An Introduction to Microeconomics
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Lecture - 32
Incidence of Tax: Effect on Surplus

Now, it gives us one more idea, who should government tax, which goods should be taxed, which goods should not be taxed. But to study that lets look at the consumer surplus, producer surplus and tax revenue, we will we will study this and that is the last topic in this chapter.

So, what we had if we go back to the original equations this is 2, this is 10 and q was 4 and p was 6.

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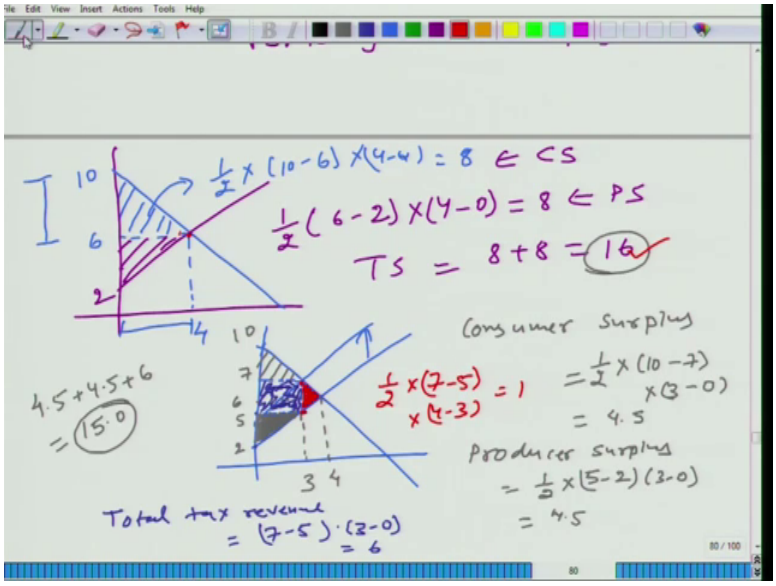

Student: 6.

Here if you remember consumer surplus is equal to this part and this area is equal to half multiplied by.

Student: 4.

10 minus 6 multiplied by

Student: 4 four minus 4 minus (Refer Time: 01:25)

Four minus 0.

Student: 4

And how much it is?

Student: 8.

8, we have done it earlier too..

Student: 8.

And how about this is consumer surplus now we have, lets calculate the producer surplus half multiplied by 6 minus 2 multiplied by 4 minus 0.

Student: 4.

And that is again producer surplus and total surplus is 8 plus 8 that is 16.

Student: 16.

Now, let 6 let us see what happens when a tax of 2 unit is imposed on seller, you can do it for what happens when it is imposed on buyer. So, let us , if it is imposed on seller then supply curve shifts upward ok, this is the sift fine.

In this case this is 4 and this was 6 fine.

Student: Yes sir.

So, in this case how much is the consumer surplus?

Student: sir (Refer Time: 02:53)

This is 10, this is 6 the new if we have imposed the 2 unit it is 3 it is 7.

Student: 10 to 7.

And it is 5, can you tell me the triangle that gives us the consumer surplus?

Student: 10, 7.

10.

Student: 10, 7.

Consumer surplus it is this triangle.

Student: 8 to 7.

Why it is this triangle? because what is consumer plus the total benefit accrue to the consumer in the transaction ok.

Student: Consumer.

So, total of 3 units, 3 units are being sold in the market.

Student: Hm.

For the zeroth at the zeroth label the marginal benefit to the consumer is equal to 10.

Student: 10.

So, the benefit would accrue to consumer as long as the marginal value is above sen 7. So, consumer surplus is half multiplied by 10 minus 7 multiplied by 3 minus 0..

Student: 3 4.5.

So, this is equal to 4.5, how about producer surplus this is 2. Producer surplus is given by this triangle, why buy this triangle because how much a producer is getting 5 per unit and for the zeroth, near zeroth unit the marginal cost is 2. So, total gain from this transaction is going to be 5 minus 2 and so on.

So, producer surplus would be half multiplied by 5 minus 2 3 minus 0, by the way whenever we have calculated the consumer surplus and producer surplus we are getting consumer surplus equal to producer surplus. Do not ever assume that these 2 are always equal it is just because of this particular example.

