Managerial Economics
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Lecture - 11
Theory of Demand (Contd…)

In continuation to our last session on elasticity of demand, in today's class again we are going to analyze, see how the change in the demand due to few other factors which influence the demand. So, today we are going to check the income elasticity of demand, cross price elasticity of demand, and we will solve few numerical related to the elasticity of demand.

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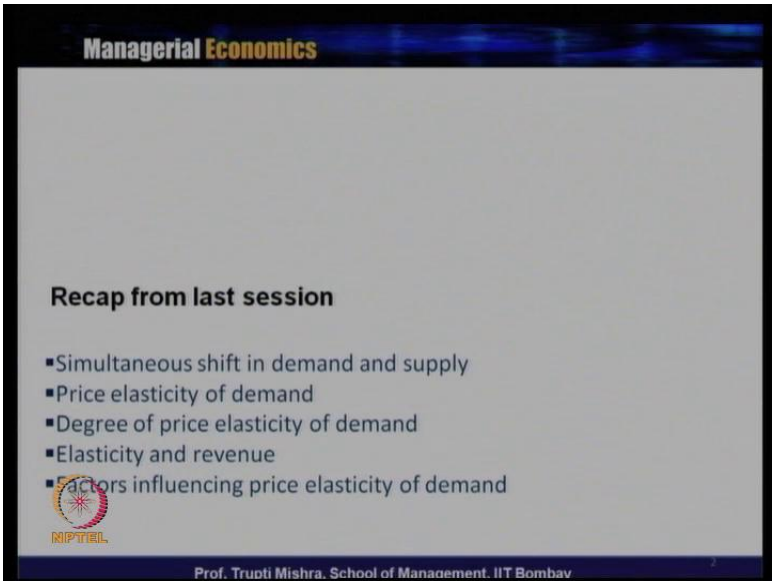

So, if you remember in the last class, just, we do a quick recap of the last session what we have covered. If you remember there is, we discussed about the simultaneous shift in the demand and supply, how it changes the equilibrium price and quantity. Then we introduced the concept of elasticity of demand which is something more than this, simply identifying the relationship between demand and price; rather it also check the relative magnitude of change in the demand due to change in the price. Then we talked about degree of price elasticity of demand. Then elasticity, how elasticity and revenue they are related? What happens to total revenue when the demand is elastic, whenever the demand is inelastic. And, finally we discussed about the few factors which influence the price elasticity of demand.

So, in continuation of this topics, today we will discuss our, the next type of elasticity of demand that is income elasticity of demand. As we know that consumer income is one of the factor which influence the elasticity of demand, or this may be which influence the quantity demanded. So, what should be the change in the quantity demanded when the consumer income changes, whether it increases or whether it decreases, what happens to the quantity demanded. And, what is the exact proportionate change in the quantity demanded when there is a change in the income.

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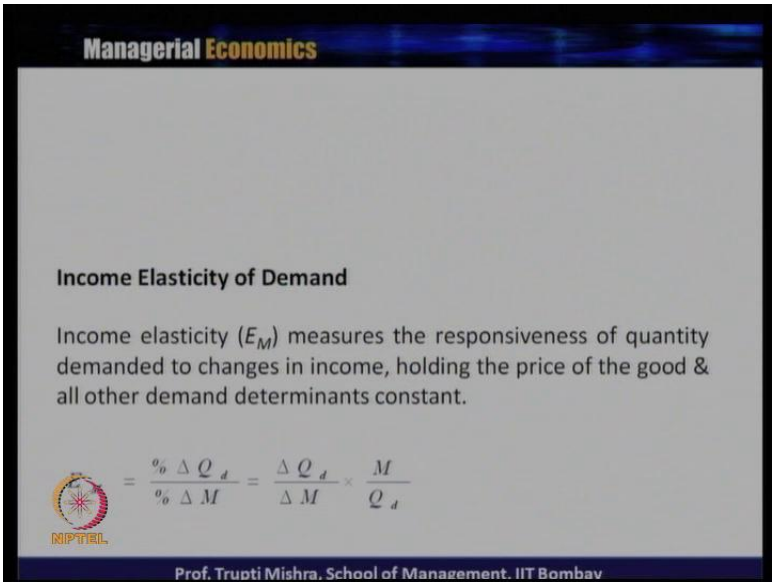

So, income elasticity of demanded, it generally measures the responsiveness of the quantity demanded, to change in income, holding price of the goods and all other demand determinants constant. So, it is basically a relationship between the change in the quantity demanded, and change in the income, keeping all other variable constant which influence the demand. So, how sensitive the consumer, to the change in the income; When income increases, whether they consume more; when income decreases, whether they consume less. What is their reaction, to the purchases of luxury goods, purchases of comfort goods, purchases of the necessity goods, when there is the change in the income, and whether there is a change in the income, in the positive and the negative direction.

Now how to find out, what is the change in the income or by what proportionate the quantity demand should change, when there is a change in the income. This we can find out by following the formula that the percentage change in the quantity demanded, the

percentage change in the income. Here Q d is the quantity demanded, M is the income. And, if you simplify this again this becomes del Q d by del M multiplied by M and Q d; M is the original income, Q d is the original quantity demanded; del M is the change in the income, and del Q d is the change in the quantity demanded. So, we can find out the income elasticity of demand by del Q d by, del Q d by del M multiplied by M by Q d.

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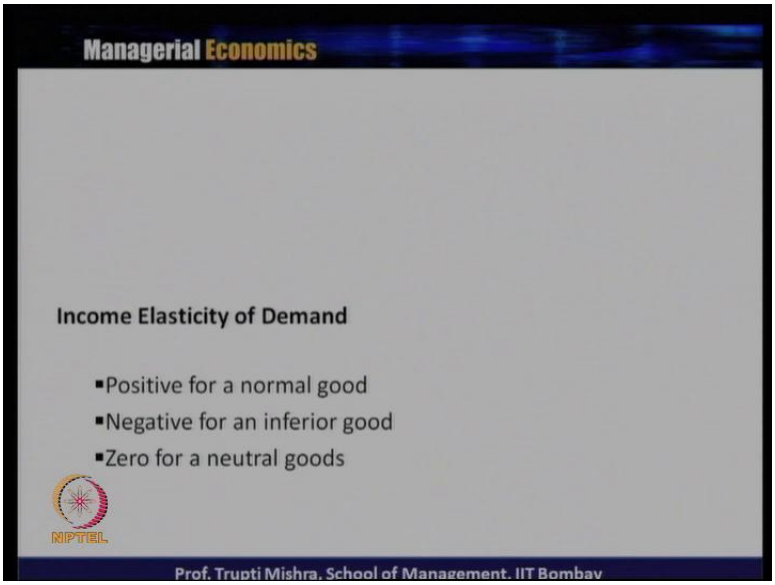

Now, how we should interpret this income elasticity of demand? We are going to get a value. If the value is positive, then this is the case of a normal good. Now, why it is positive for a normal good? Because if you see, now real life also when there is a increase in the income, generally that leads to increase in the consumption. And, in case of normal good it happens that, when increase in the income, generally increase in the purchases of the normal goods. If the value is negative, this is the case of a inferior good. Now, why it is for inferior good?

I will just give you a small example over here. Suppose you are using public transport everyday to coming to the office or coming to your college. Now, when income increases, you prefer to buy a vehicle of your own, rather than using the public transport. So, in this case, the public transport has become a inferior good, and the quantity demanded decreases, or the use decreases for the public transport, when there is a increase in the income. So, the relationship between the income and quantity demanded of the public transport is inversely related, and that is the reason we get a negative value

of income elasticity of demand. Income increases, the consumption of the inferior good decreases because the consumer now has the capability to consume a superior good with the increase in the income. That is the reason, the income elasticity of demand is negative for inferior good, which implies that when income increases, consumption of the inferior good generally decreases.

Similarly, if the value is 0, then it is neutral goods. So, what are the neutral goods, generally? If income increases, we do not eat more. If you are taking the example of a food item; when income increases, we do not increase our intake, rather what we do? We will look for the better quality, we will look for the better brand, with the increase in the income. So, if you look at, the food intake remain constant, even if the, if there is a increase in the income. So, in this case we can consider, food item is neutral goods because it never changes with the change in the income, even if it is increasing. Similarly, if there is a decrease in the income, income, the food income, the food intake never goes down, because that is required for survival. And, even if there is a decrease in the income generally we find the other way out to consume that much amount of food intake. So, in this case if you look at, this is a case of neutral good.

And how, what is the change in the nature of income in the neutral goods? There is no change in the quantity demanded, because of increase or decrease in the income. So, in this case the income elasticity of demand takes the value equal to 0. And generally in this case we interpret this as the goods, the nature of the goods as the neutral good.

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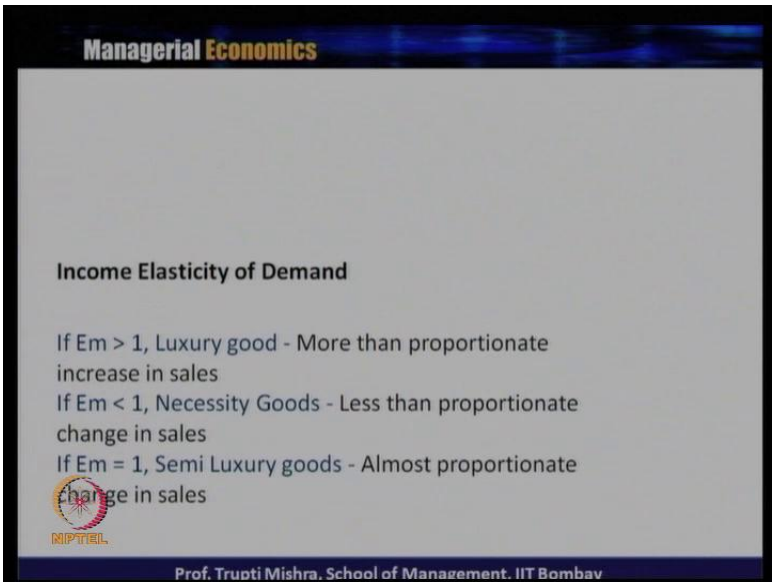

Similarly, if you categorize the goods according to the luxury necessity and the semi luxury goods or the comfort good, in this case how the value, on the basis of value, how we can interpret, what kind of good? If the income elasticity of demand is greater than 1, this is the case of luxury goods; and, its more than proportionate increase in the sales.

