**An Introduction to Microeconomics**
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Lecture -31
Incidence of Tax: Four Extremes

Now, we already have learned the concept of elasticity. Now, I am going to talk about certain extreme scenario and I will let you to interpret what happens in the middle cases. Now, I would say in all these cases just it does not matter whether it is imposed on buyer or it is imposed on seller, but just to understand let us say that the tax t, unit tax of t is imposed on seller. Now, let us see what is happening.

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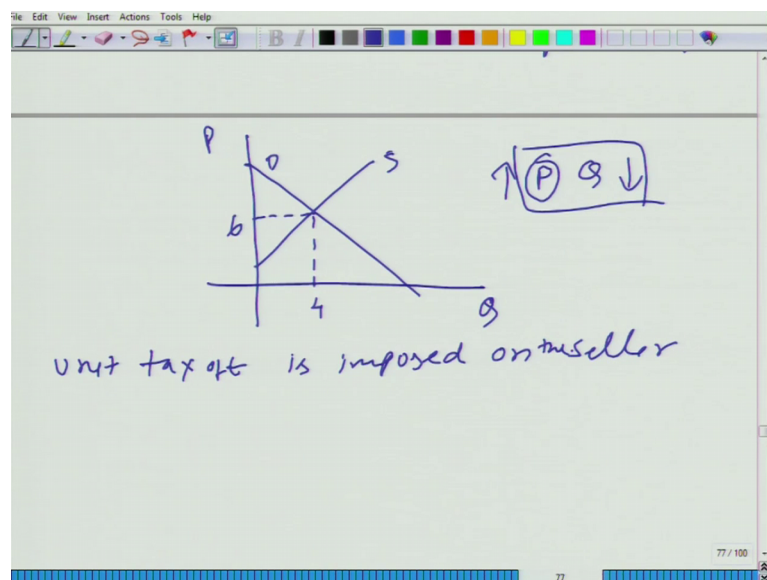
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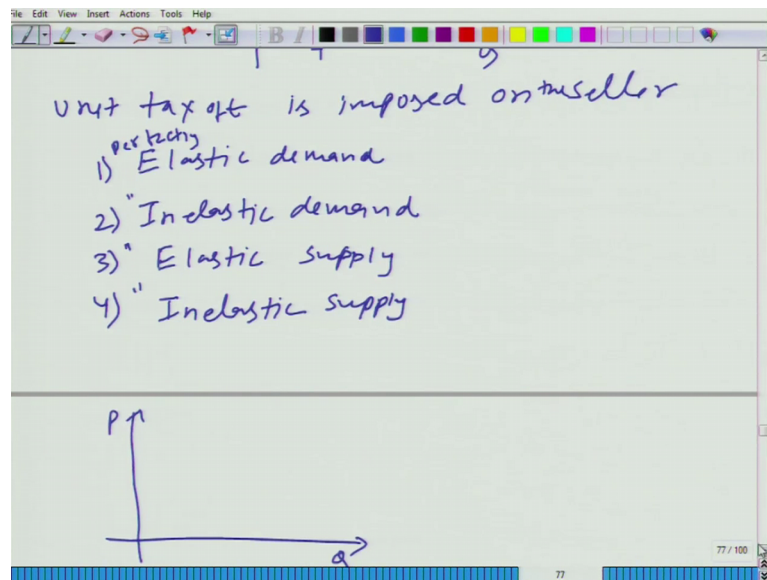
We will consider 4 cases elastic demand, inelastic demand, elastic supply, inelastic supply. How would the demand curve look like when we have perfectly elastic demand? I should as add here the perfect word here, perfectly in all perfectly elastic demand, perfectly inelastic demand, perfectly elastic supply and perfectly inelastic supply, these 4 extreme cases we are going to talk about.

So, when we have perfectly elastic demand how does it look like? Horizontal, so it is horizontal.

