**Managerial Economics**
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**Lecture - 76**
**Product pricing – II**

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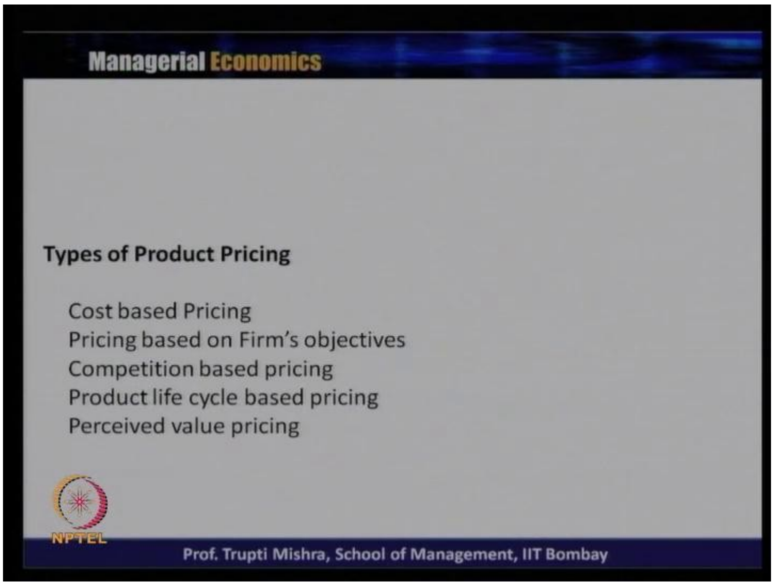


Then, we will take about some five distinctions of the, or five types of product pricing. So, we will start with a cost based pricing, where the basis of pricing is cost. Then we will talk about the pricing based on firm's objective. Then we will talk about the competition based pricing. Then we will talk about the product life cycle based pricing, and finally we will talk about the perceived value pricing.

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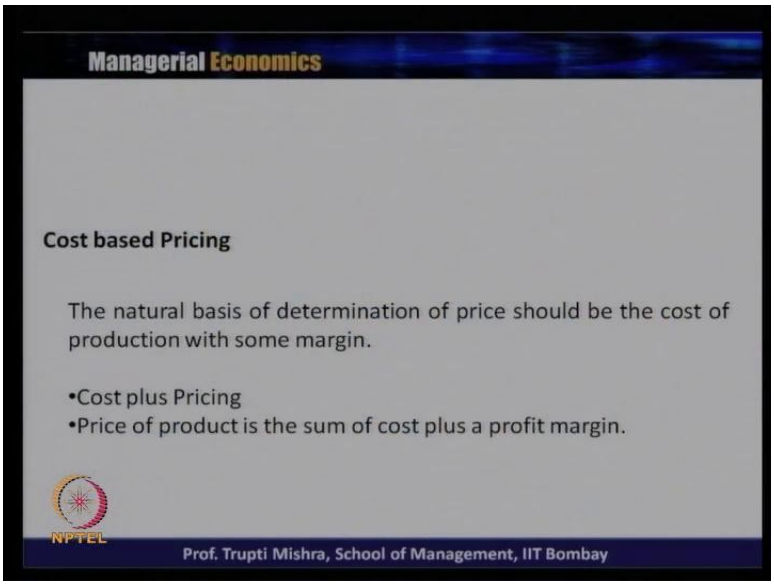


So, in case of cost based pricing, the basis is cost, but what is the natural basis of determination of price. The natural basis of determination of price should be the cost of production with some margin. So, when you find what is the market value or what is the market price for the product. We always say that what is the first component here, the first component here, is that what is the cost of production or what is the cost being incur to produce the product. So, the natural basis of determination of price should be the cost of production with some margin, and in that case, the first one comes as the cost plus pricing, and here the price of product is the sum of cost plus a plus a profit margin.

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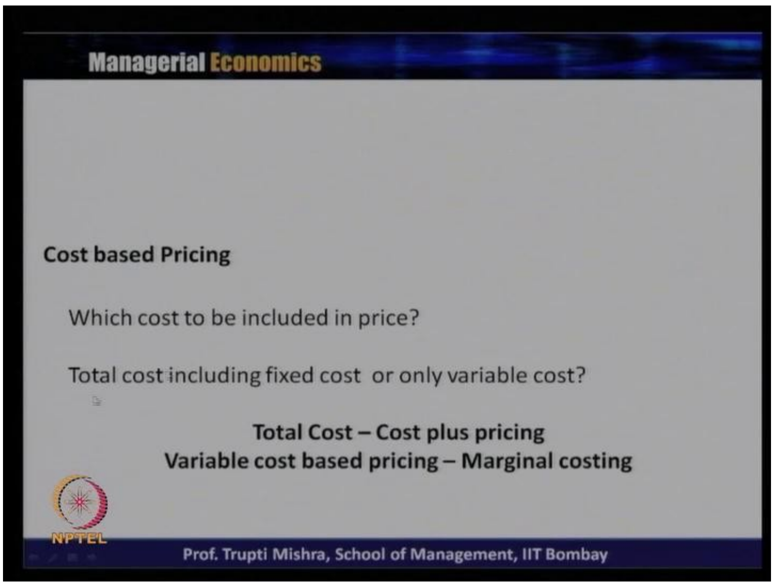

Now, the question comes, if cost is a component of the price, which cost to be included in the price, whether it is the total cost including fixed cost or only variable cost, or if, but the options are two; either total cost including fixed cost or only the variable cost. So, if the total cost is being used in the determination of price, this is generally known as the cost plus pricing. And if the variable cost is being used in the determination of pricing; that is known as the variable cost based pricing, and also this is known as the marginal cost pricing. So, there are two main category of the cost plus pricing; one is total cost, that is when total cost is being taken into consideration, this is cost plus pricing, and when the variable cost is being taken into consideration, this is known as the marginal costing. So, we will talk about the cost plus pricing first, that is also known as the markup pricing. And here the firm will consider the total cost per unit or the average cost, because total cost per unit is nothing but the average cost.