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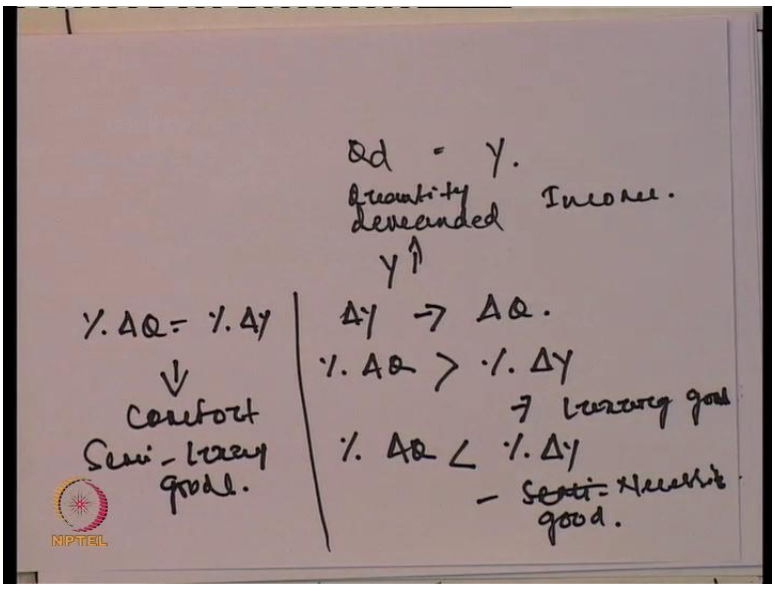

So, if you, if you look at this change in the quantity demanded due to change in the income, like this is your quantity demanded, this is your income. Now, when there is a change in the income, suppose del y that that leads to change in the quantity demanded.

So, if the proportionate change in the quantity demanded is more than proportionate change in the income, this is the case of a luxury goods. If the change in the quantity demanded is less than change in the income, this is the case of a semi, this is the case of a necessity good. Like, and if the change in the quantity demanded is just equal to change in the income, this is the case of your comfort good, or semi luxury goods.

Now, let us interpret these three types of good. So, first case we are saying this is a luxury good, because change in the income, is less than the change in the quantity demanded, and this happens for the quantity demanded. Now, when we plan for buying a house or buying a vehicle, it is not that the value of the vehicle or the value of the house, by that percentage our income has changed, but at least when there is a increase in the income, we can buy those goods at a, as a monthly basis, we are paying monthly basis like if you look at the schemes of EMI and all these. In this case, you can buy a high value product, when at least you have the capability to pay the installment. So, in this case, the percentage, if the income is increasing by 20 percent, I am going to the next one, I can see that this 20 percent I can pay as the monthly installment for buying a high value product. So, in this case it happens that, even if the increase in the income is just 20 percent, the consumer makes the purchases which is more than the worth value of 20 percent. And in this case, generally this is the case of the luxury goods.

Similarly, if you take income elasticity of demand is less than 1, it means the proportionate change in the quantity demanded is less than proportionate change in the income; and this happens in the case of necessity goods. Like just now we are taking the example of food intake, this is necessity goods. So, if the income increases by 10 percent, my entire 10 percent I am not going to spend on the food item, or the necessity goods. What I will do? May be part of it I will spend and will look for the better quality in the food, food range, but I am not going to spend entire 20 percent on the, entire 20 percent increase in the income only consuming more food, or the better quality of the food.

If it is equal to 1, then it is a case of semi luxury goods, or may be the case of the comfort good. So, in this case, if my income increases by 20 percent, what I do? Generally I, generally I buy more from the income. But that is not, that is exactly the same proportion, whatever the change in the income. So, if there is a 20 percent change in the income, I will buy a product which is worth of 20 percent not more than that. So,

in this case the percentage change in the quantity demanded is just equal to the percentage change in the income.

So, if elasticity of demand is greater than 1, this is the case of luxury goods. The proportionate change in the quantity demanded is more than the proportionate change in the price. If the income elasticity of demand is less than 1, then in this case the proportionate change in the quantity demanded is less than proportionate change in the income. If income elasticity of demand is equal to 1, the proportionate change in the income is just equal to the proportionate change in the quantity demanded.

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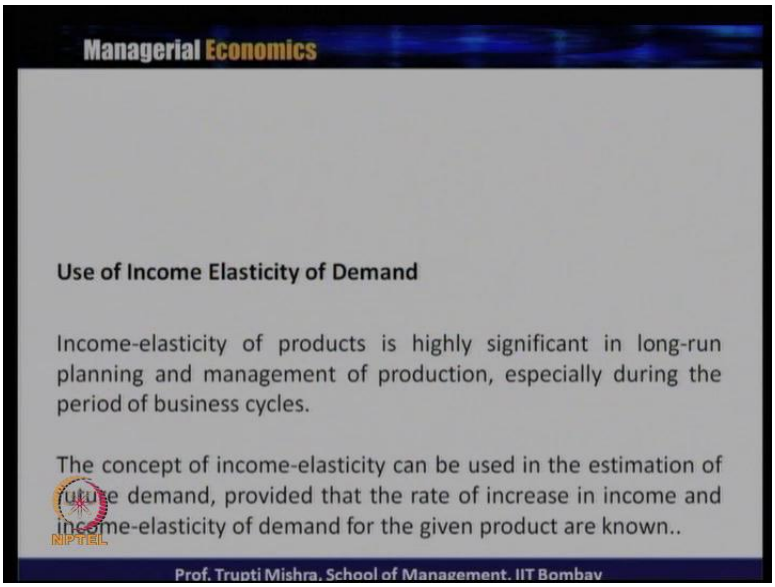

Now, where generally the use of income elasticity of demand comes? So, income elasticity of the products is highly significant in the long run planning and management of production. Especially, during the periods of business cycle, like where there is, like if the income increases the quantity demanded changes in the different direction, generally the, it helps the producer to identify, if income is increasing or decreasing, the demand is going to decrease, on that way they generally plan for their production. It can also be used as the estimation of future demand, provided the rate of increase in income, income elasticity of demand for a given product are known. It means, if there is a, if there is going to increase in income, if there is a forecasting or prediction that income is going to increase, in this case the producer can plan that, if income is going to increase for some

goods the quantity demanded is also going to increase. And in this case, may be they are planning to produce more that helps them to get some more amount of the profit.

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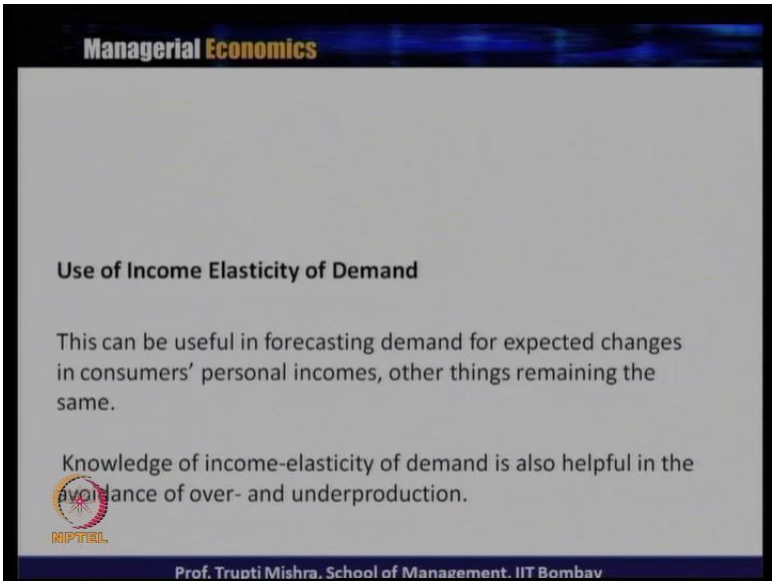

This can also be useful in forecasting demand for the expected changes in consumers' personal income, all other things atleast remaining constant. So, knowledge of income elasticity of demand is helpful in avoidance of over and under production. As you were discussing now, that when you know that income is increase, quantity demanded is more. So, you know that is the exact amount of production you are going to produce. But for producer, it helps in such a way that, if income is going to decrease, they are going to produce less; if income is going to increase, they are going to produce more. So, that generally avoids the over production and the under production.

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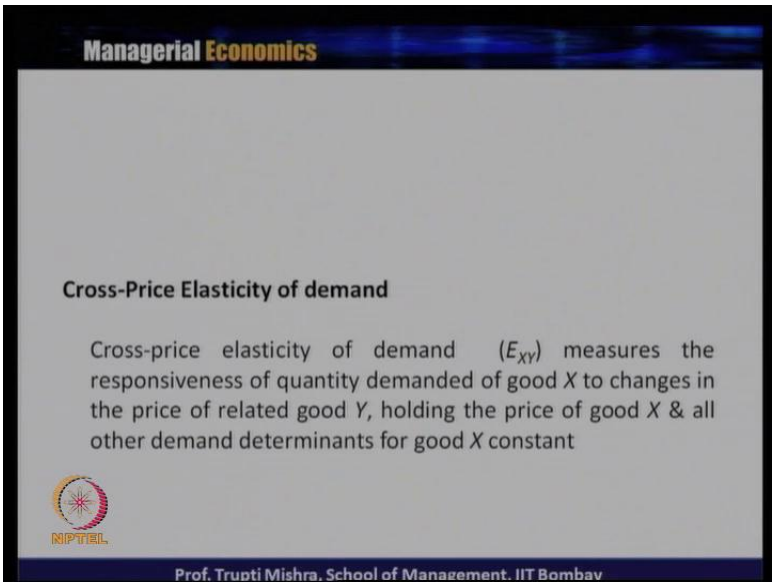

Then, we will come to the different type of price elasticity of demand that is cross price elasticity of demand. And if you remember, there is one factor which influence the demand is, the price of related goods in the market. Like, we always take the example of tea and coffee. What happens to the quantity demanded of tea, when the price of coffee increases; or what happened to the quantity demanded of coffee when the price of tea decreases. Since both the goods are related to each other, both the goods are substitute to each other, whenever there is a change in the price of one commodity that leads to change in the price of other commodity. That we capture through the cross price elasticity of demand.

What is the relative magnitude of change in one quantity demanded, when the price of the other changes? So, cross price elasticity of demand measures the responsiveness of the quantity demanded of good x, to change in the price of related good y, holding the price of good x, and all other demand determinants for good x is constant. So, if there are two products, x and y, cross price elasticity of demand measures the change in the quantity demanded of x; when the price of y changes, keeping the price of x remain constant, and all other factor that influence the price of the, or the quantity demanded of the x that is remained constant during the study period.

