An Introduction to Microeconomics
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Lecture-28

Taxation

So, we have been talking about demand and supply market equilibrium and related applications. And I gave you example of some market intervention and it is impact on market equilibrium.

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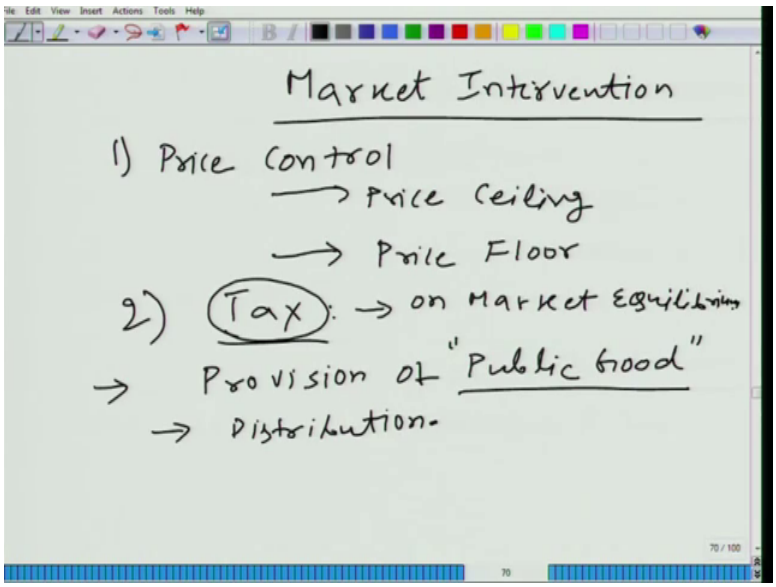

Market intervention we were talking about, and I gave you an example of price control and under this title we looked at 2 scenarios price ceiling and.

Student: Price floor.

Price floor and in the beginning of the chapter I also promised that we will talk about the effect of.

Student: Taxation.

Taxation on market equilibrium, but I did not talk about it because I wanted to use the concept of elasticity while talking about effect of taxes on market equilibrium, that is

why I told you that time that we would wait for it, but now we have to study the elasticity. So, we can talk about tax.

So, what is a tax, why do you think it is imposed although that is not the topic today, but since we are talking about tax we should have brief idea about what do we mean by tax.

Student: Sir tax is the amount we have to pay before for the service, that has been delivered to me.

What kind of service?

Student: Service in any form like products or.

So, what you are saying?

Student: (Refer Time: 02:00).

What you are saying that there are some goods although we have not learned this term, but let me use it I will talk about it more, little more, little later. The term is public good like good that cannot be provided by right now that is sufficient to learn the goods that cannot be provided by private entities private firm like street light it can be an example or cleanier. So, government provides? It and how can government provide it needs certain amount of resources to provide these goods. So, that can be one reason. So, provision of public good. The definition I gave you is definitely imprecise, but right now our focus is not on public goods. So, that is why let us not.

Student: Sir that is what we do with a do with tax.

Haa; do with tax.

Student: But what is tax?

What is tax is that the amount that you pay to the government for.

Student: Any service.

Not for any service for any transaction or for having any income a different kind of tax government collects from you. So, when you are paying you are when let us say you are buying a pen and you are paying some local tax on it, it is not at that time it is directly

tied to the certain provision of public goods or certain provision of services. What happens that government collects that money and uses it for providing certain public good or may be for some other purposes like for example, the other purpose can be.

Student: Transfer payments.

Transfer payment, distributional gestures, income to get to decrease the income heterogeneity. So, I can say distributional gestures or just distribution, but that is not the today's topic right now we are going to focus on the effect of tax on market equilibrium and there are several kind of taxes just in the example, I gave you certain example you can look is that when you buy land you will have to buy revenue stamp. So, you are paying certain taxes there or when you buy milk, if you look at the fine print Sudha milk or mother dairy milk does not matter which milk you are buying or Parag milk, it says rupees 28 it may say one of these 2 things MRP; that means, maximum retail price. So, it includes tax in that case and on it may say local tax extra you know sometime earlier long time back we had local tax extra rated, then we had MRP now you see on some of the goods again you see local tax is extra rated.