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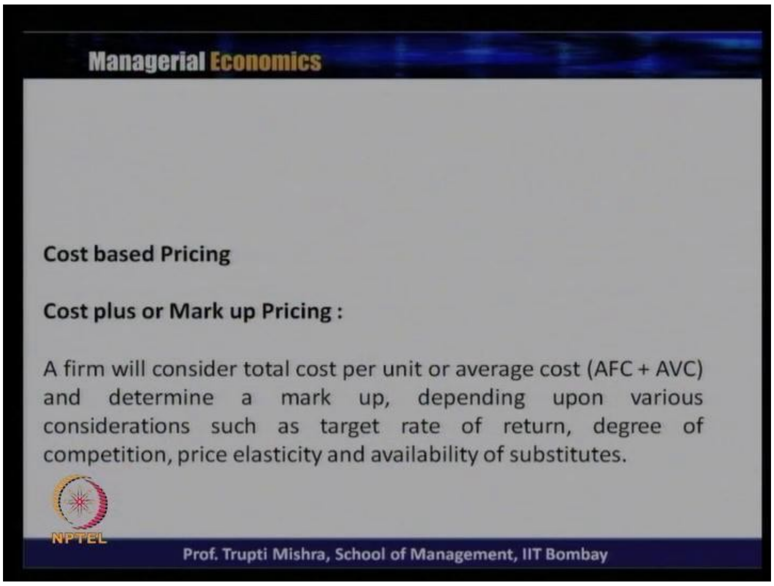


And here the average cost has two components that is average fixed cost and the average variable cost, and determine the markup depending upon various considerations; such as target rate of return, degree of competition, price elasticity and availability of substitute. So, how this price is determined here; first the cost component will be identified, and here the cost component is the total cost per unit, or the average cost; that is average fixed cost and the average variable cost. And then to determine a markup, that is the margin, and this margin is depending on that, what is the target rate of return of the company, what is the degree of competition, what is the price elasticity, and what is the availability of the substitute. These are the factors on which generally the margin dependent.

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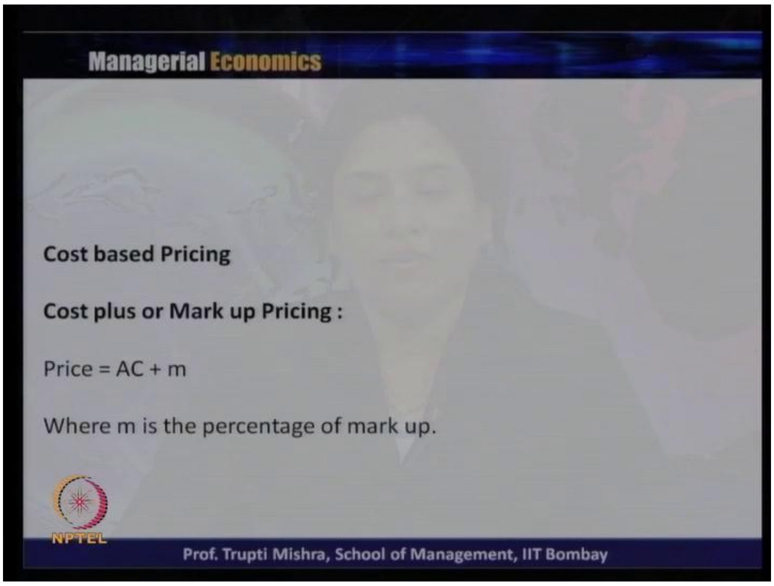


Then, the price is decided; that is average cost, which is average fixed cost plus average variable cost, plus m, m is the percentage of the markup, and this m is dependent on what is the availability of the substitute, what is the competition, what is the elasticity of demand, and what is the target rate of return of the company.

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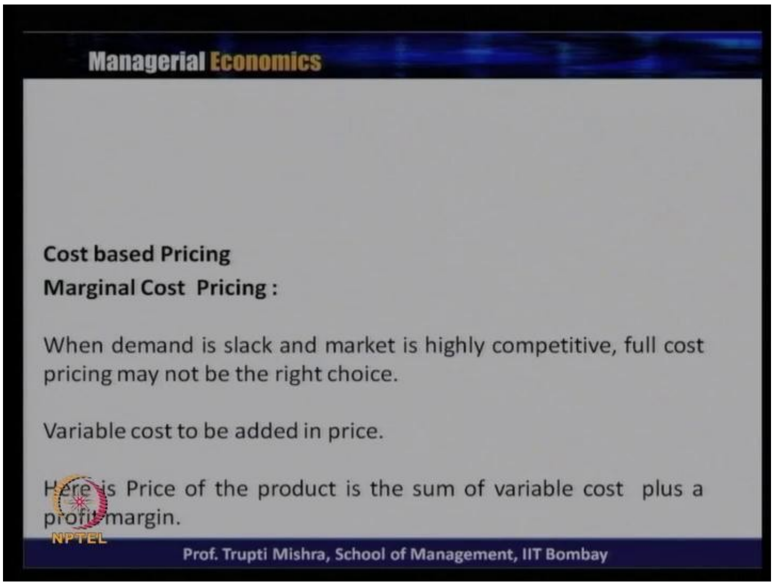

