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

Lecture – 17

Welcome to the second session of module two; module two talks about specifically theory of demand. And in the previous class, we discussed about the nature and behaviour of, mainly two market forces like, we introduced the concept of demand. And in today's class we are going to take some of the behaviour of the demand typically, how the law of demand works? How the law of demand, what is the law of demand? In which case it is applicable, which case it is not applicable? And also, what are the forces that influences this demand?

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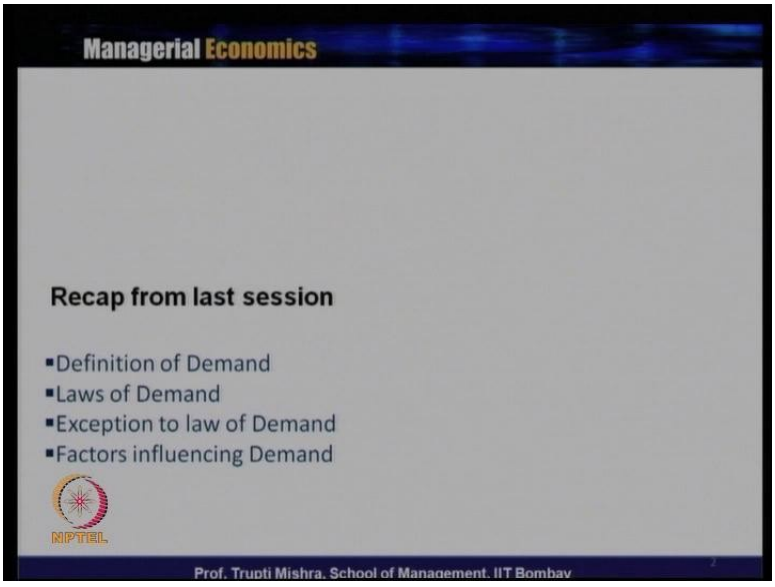

So, if you look at, if you go quickly whatever we have done in the last session, so quick recap of that is, that we defined the demand, how one of the important market forces is demand? And what is the role of demand in the market? Then we discussed the law of demand, for and, different scenario, different situation, where the law of demand does not applicable. And there are, and again we discussed the different factor that influence the demand. And market demand also always the, the summation of the individual demand that the last topic what we discussed in the last session.

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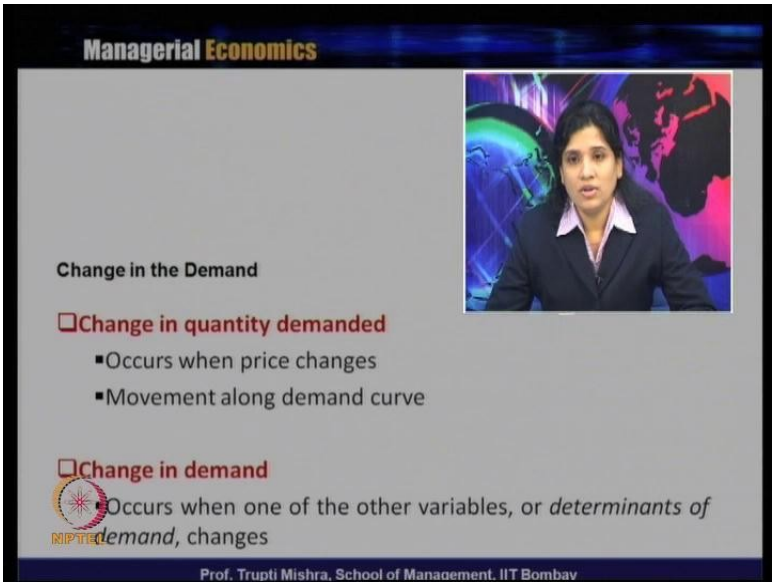

Today's class we will see that, how there is a change in the demand. Till now we have understood that demand is basically, there is an inverse relationship between the price and quantity demanded. And it gets influenced by few other factors like price of related goods, income of the consumer, expected future price of the product, number of consumers in the market, and also the taste and preference by the consumer. Now we will see why there will be a change in the demand? Whether it, this is due to change in the price, associated with the product, or due to change in the other factors, those influence the demand. So, change in the demand is because of two reason; one, when there is a change in the quantity demanded, and it occurs when there is a change in the price. And this change is generally reflected through movement, along the demand curve.

And second one, when there is a change in the demand, it occurs when one of the other variables like determinants of demand, just now we discussing, the price of the related goods of the consumers income, or expected future price of the product, or any other factor, the non-price determinants; any other factor which is not priced, if those with if the change in those variables that leads to change in the demand. So, if you look at between the, these two, the first one is change in the quantity demanded, because this is due to change in the price; and second one is the change in the demand, because of all other factors changing. So, the basic difference between these two, if you look at, one you represent along the demand curve or in the second case, we cannot reflect the changes due to other factor, along the demand curve, either the demand curve has to shift to the right or shift to the left.

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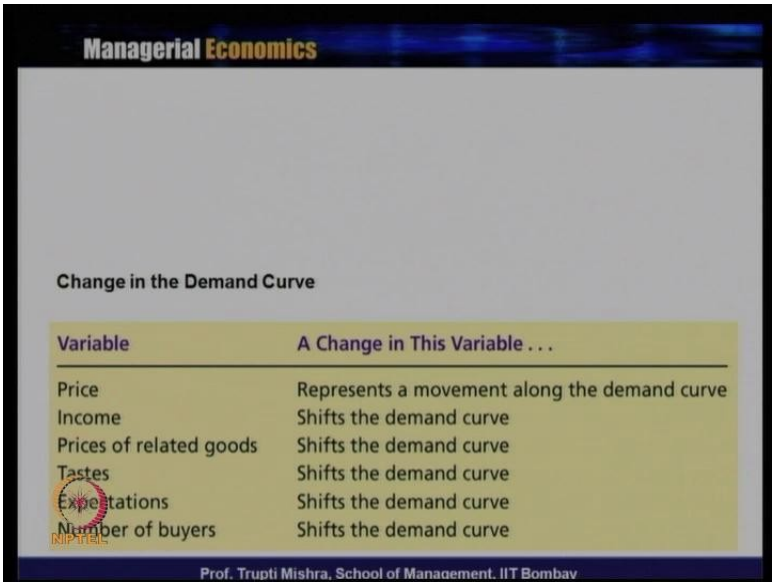

So, if, why there is a change in the demand curve? Either there is a change in the price, that leads to the change in the quantity demanded; or there is change in the price of related goods, change in the consumer income, change in the taste preference of the consumer, expected future price of the product is going to change, or there is a change in the number of buyers in the market.

