Foundation Course in Managerial Economics
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Lecture - 31
Monopolistic Competition - Determining P and K

Welcome back to our discussion on monopolistic competition. We in the previous lecture we developed the concept of monopolistic competition. We discussed how the monopolistic competition lies between the competitive market structure with lot of buyers and sellers in the market with easy entry and exit conditions and on the other hand like monopoly in case of monopolistic competition the products are differentiated.

In case of monopolistic competition products are differentiated. So although the products are substitutable to some extend there are differences in the minds of the consumers about the product because of which the consumers have some amount of loyalty or some amount of preferences towards one type of one sellers one type of product against another and because of which the monopolistic competition seller has a negatively sloping demand curve where he has some control on the market and some control over the price.

So that is what we are going to see now how does the monopolistic competition in case of monopolistic competition how does the firm choose what amount of output to produce and what price to charge.

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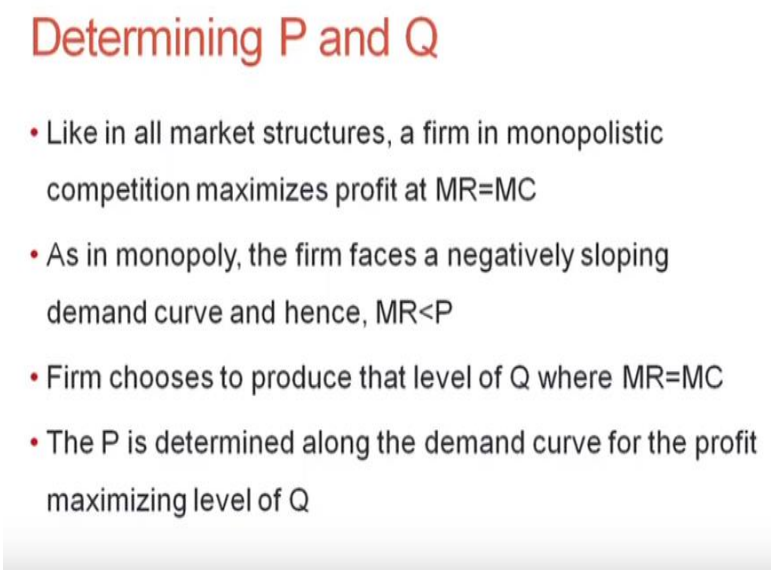

So determining P and Q, again there is a typo here it is it should be P and Q. Like in all market structures, a firm in monopolistic competition maximizes profit at MR is equal to MC. Let me correct this. So determining P and Q like in all market structures the firm in monopolistic competition maximizes profit at MR is equal to MC. As in monopoly, the firm faces a negatively sloping demand curve and hence marginal revenue is less than P. the firm chooses to produce that level of output where MR is equal to MC. The P is determined along the demand curve for the profit maximizing level of Q.

So let me explain. So like in all market structures, the firm in monopolistic competition also maximizes profit at MR is equal to MC. So we already discussed this that the profit maximizing condition for any firm in any market structure profit maximization happens at MR is equal to MC.

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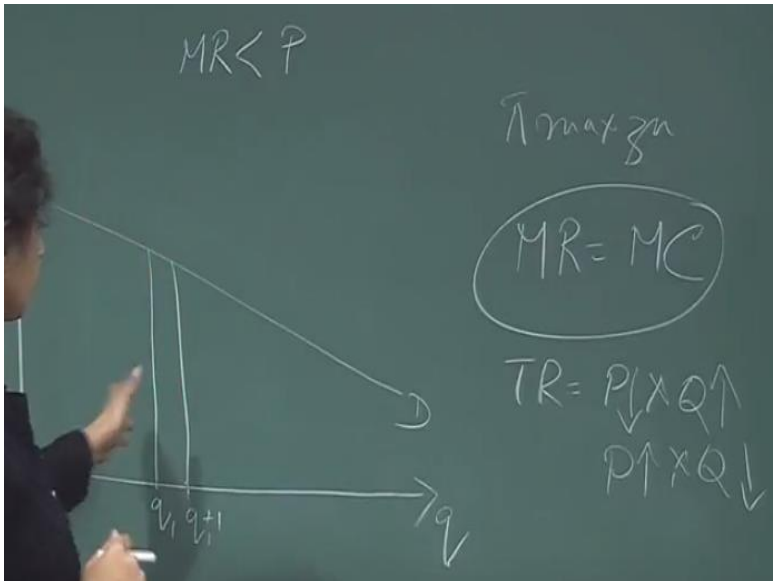

