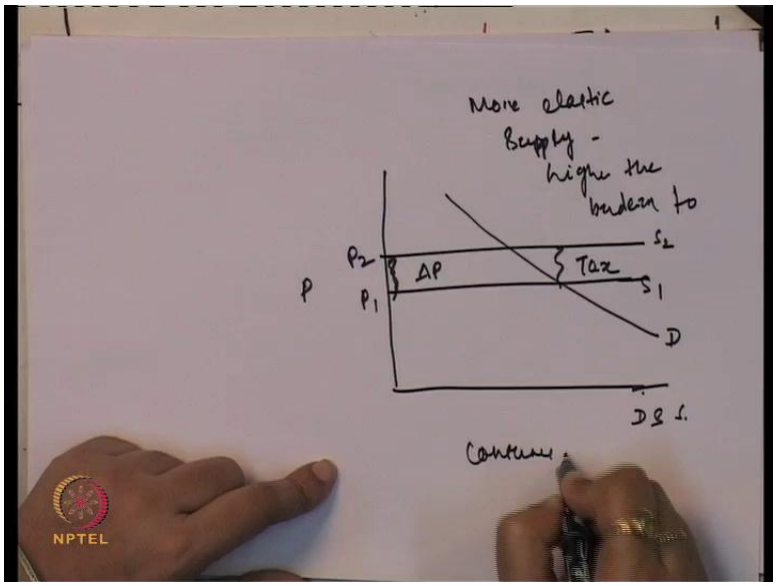
So, if you look at here the entire tax amount is not passed to the consumer entire tax amount is not passed to the consumer in the form of increasing price still this much amount is paid by the seller. So, if you look at here the imposition of the specific sale tax is equally on both the side buyers and seller if it is a case of the regular demand and supply curve.

Now, suppose we will take another example, where the supply curve is elastic than the previous case and here, if you look at this is the amount of the tax and this is the change in the price. So, in this case in the, if you make it a comparison between the first case and

the second case if the, since the supply curve is more elastic the major part of the burden of the tax is passed to the consumer in the form of increase in the price.

But, in case of the first case if you look at equally both the seller and buyer they were paying the tax amount, but here the supply curve is elastic. So, there is some leverage in the seller side to pass the burden of tax to the consumer in term of increase in the price and that is why here it is more as compared to this, because the change in the price is more in case of the second case and by through change in the price. Generally, the tax is passed to the passed to the consumer or may be majority portion of the tax is passed to the consumer.

(Refer Slide Time: 47:40)



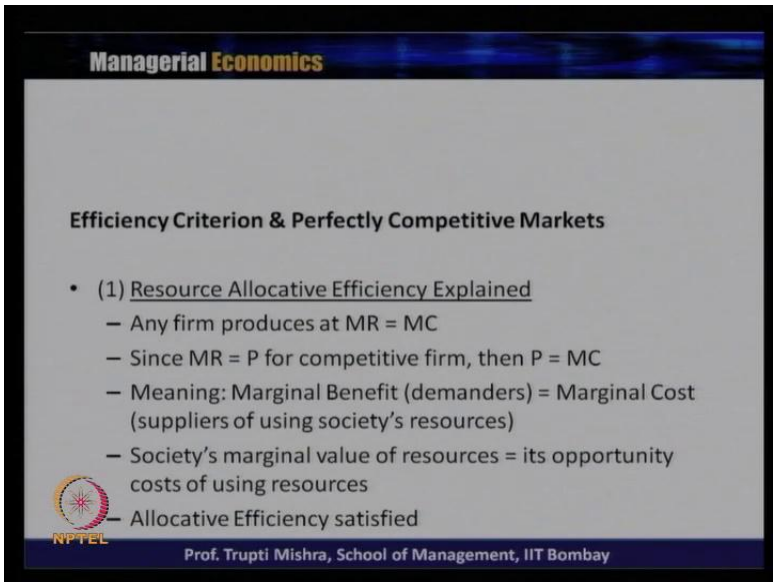
Then we will take a case where the supply curve is perfectly elastic and this is the demand curve, here we can take the may be demand and supply and here the price. So, in this case if you look at this is the tax amount and the entire tax is passed to the consumer in the form of increase in the price. Because, here is the supply curve is perfectly elastic any small change in the price will lead to greater change in the supply. And that is the reason if you look at the entire is entire supply entire tax entire tax burden is passed to the consumer.