So, if you look at, in case of a change in the price, represent a movement along the demand curve. So, this is between from one point to another point. And in case of income, in case of price of related goods, in case of taste, in case of expectation, in case of number of buyers, generally the demand curve shifts to the right, if it is in case of increase; and shifts to the left, if it in case of decrease

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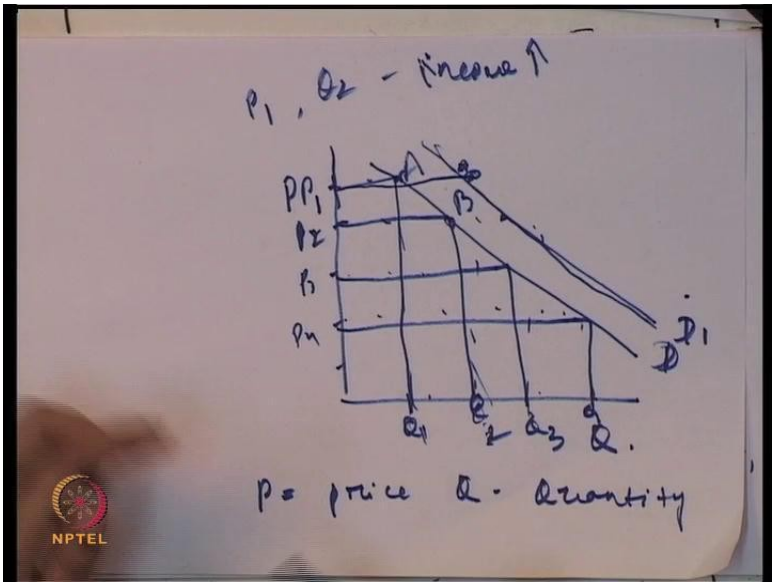

So, we will take a quick example like, in the last class also, if you look at, we have drawn a demand curve considering P in the y axis, and Q in the x axis; Q is quantity and P is price. So, if you take different point here like, suppose this you take P 1, this is P 2, this is P 3, this is P 4; and this is Q 1, Q 2, Q 3, and Q 4. So, you get different combination, and that combination gives us the demand curve. So, if you take all these points then this is the demand curve. So, we get one combination P 1 Q 1; we get second combination P 2, Q 2; we get third combination P 3 Q 3; and fourth combination P 4 and Q 4.So, if it is a demand curve, now, what happens, if there is a change in the price? If the price moves from P 1 to P 2, if you look at, there is a change in the quantity demanded from Q 1 to Q 2. So, movement from point A to B is because of change in the price. So, in this case also there is a change in the quantity demanded, but the change in the quantity demanded is not moving or not shifting the demand curve, it basically just moving one point to the another point. Suppose there is a, at the same price the consumer income is increasing; even if the price is P 1, still the consumer will demand more, because the consumer has more purchasing power to buy the same product, same, buy the more quantity at the same price. So, given P 1 fixed at this movement, may be the consumer will buy Q 2, because there is a increase in the income of the consumer. So, when there is a change in the income and correspondingly, if there is a change in the demand; that means, if the change in the demand is not because of price, the change in the demand is because of any other factor. So, in this case, we get a point this. So, even if the price is P 1, the quantity demanded is Q 2. Similarly, even if this price is P 2, the quantity demanded is Q 3.

So, in this case, if you look at, you get a new demand curve that is D 1, and the shift in the demand curve is because of change in the income. So, giving the same level of price, if there is a change in the income and, change in the income is, increase in the income, that leads to increase in the quantity demanded because income and quantity demanded they are positively related, the demand curve shift from D to D 1. And in this case, there is a shift in the demand, there is no movement along in the demand curve. Similarly, if we look at for the other variables also, whenever there is a change in the price of related goods, or whenever there is a change in the taste and preference of the consumer, or any other factor which is non price, the shift in the demand curve is goes to right, if it is in the case of quantity demanded; and it comes to left, if there is a decrease in the quantity demand curve.

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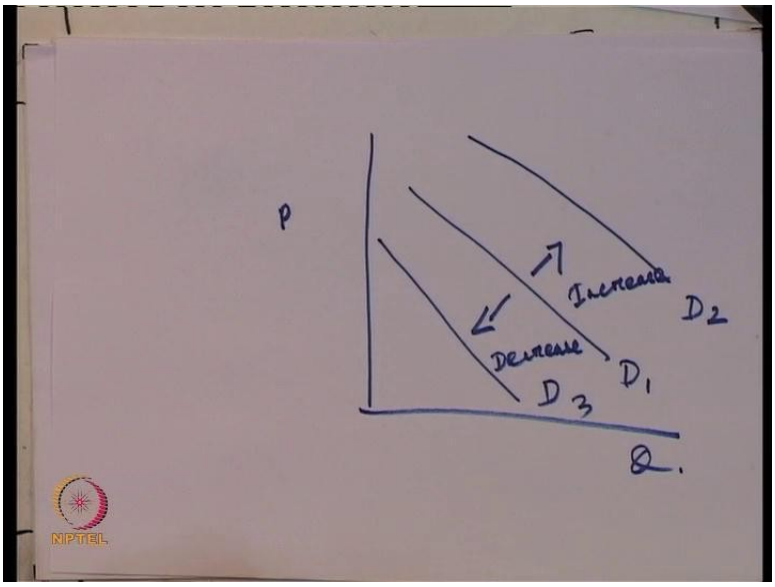

So, if you see, generally, if this is a demand curve, here we take quantity, here we take price, if there is a increase in the quantity demanded, the demand always shift to the right. If there is a decrease in the quantity demanded, the demand always shift to the left. So, this is the case of increase, demands curve shift to the right, and this is the case of decrease when the demand curve shift to the left.