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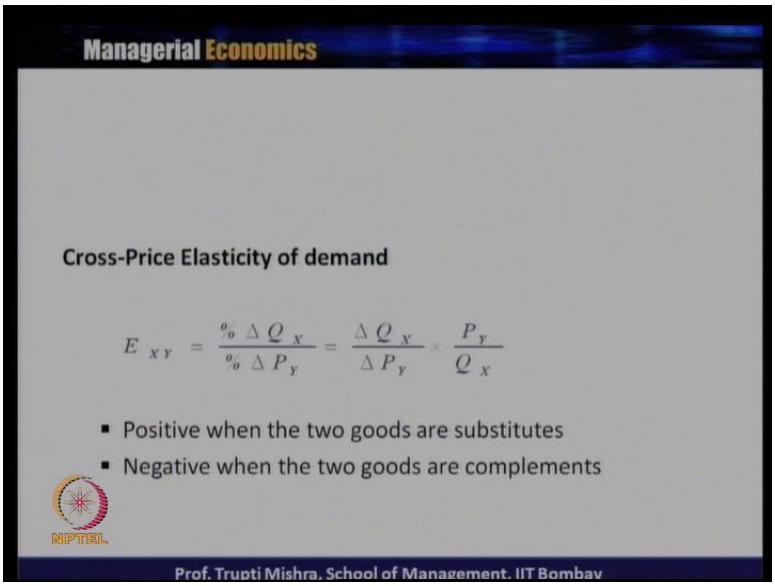

Now, what is the formula to calculate the cross price elasticity of demand? Suppose there are two goods, x and y, in this case the formula to calculate cross price elasticity of demand, in term of the relationship between the quantity of x, and price of y. So, this is, change in the quantity of x, percentage change in the quantity of x, upon the percentage change in the price of y, because if price of y changes that leads to change in the quantity of x. x and y they are substitute goods; and, here we are measuring what is the exact proportionate change in the quantity of x, when there is a change in price of y. If you simplify this, then this becomes del Q x by del P y multiplied by P y and Q x. So, Q x is quantity of x, p x, P y is the price of y, and del P y is the change in the price of y; del Q x is the change in the quantity demanded of x. Now, if the value of cross price elasticity of demand is positive, then two goods are substitute. If it is negative, two goods are compliment.

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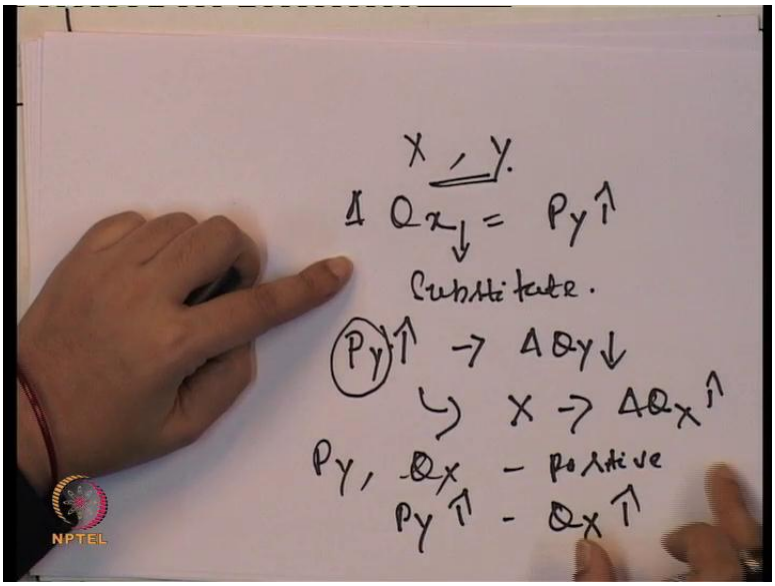

Why it is substitute when two goods are positive? So, if you know that x and y these are the two products those are in question. Now, here we are measuring, what happens to change in the quantity of x, when there is price of y changes. Now, how x and y is related? Suppose, both of them, they are substitute. So, price of x as demand, when price of y increases that leads to decrease in the quantity of y.

People those who are consuming this P y, now they prefer to consume good x, and that too lead to the increase in the quantity of x. So, how P y and Q x, they are related? They are related in positive sense, because when P y is increasing that also leads to increase in the Q x. And that is the reason if the cross price elasticity of demand is positive, we generally interpret this as the substitute good, because price of, price of y is leading to change in the quantity demanded of x. So, the positive value of cross price elasticity of demand implies that, both the goods in the question, they are the substitute to each other.

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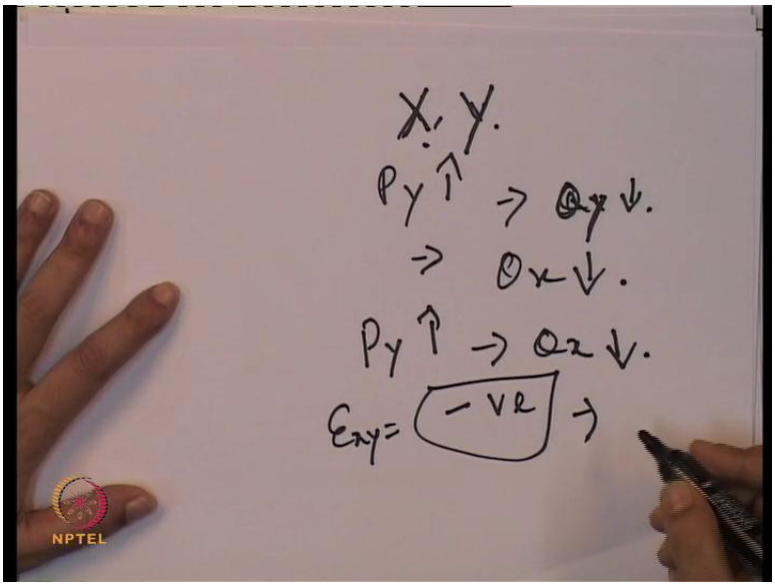

Now, we will see how it is negative for the complimentary good? Suppose, x and y, they are the complimentary goods. It means, if the consumer has to consume x, he also has to consume y. And, if the consumer has to consume y, he has to consume x. So, one good cannot be consumed without the consumption of the other good. Now, we will see how they are related? Price of y increases, leads to quantity of y decreases, because according to law of demand whenever there is a increase in the price that leads to decrease in the quantity demanded. If this happens, if the quantity of y decreases, you cannot consume x alone, in order to consume x also, you need y. So, that leads to the fact that quantity of x also decreases.

So now, how they both of them are related? Price of y increases leads to decrease in the quantity of x, and you get a negative value of the cross price elasticity of demand. And you can interpret this as, whenever there is a negative cross price elasticity of demand, that leads to the fact that both the goods in the question, they are negatively related to each other, and they are complimentary in nature .

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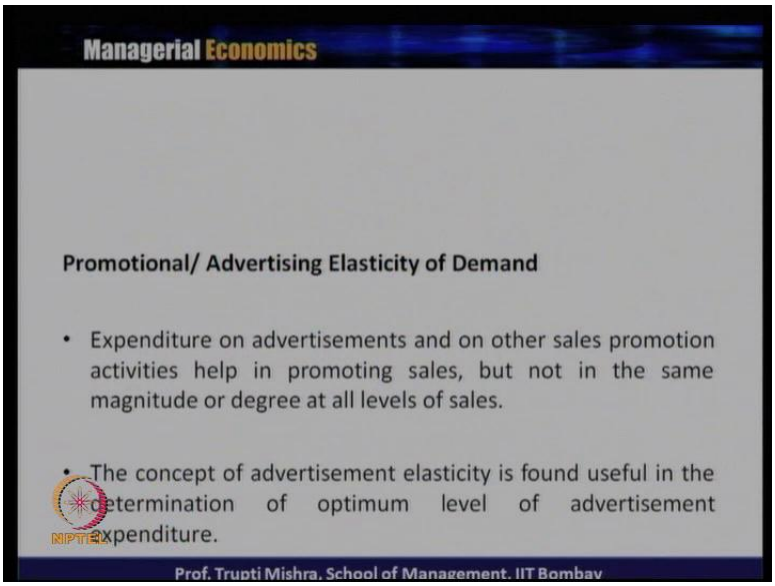

Then, we will introduce a new type of elasticity demand, which is more recent, it has come into picture that is promotional, or advertising elasticity of demand. So, if you know the, there is a fact that, whenever the company they spend more on the advertising, advertisement and other sales promotion activity, it helps in promoting the sales, but not in the same magnitude or degree at all level of sales. If you look at, whether it is T.V. commercial, whether it is hoarding, whether it is may be the through any other form of media or news paper, you will find the advertisement and the sales promotion activity, may be its discount, may be its just reaching out to the consumer, company they massively do that during specifically, if you look at, the festive season.

But does the quantity demanded also changes when this advertisement is there, and the sales promotion activity is there? Obviously, there are changes in the quantity demanded because consumer, they knows that this is the product available in the market, this is the price. But, by what percentage, or by what magnitude the change in the quantity demanded takes place, due to change in the sales promotion, or due to change in the advertisement expenditure, that will capture through the advertising elasticity of demand.

So, why it is useful? It is useful in the determination of the optimum level of advertisement expenditure. It means, if there is no increase in the sales, even if the advertisement expenditure is increasing day by day, or on a regular basis, the company need to again rethink that whether they are doing the right kind of investment, by

investment in the advertising expenditure. Because that is not leading to any changes in the quantity demanded, any changes in the sales revenue, or any change in the sales quantity, even if there is a increase in the advertisement expenditure. So, this advertising elasticity of demand will help, to determine whether that is the right amount of advertisement expenditure, or there is a need of more advertisement expenditure for increasing the sales.

