**W6 V4 Tax Incidence and Revenue**

0:09  
So in the last video, we talked about how we don't care who pays the tax at checkout because the market outcome doesn't change.

0:18  
But the reason you were uncomfortable with that is because your gut feeling says, look, when you have a tax, consumers and producers are affected differently, right?

0:25  
And so how do economists grapple with that?

0:28  
To that, we will respond by saying it doesn't matter for market price, but it does matter for what we call economic incidents.

0:38  
OK.

0:38  
So let's define what we mean by economic incidents and compare that to what we were discussing before, which is what we call statutory incidents.

0:46  
So once we have that, then we can say, OK, if you care about economic incidents, how do you measure it?

0:50  
And much more importantly, what does it depend on?

0:53  
We're going to talk to the relate that to relative elasticities.

0:57  
And then finally, you need money.

0:59  
Everybody needs money as a government, right?

1:00  
What should you tax?

1:01  
That'll get you the biggest bang for your buck.

1:03  
Then we'll talk about that when we talk about the relationship between elasticity and tax revenue.

1:08  
When I bring in some of the information from a previous module there.

1:13  
OK.

1:14  
So now the only information I've given you so far is that here's the tax, it's a $2.00 per unit tax.

1:21  
And we've just talked about who pays the tax at checkout.

1:25  
The jargony term for that is what we call statutory incidents.

1:28  
And in the previous video, we've made the case that, look, it doesn't matter for any outcome.

1:33  
The only thing it matters for is which price I call the market price.

1:37  
It doesn't change the actual effective prices.

1:40  
OK, So then what do you care about?

1:42  
What we care about is economic incidents.

1:45  
So if effective prices are changing, then how is that tax split effectively among consumers and producers, OK?

1:54  
That is what we call economic incidents, OK?

1:57  
And what we're looking for when we're talking about economic incidents is what we call a burden of the tax split.

2:03  
But split effectively.

2:06  
Here's what I mean.

2:08  
Before tax, this is what the price was in there.

2:11  
When you impose a tax, the price for the consumer changes.

2:14  
It goes up higher, right?

2:15  
Effectively, price on the shelf may go down lower, but effectively consumers are paying more than before.

2:22  
In general, now how are consumers effective?

2:26  
We'll look at the change in price, right.

2:29  
So before they were paying P star and now they're paying PD.

2:31  
This difference in price is how they're being affected.

2:34  
But now remember when we talked about in elasticities, is this gap $1.00, What if I call it cents?

2:39  
Then it's gonna be 100 cents.

2:41  
And that's gonna seem really large.

2:42  
So what do we do in this case?

2:44  
We express it as a percentage.

2:45  
So we're like, look, this is the tax, total tax, that's the gap between consumer price and producer price, OK.

2:53  
And then this is a change in producer effective price, right?

2:57  
So you are paying this fraction of the tax, this percentage of the tax and that feels a little bit more comfortable because it's a unitary measure.

3:05  
Same thing with producers, right?

3:07  
Prices used to be here, they're getting nice high prices.

3:09  
Now in general, their prices are lower.

3:11  
This gap means that their prices are effectively lower.

3:14  
I want you to think about that as a percentage, as a percentage of the tax.

3:19  
That is what economic incidence is.

3:22  
It is saying, look, and I'll show this more on a graph later, Before the tax, this is what the market price was.

3:31  
After the tax I have PDPS.

3:36  
This gap between those two is the amount of the tax.

3:40  
This is a change in price for the producers.

3:44  
This is the change in price.

3:46  
Sorry for the producers down here and the consumers up there, right?

3:50  
So this red corresponds to this and the green corresponds to this.

3:57  
But the total of red plus green has to be equal to this amount of the tax.

4:02  
And when I'm looking at the fraction, I'm basically saying what fraction of that blue line are consumers paying and what fraction are producers paying changing?

4:10  
If you bear a different burden of the tax, that's it.

4:13  
OK.

4:13  
So what does this look like graphically?

4:17  
Graphically, you're going to come in here and you're going to say, I have this wedge, I have this gap, that's the wedge between PD and PS.

4:25  
Now I'm going to move this wedge around all over and I'm going to find it could be here, it's going to be here.

4:31  
This is my new outcome.

4:33  
This is my new market quantity.

4:37  
This is PS, this is PD, this is the burden of the tax on consumers.

4:45  
This is the burden of the tax on producers.

4:48  
So here you can see producers are paying a really small fraction of the tax compared to consumers.

4:53  
So why could it be the opposite?

4:55  
And we will say what matters is relative elasticities.

5:01  
OK.

5:02  
So just to recap, statutory incidence is who pays the tax at checkout.

5:08  
It is determined by the government, right?

5:10  
In in France, price includes tax.

5:14  
In Canada, price does not include taxes added on to the consumers bill.

5:18  
Why is that the case?