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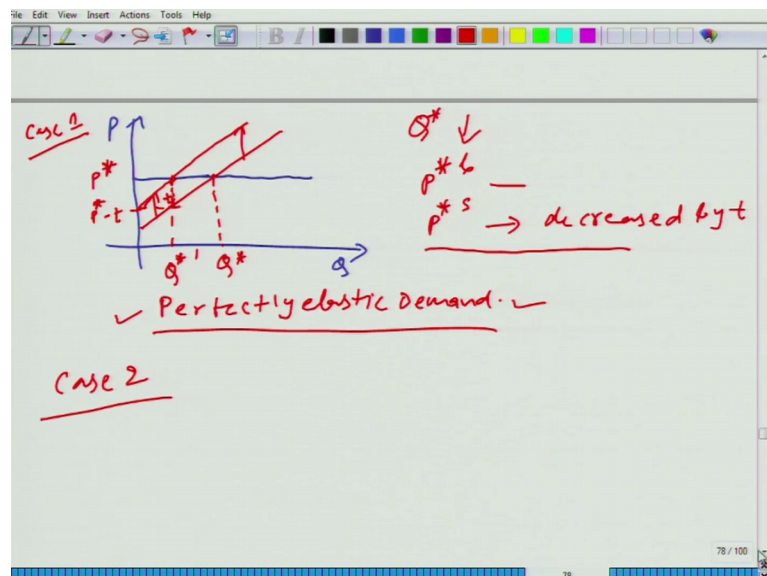
How about the supply curve? Supply we can pick any supply curve and tax t is imposed on the supply curve what would happen?

Student: (Refer Time: 02:26).

Shift upward.

Student: Upward.

That we have just now learned, shift upward, fine.

Student: Yes sir.

This is the shift, equivalent to t; this was the equilibrium quantity Q star earlier, this is the new equilibrium quantity Q star dash and this is P star, fine. Demand curve is not shifting; supply curve has shifted upward, what is happening in this case? The Q star.

Student: Increasing.

Has decreased.

Student: (Refer Time: 03:10).

Q star has decreased, fine. How about P star?

Student: Not changed.

B.

Student: (Refer Time: 03:19).

It have not changed, no change. How about P star S it has.

Student: (Refer Time: 03:29).

Decreased.

Student: Decreased.

By t.

Student: T.

Let us look at it. How do we calculate? From here, we moved here. See, now let us look at look at it through logic, just not graph, look at it through logic. What is happening? Demand is perfectly elastic, what it means is that price goes up by infinitesimal amount and.

Student: Change in quantity.

Buyers would not buy even a single unit of good, fine. Now, supply curve has shifted upward, the usual thing that seller can do that seller would pass the whole of the tax to buyer; when the seller passes on the tax to buyer, what would happen the buyer would not buy single unit, what would happen to revenue? 0.

Student: 0.

So, seller would decrease the price.

Let us say, if they decide to pass on half of the tax to buyer still buyer would not buy any of these good. So, seller does not have any other option, buyers are not willing to buy these goods at price higher than P star. So, in this case seller has to bear.
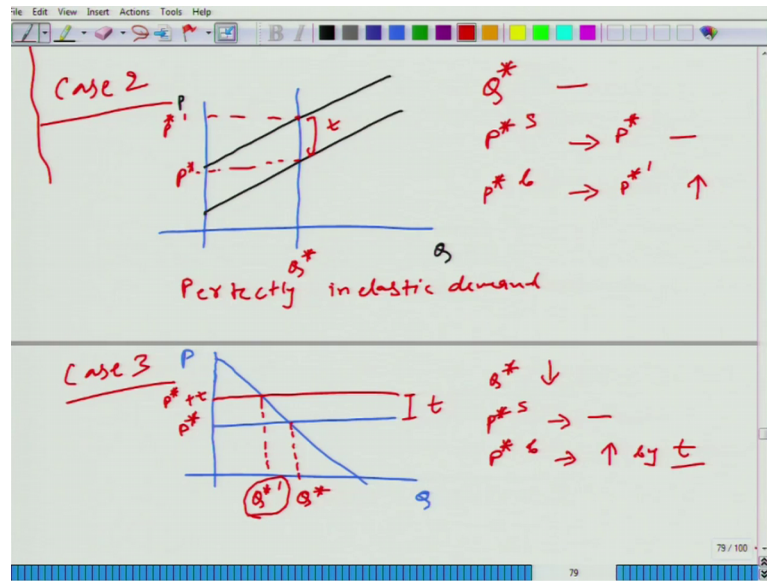
Student: (Refer Time: 04:57).