This is always going to hold true for profit maximization no matter what kind of market structure the firm is operating in but since in case of a monopolistic competition it faces a negatively sloping demand curve, it faces a negatively sloping demand curve, so at every point again as in the case of monopoly in this case also the firm faces a dilemma because it knows that if it changes the price, say for example it reduces the price there is going to be a price effect and there is going to be a output effect.

So basically if it reduces the price there is going to be a increase in output. So in total revenue so as soon as he reduces price this part falls but output increases. So they move in opposite

direction. So when P falls output increases or when P increases output falls. So there is one price effect and then output effect always and as in case of monopoly in case of a monopolistic competition also the firm has is always in a dilemma whether to change price because it knows that if it reduces the price output is going to increase so there is going to be a positive impact on revenue through output but there is going to be a negative impact on revenue through price.

So this he knows and accordingly his decision becomes difficult and that is what we saw in case of monopoly that MR is always less than P. So MR is always less than P because what is MR? Marginal revenue is basically equal to the additional revenue that the firm is going to get out of producing another unit of output. So another unit of output, production of another unit of output, is possible in case of a negatively sloping demand curve only by reducing the price.

So if the firm is producing here q 1 and it decides to produce q 1 + 1 an additional amount of output immediately it has to reduce its price from here to here. Immediately it has to reduce the price from here to here and so immediately there is a impact on the total revenue. So marginal revenue is always going to be less than price for a negatively sloping demand curve unlike in the case of competition where price is always the same. No matter how many units of output the firm decides to sell it never has to worry about price because price is fixed by the market. So here in case of a monopolistic competition also, let me draw it little more nicely.

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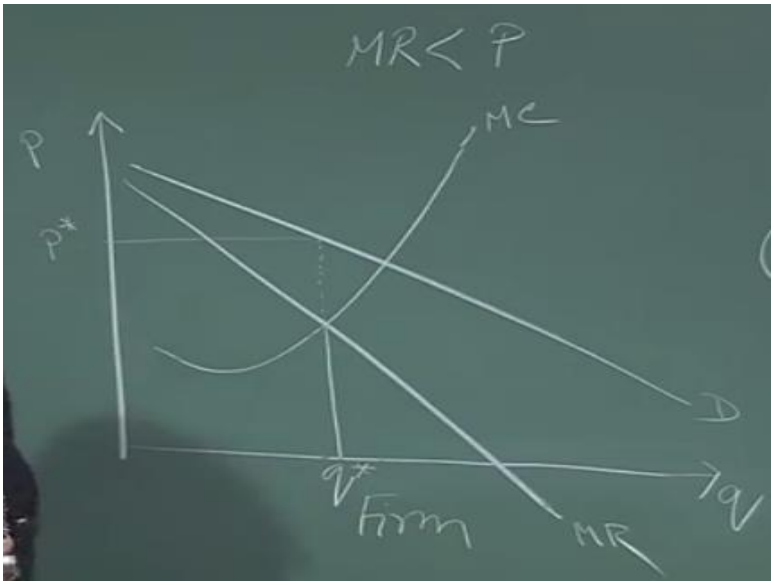

So this is for the firm and this is the price and here is the flat demand curve and since so this is the flat demand curve and this is the marginal revenue curve. So demand curve is basically the

price line and marginal revenue is always less than the price, is always less than the price line. So this is the marginal revenue curve and which is always less than P and so the firm chooses to produce that level of Q where MR is equal to MC.

Now what do we do here? You are probably quite familiar with this now and you probably have got a hand of the exercise that once we draw the demand curve we draw the marginal revenue curve, and we draw the J shaped marginal cost curve. So we draw the J shaped marginal cost curve and the profit maximization condition is marginal revenue equals marginal cost.