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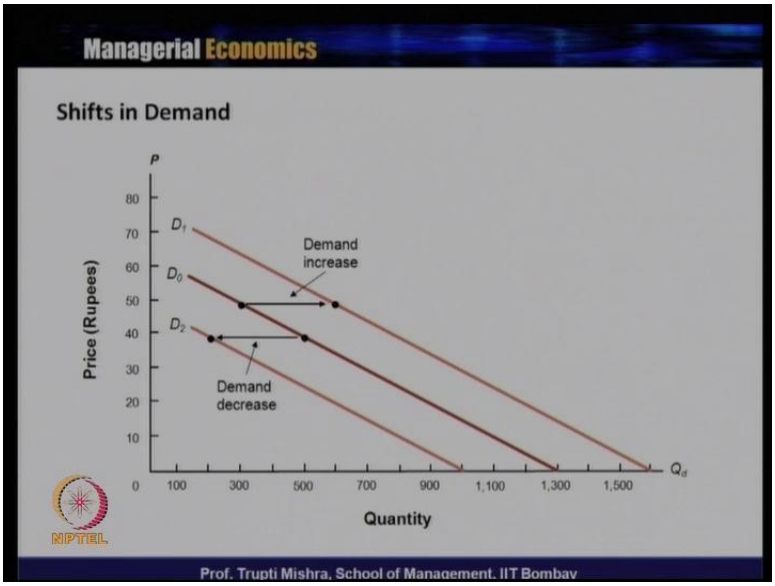

So, now we will take specific example that, in which case there is a change in the demand or in which case there is a change due to change in price or in which case there is the change in the demand is because of non price determinant. So, if you have seen the graph, initially the demand curve is D 0, whenever there is a decrease in the demand curve there is a shift towards left which becomes D 2, the demand curve is D 2; and whenever there is a shift, increase in the demand, the demand curve shift to right and that is D 1. So, in case of increase in the demand curve, it shift to right, and in case of decrease in the demand curve, it shift to the left.

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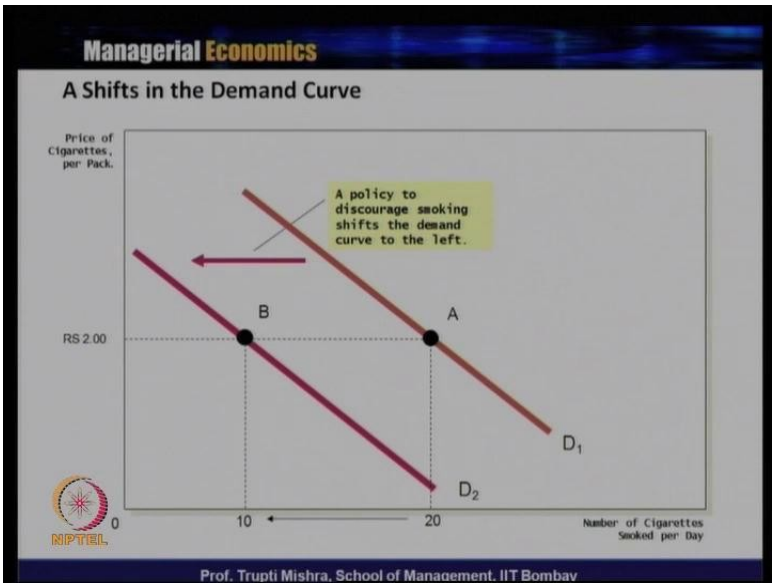

Now suppose we take a case of, specific case, if there is a policy initiative , how there is a change in the demand? A policy to discourage smoking, shift the demand curve to the left. So, this is the case of, the product is cigarette here; the price of cigarette per pack is in the, is represented on the y axis, and number of cigarettes smoked per day is represented on the x axis. The demand curve is D 1. When the price is 2, the quantity demanded is 20. Now if you remember there is a ban in the public smoking before 1 year, the policy or the rule by the government is that there is ban in the public smoking.There is no change in the price, if the same price, the quantity demanded has decreased from 20 to 10. Now, what is the reason here? The reason here is that there change in the demand, not due to change in the price, rather due to change in the non price determinants. So, in this case, because of government policy, there is a ban in the public smoking which discourage the smoking and reduce the demand; price even fixed too.

Now the quantity demand moves from 20 units to 10 units, and the demand curve shift to the left, and the new demand curve is D 2. So, the price is fixed, the change in the demand is because of non price determinant; the demand curve moves from D 1 to D 2. So policy to discourage smoking, shift the demand curve to the left, price remain fixed.

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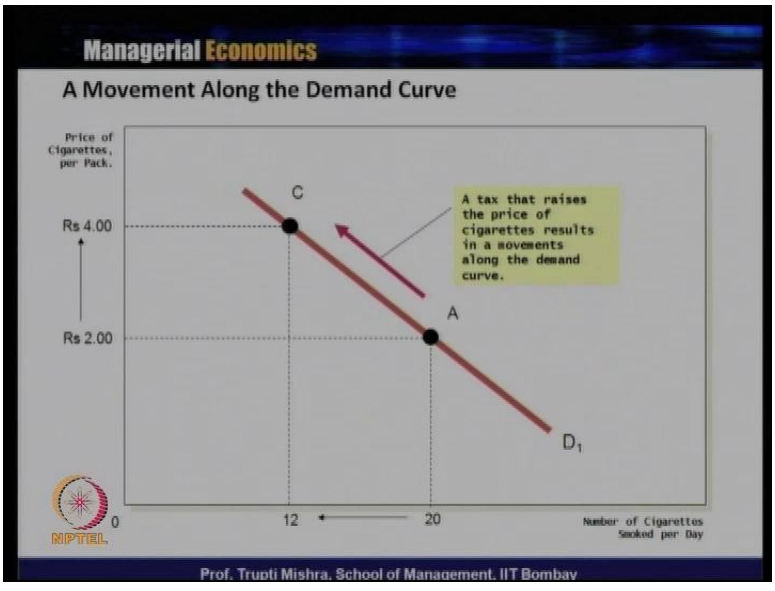

Now, suppose we take a different case, that there is a imposition of the tax by the government. Now, what is the tax? The tax raises the price of cigarettes results in the movement along the demand curve. Whenever there is a imposition of tax, the producer try to shift that to the consumer. And, how they shift this to the consumer? Through the increase in

the price. So, this typical graph if you look at, the price is again represented in the y axis and the quantity, the number of cigarettes smoked per day, that is represented in the x axis; the demand curve is D 1.