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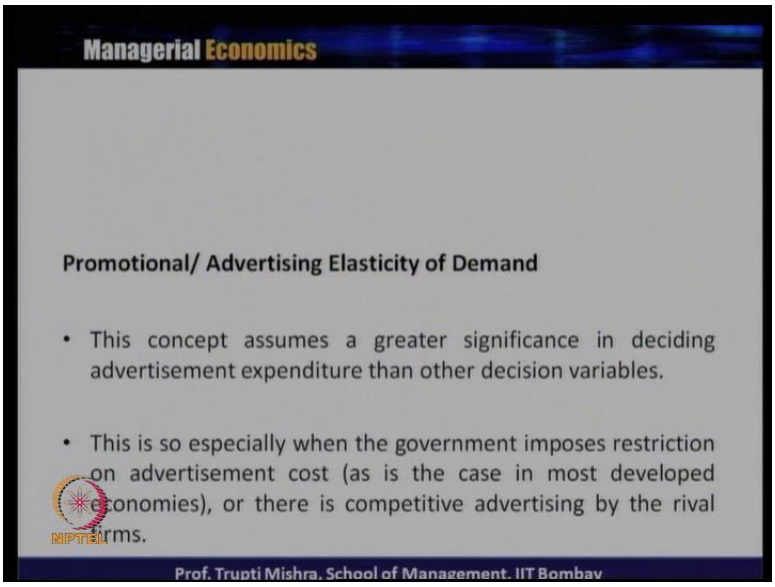

This assumes a greater significance as a decision variable. Because, we are just explaining, if you are doing certain amount of advertising expenditure, whether this is required more, or whether this is required less. And, this is especially when the government imposes that the restriction on advertisement cost, as in the case of most developed economy, there is a competitive advertising by the rival firm. You cannot just go on advertising; there is some restriction quota, atleast in the developed country. This, this help, in this scenario, the advertising elasticity of demand helps to identify what is the right kind of advertisement expenditure? What is the right kind of sales promotion?

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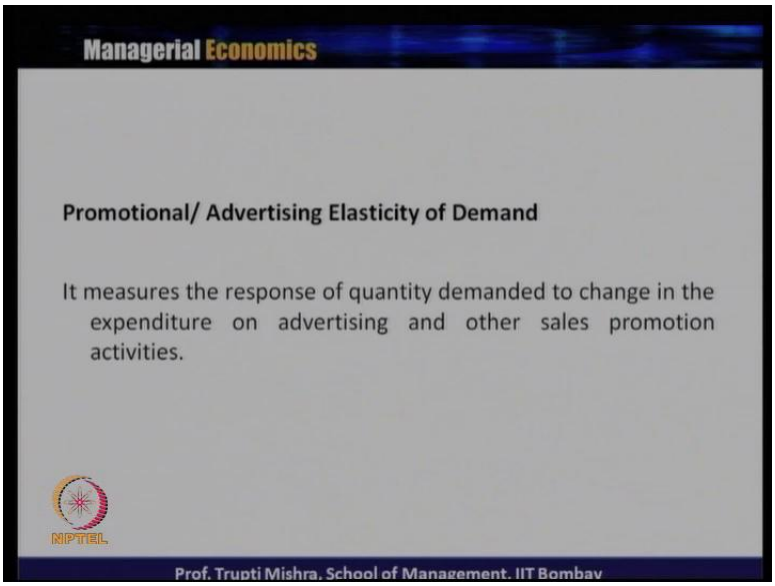

Now, how to find out, this advertising elasticity of demand? Now, this is, this is how to find out the relative magnitude; and how to find out the, what is the responsiveness of the quantity demanded? What is the responsiveness of the consumer, to the change in the expenditure on the advertisement, on the other sales promotion activity? So, promotional and advertising elasticity of demand measures the response of quantity demanded, due to change in the expenditure on advertising and other sales promotion activities.

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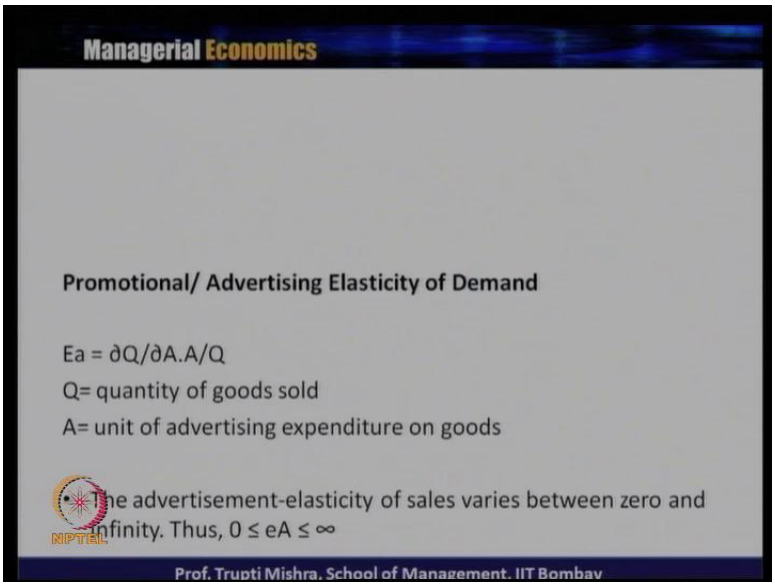

Now, how to calculate this? Suppose, E a, is the advertising elasticity of demand, and how we will calculate this? It is, we will take a formula that is del Q by del A, or the change in the Q with respect to change in the advertisement expenditure, multiplied by advertising expenditure and the quantity demanded. So, Q is the quantity of goods sold, A is the unit of advertising expenditure on goods. The advertisement elasticity of sales, it generally varies between 0 to infinity. Sometimes it is in one extreme, sometimes in the other extremes. So, that means, if it is 0, whatever may be the advertising expenditure, there is no change in the quantity demanded. And if it is infinite, then if small change in the advertisement expenditure leads to greater change in the quantity demanded.

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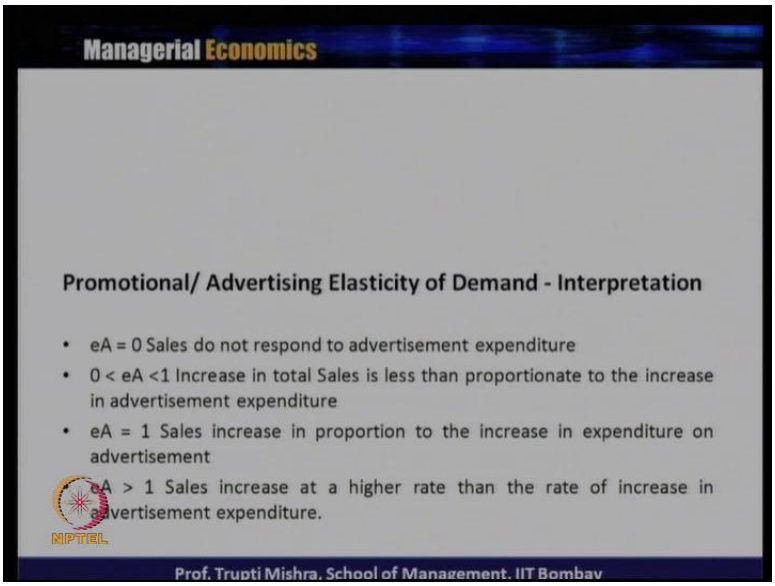

Now, how do you interpret the value of this advertising elasticity of demand? If advertising elasticity of demand is equal to 0, sales do not respond to the advertisement expenditure. If advertisement expenditure is less than, if greater than 0 and less than 1, we can interpret this value as increase in the total sales is less than proportionate to increase in the advertisement expenditure, because it is greater than 0, but less than 1. So, the proportionate increase in the total sales is less than the proportionate increase in the advertisement expenditure.

If advertisement expenditure is equal to 1, sales increase in proportion to increase in advertisement. It means 10 percent increase in the advertisement expenditure, is just 10 percent increase in the sales quantity or the sales, whatever the change in the sales. If advertising elasticity of demand is greater than 1, sales increase at a higher rate than the rate of increase in the advertisement expenditure. It means, the proportionate increase in the quantity demanded of sales is greater than the proportionate increase in the advertisement expenditure.

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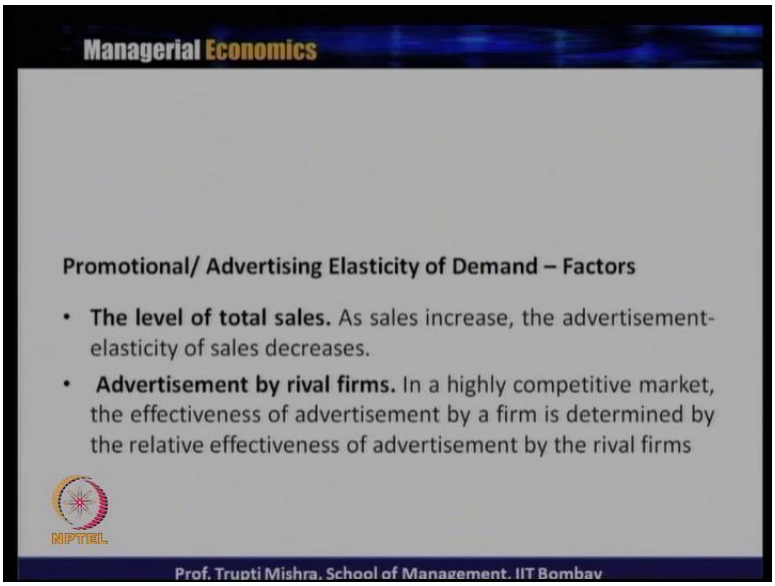

Now, what are the factors those affects the promotional and advertisement elasticity of demand? The first one is the level of total sales. If sales increases, the advertisement elasticity of sales decreases. Now, how this is related to the advertisement elasticity of demand? As sales increases, the advertisement of elasticity of sales decreases. Because it is irrespective of the fact that whether there is a advertisement or not, still there is a increase in the total sales. Means, there is no influence of the advertisement expenditure on the sales of the product.

Now, the second factor, the advertisement by the rival firms, how it effects the advertising elasticity of demand? If you look at, in a highly competitive market the effectiveness of the advertisement by a firm is determined by the relative effectiveness of the advertisement by the rival firm. If the advertisement is more better than the advertisement of this firm, generally that affect the advertisement elasticity of demand. Like, if we look at, the same product get and endorsed, whether you take the example of coke and pepsi, if you look at, for one, if celebrity, one celebrity is advertising, for the other one you will find the competitive celebrity is advertising for this. So, if the competitive celebrity is better than this celebrity, sometimes it will influence the advertising elasticity of demand. Because some, atleast some percentage of the consumer, some segment of the consumer they always, they have the loyalty for the celebrity and they prefer to buy that. So, in this case, the advertisement by the rival

firms, they plays a, they play a greater role when it comes to the value of the advertising elasticity of demand.