Student: It is a (Refer Time: 05:10) sometimes on breads cover they write this much price in Bihar Punjab they (Refer Time: 05:13).

Ha so.

Student: (Refer Time: 05:15).

Ha. So, it means different states have different.

Student: (Refer Time: 05:19).

Tax resume different rate of taxes. So, that is why the bread is sold at different price in different.

Student: Places.

Places. So, that is definitely there. So, let us look at the 2 simple right now there are of course.

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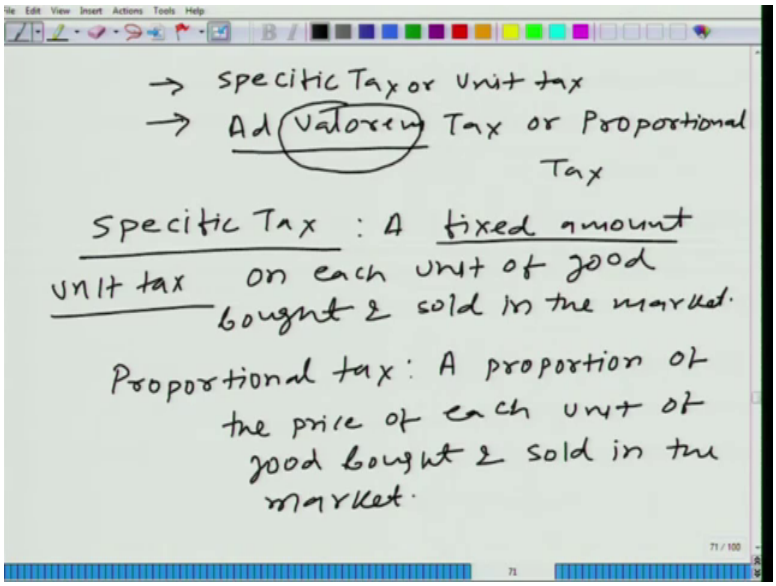

Various kind of taxes available, you can just think of just name income tax, excise tax, custom tax, when you buy the consumption tax, entertainment tax land tax.

Student: Vat.

Vat you pay now we are talking about now GST goods and services tax. So, there are several kind of tax. So, right now at this basic level we would not be bothered by a specific nature of these taxes, we will look at in detail only 1 kind of tax, but right now I want to talk about 2 very very very simple cases.

And the first case is called a specific tax, unit tax, I will come I will describe what do I mean by specific tax or unit tax and second is ad valorem tax or proportional tax.

So, now let us talk about a specific tax; as the name suggest it is typically imposed on some specific items. So, fixed amount a fixed amount on each unit of good bought and sold in the market. So, when government says that if you buy a litre of milk, you will have to pay 2 rupees per litre of milk. This is a fixed amount it does not depend on the price of milk or value of milk what you pay is fixed amount. If seller gets or if you know if it is like price is 28 rupees and it is imposed on seller then seller will have to pay 2 rupees to the government for selling 1 litre of.

Student: Milk.

Milk or if it is imposed on buyer, then buyer will have to pay 28 plus 2, 30 rupees. So, it is specific tax no proportion no you know it does not matter how much is the price of the milk it is the fixed amount ok.

And the second is this is also called unit tax as it is imposed on.

Each unit of the product fine.

Now, let us look at the proportional tax or ad valorem tax a proportion of the price of each unit of good bought and sold in the market. So, now, let us say the same example let us continue with the example of milk, let us say that price of milk is 30 rupees and a proportional tax of 10 percent is imposed on milk it means then 3 rupees will be paid to the government as proportional tax on milk. So, it is not fixed if price of milk decreases per unit tax paid on milk will also decrease, a price of milk increases per unit tax paid will also increase now this has another name that is ad valorem tax. It means the tax on value and value is definitely price represents the value of that product in the market that is why it is also called ad valorem tax.