So, more elastic is the market supply, higher is the proportion of the specific tax that can be passed to the consumer. So, more elastic is the supply, higher the burden to the consumer. So, in case of lump sum tax and fixed tax, in case of lump sum tax and profit

tax the effect is like a fixed cost of production and if you look at it is not getting it is not getting much of effect in case of short short run. But in case of longer run the possibility is that they may incur loss if they are just getting the normal profit.

And in case of specific sales tax, it is always the elasticity of supply that decides that how what is the effect of what is the effect of this imposition of tax on the sellers, if supply is more elastic burden is less if supply is less elastic the burden is more, then we will look at sum of this efficiency criterion and perfectly competitive market. So, if you remember in the initial class we talked about the allocative efficiency and productive efficiency.

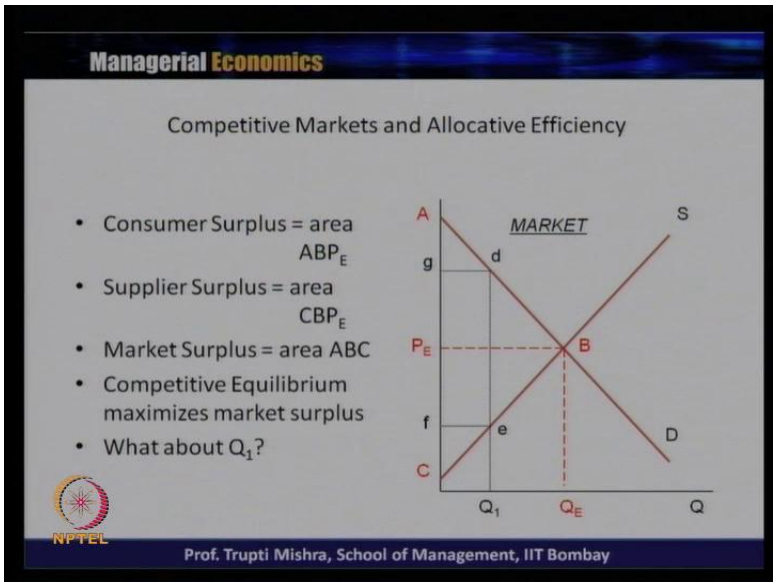
(Refer Slide Time: 49:48)



So, we will check in the first case what is the resource allocative efficiency in case of a perfectively competitive market. Any firm they produces the produce at the marginal revenue, which is equal to the marginal cost and since marginal revenue is equal to p for competitive firm then p is also equal to marginal cost.

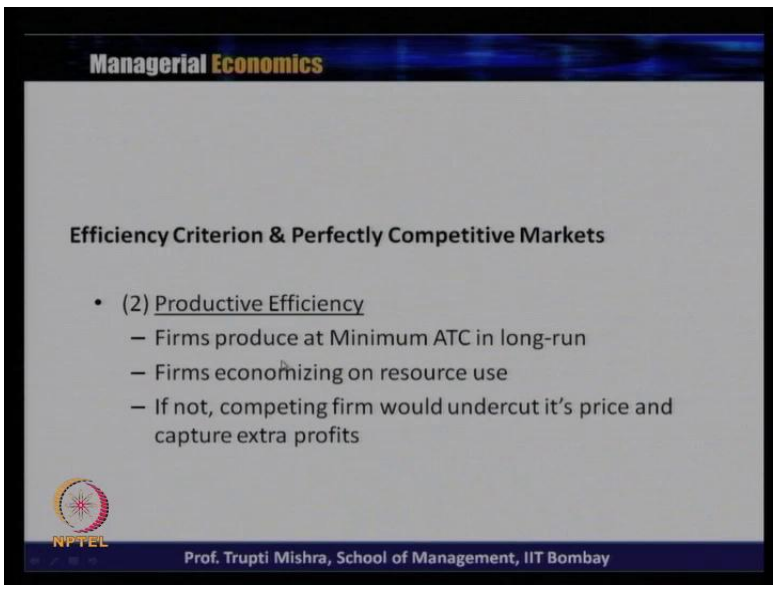
Now, what is the meaning, meaning here is the marginal when if it that is through demand and marginal cost that is supplier using the society resources. So, society marginal value of resources is equal to the opportunity cost of using resources and that is how we use the allocative efficiency or that is how the allocative efficiency get satisfied in case of a perfectively competitive market.