Student: Example.

Ok fine, but we should also not forget the total revenue because; remember ultimately this revenue will be used for the society.

So, when we are talking about total gain for the society then we should also include the total revenue calculated because eventually it will be given back to the society. So, we should also include this part and how much is this part, how much is the total tax revenue?

Student: (Refer Time: 05:48)

Tax revenue, that is 7 minus 5 multiplied by 3 minus 0 and that is 6.

Student: (Refer Time: 06:04) sir if we have if you did the new supply curve

Huh.

Student: Then the market price we can say 7.

Market price, market price is seven, but 7 is not what seller is getting paid, out of that 7 2 is going to the government.

Student: (Refer Time: 06:20)

Student: (Refer Time: 06:22)

So, how much has seller does not care how much he is getting paid how much he gets to keep, that is what he is interested in. So, how much he gets to keep, 5 per unit you understand.

Student: sir case of the proportional tax this is fine then the vertical shifts through we can see it very clear.

Huh.

Student: But if in case of that proportional tax the (Refer Time: 06:49) curve rotates.

Huh.

Student: By an angle.

Huh.

Student: Because general there is a change in. So, in that case we will consider the supply new supply curve or the old supply curve.

Old supply curve.

Student: Old supply curve.

Always see whenever we are calculating the producer surplus how do we calculate the producer surplus; it is total gain that has accrue to the producers in the transaction. So, we know his marginal cost originally because this is his original marginal cost, we can include the new one also, but everywhere we have to account for how much money is going to government, but if you look at the old one you can simply say first one is getting paid approximately 5 and his marginal cost was near 2 ok. So, right at the 0 level his gain is approximately 3 for small amount the gain is 3 and it is decreasing.

So, basically we are interested in figuring out this particular triangle because 5 he is getting paid and his marginal cost is given by this supply curve, you understand that is why we do not we are not looking at the new curve.

Student: then in that we have to my subtracting the (Refer Time: 08:10)

Huh.

Subtracting proportion fine.

Student: Hm.

So total 6. So, how much is total 4.5, 4.5 and 6 let me write it here 4.5, 4.5 plus 6 and that is 15 and earlier we had total surplus equivalent to 16 and in that this case we have 15. If you compare these 2 curve the only part that we are getting we are losing is given in the red color, this triangle is lost, this triangle is lost why, why do we lose it?

See, what is happening here in this case at this point typically someone is willing to pay little bit more than 4 and someone some seller had a marginal cost of little bit less than 4. So, if you had matched these 2 people theoretically speaking; then transaction would have produced little bit of gain and that gain would have accrue to both the supply and the buyer and hence to the society.

But now, what is happening now this transaction cannot take place because government needs to, they need to pay 1 unit to the government. So, let us say the earlier just for example, say the marginal benefit is around 4.25 and marginal cost was 4 point 3.75. So, difference was 0.5.

Now, this transaction cannot take place because different is just 0.5 and what government wants is 1 unit. So, it is not beneficial for buyer and seller to have this transaction in the market, from where they would get the 1 unit that is why this transaction will not take place fine and this transaction the transaction that would not go through is represented by this triangle and how much is the area of this triangle we can calculate.

Student: 4 unit.

Half multiplied by 7, this is the 7 and this is 5, 7 minus 5 multiplied by 4 minus 3 and this is equal to 1 perfectly equal to the difference between this total surplus and the new total surplus and this is this is called basically deadweight loss.

Student: Deadweight loss.

So, again without getting into detail deadweight loss is a you can if you can think of that we are thinking that government wants to do good for the society then we can think of this deadweight loss as the cost of tax collection that society has to pay this cost as to collect the tax ok. So, I the coming back to the earlier question it is beneficial for the society to tax the goods when we where we have list deadweight loss.

Student: List.

So, this can be a criteria that which good should be taxed the good which have less deadweight loss fine.

Now, I am not going to give you a general result, but just simple that you should look at it here.

