Foundation Course in Managerial Economics
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Lecture - 13
Elasticity and Taxes

Hello and welcome back to the foundation course in Managerial Economics. We had started our discussion on how to understand the effect of different policies of the government in the demand supply framework, the very simple demand supply framework that we started with, and we are looking at the impact of different policies of the government whether it is a price control or a tax and we are trying to understand what happens in such kinds of policy interventions by the government into a free market equilibrium.

So a free market equilibrium basically gives us a intersection between the demand and supply curve and it gives us the equilibrium price in the market and the equilibrium quantity in the market which leaves both the consumers and the producer satisfied and no one is left in the market who is looking for a good at the existing price and he is not getting it.

So and we discussed that the government sometimes intervenes in the market where the market fails due to various kinds of reasons and we were discussing about taxes in the last class we discussed about we looked at what happens when a tax is imposed on a buyer or on a seller and what we saw was it does not matter whether the tax is on the buyer or the seller because in both the situations the buyer and the seller are going to distribute the tax between themselves and the amount of tax burden that the buyer bears and the amount of tax burden that the seller bears that does not change if the tax is imposed on the buyer or the seller.

That is it is irrespective of which party the tax is imposed on it is distributed in the same way in both cases between the buyer and the seller. So next thing and we left the discussion looking at the typical example that we took and in our example we saw that the buyer in both the cases whether the tax was on the seller or the buyer in both the cases buyer was bearing major part of the tax.

We discussed about the example where the tax was 1.5 Rs per unit of product sold and we saw that the buyer was bearing 1 rupee out of that 1.5 Rs and the seller was bearing a tax a 0.5 Rs or 50 paise out of that entire tax of 1.5 per unit of good and we saw that it did not change whether it was on the buyer or the seller.

So the question that we left are last discussion with was what determines is it that always the buyer bears the major part of the tax or what is going to determine how much part of the tax the buyer is going to bear and how much part of the tax the seller is going to bear and today we are going to see that the answer lies in our understanding of elasticity that we did a few lectures back.

So we are going to discuss about elasticity and what impact elasticity or rather price elasticity of demand and supply has on the incidence of taxes. So we are going to talk about elasticity and impact of taxes.

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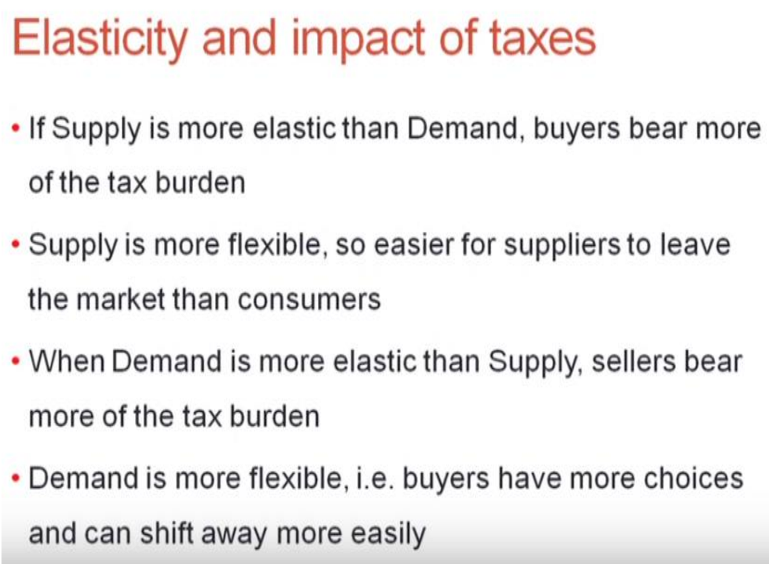

We are going to show that if supply is more elastic than demand buyers bear most of the tax burden. So if supply is more elastic than demand buyers bear most of the tax burden and let me illustrate through an example, let me show on the board why that is so.