When the price is 2, the quantity demanded is 20, corresponding to point A . And when there is a tax, imposition of tax, that leads to increase in price, from 2 rupees to 4 rupees, following the law of demand, there is a decrease in the quantity demanded from 20 unit to 12 unit. And in this case, if you look at, the change in the quantity demanded is only to change in the price, because price increases from 2 to 4 , that is the only reason that quantity demanded is shifting from 20 unit to 12 unit. So, this case, the change in the demand is represented through only in the movement in the demand curve, from one point to another point, basically representing two combination, two price and quantity combination

One combination, when price is 2 rupees, quantity demanded in 20 unit; and in the second combination when price is 4 rupees, the quantity demanded is 12 units. So, two points to remember here: point one, when the change in the demand is due to change in the price, the shift is between one point to another point in the demand curve. So, the change is represented through the movement along the demand curve from one point to another point. And second point is, when the change in the demand is due to change in the non price determinants of demand, like any other factor apart of price, the movement or change in the demand is represented through the shift in the demand curve. If there is the increase in the demand curve that leads, the increase in the demand leads to shift in the demand curve to the right. And if there is a decrease in the demand that shift the demand curve to the left.

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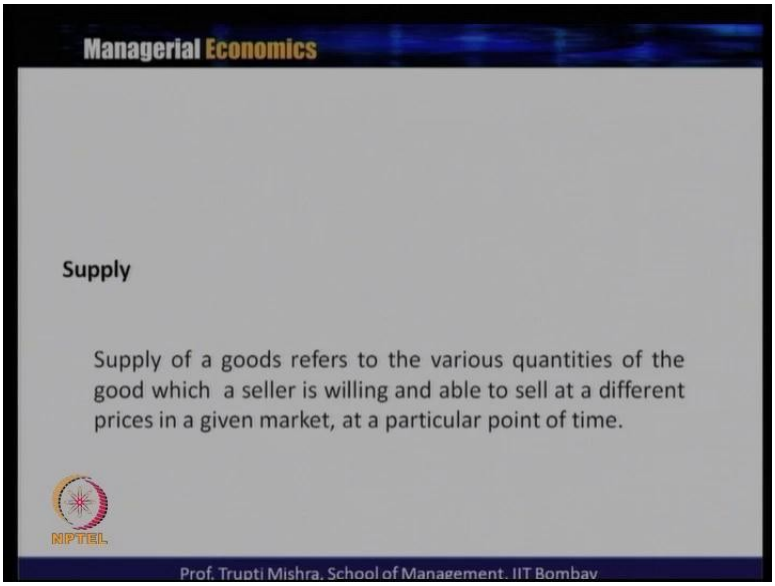

Now, we will come to the second market force, that is supply forces. So, if you remember in the beginning of the session that the market forces is always governed by the demand and supply forces, and they generally set the rule for the market mechanism or the market mechanism works on the basis of supply and demand principle.

We will discuss the second forces of market that is supply. And to define supply, we can say that this refers to various quantities of the good, which the seller is willing and able to sell a different prices in a given market, at a particular point of time. So, time being fixed, prices are different, and at different prices what is the exact quantity the producer is willing and able to sell, that is supply. So, if you look at, again it goes to the basic principle of demand that, it is not only, the supply is dependent only, also the producer is willing to sell and able to sell.

So, when it comes to willing to sell, the whatever the price that is gives some profit to the producer; and when it comes ability to sell, whether the producer has the ability to sell, or ability to produce the product or not. If the producer has the ability to produce the product, generally they sell it in the market. If they are getting a good price that leads to the willingness to sell in the market. So, supply, it refers to various quantity of goods and services which a seller is willing and able to sell at the different prices, in different market, or may be in a given market, at a particular point of time.

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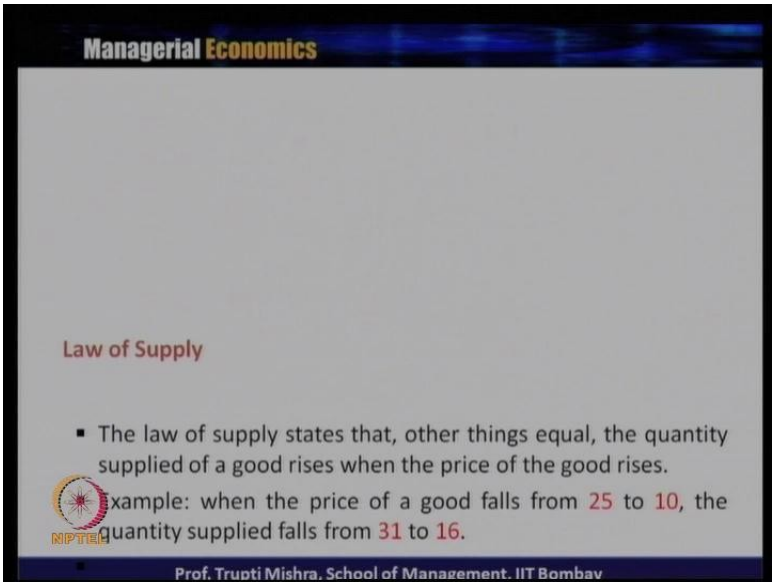

Now, what is law of supply? As you remember that, price in the quantity demanded is always inversely related, other things remaining constant. So, following the Ceteri Paribus principle, Ceteri Paribus means everything is, every other thing is equal. The law of supply states that the quantity supply of good increases when the price of good increases. So, in this case, if you look at, the economic law for supply, the relationship between the supply and price is , there is a positive relationship between the price and the quantity supply; more is the price, more is the quantity supply.

But in case of demand, if you remember, there is a inverse relationship between the price and quantity demanded. More is the price, less is the quantity demanded; and less is the price, more is the quantity demanded. In case of supply, more is the price, more is the quantity supply; less is the price, less is the quantity supply. And the logic is also quite clear that, if the price is more, the seller will sell more in the market because they will get more profit. If price is low, they will prefer to sell low because they are not getting more profit, if price is low.