Now, this tax whether it is ad valorem tax or it is a specific tax, it can be imposed either on.

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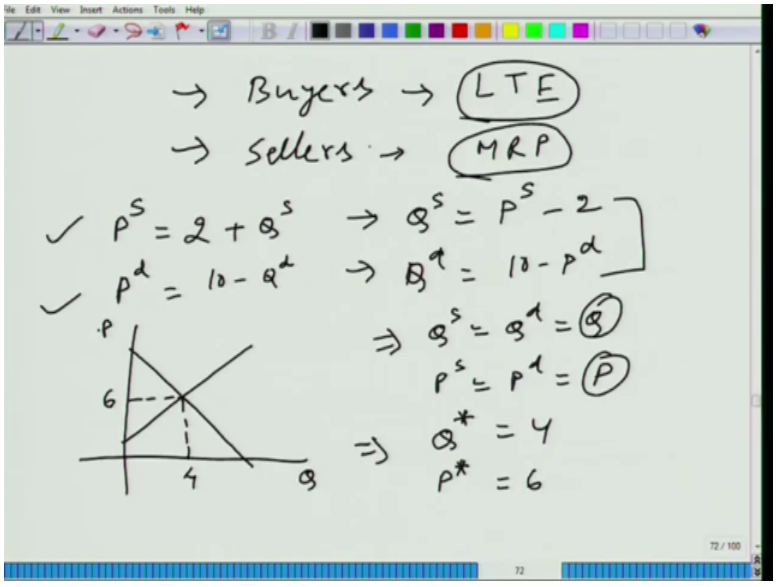

Buyers or it can be imposed on.

Student: (Refer Time: 10:01).

Sellers one of these 2 what does it mean if it is imposed on buyers. It is imposed on buyers then whatever is the price of that good, buyer pays on top of the price of that good certain amount certain fixed amount if it is unit tax and certain proportion if it is

Student: Proportional.

Proportional tax. So, buyer is paying on top of the price of that product fine ok.

Now, or in other word you can say that the stated price of that good does not include the tax. So, you can take the example of local tax extra, because when it says local tax extra it clearly let us say it is written 15 rupees 84 paisa, local tax extra and you know local tax let us say for example, is 10 percent. What it means is that 15 rupees 84 paisa that you are paying to the seller and on top of this price 15 rupees 84 paisa you are paying, if it is proportional then certain percentage or if it is unit tax then certain fixed amount. On top of that price written on the product I am not saying it has to be written, written part is not important what is important that buyer has to pay on top of the price ok.

And if it is imposed on seller then what does it mean? The seller has to it see here what it means that whatever seller is asking the buyer to pay that includes the.

Student: Tax.

Taxes also here whatever the seller is asking to pay it includes the taxes. So, in this case when it is written MRP, I am not saying in this case it is definitely it includes tax, but in this case it is a possibility that here the tax is imposed on seller. Now let us take an example what happens you know which one would you prefer. An imposition of tax on buyer or an imposition of tax on seller consider that you are largely buyer in the market, you do not sell as a student you do not sell any product in the market you are largely you are buyers.

Student: (Refer Time: 12:34) depends on the supply demand function.

That depends on supply demand function, but typically I think you know about it, but typically what happens? The common reaction that you get from people they would say

if they are buyer then they would say they would claim the tax would be imposed on seller, and if they are seller they believe that tax would be imposed on buyer.

But let us see let us take 2 simple example, where this is the original demand and supply function I used, while talking about market equilibrium and with help of this we will see that the impact of what happens when it is imposed on buyer and what happens when it is imposed on seller. Of course, this is inverse demand function. So, if you want to write demand function from here you just has to express Qs as a function of Ps and from here Qd as a function of Pd and what did we get? Let us look at it let me draw if we solve it if there is no intervention from government, it means there is no taxation in the market then what is the equilibrium price what happens in that case Qs is?