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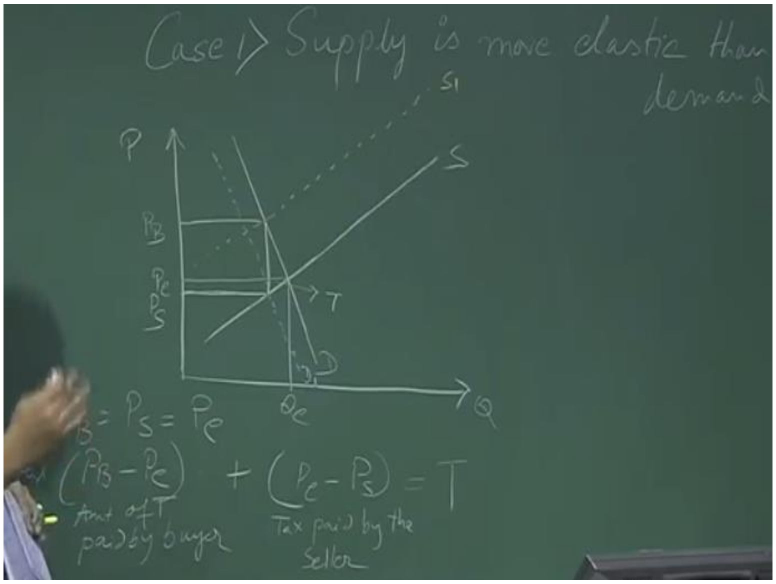

So we are talking about a case is one is supply is so supply is more elastic than demand, supply is more elastic than demand. So we draw a so we draw a supply curve which is more elastic means the supply curve is flatter so we draw a very flat supply curve and a steep demand curve. So supply is more elastic than demand and this is the equilibrium price equilibrium quantity so this is what happens before taxes.

Now say a tax is imposed of amount T so the first thing that we can do when we are trying to find out the impact of a tax through this kind of a diagram what you can do is you can imagine a tax of T and straightaway draw the amount of the tax between the demand and the supply curve.

So this is the amount of tax that has to be paid to the government and we know that whether it is the tax is imposed on the supply or on the seller or the buyer the tax is going to be distributed in the same way in both the cases and so this tax has to be paid by the seller and the buyer and so this is the amount this is the price that the seller is going to pay on the supply curve, this is the price that the buyer is going to pay on the demand curve and so now what I am doing here is slightly different from the way I was illustrating the tax in the previous lecture.

So it is follow me through so this is the equilibrium price and the tax has been imposed so we imagine a tax of this size between the demand and the supply curve so this is T so let me colour it. So this green line is the tax of amount T. So this tax is to be split between the supplier or the seller and the buyer and the buyer now the buyer pays a higher price of P B and the seller gets a lower price of P S than the equilibrium price.

So this is how the tax is distributed between the two and if you are interested to know how the diagram can be completed looking at the new demand curve looking at the new supply curve etc. it is very easy to do that. If the tax is on the seller what happens the supply curve basically shifts up. So if it is on seller if it is on the seller then the supply curve is going to be a parallel shift like this. This is S 1 and if it is on the buyer if the tax is on the buyer then the demand curve shifts downwards that is there is less demand now and you can imagine a this to be the new demand curve. This can be the new demand curve.

So either it is the new supply curve or it is the new demand curve. In both the cases, in both the situations the price the new prices are going to be P B and P S and so even without drawing the shift in the demand or the supply curve we can actually say how much of what is going to be the new price in the both cases.

So now we can see that this is how the tax is divided between the two. So this is the green line is the amount of tax that has to be split up between the two and earlier both were the price that the P B was equal to P S was earlier before tax P B was equal to P S was equal to P e. After tax P S is the price that the seller receives which is less than P e and buyer pays a price which is higher than P e and the tax is split between the two so P B - P e, P B - P e is equal to P B - P e is the amount paid by the amount of tax paid by buyer plus P e - P S this is the amount of tax paid by the seller.

This is actually not paid by the seller but this is a reduction in price that the seller now receives so it is like the incidence of tax has fallen on the seller also. So the total amount that is equal to now T. So that is equal to T and so that is equal to P B - P S and that is equal to T. So T is now split up between the two.