So, if you take a typical example, when the price of good decreases from 25 rupees to 10 rupees, the quantity supply decreases from 31 rupees to 16 rupees. So, when price was 25, the quantity supply is 31; and when price is 10 the quantity supply is 16 , which goes according to the basic principle of law of supply; that when price is more quantity supply is more, and when the price is less quantity supply is less. That gives us, in term of the number also price is 25quantity supply is 31; price is 10, and quantity supply is 16.

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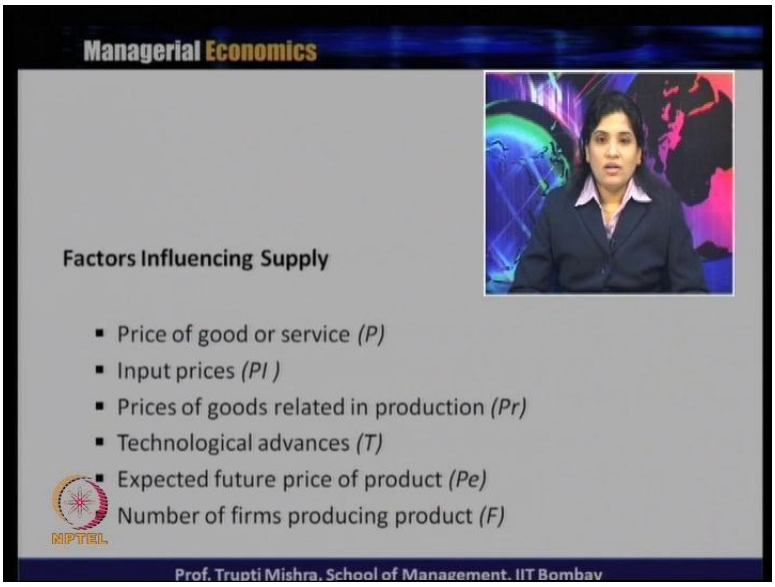

Now, we will discuss, what are the factor that influence the supply? The first factor which influences the quantity supply is, price of the goods and services. So, just in the previous slide, we are talking about, that how the price and quantity supply they are related to each other? If price is more, quantity supply is more; price is less, quantity supply is less. So, they are positively related price and quantity demanded they are positively related. So, the first factor that influences the supply is price, because the seller or producer they always look for profit when they are producing in the market, and selling in the market. So, if price is more, they are going to sell more. So, the first factor which influence the price, influence the quantity supply is the price of the good or services.

The second factor which influences the supply is, input prices. Like, how input prices is influencing the supply? Input price is one, this is the input for the output. So, whether the input is land, whether the input is labour, whether the input is capital, whether the input is technology, whether the input is entrepreneurship, the more is the price of those inputs, it is more costly for the producer to produce. And if price remain fixed, input price is more, the difference between the cost of production and market price comes down. And that leads to less profit to the producer. So, in this context, if the input price is increasing, the supply is less, because if you are keeping all other constant and the producer is not able to increase the price, with the increase in the input prices, they will prefer to supply less, because they are not getting a good amount of profit, if input price is on a higher side and the market price remain constant. So, input price is increasing, generally the quantity supply decreases; and if

input price is decreasing, the quantity supply is more, because the gap between the input price and market price is more, and they get more profit. So, input price and quantity supply, they are inversely related.

Then the third factor is price of goods related in the production. Now what is the price of good that is substitute and the complementary good? If substitute good is supplied more, then this typical good has to supply less. So, there is inverse relationship between the substitute good and this good price of the substitute good and this; and there is a positive relationship between the price of complementary goods, and the price of, between the quantity supply of this typical good. Similarly, technological advances, if the good technological advances, if technology is good, there is a progress, that leads to more supply in the market. Expected future price of the product, it works, if there is a increase in the, if the expected future price of the product is going to increase, they supply less; and if the expected future price is going to decrease, they supply more. So, again the relationship between the quantity supply and the expected future price of the product is inverse; and number of firms producing the product, more the number of producers in the market, more the number of seller in the market, the quantity supply is more.

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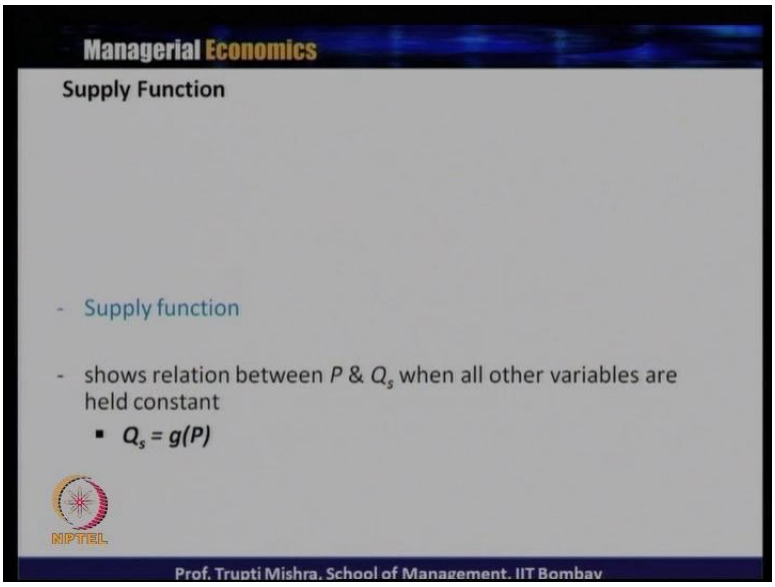

Then we will come to a supply function; and supply function at this point if you are keeping all other variables which influence the quantity supply remains fixed, only if it is the relationship between the price and quantity supply, which comes directly between the law of supply, all other things remaining constant; law of supply says that there is a positive

relationship between the price and quantity supply. Following that, if you formulate a supply function which shows a relationship between price and quantity supply, quantity supply is a function of P.