5:19  
I don't know historical reasons, but we're like we don't care, right?

5:23  
The only thing that matters for us is effective prices.

5:26  
Both those scenarios, effective prices for the same tax, same curves will be exactly the same.

5:30  
What we care about is effective prices and they are determined by demand and supply, right, because we've got to find our wedge where it matches neatly in between the demand and supply curves, OK.

5:41  
So that's kind of giving us a hint that demand and supply kind of matters in there and a gap between those two.

5:47  
So how do we think about this?

5:51  
Let me just kind of come in here to give you a heads up so that you know where we're headed.

5:56  
OK.

5:57  
This gap is going to be related to the shape of the demand curve and the shape of the supply curve around this line.

6:06  
Just keep that at the back of your head.

6:07  
We're going to come back to this, OK.

6:10  
At this point, I want to address a couple of questions that commonly come up right at this stage when I typically teach it.

6:19  
At this point people will say you're just saying prices for consumers will increase.

6:23  
But sometimes when you have a tax, when I look at the problem set, it says market price decreases on a taxes imposed.

6:29  
How do I reconcile the two?

6:31  
To which I will say, remember market price can be PD, market price can be PS, PS is lower than the original price, PD is higher than the original price.

6:42  
If I choose PS to be the market price because of the statutory incidents, then yeah, market price can decrease.

6:48  
It's not going to change effective prices or anything else in the market.

6:53  
Second, much more relevant question is, OK, how can we make sure that consumers don't bear a burden of the tax?

7:00  
If you're interested in consumer effective price, make sure that they don't bear a burden of the tax.

7:07  
To this.

7:08  
I'll say that's beyond my control.

7:09  
That depends on demand, supply, and specifically demand relative to supply and their elasticities.

7:20  
OK, so I want you to think about two things.

7:25  
So one example can be two siblings, right?

7:30  
You need to wash the dishes.

7:33  
Task has to be done.

7:34  
No negotiation about that.

7:36  
It has to be done.

7:37  
Any question is which sibling has to do the dishes.

7:41  
Now I'm going to come in here.

7:42  
I've got two kids.

7:43  
I'm going to say somebody needs to finish the dishes.

7:45  
I'm not doing.

7:46  
It has to be done.

7:47  
What are the kids gonna do immediately?

7:48  
They're gonna start complaining, right?

7:50  
And I'm gonna be like, I don't want to do it, but I gotta push the task on to them.

7:54  
Now, what happens when we're talking about elasticity?

7:58  
Elasticity is kind of this measure of reaction, right?

8:01  
Somebody that's very elastic has this huge reaction.

8:04  
You say do the dishes, They're gonna be like, no, I don't want to do the dishes and complain and complain, right?

8:09  
Somebody who's not so elastic is gonna say I'm gonna complain I don't want to do the dishes but not as responsive.

8:16  
So if I've gotta push the task, OK, I wanna push them.

8:21  
But I wanna push them in such a way that quantity demanded equals quantity supplied.

8:27  
If I push one side and they have a huge reaction, then one side is gonna go down a lot and this side is not gonna go down too much and I'm not gonna have equilibrium, right.

8:38  
So when I have to impose something, I need to impose its shared between the two sides, but in such a way that the net change is the net amount of complaining is exactly the same across both those kids.

8:51  
So if I want push the one who complaints a lot, just a teeny tiny push a little bit of washing the dishes, the complaining is going to be so loud that I'm not going to put too much on them because effectively I just want the same amount of complaining, right?

9:04  
So not surprisingly, the sibling who complaints the least gets to do the most dishes and the one who complaints, you know a lot gets to do a little bit that way the task is done.

9:15  
And I've gotten the same amount of complaining from both of those kids, right.

9:19  
That's what's happening when we have elasticity.

9:23  
So here I've got exact, I've got a demand curve in here and I've got exactly the same starting point in terms of the price and quantity.

9:30  
But what's different is the elasticity of both of those things here.

9:34  
Supply, that's the one that's whining a lot.

9:37  
You push them a little bit, you lower price a little bit on them.

9:40  
The quantity response is huge.

9:42  
So they're not going to have a very big change in their price, right?

9:50  
That's going to be the economic incidence on them.

9:52  
And the one who doesn't complain, which in this case is demand, is going to get a larger burden off the thing.

9:57  
Now take that same wedge and move it to the other scenario, right?

10:03  
In this case, demand is the one who's complaining a lot.

10:06  
So they're going to get a relatively low burden of the tax and produce a spare burden of the tax, right?

10:14  
And now you're gonna be like, well, why?

10:16  
Relative elasticity?

10:18  
In some households, kids complain.

10:20  
They're really complaining.

10:21  
For both our kids complain a lot and in some household, neither.

10:25  
Kid complaints, right?

10:27  
Very much.

10:28  
So I'll say it doesn't matter.