Now coming back to our original question that how much of the tax should the buyer pay and how much of the tax should the seller pay. Now in this situation we can clearly see that when we have drawn a flat supply curve and a steep demand curve we can see that the amount of tax paid by the buyer is much higher than the amount of tax or the incidence of tax that falls on the seller.

So here we can clearly see that this is the amount of this is the amount of tax paid by buyer and this is the small amount this is the amount of tax paid by seller. This is the tax paid by seller or it is a more correct way of saying it is the incidence of tax that falls on the seller because the tax has been imposed. The seller ends up receiving a smaller price than what he was receiving earlier so it is like he has split up the amount of tax with the buyer.

So whether it is the tax has been imposed or the seller or the buyer in both the cases we see in this situation that the buyer ends up paying more major part of the tax and the seller the incidence or the burden tax burden is less on the seller. So this is what we see in the case where supply is more elastic than demand.

Now this is what we illustrated through this is what we illustrated through diagram but what is the intuition behind it. Why does it happen this way? So I am sure many of you have already figured that out or the logic would be working in your brain already that supply is more flexible. So when supply is more elastic that means what?

When supply is more elastic that means that supply is more flexible and so it is easier for suppliers to leave the market than consumers. So it is easier for suppliers to leave the market than consumers. So whenever there is tax in the market on any good whether it is on the seller or the buyer that means the market is not very friendly to either of them because the price has been increased forcibly by the government and there is a tax on the product.

So in such a situation the one of the buyer and the seller the party which is more rigid or which is more inflexible he that party has to bear the major part of the burden of the case. So in this case demand is steeper which means the people probably this is the kind of necessity necessary good or there are no substitutes or people are there are no substitute of this product so people cannot change their habits or consumption requirements so easily so even if the price increases of or the market is not very friendly still the buyer stick to the market.

So in that case obviously who the party which party which is more flexible that is the party which can leave the market which can decide not to produce since it is not the price has the cost has gone up for the seller so the seller might just decide that I am going to produce less or I am going to really not I am not interested in paying so much of tax so I am going to produce less for unit of output I am going to pay less tax.

So in that case the supplier is more flexible so he can manage to get away with a lower by bearing a lower part of the tax and the party the buyer who has a very inelastic demand curve and cannot change his consumption requirement so easily that party has to bear the major part of the tax.

Next we are going to show that when demand is more elastic than supply, sellers bear most of the tax burden. So again it is just a matter of showing it graphically what happens or in the through diagram what happens when demand is more elastic than supply but again I am sure that the logic has already worked in your minds that what happens when demand is more elastic than supply. So let us just draw the diagram and see what happens.

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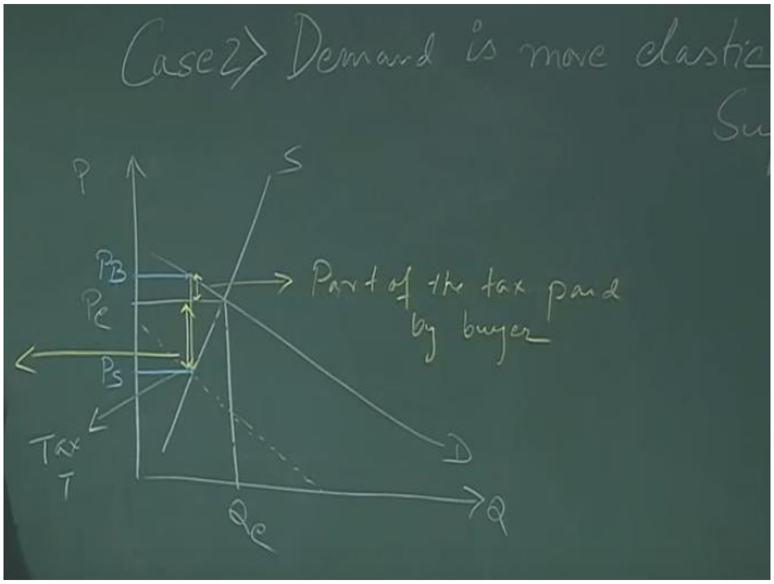

So now we are discussing case 2 where demand is more elastic than supply. So demand is more elastic than supply that means we have a very flat demand curve and we have a steep supply curve. So demand is more elastic than supply. Again you have a equilibrium price P e and equilibrium quantity of Q e.