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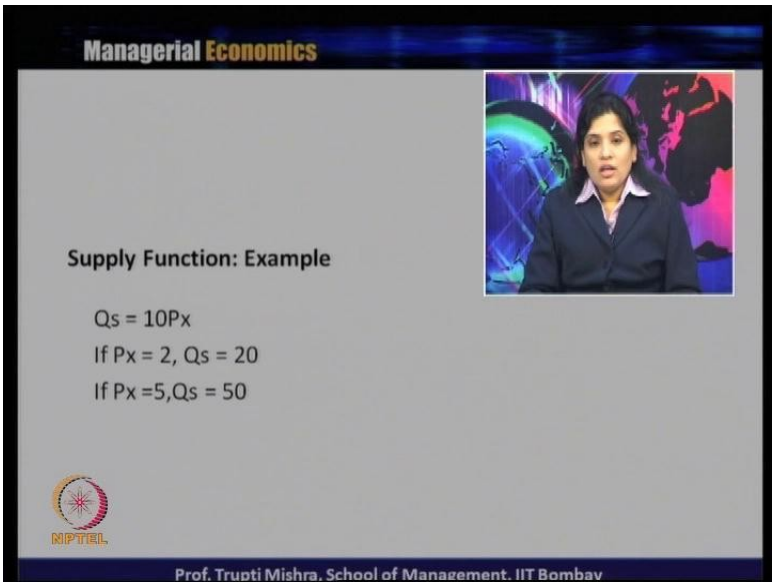

So, if you are taking a supply function where Q s equals to 10 P x; if value of P x takes 2 then Q s is 20; if the value of P x is equal to 5 Q s takes 50. So, if you look at, in the supply function also, the price, quantity supply is dependent on the price if is positive, that is because it is positive sign there is no negative sign over here, so, they are positively related. And, Q s is equal to 10 P x means always whatever the price of quantity supply is multiplied by that number.

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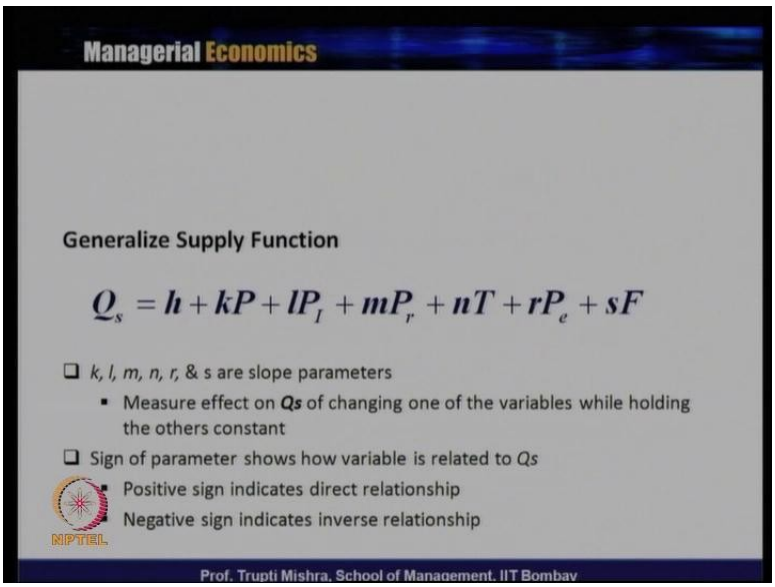

Now, if you consider the generalized supply function, which includes all the variables which, influence the supply. So, what are the variables that influence the supply? The first one is, price of the product, that is represented through k P; h is the value of intercept; P is the price of product; P i is the input price; P r is the price of related goods in the production whether it is the substituted goods or whether the complementary goods; T is the technological advances; P e is the expected future price of the product; and F is the number of producer in the market.

So, there is one variable attached with each variable, in terms of parameter. So, k is associated with P, l is associated with P 1, m is associated with r, n is associated with t, small r is associated with P e, and s is associated with F. So, all these variables like k, l, m, n, r, and s, they are the slope parameters. And what is the role of slope parameters in case of a generalized supply function? It measures the effect on quantity supply of changing one of the variables by holding the other constant.

So, suppose, what is the role of k or how k is being used? k will measure the effect of quantity supply of changing, when there is a change in the price. Similarly what is the role of l? l will measure the effect and quantity supply when there is a change in the input price; similarly m will measure the effect on quantity supply, when there is a change in the price of related goods. Similarly n will measure the, change in the quantity supply when there is a change in the technological advances, r will measure the effect on quantity supply when there is a change in the expected future price of the product, and s will measure the effect on quantity supply, when there is a change in the number of producer in the market.

And, how we represent the sign of parameters? The sign of parameters shows, how variable is related to quantity supply. Positive sign indicates, there is a direct relationship between that variable and quantity supply; and negative sign indicates there is a inverse relationship between, the typical variable and the quantity supply.

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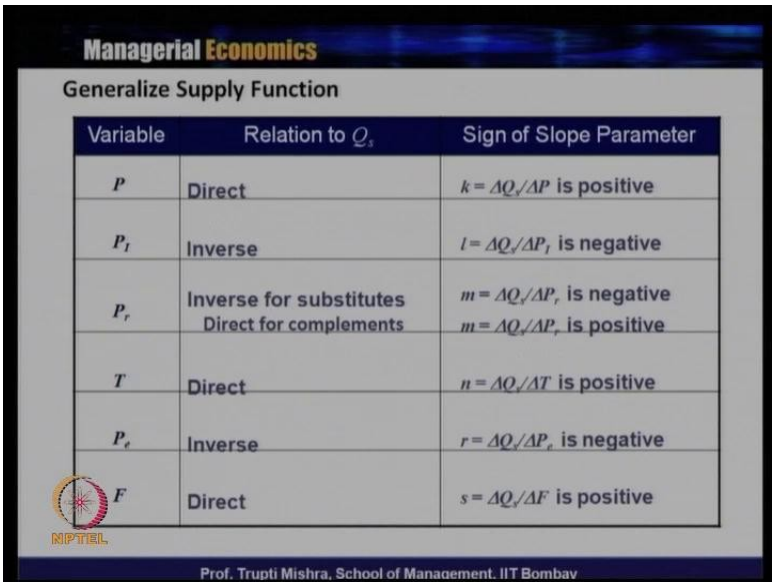

Now, we see that, how both the variables, all the variables, the, all the factors, those, all the factors that influence the supply, how they are related with supply. The first variable is P, price of the product, directly related to quantity supply. And the value of the slope parameter del Q s by del P is positive. Input price is inversely related with the quantity supply. The value of slope parameter is del Q s by del P h negative, because there is a inverse relationship between the input price and the quantity supply. The related price of the goods, other goods in the market, the relationship is inverse for the substitute and direct for the complement.