So marginal revenue equals marginal cost at this point. So this intersection is going to give me the equilibrium output or is going to give me the profit maximizing output. So q star is the amount that this firm is going to produce. How does it decide what price to charge? How does it decide what price to charge? Again the exercise is exactly similar to the monopoly situation so what does he do?

He knows that he has to produce q star and how much are the people willing to pay for q star? How much are the people willing to pay for q star so for that he traces back to the price line or the demand curve that he faces in the market so this is the demand curve that he faces in the market and this is the price P star that he is going to charge in the market.

So this is a differentiated product in the say toothpaste market so this is the this is the firm which sells a particular variety of toothpaste and this is the output that he decides, he is going to produce and this is the price that he is going to charge and this price he determines from the demand curve of the differentiated product. So this is the demand curve for the mint toothpaste that he is selling in the market and he charges a price P star from here.

So this is so the P is determined along the demand curve for the profit maximizing level of output. Now coming to the next slide to discuss about profit and loss. So once so now we know what the what how the equilibrium condition for the how the firm perfectly monopolistic competition monopolistically competitive firm decides what output to produce and charge what price. So next question is what is the profit and loss that the firm is going to make?

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So profit or loss depends on the average total cost of the firm at Q. If price is more than average total cost the firm's economic profit is more than 0. If price is less than average total cost the firm's economic profit is less than 0 or the firm is making a loss. If price is equal to average total cost the firm's economic profit is equal to 0.

So in the short run the firm minimizes its loss. In the long run the firm will exit the market if it is making a loss. If some of the firms are making a positive economic profit, new firms will enter the market. So let me explain here. So what do we mean by this? We know that this is the profit maximizing level of output but profit maximizing itself does not mean that there is actually a profit being generated. It does not mean that.

It just means that q star maximizes the profit that is possible there. So that profit could be negative also. There could be a loss also. So profit maximization is basically it is minimizing the loss. So what does profit actually depend on. Profit depends on, what does the average total cost curve look like? Say for example the average cost curve say looks like this.

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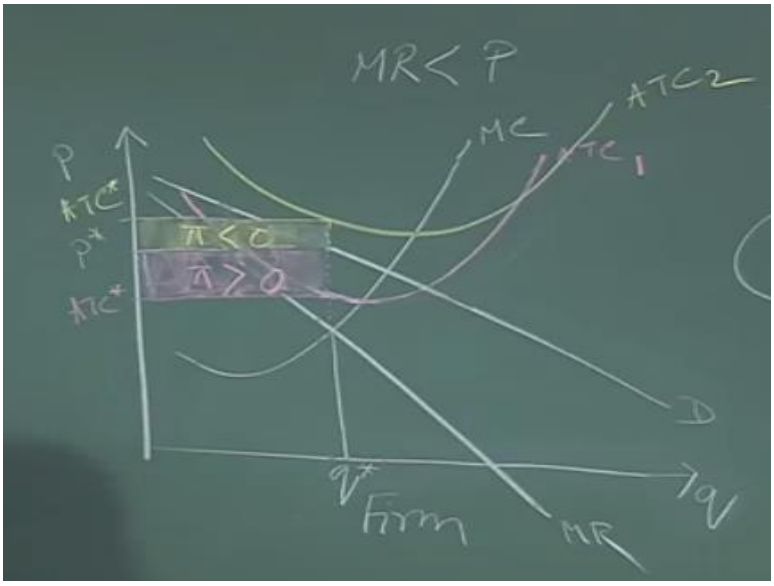

Say the average cost curve looks like this. So le me call, use a different, sorry I. Okay, this is supposed to be the minimum point of the average total cost curve. So I hope you have been able to figure out why I changed the average total cost curve because I wanted the marginal cost to intersect the average total cost at its minimum point.