Then, the other part is marginal cost pricing. In case of marginal cost pricing, when this marginal cost pricing is followed as a method of cost price determination. When the demand is slack and the market is highly competitive, full cost pricing may not be the right choice, and in this case generally the marginal cost pricing is being followed. So, here the variable cost to be added in the price, and the price of product is the sum of variable cost plus a profit margin. And this is also known as the incremental cost pricing. Here the base price or the cost is less than in case of full cost pricing, hence price should be highly competitive, because in this case, we are only considering the variable cost, but in case of the cost plus generally we consider the fixed cost also. And since we consider the variable cost, here the base price is always less as compared to full cost pricing, and that is why this price is highly competitive. Generally this method is used to beat the competitors, and used in case of the public utility service, like social justice, where profitability is not the objective. So, we will just take an example to understand the difference between the cost plus pricing and the marginal cost pricing or the incremental pricing.

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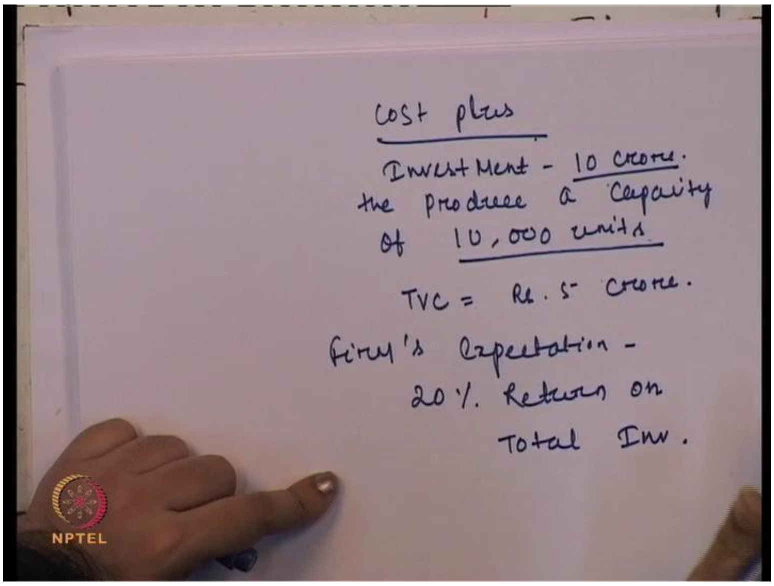


So, suppose a typical producer has invested 10 crore, to produce a capacity of 10,000 units. So, investment is 10 crores, the capacity is 10,000 units. Total variable cost is, this is 5 crore, and the firm expect or firm's expectation is 20 percent return on total investment. So, now we will find out the price under the cost plus.

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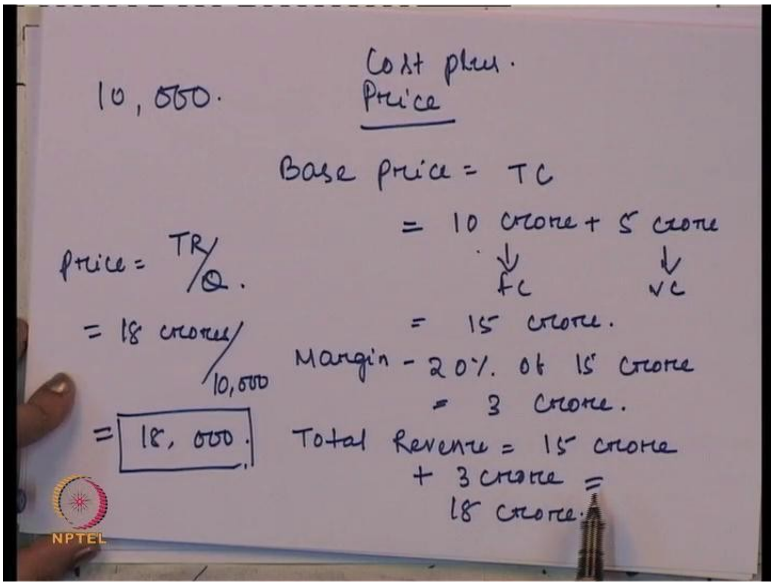


We will decide the price or we will determine the price, what will be the base price. Base price will be total cost, what is total cost, investment; that is 10 crore part of fixed cost, plus 5 crore; that is part of the variable cost. So, the total cost will be 15 crore. Margin the expectation is 20 percent return, so margin is 20 percent of 15 crore. So, that comes to 3 crore. Then what will be the total revenue, total revenue should be 15 crore, plus margin is 3 crore. So, this should be 18 crore. So, total revenue should be 18 crore, and total revenue if it is 18 crore, then how we will decide the price. Price is, this is the total revenue divided by the, whatever the quantity. So, entire total revenue has to be, generated from this 10,000 unit.