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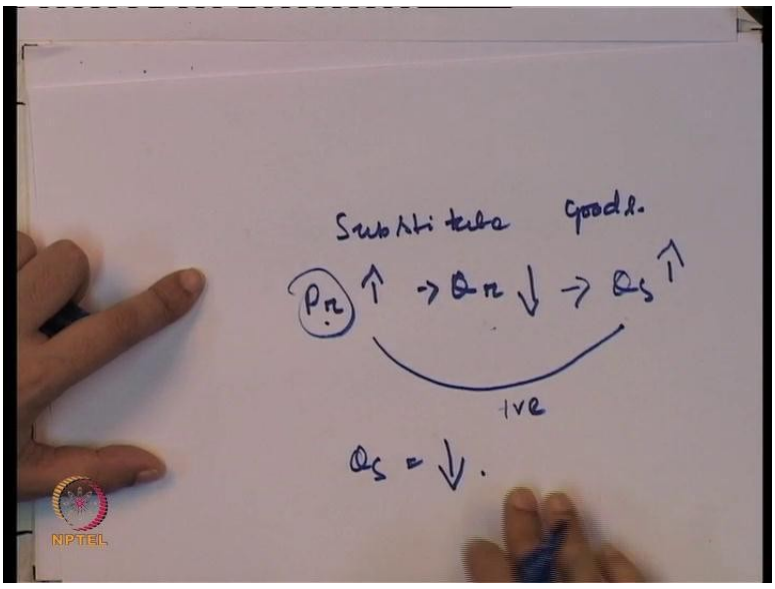

How this is inverse for the substitute? So, this is substitute goods . So, when the price of related good increases, that leads to quantity of the related goods to decrease, because they inversely related, price and quantity supply, the price and quantity demand they get inversely related. But, how they are related with the quantity supply? Quantity supply is positive. So, whenever the price of related good increases, quantity demand decreases, but quantity supply increases; h price and quantity positively related. Now, how this will effect this quantity supply of this typical good? Since the substitute good is supplying more, in this case, price, there is no increase in the price, there is only increase in the price of related good, the quantity supply of this will decrease and how this work for complementary goods?

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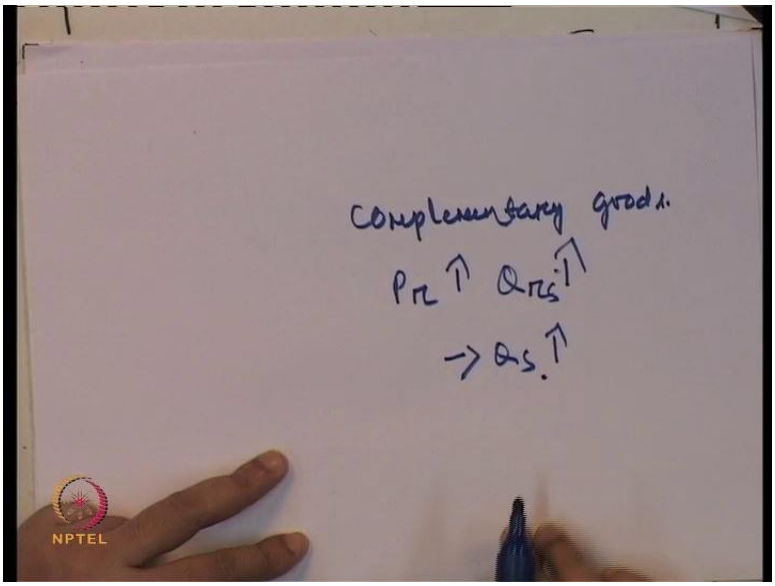

What is the nature of complementary good? complementary good is one good , if two goods are complementary, one good cannot be consumed with other good. So, in this case, if the price of related good increases that leads to quantity demanded of, quantity supply of the related good increases; and that also leads to increase in the quantity supply, because if there is a demand for this, there is a supply of this, again there is a supply for this quantity supply.

So, again it is the same logic for the quantity demanded; also that complementary goods, it cannot be consumed individually, one cannot be consumed without another. So, in case of relationship between the quantity supply, and the price of the substituted goods, and price of complementary goods, it always inverse for the substitute, the price of related good and the relationship to the

quantity supply. And if it is a case of complement, it is always direct because more is the quantity supply of the complementary good, more is also quantity supply for the, this typical good, for what we are discussing the factors.

In the first case, this is negative, the slope parameter is negative. In the second case the slope parameter is positive. Now technological advances, the relationship is direct to the quantity supply; more is technological advances, more is the quantity supply. Expected future price of the product, if the expected future price of the product is going to increase, quantity supply will decrease, now, because the producer or the seller will feel more profit, if they are going to postpone their sale in the market; and if it is going to decrease, they will pre pone all their sale and sell more now. So, the relationship between the quantity supply and the expected future price of the product is inverse; and the slope parameter r that is del Q s by del P that is negative. Coming to the last factor that influence the supply function that is the number of producer and the number of sellers in the market. And how they are related to the quantity supply? They are directly related to the quantity supply. Because, if there are more producer, more seller, generally the market supply is more and also the individual firm again, summation of the individual firm, the market supply is more, and they are directly related to the quantity supply. Here the slope parameter s, that is del Q s by del P is positive.

So, this is how all the factors, they are related to quantity supply; some of them are directly related, and some of them are inversely related with the quantity supply.

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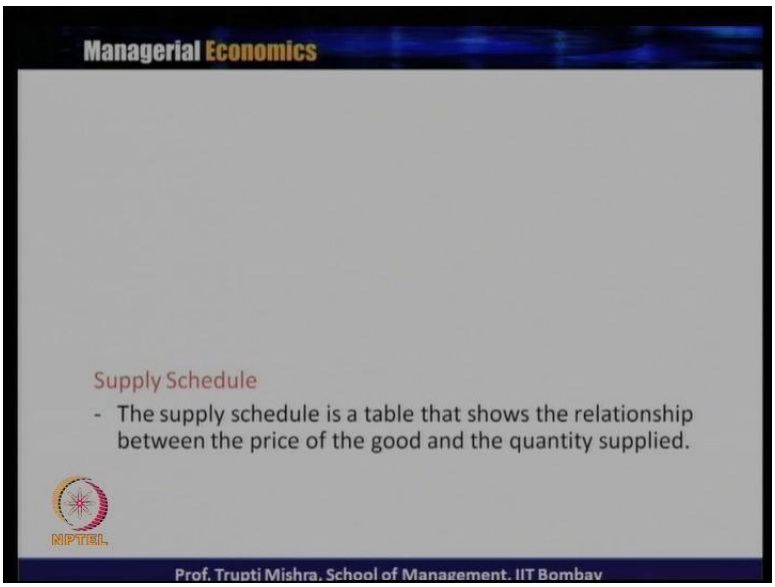

Now, we will see, what is a supply schedule? Supply schedule is a table that shows the relationship between the price of the goods and the quantity supply. So, this is nothing but when you take the exact quantity, exact number, of price and quantity supply, in different time period or it is a trend, giving a trend that how the quantity supply and price are related, that shows through a supply schedule.