So this is just to draw it as correctly as possible. The marginal cost always intersects the average total cost at its minimum. So this is the average total cost for example. So it is average total cost for example. So when the firm is producing a output of q star what is the cost that it is incurring? So along q star I find out here the q star that q star it is incurring a cost of this much, ATC star. So this is the cost, this is the price. So obviously for each unit of output it is getting a profit of P star minus C. So this is the amount of profit, the pink portion is the amount of profit that the firm is getting. So this is economic profit is more than 0.

Now what would happen if the cost curve looked like this? If the cost curve was here ATC, had the cost curve looked like this had the cost curve looked like this then what would be the cost like at q star? At q star then cost would be ATC star in yellow. So this would be the cost and in that case there would be a loss of the amount equal to the yellow rectangle.

So there here profit is greater than 0. Here profit is less than 0. So here profit is greater than 0, here profit is less than 0. So again to repeat this profit maximizing condition is MR is equal to MC. So profit maximizing condition tells me that the firm should produce q star if at all it produces. Now when the firm produces q star it is possible that the firm is going to earn a positive economic profit and it is also possible that the firm is going to earn a negative economic

profit and that would solely depend on what is the average total cost of the firm at that level of output and we took 2 examples. One, the example of a pink average total cost which we drew like this and showed that if it looks something like this then there is a positive economic profit. Again we took another example of a ATC 2 and we said that if the cost looks something like this then the firm is having a negative economic profit. So this is what we said.

Now and in the typical case of where ATC is exactly equal to price where basically ATC at q the ATC basically passes from here at this point, if the ATC passes through this point so here basically cost is equal to price for every unit of output. So there economic profit will be equal to 0. When economic profit is equal to 0 means accounting profit is more than 0 and if that also happens the firm is happily going to continue to produce in the market.

Now what happens, so this is the case of a typical firm. So there are whole lot of firms, similar firms in the market and they are facing different demand curves depending on the kind of differentiated products they are selling in the market. Now all the firms like there are whole lot of firms in a market some have cost curves which are similar to the pink ones, some have cost curves which are similar to the yellow ones.

Now what happens in the long run? Now in the short run if the firm is incurring loss here, what is the condition? If you may remember when we discussed about producer theory, we said in the short run what is the firm going to do? It cannot exit in the short run. So in the short run it is going to see if it is getting a price which covers at least the average variable cost.

So for firms where the cost curve looks like the yellow ones, the firm is going to see that if the average variable cost lies below the price, so in that case price is able to cover at least the variable cost. So the firm is going to stay in business. Now and if it is above the price line, even the variable cost, then the firm is going to shut down. What happens in the long run? In the long run, in the long run the first let us talk about the yellow ones.

In the long run these firms if they see that they are not able to cover the, the price is not able to cover their cost, they are going to exit the market. They are going to exit the market. What happens to the firms which have positive economic profit? Now there are firms which have positive economic profit in the market and looking at this there are whole lot of producers outside the market who are keeping a watch on this market and who are potential producers in this market or potential sellers, they will see that there is profit to be made in this market.

There is there are firms which are producing which are getting positive economic profit and that attracts these potential sellers into this market. So these producers are going to enter this market. So these producers are going to enter this market and what will happen is, I will so at the producers, so more producers enter this market and let me remove this and draw another figure to show you what happens when there are new entrants in the market. What happens when there are new entrants in the market?

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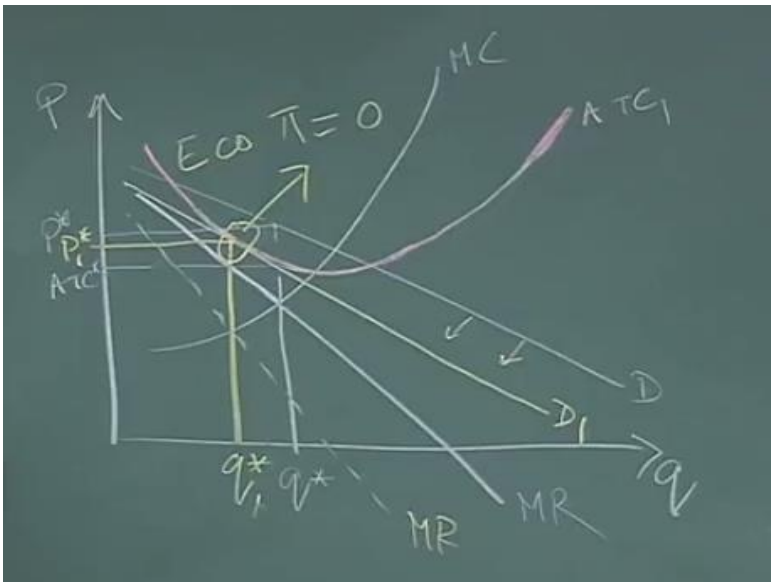