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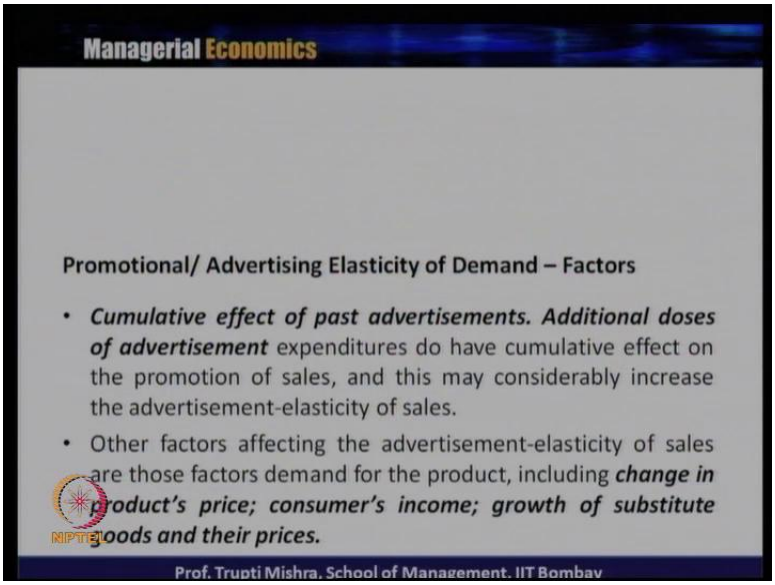

Similarly, the third factor, the cumulative effect of past advertisement, or the additional doses of advertisement expenditure, do have cumulative effect on the promotion of sales. And this may considerably increase the advertisement elasticity of sales. So, if there is some cumulative effect like, what is the cumulative effect over here? If the product is continuously on the consumer minds, some change it brings, some change in the advertisement elasticity of sales.

Like, if you take the example of the soap blocks. It is there since, since the beginning, the product remains same there is no more change in the product, but the celebrity who endorse for the product that changes. Or, if you take the example of typically all (( )) goods, generally the normal change in the product, but every time they come, there comes the advertisement with a new kind of, new kind of may be concept, or the new celebrity that again brings some fresh to the, freshness to the consumer mind for this product. So, even they are consuming the product over a long time, still they prefer to consume the same product, because it gives a newness in the term of the new kind of advertisement expenditure.

Then, apart from these three factor, there a few other factor that also influence the advertisement elasticity of sales, like, change in the product price, the consumer income

and growth of the substitute goods and their price. Like, if it is, there is only one goods in the, or maybe there is few goods in the market, if the goods is doing over if, one of the product is doing good over a period of time, generally you do not require much of the advertisement elasticity of demand. But, if there are many products available in the same category, many substitute products available, in this case the company has to go for a massive advertising, massive promotion activity, then only that leads to the increase in the quantity demanded.

So, in this case if you look at, atleast initially the elasticity of, advertising elasticity of demand will be less than 1, because of the proportionate change in the quantity demanded will be less than the proportionate change in the advertising expenditure. They have to do a massive scale of advertisement, in order to increase the quantity because there are many more substitute products available in the market.

So, we will try to now, if you look at, we discussed about price elasticity of demand which talks about the relationship between quantity demanded, and price. What happens to change in the quantity demanded, when there is a change in the price? Then we discuss about the income in our elasticity of demand, which talks about the change in the quantity demanded due to change in the income. Then, we discussed the cross price of the elasticity of demand which reflects the change in the quantity demanded due to change in the price of the related goods. And, finally we discussed the advertising, and advertisement, promotion elasticity of demand which talks about the change in the quantity demanded, when, due to change in the promotional activity and the advertisement expenditure.

Now, what we will do? We will solve some numericals taking each kind of the elasticity of demand. So, if you remember in case of price elasticity of demand, we discussed two types of price elasticity of demand, one is point elasticity and the second one is the arc elasticity.

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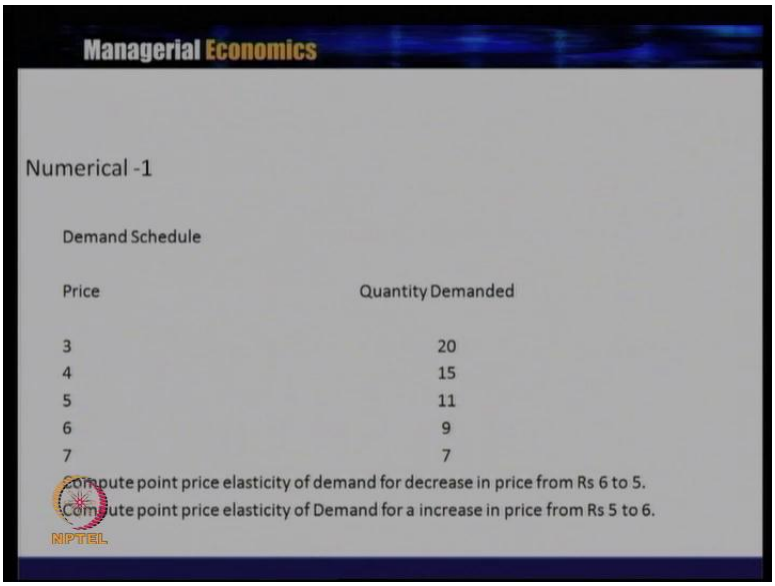

So, in the first case, we will see how we will calculate the point elasticity of demand? So, the demand schedule is given here. When price is 3, the quantity demanded is 20 ; when price is 4, quantity demanded is 15; when price is 6, quantity demanded is 9 ; when price is 7, quantity demand is 7. We need to compute the point price elasticity of demand for decrease in price from 6 to 5. And we, we have to compute the point price elasticity of demand for increase in price from 5 to 6. So, we will see how we can do the point elasticity in both those cases.

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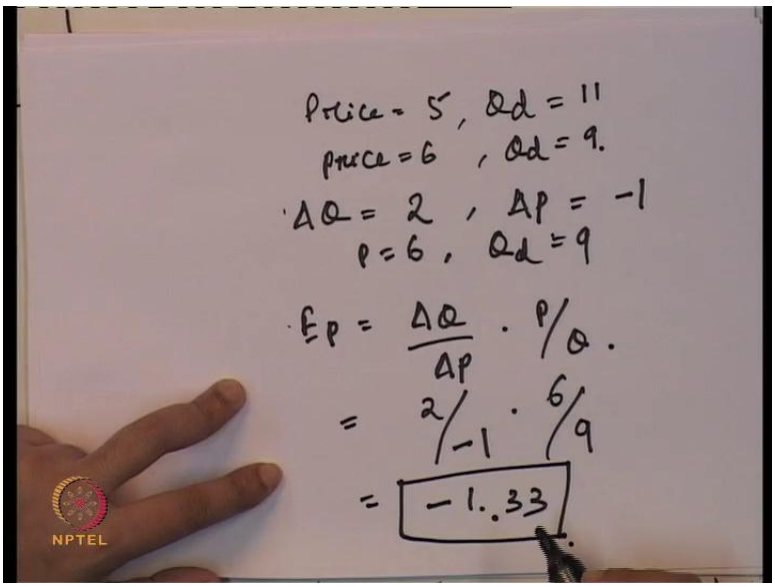

So, in the first case, when the movement is from 5 to 6, the original price is 5, the original quantity demanded is 11. The movement is from price 5 to 6, and the quantity demanded 11 to 9. Now, what is the change in the Q? When the price moves from 6 to 5, What is the change in the quantity demanded? Quantity demanded is from 9 to 11. So, quantity demanded is 2. What is the change in the price? The change in the price that is the decrease from 6 rupees to 5 rupees; so this is minus 1; so and what is our original price? Our original price is 6, original quantity demanded is 9.

Now, how we will find out the price elasticity of demand? Price elasticity of demand, if you remember the formula, this is del Q by del P multiplied by P by Q. So, in this case, what is del Q? del Q is 2; what is del P? del P is minus 1; P is 6, and Q is 9 . So, if you solve for this, you get a value which is 1.33. So, the price elasticity of demand is minus 1.33, if there is a decrease in the price from rupees 6 to 5.

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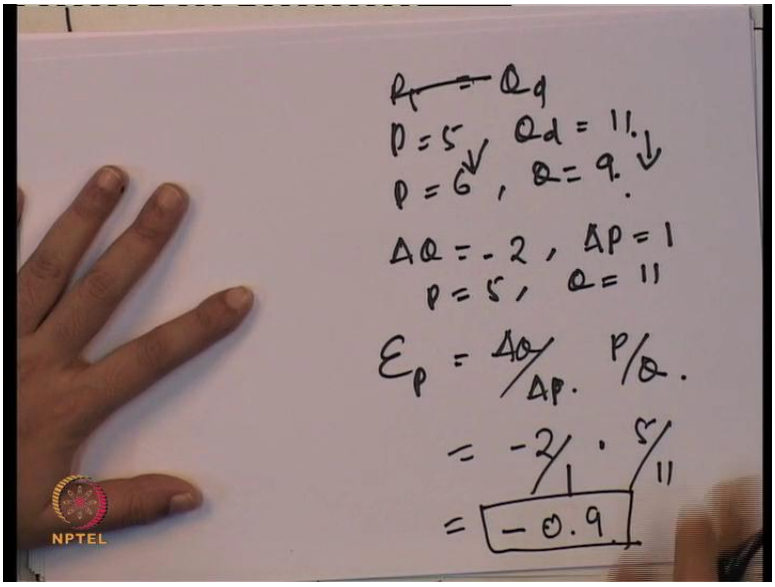

Now, let us see the other one like, whether there is in the price from rupees 5 to 6; whether it is the same elasticity of demand or the different elasticity of demand. So, in this case, price is 5 quantity demanded is, price is 5, quantity demanded is 11; price is 6, quantity demanded is 9. Increase in the price from 5 to 6, quantity demanded decreases from 11 to 9. What is the change in the Q? Change in the Q is minus 2, change in the P is, change in the P is 1; P is equal to 5, and Q is equal to 11. If you find the price

elasticity of demand now, it comes to del Q by del P, multiplied by P by Q. So, in this case, del Q is minus 2, del P is 1; P is 5, Q is 11. So, the final value comes as 0.9.

So, if you look at, even if in the same demand schedule, when we move from one to, one point to another point, whether price 6 to price 5, or whether price 5 to price 6. The elasticity of demand is not same, because it is from the different direction, if it is increasing, or if it is decreasing. It means, if the case of increase, or in case of decrease, the demand may be different; sometimes the demand may be in elastic, and sometimes may be in elastic.