The burden of entire tax and in graph you see, here Q star dash is the new equilibrium, this is the new supply curve to get the price that seller would get, we will have to move to the original supply curve from here and this much P star minus t seller would receive. So, in this case the entire tax burden is borne by.

Student: Sellers.

The seller, fine; so case 1 we discussed the perfectly elastic demand and we saw that in this case the entire tax burden falls on the seller. now, we are talking about case 2 and that is when we have perfectly inelastic demand.

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Perfectly inelastic demand means?

Student: (Refer Time: 06:01).

Demand is vertical, this is demand and supply is any supply curve we take up and any upward sloping supply curve that we are taking and when tax is imposed supply curve shifts upward. So, this was the original P star and the new this is P star dash or P star new, Q star remains the same. So, here are 2 scenarios on top we had perfectly elastic demand, what happened that Q star decreased, P star for the buyer remained the same, P star for seller also decreased.

Now, see let us see what is happening here. Q star remains the same, it does not change. We will immediately get into just in a moment we will get into why? Now, what is happening to P star for seller? And what is happening to the P star buyer?

Student: P star seller is not changed, yes sir P star (Refer Time: 07:36) buyer is increasing.

So, how do we find out P star seller? Now, at the new equilibrium quantity that is Q star it is the same, we take a vertical shift to move to the original supply curve. So, when we take that shift and this shift is equal to t, we go back to the original point. So, P seller is getting paid even in the new scenario it is still P star. So, remains the same, but how much the buyer is now paying, that is P star dash, so it has gone up.

Now, let us see what is happening rather than using graph. Let us use, let us look at it using logic. Because of tax the marginal cost of sellers have gone up, if for example, if sellers were willing to supply 5 units of good at 5 rupees per unit and now let us say 1 rupees tax government has imposed on seller then seller will be willing to supply 5 units at 6 rupees cost, 1 rupee increase.

Now, what is happening on the buyer side? The buyer side demand is perfectly inelastic, it means that price goes up quantity does not change. I am not saying market works in this particular fashion, but the earlier example that I gave that seller would try to pass on the tax to buyer and if seller is passing on this tax to buyer it means the new equilibrium price is just t amount above the earlier price, buyers would buy the same amount of good because buyers demand is perfectly inelastic, it is a vertical curve, buyers they buy the same amount of good at all the prices.

So, here seller would be able to successfully pass on the tax to the buyer. So, who is paying the tax here?

Student: Buyer.

Buyer, now we have, so far we have looked at 2 cases, in first case what we had was perfectly elastic and in the second case we had perfectly inelastic demand and when we had perfectly elastic demand tax burden fell on the.

Student: Seller.

Seller.

Student: Seller.

When we have perfectly inelastic demand then buyer had to pay the whole tax. So, can we get some idea that it has something to do with the.

Student: Elasticity.

Elasticity, it will become more clear when we look at 2 more examples, fine. Case 3, when we have supply is perfectly elastic; perfectly elastic supply means a horizontal curve and we take any demand function, any downward sloping demand function. If government imposes tax what happens?

Student: Downward shift.

Downward shift or upward shift, think about it. When supply curve is perfectly elastic or it is horizontal what does it mean that marginal cost is same at all point and let say that marginal cost is in this case P star, when government imposes a tax of t unit a specific tax of t unit then what happens marginal cost goes up by.

Student: T.

T. So, supply curve will shift.

Student: Upward.

Upward, exactly t amount, it shifts upward exactly t amount and how much is the shift? This shift is t, is it clear now? Why it will shift upward?

Student: (Refer Time: 12:04).

No, I am saying that here I said right in the beginning sorry if I said it is a demand curve, then I was wrong because we are talking about scenarios where tax is always imposed on seller those 4 cases we are discussing. You can do it same, when tax is imposed on buyers, but here right now we are talking about scenarios where tax is imposed on seller. Now, what happens? Let see, that earlier equilibrium quantity was Q star, the new equilibrium quantity is Q star dash, this is P star plus t. So, Q star decreases what happens to P star S, let us look at the graph at this new quantity Q star dash. If what is the price that seller is getting? P star; so remains the same and how about P star b it is rises by t. So, again who is paying the tax?