So, if the price, we will take 18 crores plus 10,000 unit, so that comes to 18,000. So, price is equal to 18,000, and how we have calculated this price over here. The base price is on the basis of the total cost, since this is cost plus, the total base price, the total cost will be both the fixed cost and the variable cost. So, fixed cost is 10 crore variable cost is 5 crore, so total cost is 15 crore. The firm expect at least 20 percent return from the investment, so 20 percent of 15 crore is 3 crore, total revenue has to be 15 crore plus 3 crore that comes to 18 crore. And how we will decide the price, the entire total revenue has to be generated from this 10,000 units, and that is why the 18,000 has to be the price.

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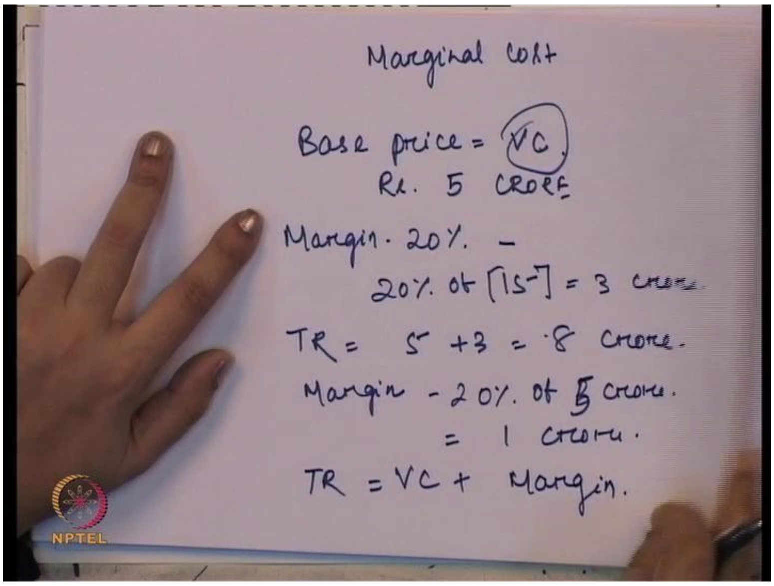


Now, we will do, taking the same example, the same facts and figures that the same information about the company. We will find out or we will determine the price on the basis of the marginal cost. This is known as the marginal cost pricing or incremental cost pricing. Here what will be the base price, here the base price is, only on the basis of the variable cost, and what is the variable cost here, variable cost is 5 crores in this case. Now, margin is, again 20 percent, if margin is 20 percent, then this should be 20 percent of the 15 crores, so that comes to 3 crore. So, total revenue will be 5 plus 3, that comes to 8 crore. How in this case we will decide the margin again, the margin will be again 20 percent of the, because this is on the basis when the full cost is being taken, but here the base price is variable cost. So, margin will be 20 percent of 3 crore, so that comes to 20 percent of the variable cost; that is 5 crores, so that comes to 1 crore.

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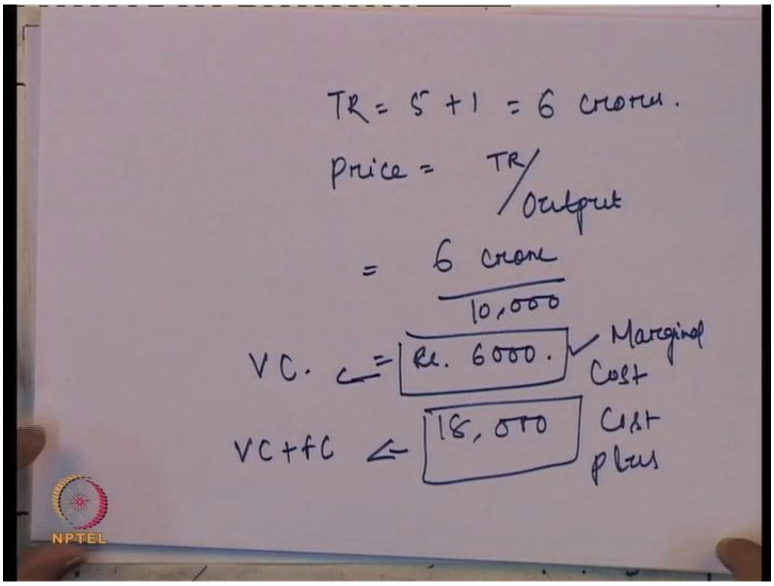


So, total revenue will be variable cost plus the margin, and if it is variable cost plus the margin, then it is total revenue is equal to 5+1; that is 6 crore, and price will be, total revenue minus the total output, so that comes to 6 crore divided by 10,000 is equal to rupees 6000 price. So, when we have found out the full cost on the basis the full cost; the price is equal to 18,000, and when on the basis of the marginal cost the price. So, this is cost plus, this is marginal cost, and what is the difference between this two. In case of cost plus, we take variable cost plus fixed cost. In case of marginal cost, we only take the variable cost. So, when the price determination is on the basis of the cost, generally we have two kind of method one is cost plus pricing and another is the marginal cost pricing. In case of cost plus pricing, we take the full cost as the variable cost and the fixed cost. And in case of marginal cost pricing only we take the variable cost.