Now again a tax of amount T imposed and so this is the almost the same amount of tax that we have been drawing so this is let this be the tax that is tax T. So this amount of tax is imposed and so immediately we draw the amount of tax between the demand and the supply curve and we get the after tax prices.

So now along the demand curve the buyer is going to pay a price of P B which is higher than the equilibrium price and the along the supply curve the seller is going to receive a price of P S which is less than the equilibrium price and this is the incidence of tax that is happening on the incidence of tax that is the seller is bearing.

So this is now the tax creates a wedge which is split up between the seller and the buyer and these are the prices that the price that the seller gets and this is the price that the buyer pays and the difference is basically the amount of the tax.

Now here we can clearly see that the amount of tax that the buyer is paying that is this amount this very small amount this is the amount of tax the buyer is actually paying. No matter if the say the tax the amount of tax has been imposed on the buyer, then what happens? The demand curve basically shifts down by this amount.

So the demand curve has made a huge shift downwards but the tax that the buyer actually ends up paying is this very small amount, this is the part of the tax paid by buyer and the seller ends up foregoing this amount of price per unit of the output. So earlier he was receiving P e now he is receiving P S and this is the amount which he is which is the amount he gets less than what he was getting in during equilibrium.

So this is the amount that is part of the tax shared by the shared by the seller. So this is the part of the tax shared by the seller and in this case we clearly see that since demand is more elastic than supply what is happening is the amount of tax burden that the seller is bearing is now much more than the amount of tax burden that the buyer has to bear and again the again the reason is again the same.

Now demand is more flexible. That is buyers have more choice and can shift away more easily. So basically demand is flat or it is a very elastic demand curve means that demand is more flexible. That is probably the buyers have choices in the market and when they see it does not it is not too attractive to buy this product in the market with all these taxes they will quickly shift their demand to a probably a substitute good or probably they will stop consuming this good altogether or reduce their consumption of this good because it is not so much of necessity to them.

So in such a situation and we can see that the amount by which the curve shifts in each of the cases if you look at the earlier diagram also you will see that the amount by which it shifts depends on how flat or steep it is. So if the demand if this is the amount of tax the demand curve has made a huge shift that means the demand is flexible and it has made a huge shift. On the other hand supply is steep and say if the tax had been on the supplier.

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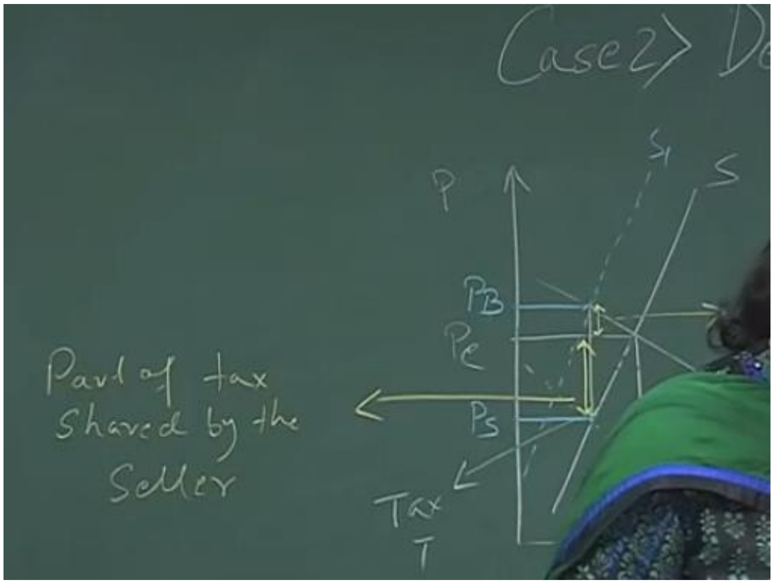

In that case what is what would have happened? In that case supply would have shifted this to the left or to the upward and this would have been the new supply curve this would have been the new supply curve and we can clearly see that the shift in the supply curve is also very small which shows that which is basically happening because the intuition is that supply is probably inflexible at least in the short run or in the given circumstances supply does not adjust so easily so the supplier is willing to bear major part of the tax than the buyers.