Equal to Qd is equal to Q and Ps is equal to Qd is equal to P of course, here I am putting Q and P for simplification for transforming these 4 variable equations into 2 variable equation system and what do we get if we do that.

Student: Q equals to 4.

Q is equal to 4.

Student: Pequals to 6.

And P is equal to.

Student: 6.

P is equal to 6, that is what we get.

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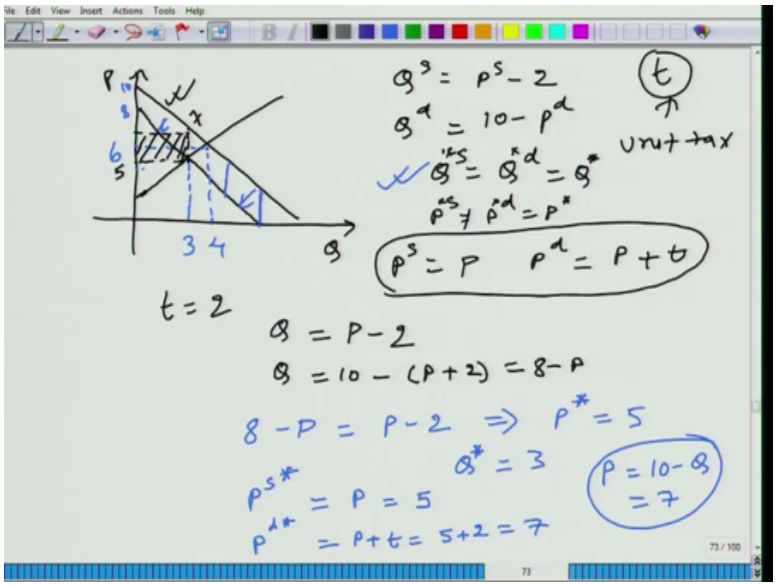

Now, let us say the tax is imposed on buyer, what would happen? Of tax is imposed on buyer demand curve would shift where in which direction.

Student: Left (Refer Time: 15:07) inverse.

Lets first see why the demand curve would shift let me write the equation again let me write the demand function here Qs is Ps minus 2 and Qd is 10 minus Qd now let us say a tax is being imposed a tax of let us say t.

Student: Sir 10 minus.

Ten minus Pd yes thank you 10 minus Pd and a tax this t is unit tax, this tax is unit tax what is important for the buyer is the total amount he pays. The basic notion that we have to think buyer does not care whether the money that he is paying is going to seller a or seller b or the part manufacturer or to the government, what he cares about is that the money a buyer is paying from his pocket ok.

So, earlier remember when we did not had tax what could we do? We can say Qs is equal to Qd is equal to Q, that still be true here because still quantity bought and quantity sold would be equal in the equilibrium, but we can no longer say Ps is equal to Pd is equal to P we can no longer say of course, we are talking about at equilibrium level. It would not be equal is it clear? It would not be equal it no longer be equal what we said remember then when it is imposed on buyer, what it means is that buyer pays on top buyer pays

some extra price more than what is written on the product, more than what is quoted for the product. So, what I can say Ps is still equal to P, but Pd is no longer equal to.

Student: P

P it is P plus.

Student: T.

T it is P plus t now for illustration let us take t is equal to 2, is it clear this part is clear to you that Ps is still equal to P, but Pd is not equal to P. We are no longer giving demand function as a function of price that the buyer is paying what we are writing? We are writing here that demand function is a function of price the market price P as well as t. So, I can now say the supply side the equation is still Q P minus 2, but what do we get on the demand side? Q is equal to 10 minus P plus t and t is equal to.

Student: 2.

2. So, what do we get 8 minus?

Student: P.

P. So, when we have 8 minus P of course, it is shifting inward, that is I illustrated mathematically that it will shift inward. This is 10 this is 8 can you explain it to me without using any math why it is shifting inward.