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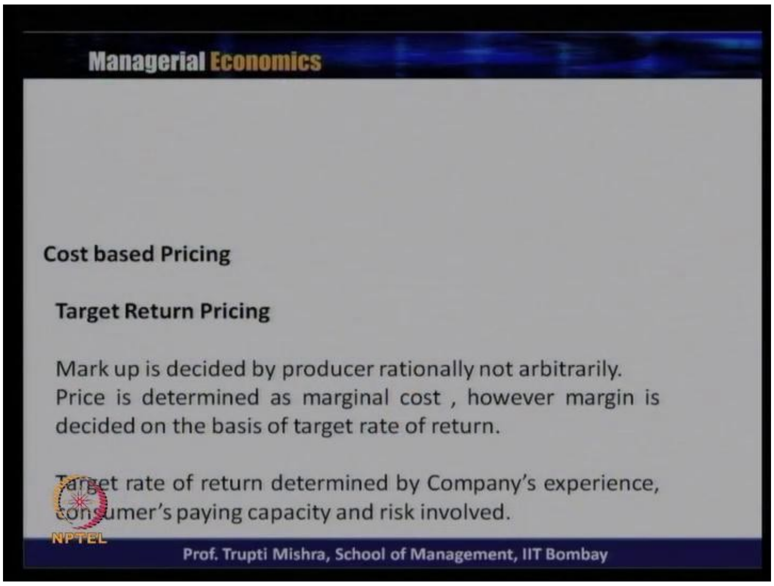


Then we have target return pricing, and here the markup is decided by the producer rationally, not arbitrarily, price is determined as the marginal cost, however the margin is decided on the basis of the target rate of return. And here again the pricing is on the basis of the marginal cost pricing, but here the margin; that is the cost plus m, the margin is decided on the basis of the target rate of return, and how target rate of return is determined. Target rate of return is determined by, what is the company's experience, consumers paying capacity and the risk involved. They have to assess that how much the consumer ready to pay or how much they can pay for this product, and on that basis generally they charge the price or they set their margin. Then second category of pricing is based on the firm's objective, and what is the base price here or what is the objective here.

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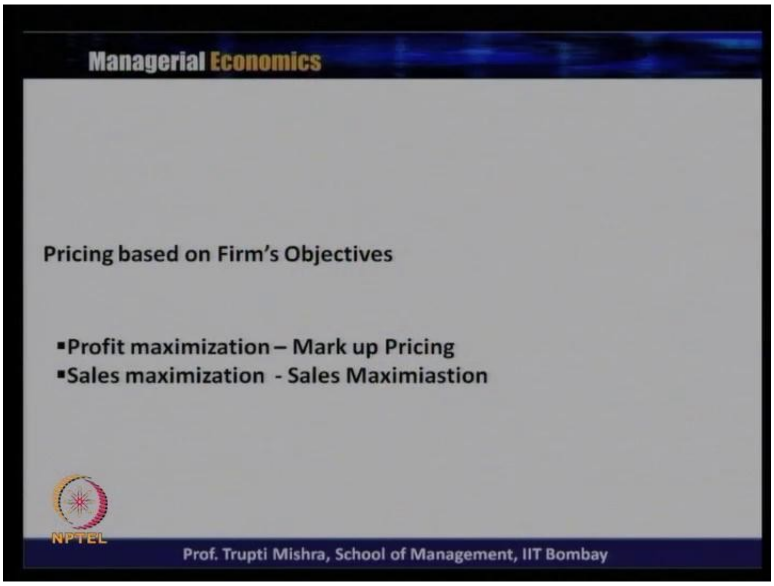


There are two objectives to the firms; one profit maximization, and second is the sales maximization. So, in case of profit maximization, generally the markup pricing is being followed. And in case of sales maximization, generally the sales maximization is, sales maximization generally the marginal cost pricing is being followed. So, we will just take an example to understand how the price differs, if the objective of the firm is to maximize the profit, and the objective of the firm is to maximize the revenue.

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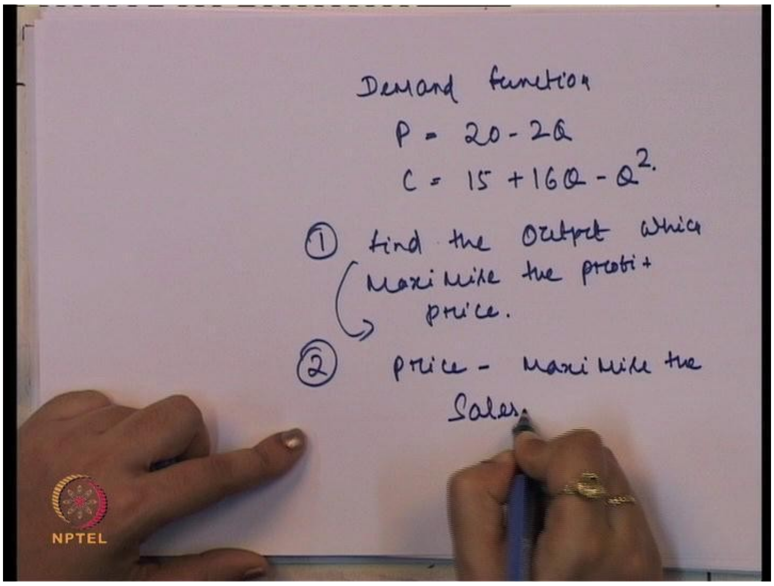

So, we will take a demand function; $P=20-2Q, C=15+16Q-Q^2$. Now we need to find out the output, find the output which maximizes the profit or the other word we can say, find the price at which the output will maximize the profit, and second we have to price, find out the price, which will maximize the sales. Now, we will see how we will find out the price in both this cases.

