**W10 V2 Perfect Price Discrimination**

0:10  
In this video we're gonna start off with an extreme form of price discrimination because here we're gonna focus on the types of assumptions needed and the market outcome.

0:18  
And we're going to use this to focus on marginal revenue because remember, firms choices, quantity and everything else flows from how their incentives change and that depends on marginal revenue.

0:30  
Again, a reminder, we're using monopolist as an example, but our general insights will translate into other scenarios as well.

0:40  
OK, now the third exercise, the reason we call this perfect price discrimination, and in the same way that we talk about perfect markets or perfectly competitive markets, it's to set a benchmark, right?

0:51  
In the perfect case, the best case scenario for a firm, what would it do if it was price discriminating?

0:57  
Now remember, it wants to sell the extra unit, but it wants to sell it to make sure it's just enough of a price decrease to induce that person to buy.

1:06  
It doesn't want to lower the price too much because then person will buy the good and they'll be very happy.

1:10  
No, we want to extract surplus.

1:13  
So I want to lower the price just enough to get that additional person to do that.

1:17  
What am I going to do for that additional person?

1:19  
I'm going to choose a price that's marginal willingness to pay equal to price.

1:23  
Because remember, when they're indifferent, they buy it.

1:26  
Now, the other thing I want to do is to think about those previous units sell.

1:31  
So I want to sell that extra unit and extract the marginal willingness to pay.

1:35  
But for those units that were sold already, I want to keep that price as high as possible.

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In fact, I want to go as high as possible, all the way up to marginal willingness to pay in order to keep those transactions going.

1:50  
What does this look like on a graph?

1:52  
So suppose I am selling these many units right now.

1:58  
Let's pick 10.

2:00  
Now if I want to get an additional unit, I want to get the 11th unit.

2:05  
I could charge the consumer any price for this.

2:09  
Let's say that suppose this is 25 and this is 23.

2:14  
To get that 11th consumer to buy it, I could charge any prices 23 or below.

2:17  
But I want to go as high as possible.

2:19  
So I want to charge the consumer for the 11th unit exactly 23.

2:25  
Now what about the 10th unit?

2:27  
I was already charging them 25 for the same reason I'm charging the 11th unit, 23, and I want to keep that at 25 when I reduce the 23.

2:36  
In fact, I want to do that for all of these previous people as well.

2:42  
That's the best case scenario for me, right?

2:45  
In that case, the price that I'm charging each one of those units will be effectively the revenue I'm getting from that extra unit.

2:53  
And it's going to make demand equal to marginal revenue.

2:59  
That's somewhat a little bit hard to see on a diagram.

3:02  
So let's think about that with a discrete example.

3:07  
So here's what we're trying to do for perfect price discrimination, the firm knows, right.

3:13  
It has full information on every consumers marginal willingness to pay, OK, That's a huge informational assumption.

3:21  
I know your demand curve.

3:22  
I know everybody's demand curve, and I can charge you your marginal willingness to pay for each and every teeny tiny bit of the good, right?

3:31  
So if I give you another good, I'm not going to reduce the price on all of those previous goods.

3:36  
And the price I can charge you is your marginal willingness to pay, because I know it and I'm able to do that.

3:42  
That's going to make the demand curve for an individual and hence the market, the firm's marginal revenue curve.

3:50  
Let's convince you using discrete data.

3:54  
So what I have here is a classic example.

3:56  
I'm going to give you 5 four buyers in this case, and I'm going to tell you their willingness to pay.

4:02  
Now here I'm looking at an example where there's only one unit, either A buys the good or not, B buys the good or not.

4:09  
In this case, marginal willingness to pay and willingness to pay can be interchangeable.

4:13  
OK, so if I'm a firm and I want to sell only one unit, well, who am I going to sell it to?

4:19  
I'm going to look at all of my consumers.

4:21  
I want to scan across them.

4:23  
I want to find the one that I can get the maximum surplus out of.

4:27  
I'm going to pick this guy here because this person has the highest willingness to pay.

4:34  
If I'm doing perfect price discrimination, I can charge them their willingness to pay for that first unit, 67.

4:40  
Which means that for my first unit, my marginal willingness to pay is equal to my marginal revenue, which is 67 second unit.

4:48  
Now I want to drop the price so that it's just low enough for the second person to buy.

4:54  
Scanning down, that's going to be B right?

4:57  
This notice as I'm doing this, this is the same third experiment we did when we were deriving the demand curve, right?

5:04  
The second unit is only sold if I lower the price to 53.

5:11  
Then I will sell to number one or to A, sorry C in this case, and then I can also sell to B.

5:18  
Now the difference with what we did before and what we're doing now is what happens to the price C is paying.

5:24  
What we did before is we said if I'm charging B 53, then I also have to charge C53 with perfect price discrimination.

5:31  
That's not the case.

5:33  
C keeps their price of 67.

5:36  
I'm not changing that.

5:37  
I'm giving CA price of 67C.

5:39  
Cannot look around and change it.

5:41  
That's their price.

5:43  
But then I'm going to charge B 53.

5:46  
There is no lowering of price on C so I'm still getting the same 67 from C and now I'm getting 53 additional dollars.

5:55  
That's my marginal revenue just from B.

5:58  
Keep going to get the third unit sold.

6:01  
I'm going to sell it to A at $40, but I'm keeping the price on B&C the same as what they were paying before, which means the extra revenue I'm getting is just the revenue from A.

6:12  
Only a quantity effect, no price effect, because I'm not lowering the price on anybody else.

6:17  
And then you do the last one right, which will be D $30 and $30.

6:22  
Notice this year.

6:24  
This relationship between quantity and price this year is my demand curve.