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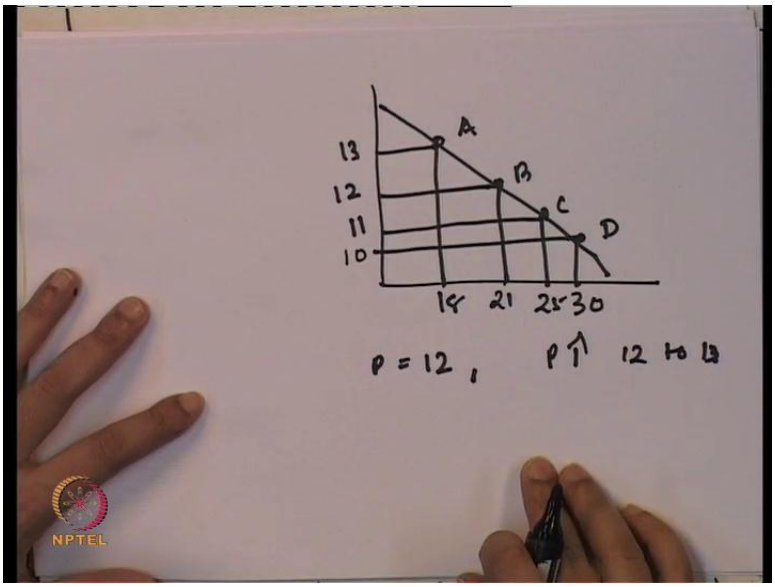

Now we will take the case with respect to the arc elasticity of demand. So, if you remember arc elasticity of demand, where you measure the elasticity of demand in a segment. So, if you consider here, the different point of price and quantity combination, so price is, suppose price is 10, quantity demanded is 30; price is 11, quantity demanded is 25; price is 12, quantity demanded is 21; price is 13, quantity demanded is 18. Suppose point A, point B, point C, and point D. The current price is rupees 12. Now, if there is a increase in the price by 1 rupee, suppose from, price increases from 12 to 13, we will calculate how much is the, change in the quantity demanded. So, now, we have to calculate the price elasticity of demand in the segment or in the arc.

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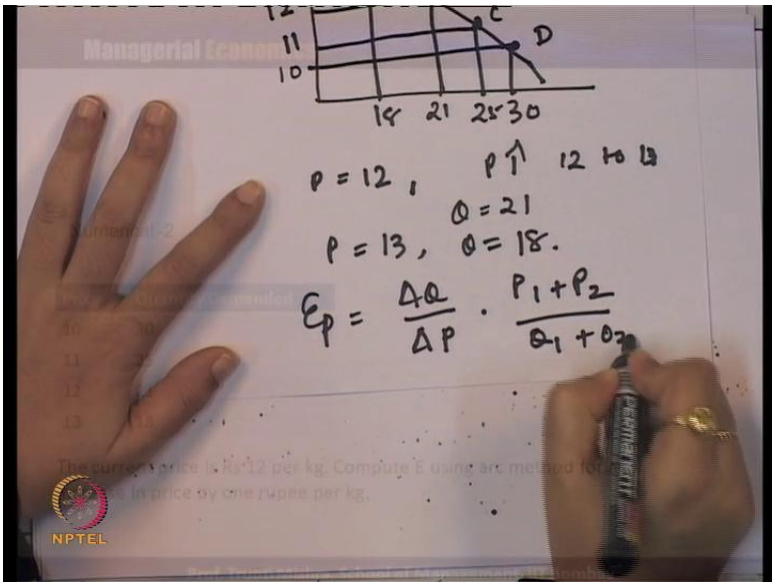

Now, how we are going to do this? So, when price is 12, quantity demanded is 21. Price increases from 12 to 13, quantity demanded will decrease from 21 to 18. Now in case of arc elasticity of demand, what is the formula? Del Q by del P, multiplied by P 1 plus P 2, on Q 1 plus Q 2.

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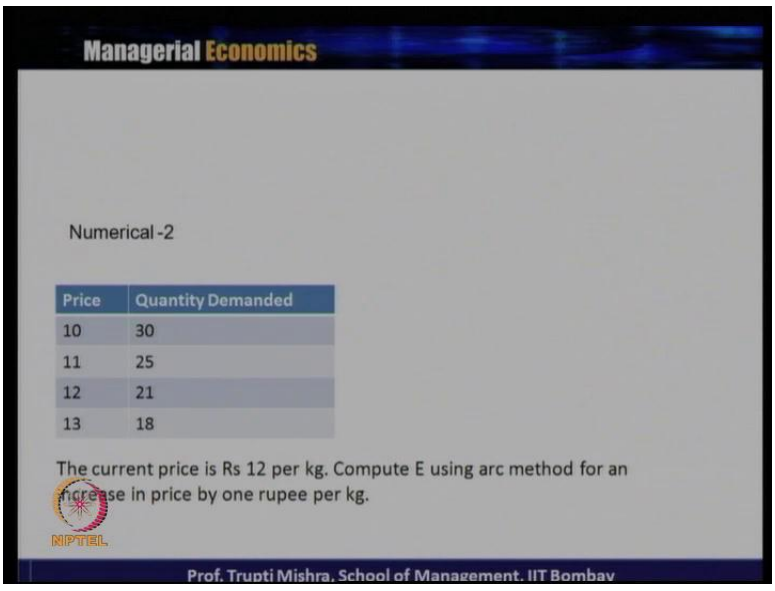

Since, we are calculating this in a segment; we always take the average price, for, find out what is the original price and what is the original quantity.

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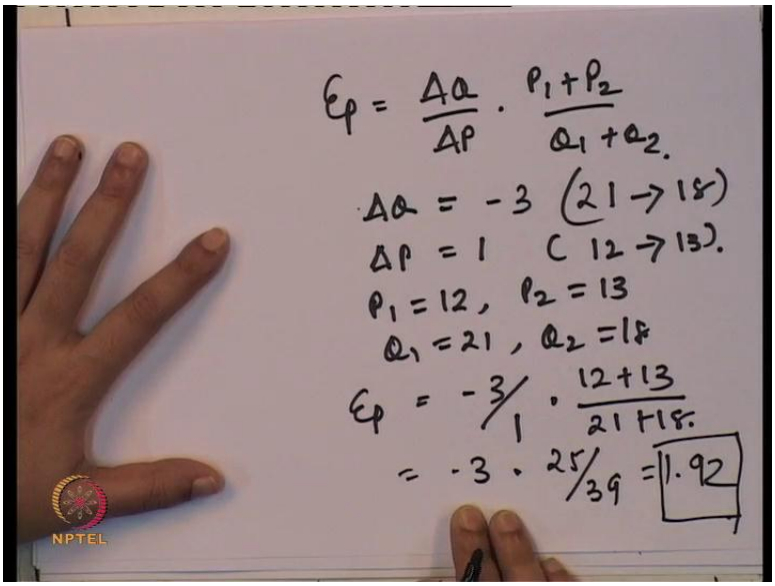

So, if elasticity of demand is del Q by del P multiplied by P 1 plus P 2, and Q 1 plus Q 2. Let us find out what is del Q? So del Q is minus 3, because if you remember the quantity demanded decreases from 21 to 18. What is del P? Del P is equal to 1, because the price increases from 12 to 13. What is P 1? P 1 is 12, P 2 is 13; Q 1 is 21, Q 2 is 18. So, if you put all the value now, then del Q is minus 3, del P is 1, multiplied by 12 plus 13, upon 21 plus 18, which leads to minus 3, multiplied by 2 5 by 39 leads to 1.92. So, elasticity of demand is equal to 1.9, which is greater than 1, it means the percentage change in the quantity demanded is greater than percentage change in the price. And this generally happens in case of the, in case of, if you remember in case of ,which type of good supply this quantity demanded is more than change in the price, in case of the elasticity good; any small change in the price leads to change in the quantity demanded .

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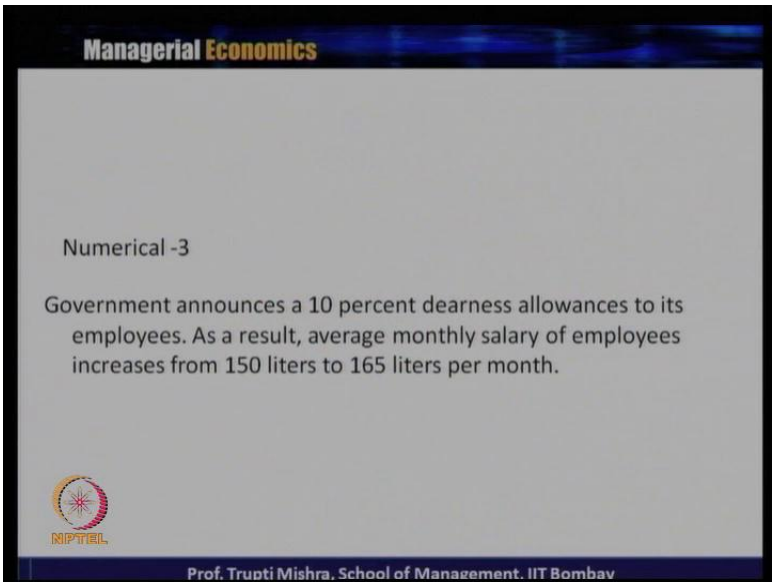

Now, we will take the case of a numerical, in case of a income elasticity of demand. So, if you look at, the government announces the 10 percent dearness allowance to each of its employee. So, in this case, if there is a increase in the D A that leads to increase in the income. Now, we need to see, what is the corresponding change in the quantity demanded, or by which magnitude the quantity demanded is changing, when there is a change in the income of the consumer.