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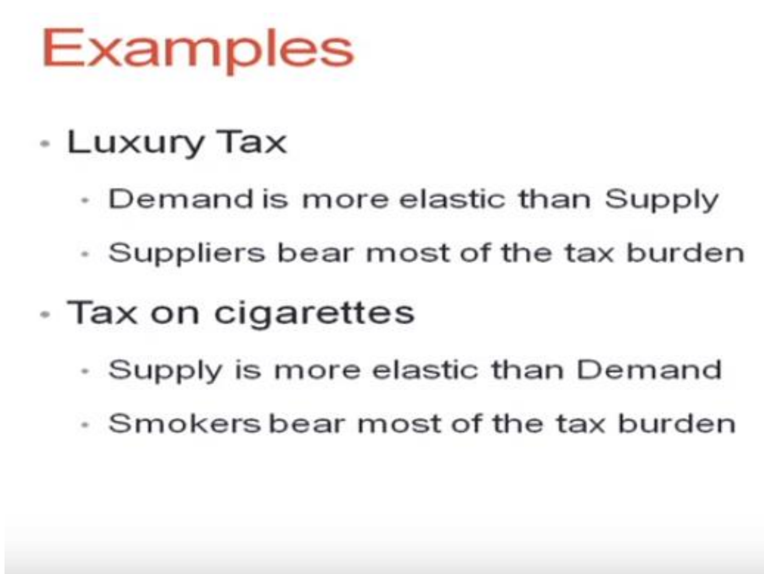

So let us discuss some examples, let us look at some examples. What happens in case of a luxury tax? What happens in case of a luxury tax? Often during the budget we hear that the tax on luxury goods has been increased say tax on branded high-end products or taxes on room rents in hotels or say taxes on luxury cars high-end cars the tax has gone up and sometimes even it happens that the tax is on the buyer we feel kind of happy that okay the rich are paying more taxes now and they will be paying they will have to top up more money for every unit of luxury product that they consume but does it happen that way.

What have we learnt from the exercises that we did right now? What kind of supply or demand curve does the luxury product have? Now a luxury look at looking at demand curve luxury product is not a necessary product and sometimes luxury products have lot of lot of substitutes in the market also.

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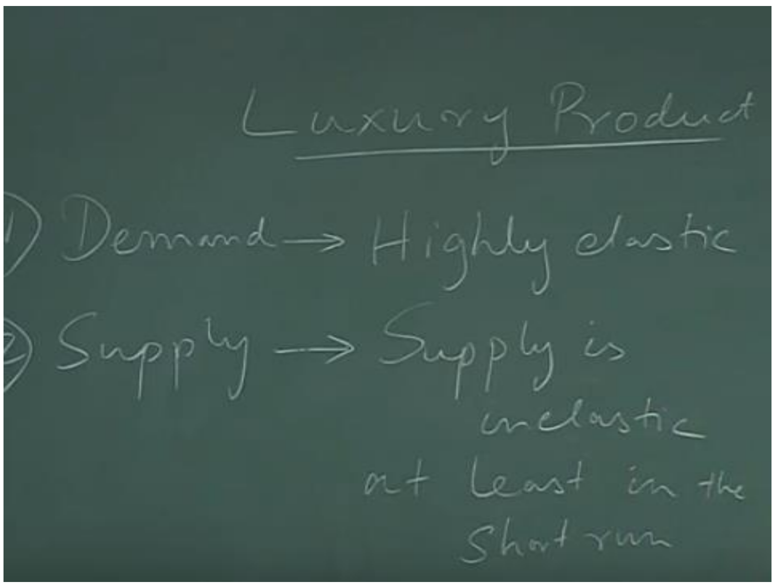

So if the tax goes up on the luxury product that basically means that so luxury product is so in case of a luxury product first looking at demand first looking at demand is it elastic or inelastic. So luxury product is not a necessary product. It is not that people really need to consume it immediately even if the price has gone up. So people can move to other substitutes and so basically demand is highly elastic.