(Refer Slide Time: 50:37)



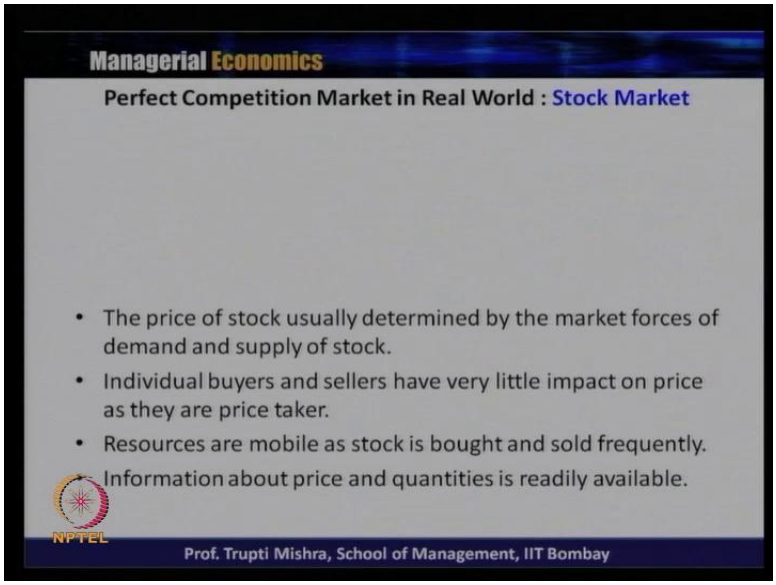
And when we again explain this through the consumer surplus and producer surplus if you look at the graph over here the consumer surplus is if you remember the at least the definition the consumer surplus is one. Where any price above the market price if the consumer is ready to pay more and if they are paying less generally they get some amount of the consumer surplus. So, consumer surplus area in specific graph if we look at A B P P is the consumer surplus area, because that is the above the market price and supplier surplus is that is C B P E. So, that is again C P E and B and competitive equilibrium maximize the market surplus.

(Refer Slide Time: 51:24)



Now, the question is what about q one what is what about the level of output. So, the second case is productive efficiency here the firm produces at the minimum of average total cost in the long run. And firm economizing on resource use and if not competing firm would undercut it is price and capture the extra profit. So, since their economy is on the economizing on the resource use, that is again satisfy the productive efficiency.

(Refer Slide Time: 51:49)



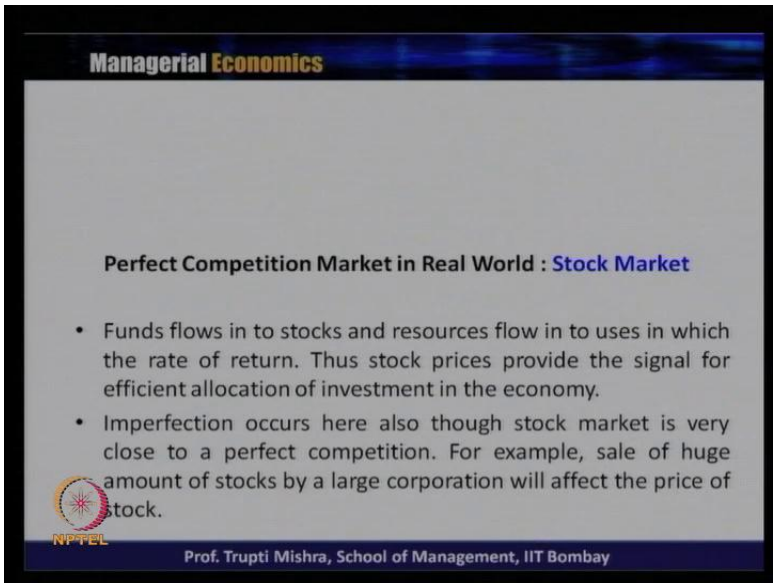
Then we will see what is the application of perfect competitive market in the real world and we will take the typical example of stock market. As I said the stock market share market somehow share at least some of the feature of the perfect competitive market. So, if you are taking the example of stock market, whether this a perfect competitive market in the real world let us analyze what are the similarity and what are the dissimilarity.