Student: Buyer is paying.

Buyer is paying the tax or can I say this, the side which is relatively less in less elastic is paying the higher proportion of tax. Here, it is the perfect it is perfectly extreme case where supply curve is perfectly elastic, so supplier does not have to pay any tax, the perfectly elastic side does not pay any tax, is it clear?

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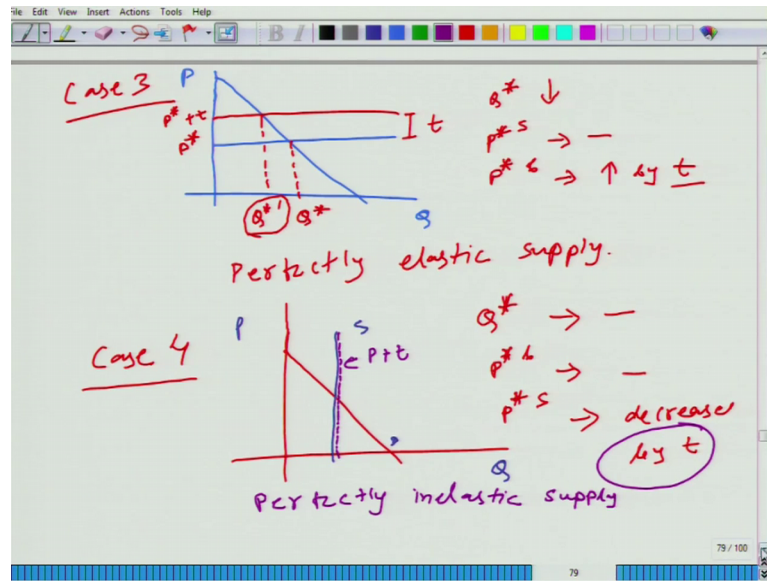
So, here supply perfectly elastic supply and the 4th case, the logic that I gave you in words that you can apply here too in this case also, but let us move on to the 4th case, we have downward sloping curve and perfectly elastic.

Student: Inelastic sir.

Perfectly inelastic supply function, what does it mean? That supply function is the vertical.

Student: Vertical.

This is supply, this is demand. Now, a tax is imposed on seller what would happen here? The supplied, the new supply curve is the same as the earlier supply curve.

Student: Yes sir.

Why? because this curve has to shift upward, by how much? T.

Student: Yes sir.

It is the same thing when you shift a vertical curve upward you get the same curve. What it is saying? That at all price this person would supply the same amount, fine. Is it clear? Now, what is happening to the equilibrium quantity and equilibrium price, Q star remains the same no change, how about P star b?

Student: (Refer Time: 15:35).

Remains the same, does not change? How about P star s?

Student: Decreases by t.

Decreases by t and it is difficult to see in this graph, but what is happening that because there is another graph super imposed on this and this graph is P plus t. So, earlier that the new equilibrium point does not give P star s, but it is giving P star S plus t, which is same as the earlier P star, so what is happening to the equilibrium price that seller is getting, it is t unit less than the earlier equilibrium price.

So here, the whole tax the complete burden is borne by.

Student: Seller sir.

By the seller and seller is inelastic, perfectly inelastic supply, fine. Is it clear?

Student: Yes sir.

So, here we have taken the extreme cases. Now, let us talk about you know in between cases, when we do not have perfectly elastic demand and perfectly elastic or inelastic supply what happens? Can I say again I am saying heuristically without proving it without showing it to you, the side which is relatively more elastic pays relatively, share relatively less burden of the tax. The side which is more inelastic, shares the larger burden of the tax. Is it clear? Again look at the word elastic and inelastic, what does elasticity mean? perfectly elasticity represents the price responsiveness basically. So, elastic means that you have extreme high responsiveness.

So, if price goes up by even little bit, your response in quantity is great. So, here demand is a downward sloping curve, so let us look at from the demand side, price goes up by little bit your demand goes down considerably, that is supplier would not prefer. So, what would they do? They would share the burden higher burden of tax. So that consumers do not decrease their consumption significantly. So, the tax has, who would, the incidence of tax in economic sense, in real sense it depends on the relative elasticity of demand and supply, fine.