10:29  
What matters is how much one kid complaints relative to the other, because that depends on how the burden of the tax is, how the economic incidence is going to be done.

10:39  
OK.

10:40  
Please remember again relative, because now we're going to talk about how absolutes matter.

10:46  
The other type of question we can ask is what happens when we increase tax.

10:51  
So here we have this tax.

10:52  
It's bad because I have a lower quantity, deadweight loss, all of those things.

10:58  
But now I want to increase the tax.

11:01  
If I increase the tax, I need a bigger gap.

11:05  
If I need a bigger gap, I need to move quantity down even further.

11:09  
Fine, move quantity down even further there we loss is going to get higher, right.

11:15  
So just from the quantity perspective, you can kind of see that higher taxes will increase deadweight loss, that makes sense.

11:25  
But then you're kind of saying, well, on a previous slide you talked about complaining and elasticity's.

11:32  
Shouldn't that kind of come in to which I'm going to say, hold on, we're going to talk about that when we talk about tax revenue.

11:38  
But for now, we're just saying if I want a bigger tax, it's going to result in a larger dead weight loss because of the lower quantity.

11:48  
OK.

11:48  
So now let's talk about how large this is depending on the amount of complaining that's happening.

11:56  
OK.

11:56  
So if I have a tax right now and let's put the same tax here as well as no, let me make it smaller, This is the tax.

12:09  
This is the tax.

12:13  
Assuming those blue lines are exactly the same width, you can kind of already see that here relative to efficient, we have a bigger quantity response.

12:24  
Now why is that the case?

12:25  
What's different across those two diagrams?

12:28  
We have both supply and demand be more elastic.

12:34  
OK, so you're saying?

12:36  
Well, fine, OK, Does it need to be both?

12:39  
The answer is yes.

12:39  
It needs to be both to have this larger quantity response.

12:43  
Because if just one kid is complaining and being really elastic, it's not a problem.

12:49  
I just shove the task onto the other kid who's not complaining very much, and I can get the job done without very much complaining, right?

12:57  
But if both kids are complaining, I'm going to get the task done, but I'm going to get it done with a lot of complaining, right?

13:04  
Huge reduction in the quantity.

13:07  
OK.

13:08  
So this is when we see absolute elasticities when both supply and demand are elastic, we get a really higher kind of increase in deadweight loss as we continue to increase the tax.

13:23  
OK, let's summarize what we just did.

13:28  
When we introduce a tax, we have a deadweight loss because of the decrease in quantity.

13:33  
How large is this?

13:34  
It depends on how much quantity falls.

13:37  
The more elastic demand is fine.

13:42  
I will have to not push them too much, but in the same hand the job has to be done.

13:49  
So if I can get away by pushing it on to the supply side, then fantastic, I'll push it on to the other inelastic side and get the job done without much whining.

13:57  
But what happens when both wine?

13:59  
Then I'm going to have to push it and push it.

14:01  
And if both supply and demand are elastic, I'm going to get a much higher quantity response and a much higher deadweight loss.

14:11  
OK, now let's talk about revenues.

14:12  
Let's keep the same thing and do a small kind of minor variation on this.

14:17  
If you read the news, Toronto has a huge budget shortfall.

14:20  
They need to, you know, raise a lot of money.

14:22  
OK, now how do you get money?

14:24  
You've got a tax.

14:25  
You can cut spending, but that's only going to work a little bit.

14:28  
And you're kind of seeing what's happening already to the infrastructure, given that Toronto's cutting spending.

14:33  
So one of the things that may have to decide is kind of what should be taxed.

14:37  
And what you want to do is you want to get the maximum revenue for the tax.

14:44  
Given the tax is kind of fixed, you also have to worry about your tax base, which is the quantity.

14:51  
And you know already when you impose a tax, quantity is kind of going down.

14:55  
So if you're forgetting about the quantity response, you're going to say just raise taxes, Fantastic.

15:00  
When the tax goes up, I'll get more money.

15:02  
But what you're forgetting about, and most most people forget about is that quantity decreases in response and they have opposite effects.

15:10  
So we have to think about which one matters.

15:12  
OK.

15:13  
And in that case, coming in here, what you want to do is you want to scan across all of the things you can tax, find the one where both demand and supply are not very elastic and tax those, right.

15:27  
So for example, this is one of the reasons people are trying to say they should tax housing a little bit more because housing demand and supply are not that elastic compared to other things.

15:40  
But then you have people who will benefit and hurt by these taxes and they're not so happy about it.

15:44  
So this is a really complicated question and then we need to think about a little bit more.

15:49  
But to summarize again, what we care about is economic incidents.

15:53  
We do not care about statutory incidents.

15:55  
We care about how the actual effective burden of the tax is split and that depends on relative elasticity's.

16:02  
When both are more elastic, then we have a larger total quantity response and that's when we look at deadweight loss and not so much about economic incidents and how the tax is split.