So demand is highly elastic. What about supply? What about supply? What about the elasticity of supply of luxury goods? Now in most cases you can imagine if the luxury good is say as I said if it is a high-end five star hotel rooms or it is high-end cars really luxurious cars, supply is going to be inelastic at least in the short run, why?

Supply is inelastic at least in the short run because that most supplying these kinds of incur a lot of cost like say for example if there is a five star hotel for the maintenance of the rooms the hotels the taxes that they pay for having the I am not talking about the per unit tax but I am saying that the all the cost that are incurred by the hotels they are quite high and they cannot be reduced they are not so flexible in the short run.

Later we are going to talk about variable cost and fixed cost and we are going to see that in these hotels the fixed costs are very high. So basically hotels or even high-end cars the plants, the manufacturing units everything has been set.

So all of a sudden because the prices are high the supplier cannot reduce the supply or cannot all of a sudden decide that I am not going to produce any more cars or I am going to cut down on the production of cars because they already have created a enormous capacity or even if not enormous they had created certain capacity with some with some plan about production in the near future and all of a sudden he cannot just cut back on production.

So basically supply is inelastic. So supply is inelastic at least in the at least in the short run. So in such a situation this is going to happen. This is going to happen. Demand is more elastic than supply and part of the tax paid by the buyer is going to be very small and most part of the tax incidence is going to be would have to be borne by the supplier.

So is that a good policy or bad? Now since we already said that the from our understanding of elasticity that we discussed in the earlier classes now income elasticity of demand or price elasticity of demand of luxury goods is very high it is a very elastic demand. So in that case the revenue of suppliers or sellers is going to increase if they can reduce the prices.

If they cut if they reduce cost there will be enormous increase in output sold and the opposite is going to happen if they try if they raise the prices. So the government is basically discouraging this sector if it is imposing ya if it is imposing taxes on this sector’s consumption.

So if it is discouraging this sector then what will happen is when the people’s income grow or when the when they try to be more cost efficient or when they try to reduce their cost I mean they will not have any incentive to reduce or they will not have much incentive to grow this sector. In that case the revenue from the entire sector is going to fall.

So it at the end of the day it is not a very attractive proposition for the overall growth of the economy because this is the sector the luxury sector again going as per our understanding of elasticity that we have been discussing since the last classes since elasticity of demand for luxury products is very high it makes sense to encourage this sector to grow and be more efficiently and to reduce the prices cost and prices so that their overall revenue grows in the sector. So this was about luxury tax and demand is more elastic than supply and suppliers bear most of the tax burden.

On the other hand what happens when there is a tax on cigarettes? When there is a tax on cigarettes supply is more elastic than demand. So supply is more elastic than demand because cigarette is mostly addictive and to the consumers or to the smokers probably they are not going to be able to change their habits at least in the short run.

So and even unlikely to change their habits in the long run so supply is very demand is very inelastic and on the other hand supply is more elastic than demand. It is possible for a cigarette company to just start producing less cigarettes or they can just some of if they feel that it is unattractive to be in this market they can quit the market. So smokers bear most of the tax burden in this case.

So these 2 examples show us what kind of issues the policymaker needs to keep in mind when he is deciding who to impose the tax on. When I say who to it does not mean whether the buyer or the seller but on which sector so because we have already seen that imposing a tax on the buyer or the seller does not make any difference as per as incidence of tax is concerned. So we are going to discuss about efficiency of efficiency of a market equilibrium in the next class. Thank you.