So again this is a typical firm, it is operating in this market and this was his demand curve, this was his MR, this was his marginal cost curve and he was producing q star, charging a price of P star okay and he was incurring a profit. So basically I have to so this is the average cost curve of this firm. This is the average cost curve of this firm, and so this firm was, so the firm was incurring a profit which is equal to this rectangle. Now, no let me keep it clean. So this is average total cost and this is the profit that this is the profit that the firm is making in the short run.

Now what happens if you remember from just the earlier diagram we saw that this the profit that the firm is making and looking at this profit new entrants will enter the market. So new sellers will enter the market and they will also start offering new differentiated kinds of products so there will be some so this was a minty toothpaste so there will be new products. We will say not only ours have a mint flavor it also has this colour. It has these properties. See this is endorsed by this film star. So all these are possible.

So once that happens when there is new product in the market some of the people who were loyal consumers of this product they are going to move to the new products that are being offered in the market. So they are going to move away and because of which the demand curve is going to shift inwards. So this demand curve is going to shift inwards and this continues to happen in the market till there are so it is going to shift inwards but still there may be positive economic profit.

So as long as there is positive economic profit being made by some of the firms in the market new entrants will keep on entering the market so till these consumers they disperse and these consumers they some of them at least move away to other sellers in the market move away to other differentiated products as a result of which this demand curve shifts inwards.

So this demand curve is going to shift inwards till the time till the demand curve so this is the new demand curve till the demand curve shifts so much inwards that it so the it is tangent to the average cost curve of the firm. So this is the new demand curve and this will be the new marginal revenue curve and this will be the new output that the firm is going to produce and this is going to be the new price of P 1 star.

So this is going to be the new price and you can clearly see from here that the demand curve has shifted so much inwards that the demand curve is now equal to the, the demand curve is tangent to the cost curve as a result of which at this level of output the price that the firm is charging is exactly equal to the cost that the firm is incurring for producing that unit of output.

So here at this point, economic profit is equal to 0. Economic profit is equal to 0. So in the long run the firms what so it is very similar to the perfect competition case here also in case of perfectly competitive market what happened? As more and more buyers, sellers entered the market the demand curve the supply curve would shift.

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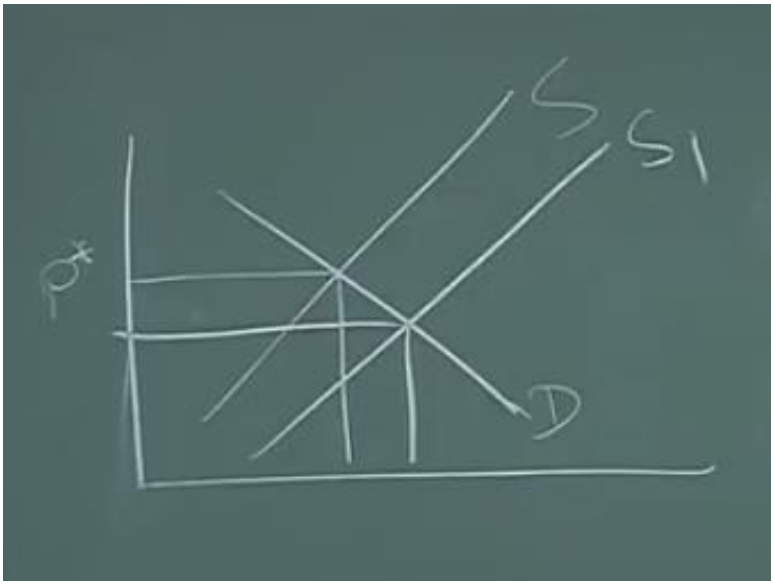

If you may remember, in case of perfectly competitive market as more and more sellers enter the market, so this is the demand curve, this is the supply curve and this was the equilibrium price. So as more and more sellers entered the market the supply curve would shift to the right and price would come down and bring down the economic profit of the existing sellers in the market.