6:31  
It's also the same relationship as my quantity and marginal revenue curve, right?

6:37  
That's my marginal revenue curve demand and marginal revenue will exactly overlap when we have perfect price discrimination.

6:46  
And that's really great, right?

6:47  
Because when we have demanded marginal revenue overlapping, we're going to potentially get to efficiency.

6:55  
So let's think about that a little bit.

6:56  
OK, so here's the continuous version.

6:59  
I've got my demand curve, which is my marginal willingness to pay curve.

7:05  
But with perfect price discrimination, it is also my marginal revenue curve.

7:12  
Then you push the marginal cost in here, the firm, any firm monopoly, anybody, Right?

7:19  
Marginal revenue equals marginal cost and they're going to choose this quantity.

7:24  
OK, is this efficient quantity or not?

7:27  
Under no externalities, I'm going to get social costs and benefits equal to private costs and benefits, and this is going to also be the efficient quantity.

7:42  
So just by allowing firms to price discriminate in perfect price discrimination, you end up all the way at efficiency.

7:49  
But a more general insight is, as you allow firms to scoop up some extra surplus, they're going to dampen that effect of this marginal revenue through the price effect and they're going to increase quantity, right?

8:03  
So a more general version of this is by decreasing or dampening the price effect, we're going to get a quantity increase, which brings us closer to efficiency.

8:29  
OK, perfect.

8:30  
Price discrimination shows us the extreme.

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More generally, we're going to kind of work towards that.

8:36  
So here's the what we've just done under extreme informations on under extreme assumptions on information and what the firm can do.

8:46  
For example if the firm has all of those basic conditions, no arbitrage and and some market power and the information on every single consumers demand, curve, willingness to pay for every single unit and the ability to charge people prices per individual and prices for teeny tiny extra bits of the good, you can get efficiency because the firm is going to capture all of the surplus and the market is going to reach the efficient outcome.

9:19  
So if I'm looking from an efficiency perspective, fantastic, right?

9:22  
Dampening this is going to end up at the efficient outcome.

9:26  
But is everyone going to be happy with this?

9:29  
Not really, because capturing all the surplus means that consumer surplus disappears, right?

9:42  
All of the total surplus becomes producer surplus and consumers are not going to be happy about it.

9:47  
So here you can kind of see this, this again, this interesting trade off between efficiency and fairness.

9:52  
Efficiency says we let them capture all of the surplus because we get the efficient amount traded.

9:57  
Fairness says the way you're doing this is by giving firms all of the surplus and consumers are left with no surplus.

10:03  
And is that fair?

10:04  
And that's kind of a larger question.

10:06  
And that's where this tension comes in between efficiency and fairness, right?

10:10  
But from this perspective of allowing firms to do perfect price discrimination from an efficiency perspective, it is fantastic, but it requires a whole bunch of crazy assumptions which may or may not hold.

10:25  
In the past I used to say it will never hold, so don't even recommend that.

10:30  
However, now with, you know the amount of data that firms have and the kind of technology in the way that it's proceeding, it's becoming more and more likely that firms can charge individual prices for individual units and it's getting kind of closer in there.

10:46  
Now, if you're convinced about this and saying, look, sure, I believe technology is increasing and maybe firms have the information, but really, how ridiculous is it that you're going to charge?

10:59  
You know, if I'm thinking about storage space, I'm willing to pay $5 for an extra GB of storage, Somebody else is willing to pay $20.00 for an extra unit of extra GB of storage.

11:13  
That's kind of hard to get around, right?

11:15  
Here's one way firms get around it.

11:19  
OK, this is your price.

11:21  
This is your quantity.

11:23  
Now I want you to buy this quantity.

11:27  
That's for you with perfect price discrimination.

11:31  
OK, Why?

11:32  
Because that's where my marginal cost exactly equals your willingness to pay.

11:39  
Now, I can implement this by saying you get this GB at this price, you get this GB and every additional thing, and you have to do this complicated calculation.

11:49  
Or I can make your life really simple and my life really simple.

11:53  
If I have to kind of do processing credit card payments is to say, look, this is going to be this, this is going to be this.

12:00  
And I want you to buy all of this.

12:02  
This is your willingness to pay for each one of these.

12:04  
So alternatives for perfect price discrimination.

12:07  
I can offer you this range of things or I can offer you QPD units for these many dollars.

12:18  
That's your entire surplus.

12:20  
It's the total surplus that you would be getting because it's your willingness to pay.

12:24  
I'm just going to scoop it all out as a price, OK?

12:29  
That's one way you would see it operationalized.

12:32  
Another way you can see it operationalized is you say I'm going to offer you buy as many GB as you want.

12:39  
OK.

12:39  
So a per GB price equal to marginal cost.

12:45  
So I say that's the per GB price.

12:48  
I know that when you face this per GB price, you are going to choose QPD because that's for you where your marginal willingness to pay exactly hits your thing.

13:09  
In that case, I'm going to get this amount of revenue, I'm going to get price times quantity.

13:16  
That's going to be my revenue.

13:18  
Fantastic, right?

13:19  
If I charge you a per unit price, but I'm also going to charge you a fixed fee, I'm going to say this black region here.

13:33  
You can get as many GB as you want at this per GB price, but you also got to pay me a fixed monthly fee.

13:39  
Notice all of these are going to be the same effectively for the for the consumer firm just picks whichever one is easier for to to get by, an easier one for the consumers to accept, but they all result in the same thing.

13:52  
OK.

13:52  
So under these crazy assumptions, this is how you will see this operationalized.

13:58  
I also want to take this idea of a fixed fee and we're going to expand on that a little bit more when we talk about second degree price discrimination.