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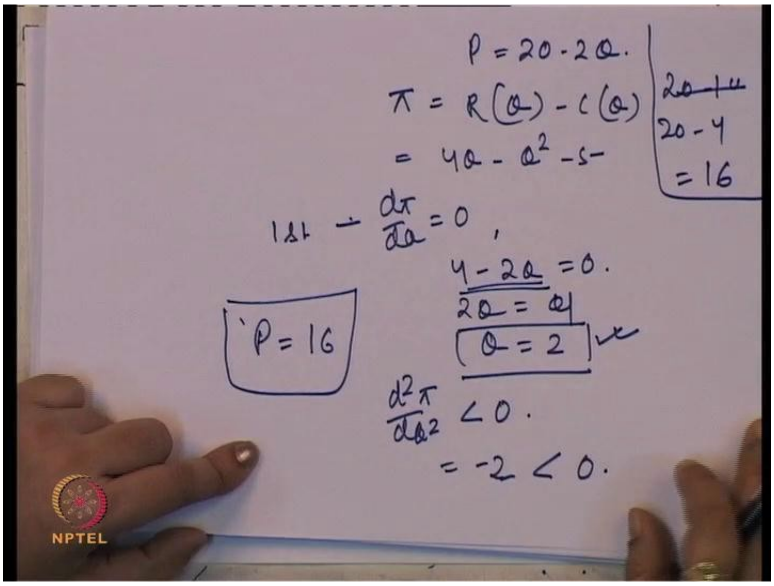


So, the first case we need to find out the profit, profit is $\pi=R(Q)-C(Q)$, so that comes to $4Q-Q^2-5$. So, $\frac{d\pi}{dQ}$ should be equal to 0. So, $\frac{d\pi}{dQ}$ if you look at then it comes to, $\frac{d\pi}{dQ}=4-2Q=0$, $2Q=4, Q=2$. Now, we need to check this is first order condition. So, we need to check whether second order condition is being fulfilled or not. So, in this case we will take $\frac{d^2\pi}{dQ^2}<0$. So, again taking the derivative of this $4-2Q$, we get minus 2 which is less than 0. So, second order condition gets fulfilled Q is equal to 2. Now, we need to find out what is P, and to find P we can put the value of Q in that equation, and $P=20-2Q$. So, that comes to $P=20-4=16$. So, 16 is the price which maximize the profit in the market.

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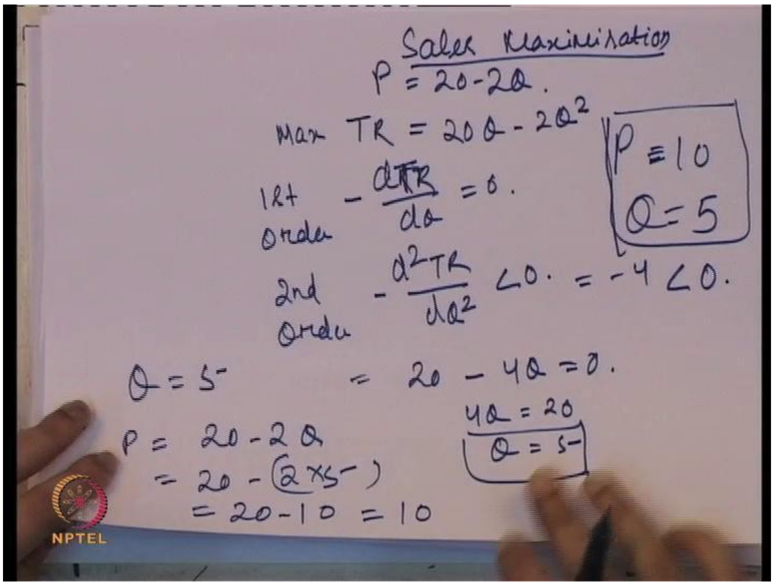


Now, we will see what is the price, where the sales are getting maximized, or the revenue is getting maximized. So, in this case again we will take the total revenue. So, $P=20-2Q$, and total revenue is equal to $TR=20Q-2Q^2$. So, this first $\frac{dTR}{dQ}=0$, because here this is to maximize the total revenue. So, in this case the first order condition will be, the first order derivative with respect to the total revenue has to be equal to be 0. And second $\frac{d^2TR}{dQ^2}$; that is the second order, this has to be less than 0. So, taking that, if you take this equal to 0, then it comes to $20-4Q=0$. So, $4Q=20, Q=5$. And second order condition is minus 4, which is less than 0. So, if it is Q is equal to 5, then $P=20-2Q$. So, this is $P=20-2(5)=20-10=10$.

So, p is equal to 10 and Q is equal to 5, in case of the sales maximization. So, if it is a case of the profit maximization, the price what we discussed in the previous case; price was 16, quantity was 2. And if it is sales maximization P is equal to 10, Q is equal to 5, so how we can conclude this two kinds of pricing. So, if the same demand function, if the firm is having the same demand function, and the same cost function. If the objective is different, they have to charge a different price. If they are trying to maximize the profit, they have to charge a higher price, and if they because in that way even if the quantity getting sold if it is less, still they are getting a higher amount of, gap between total revenue and the total cost. Whereas in case of the sales maximization the focus is, more on getting more revenue and more share, that is why they charge a lower price, so that they can maximize the sales revenue, because a small change in the price, would also leads to greater change in the quantity demanded.