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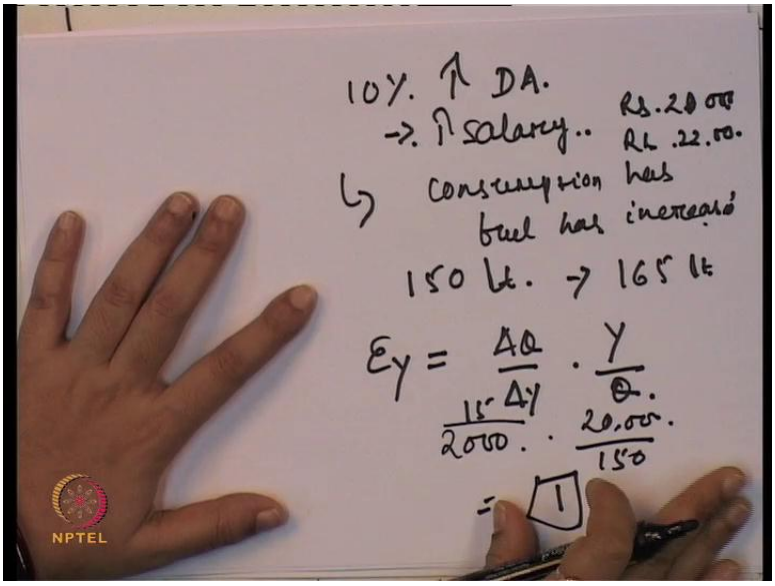

So, 10 percent increase in the dearness allowances, it is announced by the government. As a result, the, as a result the monthly consumption of the petrol, that leads to increase in the salary. So, 10 percent increase in the D A leads to increase of salary of the, increase of salary of the employee. That leads to the fact that the consumption of has increased, because there is a increase in the income. Now, what is the increase? Increase, earlier they used to consume 150 liters of well, now they are consuming 165 liter of well per month. In this case, what we will do? We will find out what is the income elasticity of demand. For this, what we require? We require the change in the quantity; we require the change in the income; we require the original income; we require the original quantity.

So, what is the increase in the seller, when the increase in the 10 percent D A. Earlier they were getting rupees 22, 000, and earlier they were getting rupees 20,000, now they are getting rupees 22,000. So, what is the change in the income? The change in the income is 2000; the change in the quantity demanded is, what is the quantity demanded change? That is 15. And, what is the change in the, what is the original income? Original income is 20,000. What is the original quantity? Original quantity is 150. If you simplify this, you get a value which is equal to 1; and that leads to the fact that increasing in the income, is just equal to the increase in the quantity demanded.

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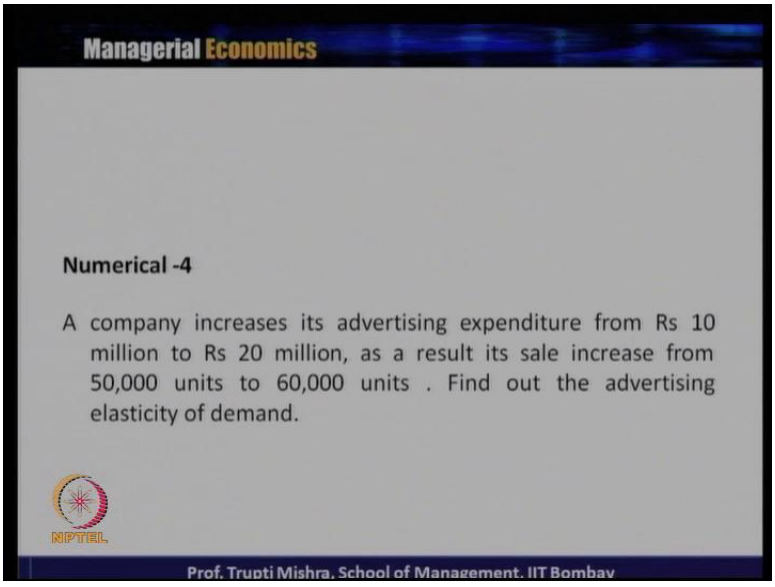

Now, we will take a numerical with respect to the cross price elasticity of demand, or may be the first with the advertising elasticity of demand. So, the company increases the advertising expenditure from rupees 10 million to 20 million, and as a result the sales decreases from, sales increases from 50,000 thousand unit to 60,000 unit. We need to find out, what is the advertising elasticity of demand.

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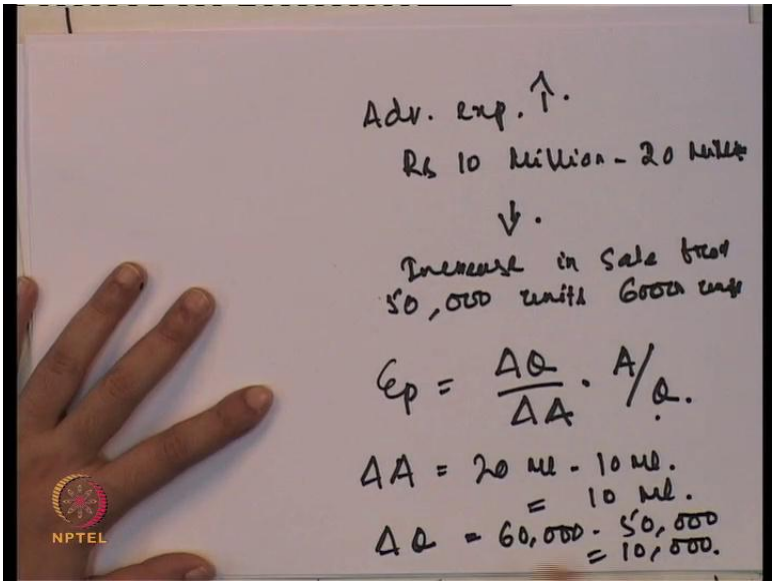

So, advertisement expenditure is increasing, that is rupees 10 million to 20 million. This leads to increase in sale from 50,000 units to 60,000 units. Now we will find out, the advertising elasticity of demand. So, advertising elasticity of demand generally captures the relationship between the change in the advertisement expenditure and change in the quantity demanded of the sales. So, what is the formula for this? Change in the Q, with respect to change in the advertisement expenditure; the original advertisement expenditure and the original quantity demanded. Now what is the change in the advertisement expenditure? That is 20 million to 10 million. 10 million to 20 million increases. So, what is the change? The change is 10 million. What is the change in the quantity demanded? The change in the quantity demanded is 60,000 to 50,000. So, the change is 10 thousand, the difference between 60,000 and the 50,000.

So, we know the change in the advertisement expenditure, we know the change in the quantity demanded; we know what is the original advertisement expenditure, we know what is the original sales.

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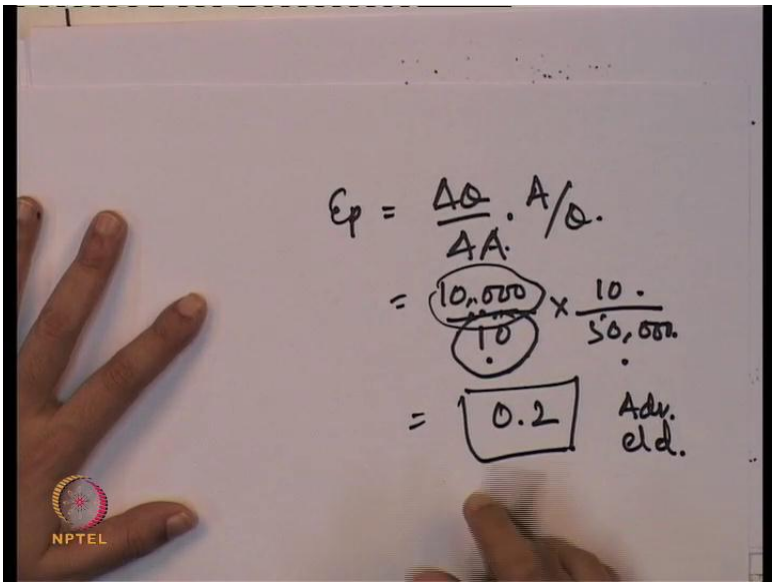

Now, we will find out, what is the advertising elasticity of demand? So, del Q by del A. So, del Q is 10,000, this is 10 million multiplied by 10; this is 50,000. So, 10,000 is the change in the quantity demanded, because there is a increase in the sales from 50,000 unit to 60, 000 unit. So, 10,000 is the increase in the unit quantity demanded, change in the quantity demanded. Earlier 10 million was the advertisement expenditure, now 20 million is the advertisement expenditure. So, 10 is the change in the advertisement expenditure. 10 is the original advertisement expenditure, 50,000 is the original sales. So, if you do this, then it will lead to 0.2, is the advertisement expenditure, advertisement elasticity of demand. It means, 1 percent increase in the advertisement expenditure leads to point 2 percent increase in the sales. And if you look at, this is the case of a relative in elastic because the change in the quantity demanded is less than the change in the advertisement expenditure.

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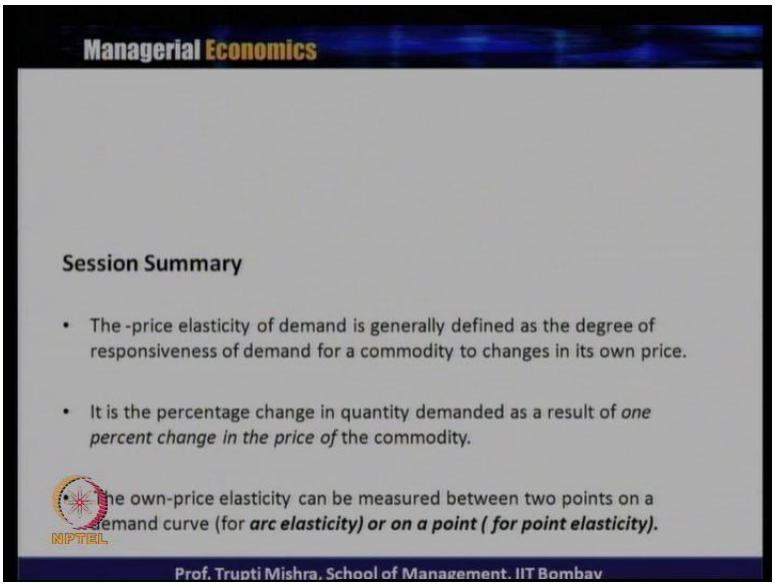

So, if you summarize, whatever we have discussed in today's class, and also what we discussed previously on the price elasticity of demand. The price elasticity of demand is generally defined as the degree of responsiveness of the demand for a commodity to change on its own price. It is the percentage change in the quantity demanded, as a result of one percent change in the price of the commodity. So, if there is one percent change in the price, what is the corresponding percentage change in the quantity demanded? So, through price elasticity of demand we generally measure the sensitiveness of the buyers due to change in the price, if there is a increase or if there is a decrease. So, the price elasticity on demand measure in two points, one is on point and other there is in the arc elasticity of demand. So, if it is in the segment, generally this is known as the arc elasticity of demand; if it is measure in a point, it is generally known as the point elasticity of demand.