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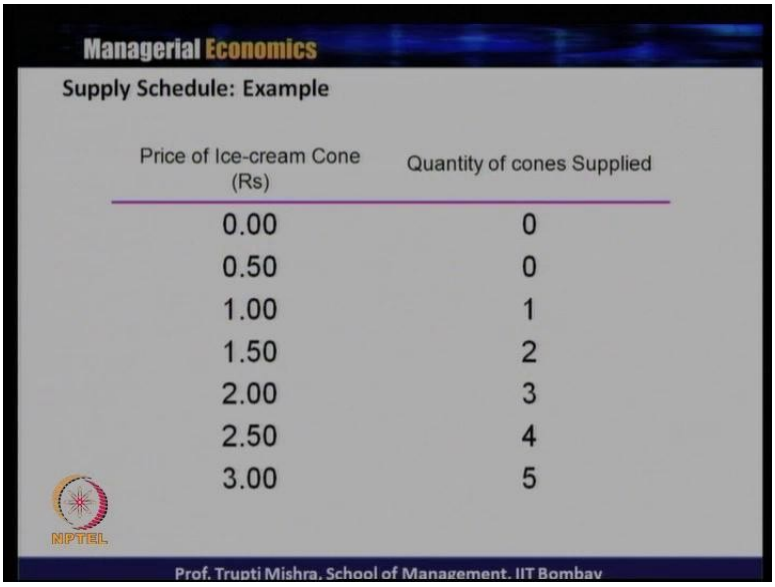

So, if you take this specific example of the supply schedule, when the price is 0, this is the case of, the product is ice cream over here. So, the price of ice cream cone is the represented in the first column, and the quantity of cone supplied is represented in the second column.

If you look at, when the price is 0, the quantity of cone supplied is 0. The simple logic over here is that, if there is no price for the product, producer is not going to produce the product, and they are not going to supply also. When the price is 0.50, still the quantity supply is 0, may be we can, explain in this way that, if this is 0.50 the producer is not getting their share of profit, or it is not profitable for them to supply in the market, and that is the reason that they are not supplying it. So, one is 0, another is 0.5. So one understanding from here is that, when they are not getting profit by supplying in the market, they are not supplying in the market.

And the third case, when the price of the ice cream cone is 1 rupee, the quantity supply is 1 unit. And similarly, when the price goes on increase from 1 to 1.5 , 1.5 to 2, 2 to 2.5, 2.5 to 3; and look at the second column, the input, the quantity of cone supply unit generally goes on increasing, that is 1 to 2, 2 to 3, 3 to 4 unit and 4 to 5 unit. Now looking at the basis of the law of supply that the price and quantity of supply is positively related, in this case also, you can get an evidence of that. If there is a increase in the price, that leads to increase in the quantity supply, in the market. And that is become evident when we are discussing about this supply schedule. So, this is the case of the individual supplier schedule.

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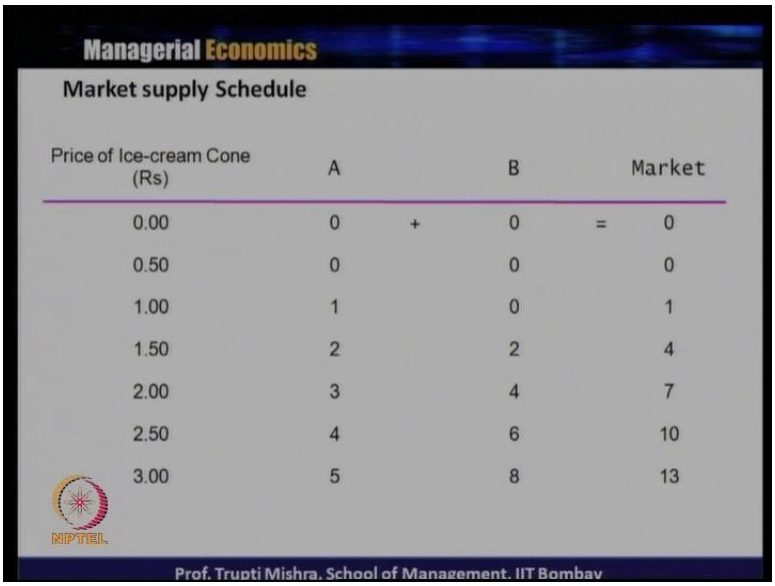

Now, if you say, how you find the market supply schedule, when the number of firms are more in the market. Suppose there are two producer, they are producing the ice cream cone and they are supplying it to the market; assuming the producer and seller, they are the same entity.

So, in the first column there is a price, in the second column, the supply, quantity supplied by seller A, third column quantity supplied by seller B ; and if you are assuming that in a market, there are only two supplier, summation of the quantity supply of both the supplier A and B that will give us the total market supply. So, if you look at, when the price is 0, or price are 0.5, the market supply or the total market supply is 0, because none of the supplier is applying the ice cream cone when the price is 0.

Similarly, when the price increases from 0 to 0.5 to 1 to 3, if you look at, both the cases supplier A and B, there is a increase in the quantity supply. And if you take a summation

of supplier A and supplier B, assuming there are only two supplier in the market, the market supply is represented in the last column and that is total market supply of ice cream cone, at different price level in a given period; the given period can be a month, the given period can be a week, given period can be a year. So, generally, market supply is the total quantity supplied by different seller in the market, at different prices in a given period represented through the market supply.