But in case of the perfect in the case of monopolistic competition nothing happens to the supply curve in the market or the supply curve in the market obviously the supply is going to increase but that is not changing the economic profit. What is changing is for each of the firms the number of consumers or the demand in the for each of these firms that goes down.

So each of the firm has its loyal set of consumers whose demand curve it is facing but that demand curve shifts inwards as more and more suppliers enter this market, as more and more suppliers enter this market, so their economic profit is wiped out till the time when economic profit of all existing suppliers in the market reduces to 0 and in the process if it happens that some of the suppliers demand curve shifts inwards so much that economic profit reduces to less than 0 these firms are going to exit the market. So these firms are going to exit the market.

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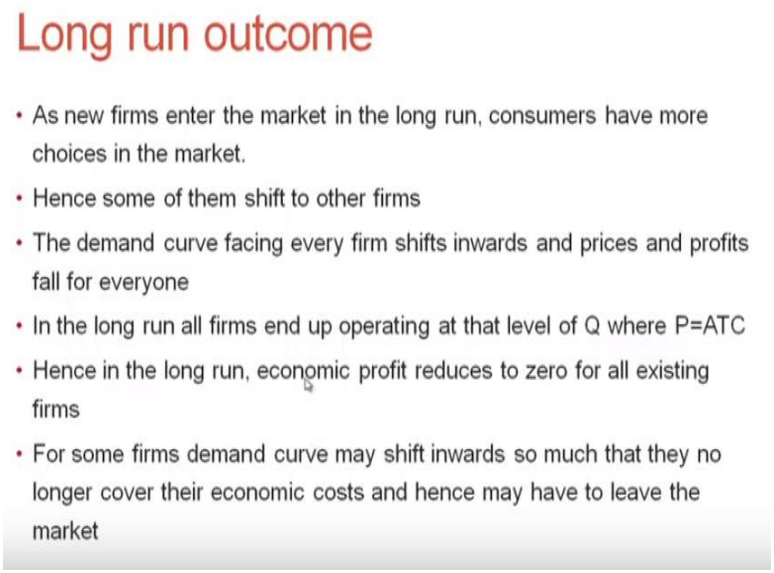

So what is the long run outcome? As new firms enter the market in the long run consumers have more choices in the market. Hence some of them shift to other firms. The demand curve facing every firm shifts inwards and prices and profits fall for everyone. In the long run all firms end up operating at that level of output where P is equal to average total cost.

Hence in the long run economic profit reduces to zero for all existing firms. For some firms demand curve may shift inwards so much that they no longer cover their economic costs and hence may have to leave the market. But one thing is of interest here which you may have noticed is that how is this outcome different from the perfectly competitive outcome.

In case of perfect competition in the long run so in case of perfect competition in the long run all the firms have zero economic profit. Similarly, in case of monopolistic competition also in the long run all the firms have zero economic profit. However, the difference is in case of perfect competition the firms charge a price equal to the minimum average total cost of every firm. So the firm is going to charge a price which is here.

So the competitive outcome will be price will be here where the marginal cost intersects the average total cost and that price will be charged in the market. So that will be the single price that is going to be charged in the market and price will be equal to the minimum of the average total cost. However, in case of monopolistic competition each of the firm charges a price which is equal to the average total cost at that level of output yet that price is not equal to the minimum of the average total cost for that firm.

So basically the firm is charging, it is slightly short of the average total cost. It is charging a price over here which is although along the average total cost yet here average total cost is falling and it is not the minimum. So this is a fundamental difference between a competitive outcome and a monopolistic competitive outcome. So in the following section, in the following module we are going to see what is the welfare implication of a monopolistic competition as compared to say perfect competition. Thank you.