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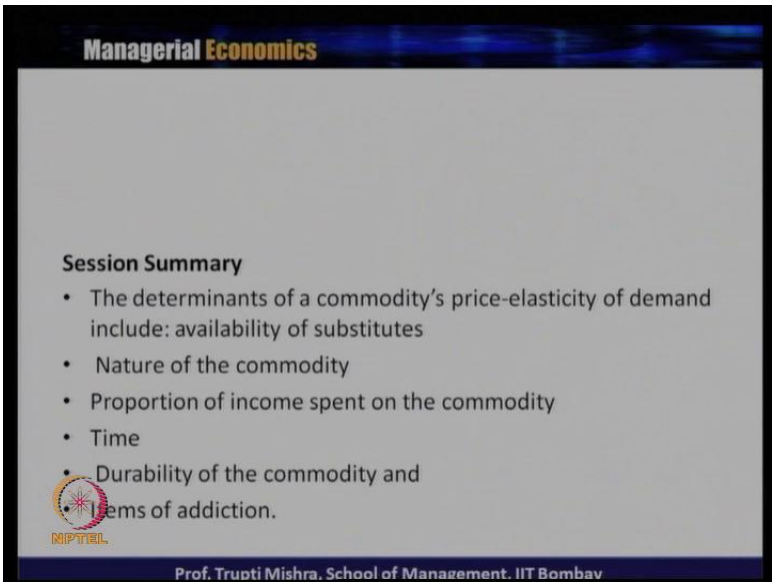

Now, what are the determinants that influence the price elasticity of demand? The first one is the, the nature of the commodity. The second one is the availability of the substitute; more substitutes in the market, more is the price elasticity of demand. Then nature of the commodity; whether it is a luxury, whether it is necessity, whether it is a semi luxury. Then, what is the proportion of income spent on the commodity? If it is more, generally it is more elastic, because when the consumer is spending sufficient amount of money on a commodity, when the price changes they always look for the alternate.

What is the time of, time for adjustment available to the consumer? The longer is the time, more elastic is the demand; shorter is the time, less elastic is the demand. What is the durability of the commodity? If it is more durable, it is more elastic, if it is less durable, it is less elastic. Item of addiction, generally this is not considered as the normal consumer because the people they are addicted to more, and in this case the demand is inelastic.

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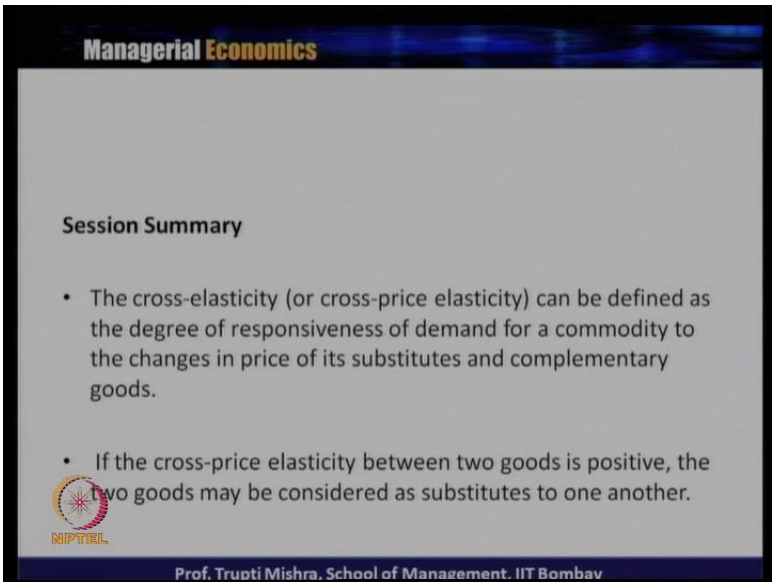

Then, we discussed about the cross price electricity of demand. So cross price elasticity of demand is the degree of responsiveness of demand for a commodity, to change in the price of it substitute and complimentary goods. And, if the cross price elasticity of demand between two goods is positive, then two goods may be considered as the substitute goods; and if it is negative, two goods may be considered as compliment.

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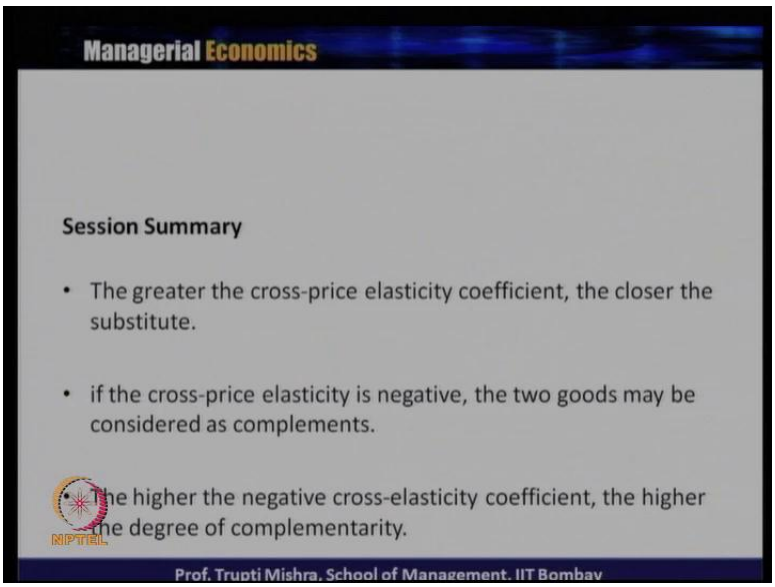

The greater is the cross price elasticity of co efficient, the closer is the substitute. And the higher is the negative cross elasticity coefficient, the higher is degree of the complementarity.

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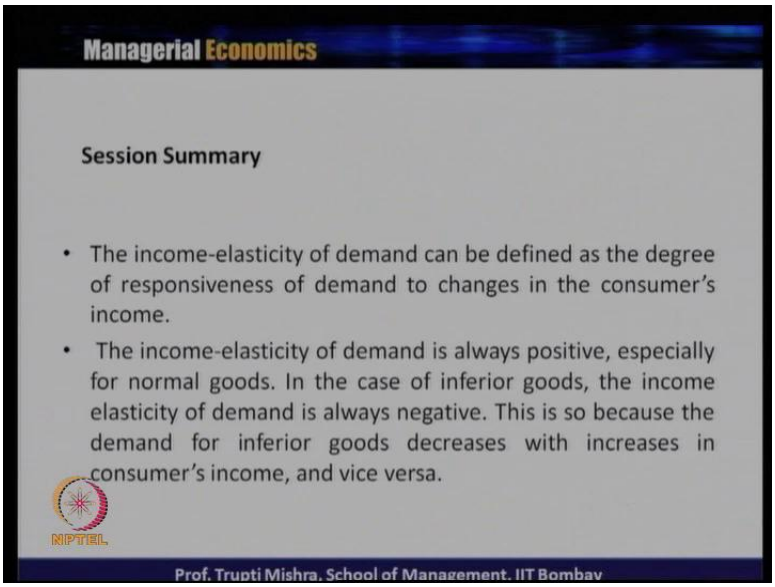

Then, we discussed about the income elasticity of demand. It can be defined as the degree of responsiveness of the demand to change in the consumer income. The income elasticity of demand is always positive, specifically in the case of the normal goods. But in case of inferior good, the income elasticity of demand is always negative, because the demand for a inferior good decreases with the increase in consumers income, and vice versa.

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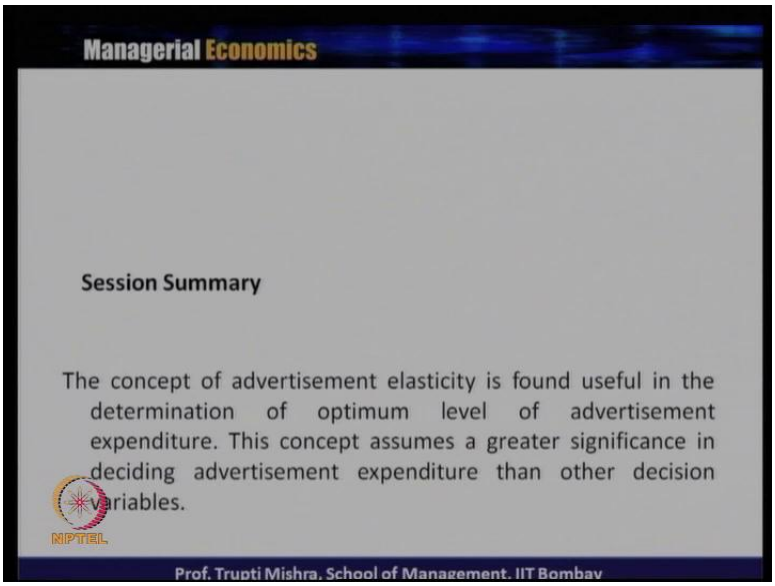

Then, we discussed the advertisement elasticity of demand, and how it is useful in the determination of the optimum level of advertisement expenditure. And, it helps the producer to decide, that what is the right kind of production they have to do it in the future, so, that it affects the over production and under production.

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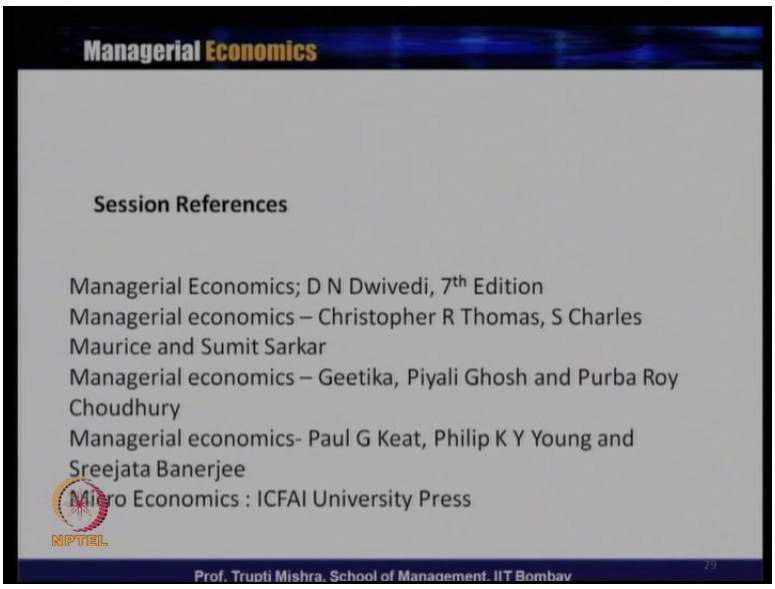

And for this typical topic, this elasticity of demand, these are the reference, what are being followed for preparing this specific session.