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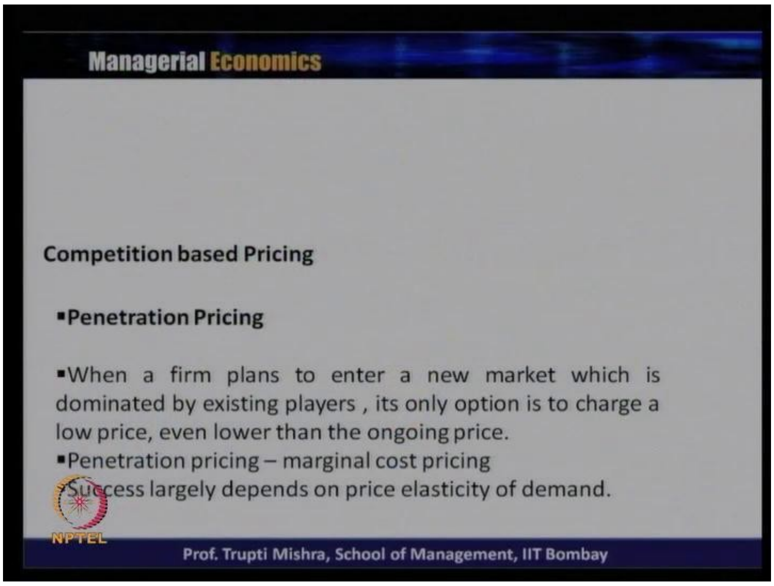


Then we will talk about the pricing method for which the base is competition. So, here the first category of price comes as the, penetration pricing, and generally when this pricing is being followed. When a firm plans to enter a new market which is dominated by existing player, its only option is to charge a lower price, even lower than the ongoing price. So, in this case generally this penetration pricing or the marginal cost pricing is being followed. And here when this particularly gets used, when a firm enters into the market, they have to charge a lower price, if they want to enter into the market and compete with the existing market. So, in this case, generally they follow a pricing method on the basis of the marginal cost pricing, which is known as the penetration pricing, and here the success is largely depend on the price elasticity of demand. And why we say that the success is dependent on the price elasticity of demand, because in this case penetration pricing, if they are charging a low price, the market should be elastic, so that when the firm is entering into the low price, there should be increase in the quantity demanded. Here you can take the example of like, when the reliance enter into the low cost segment or when Air Deccan enter into the airline industry, they charges, they enter as a low cost options, and that is why, whatever the pricing they followed; that is typically the example of the penetration pricing.

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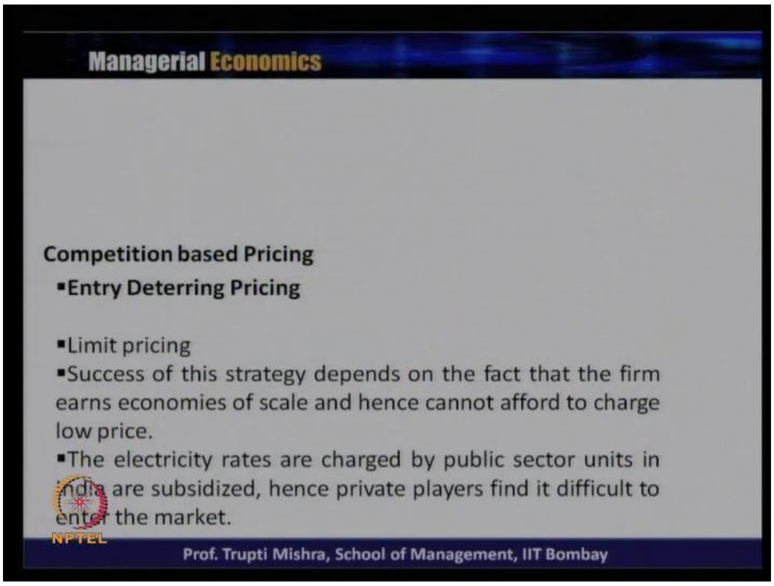


Then we have the second category of pricing under competition based pricing; that is entry deterring price. This is also kind of a limit pricing, and here the success of this strategy depends on the fact, that the firm earns economies of scale hence cannot afford to charge a lower price. So, here the strategy should be that, the price should below, so that or price should be limit, so that other should not get enter into the market. And typically the electricity rates charged by the public sector unit in India are subsidized. Hence the private players find it difficult to enter into the market, because at the lower price private sector, if they are entering into the market they are not getting any profit or any benefit, and that is why they get into a, they are not interested to operate in that typical market segment.