Student: Because sir prices increasing for consumer and if price is increasing demand will decrease.

Go back to your original that the original description that we had about the demand function. When we draw the demand graph we basically draw the marginal value verses quantity.

Student: It is marginal value increases.

Marginal value is not increasing.

Student: (Refer Time: 19:06) marginal value (Refer Time: 19:07).

Marginal earlier what we were saying that marginal value is equal to price.

Student: Price.

Now, what we are saying that marginal value should be equal to price plus.

Student: Tax t.

Taxation you understand now. So, now, marginal value is no longer just a function of price, but it is also a function of taxation, and since taxation is positive amount it forces the demand curve to shift inward. So, for that particular quantity marginal value is decre marginal value has decreased, it is no longer the same marginal value that you gain. Effectively speaking the marginal value from the same good is now little lower because you have to pay higher price because of that tax. So, that is why it would shift inward. So, now, let us see what happens here, this was the earlier equilibrium and earlier equilibrium was Q is equal to 4 and P is equal to.

Student: 6.

6 what happens and how much is the shift, can you quantify the shift in the demand curve.

Student: 2.

The vertical shift is equal to.

Student: 2.

Tax.

Student: Tax.

Whatever this unit tax you have and here that unit tax is.

Student: 2.

Two. So, anywhere you calculate of course, this drawing is not perfect this height should be equal to.

Student: 2.

Two this should be equal to 2.

Now, notice one thing the demand curve is a downward sloping curve and supply curve is an upward sloping curve. So, do you think the equilibrium price will go down by 2 or more than 2 or less than 2 less than 2?

Student: Less than 2.

Less than 2 why because the curve is curve has some slope, if it were flat then either you would get no change or just equal to2.

Student: 2.

But since you have slope it will be somewhere between 0 and 2 is it clear.

Student: Yes sir.

Fine mathematically if you solve it what would you get now.

Student: 5.3.

If you solve now 8 minus P.

Student: (Refer Time: 21:30).

Should be equal to remember still this equation is still valid Q star s is equal to Q star d is equal to Q star. So, if you solve it 8 minus P should be equal to.

Student: P minus 2.

P minus 2.

Student: P equals to 5.

So, that will give you P is equal to.

Student: 5.

P is equal to 5 and that will that means.

Student: Q equal to 3.

Q is equal to.

Student: 3.

Three, but this P star if you notice this P star is the amount that seller is getting paid. So, Ps star the amount that seller is going to getting is also equal to P and it is equal to 5, and how much buyer is paying? P plus t and that is 5 plus 2 7 buyer is paying now 7. Look at the original equation for demand there are 2 ways you can get it the original equation for demand is 10 minus.

Student: P.

10 minus P. So, Q is equal to 10 minus P or P is equal to 10 minus.

Student: Q.

Q P is equal to 10 minus Q, Q we have obtained is Q that we have obtain is.

Student: 3.

3.

Student: 3.

So, P is going to be equal to.

Student: 7.

Seven that is one way to look at it another way to look at it that the amount that buyer is paying is equivalent to the amount that seller is receiving plus the tax that is being paid to the government. So, how much seller is getting paid 5.

Student: 5.

How much government is getting.

Student: 2.

Two. So, 5 plus 2 7.

Student: but this sir 7 is the amount which consumer have to give for getting that 4 quantity [FL].

Not 4 quantity.

Student: 3 quantity.

Three look at it here now look let us look in the graph here you have what we have obtain.

Student: (Refer Time: 24:00).

That it is 3 and this is 5, but this curve that we are using this curve has already taken care of the effect of tax. So, when, but if you want to look at the original demand curve which is the earlier one, before the shift when quantity bought and sold is 3 how much is the equivalent the corresponding price.

Student: 7.

Seven. So, you go here this is the vertical 7. So, what is happening here 5 seller is getting paid and 2 unit goes to the government, and this is the tax revenue for the government, 2 multiplied by 3, but I will come to this tax revenue part little later is it clear.