The price of stock usually determined by the market force of demand, and supply of stock, which goes with the perfect competitive market structure. Individual buyers and sellers have very little impact on price as they are the price taker again the same situation what we generally face in case of a perfect competitive market structure. Perfect mobility of resources and here also the resources are mobile as stock is bought and sold frequently and information about the price and quantity are readily available.

So, there is full information and perfect information to all the people those who are in the stock market buyers and seller. So, price decided by the market demand and market supply first feature, individual buyer seller has less impact, second feature perfect

mobility of the resources, third feature. And full information about the product price forth feature; all this four features get match or it is comes from the characteristic of a perfect competitive market structure.

(Refer Slide Time: 53:50)



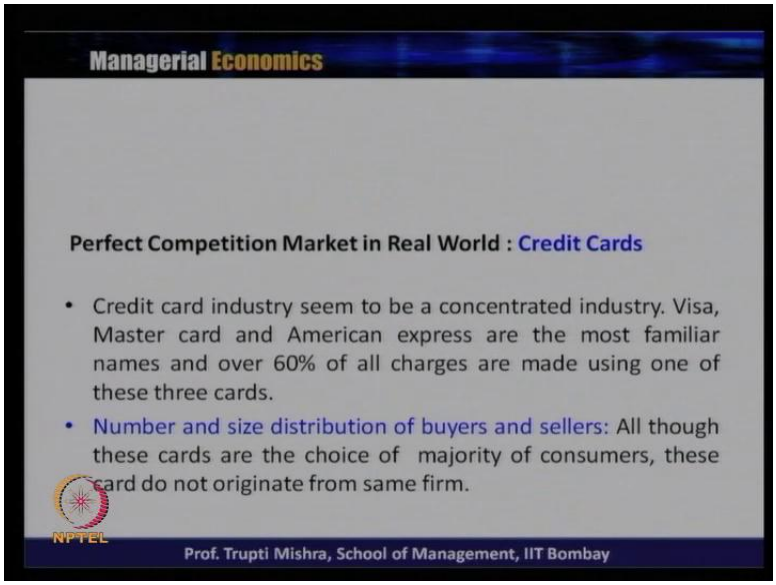
Now, we need to see that whether there is imperfection, but before that we see that whether like in before couple of minutes we were talking about the efficiency of the or whether the productive efficiency and allocative efficiency gets satisfied in the perfect competitive market structure or not. So, to take that as a q and same thing happens in case of stock market that fund flows into the stock and resources flow into the use and in which the rate of return. So, stock price provide a signal, signal for the efficient allocation of investment in the economy.

So, till the time all this features are matching with the perfect competitive market structure, but still there are some imperfection. And that is why we cannot say that there in a rigid form there are the perfect competitive market structure, but somehow there is a close resemblance of this type of market structure with the perfect competitive market structure.

Now, what are the what is the imperfection over here, imperfection occurs here also those stock market is very close to perfect competition. For example, sale of huge amount of stock by a large corporation will affect the price of stock, which goes against

the characteristic of perfect competitive market structure, that one seller or one buyer cannot influence the price of the product.

(Refer Slide Time: 54:30)



So, to summarize we can say that perfect competitive market stock market closely come to the perfect competitive market, but still it is there are some imperfection occurs. So, in the next class again we will take one more example like whether credit card industry comes in the category of perfect competitive market structure or not. And then we will start our discussion on the monopoly.

So, to summarize whatever we discussed today is we talked about the market supply in the short run, which is the segment segment of m c which lies above the average variable cost. We talk about the long run equilibrium, we discussed about the long run supply curve in case of increasing cost industry, constant cost industry, decreasing cost industry. And we talked about the imposition of tax and we talked about the allocative efficiency and productive efficiency, whether that is getting satisfied in case of a perfect competitive market structure or not. So, we will carry forward our discussion of perfect competitive market structure application to real word and monopoly in the next session.