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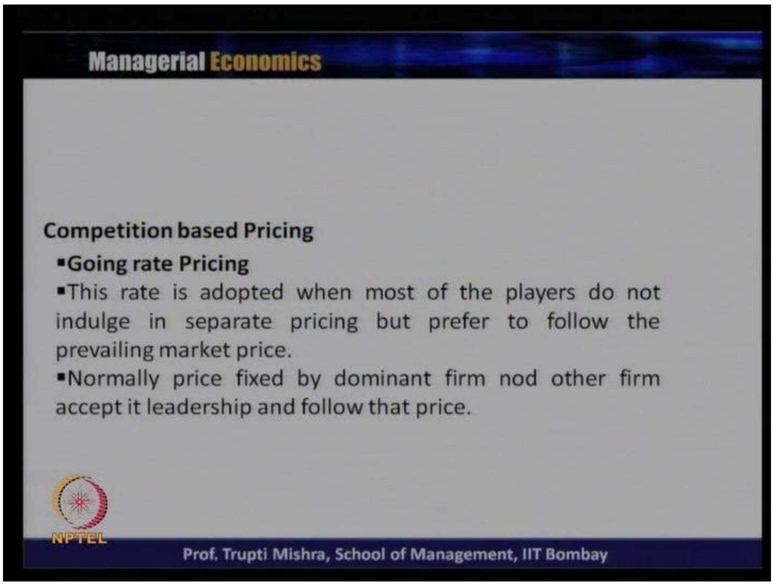


Then there is one more competition based pricing; that is going rate pricing. So, typically I will just give an introduction to this going rate pricing, and we will talk about this when we discuss in the next class, but here for the understanding, going rate pricing is the rate adopted when most of the player do not indulge in separate pricing, but prefer to follow the prevailing market price. Here we can take the example of the mineral water, but unlike if you look at, whether you are taking a Aquafina, whether you taking a Bisleri, at least those were the known brand they charged at the same rate.

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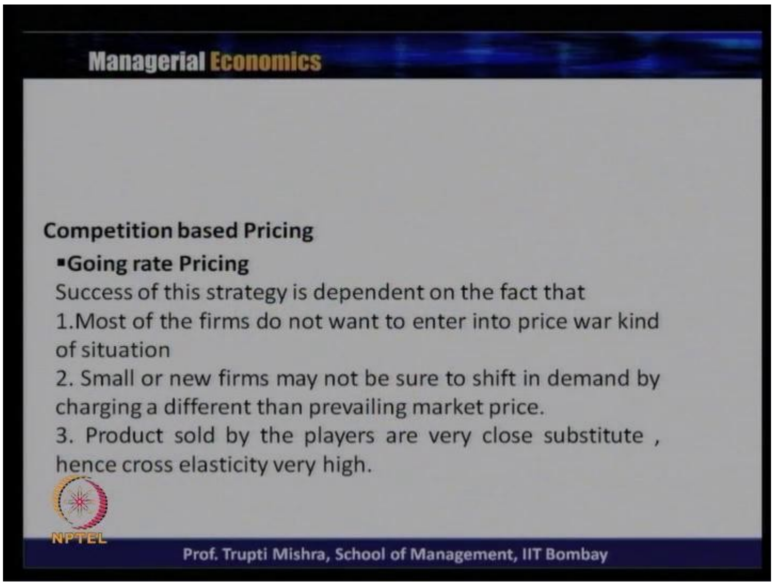

And here the normally the price is fixed by the dominant firm, and other firm generally accept it the leadership and follow the price. And here the success of the strategy is depended on the fact that, most of the firm do not want to enter into the price war kind of situation, because they know that if they are getting into the price war, it will benefit the consumer not benefit the producer. Small or new firm may not sure to shift the demand by charging a different than the prevailing market price, because if they are charging a different price they have to shift the demand, and that is to be in a different market price. And product sold by the players are very close substitute, hence cross elasticity is very high. So, whenever there is a change in one price, that is going to affect the price of the other product, and that is why people they or the firms they feel it is better to follow a uniform price across the market.

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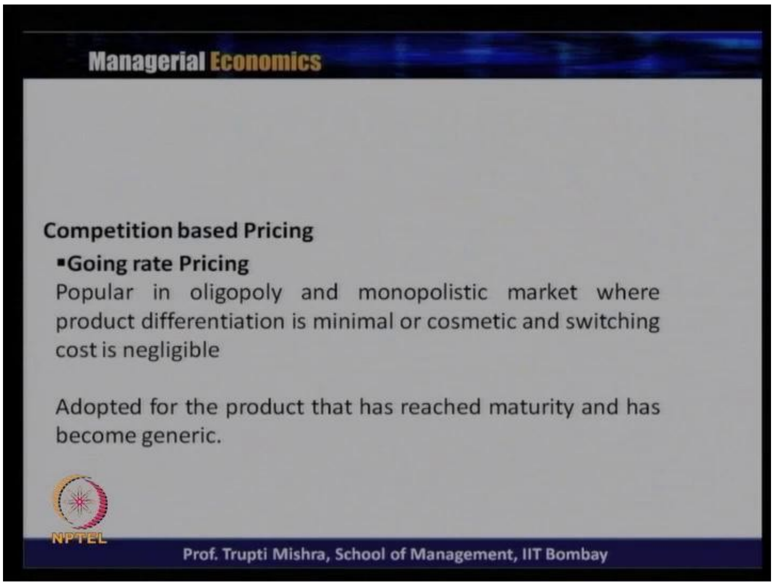


This going rate pricing is more popular in case of the oligopoly and monopolistic market, where product is differentiation is minimal, or cosmetic and switching cost is negligible. And typically, this is adopted for a product that has reached the majority, and generally it is a kind of a generic product, it has already reached the maturity. Then next class, we will discuss the pricing based on the product life cycle, and also on the basis of the policy, and few more category of the type of product pricing in the next session.