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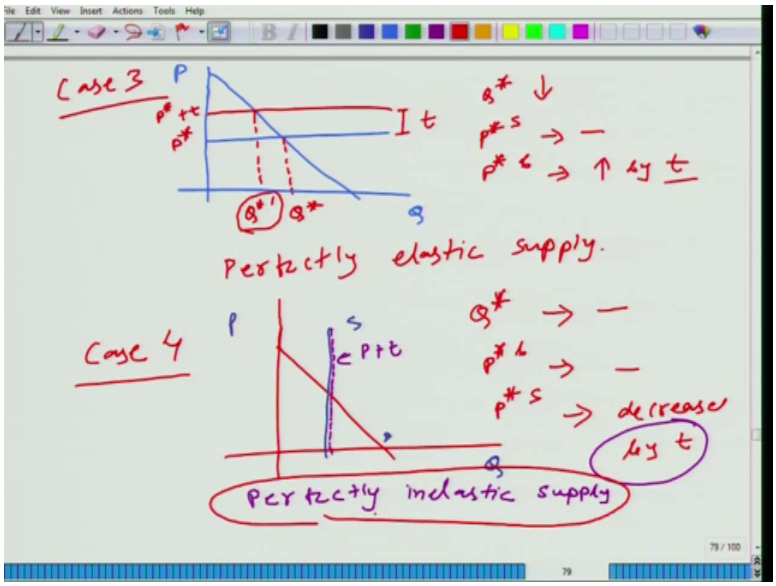

Let us look at in this example how much is the deadweight loss in perfectly inelastic supply case 0.

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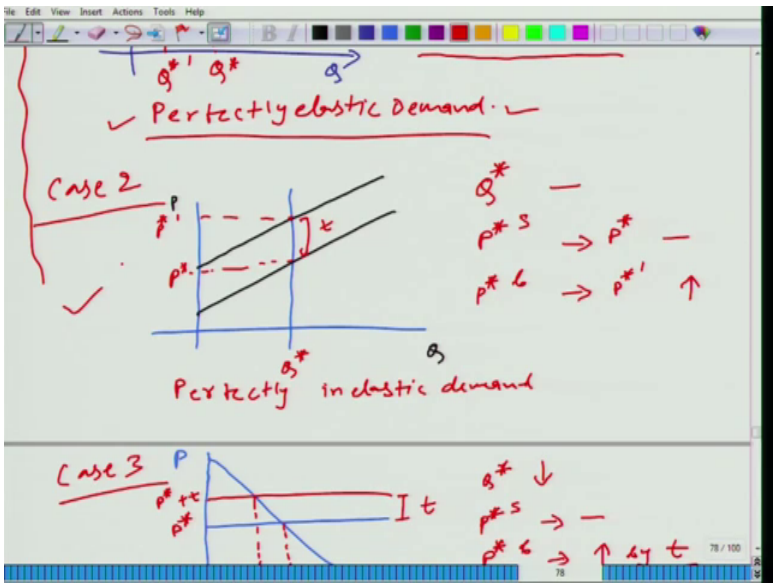

How about in this case, when we have perfectly how much is the deadweight loss here, no deadweight loss.

Student: 0.

0.

Student: (Refer Time: 12:09) case 2 (Refer Time: 12:10)

Case 2.

Student: 0.

0. So, you can consider these scenarios where tax can be imposed and society would not incur any cost fine you can think of like for example, patrols demand is fairly inelastic in the short term, someone was talking about because recently the price of petrol was raised significantly. So, why?

Student: (Refer Time: 12:37)

So, why does government tax petrol because petrol demand is fairly inelastic, do you see how much is the deadweight loss.

Student: very (Refer Time: 12:48)

Very lim[ited] limited. So, it is a good you know good product to tax fine , but I am not saying that government should consider only this particular criteria although it is not within this chapter , but I just want to say like for example, milks demand is also fairly inelastic.

Student: Inelastic.

But milk should not be probably taxed because you know poor people also need to have milk and if it is tax they will have to because demand is inelastic they will have to bear the burden of tax. So, there are some other criteria's also, but that is not in purview of this particular chapter ok, that we can discuss later as we progress. As we are moving from one chapter to another chapter we are building our basic tools to understand an economic phenomenon that is the aim and slowly and gradually we will build our toolkit ok. So, now, that brings an end to this chapter.