Microeconomics: Theory & Applications
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Lecture – 16
Price Consumption Curve & Related Issues

Hello. Welcome back to the lecture series on Microeconomics. Let us continue with the discussion of comparative statics in the context of a consumer's equilibrium.

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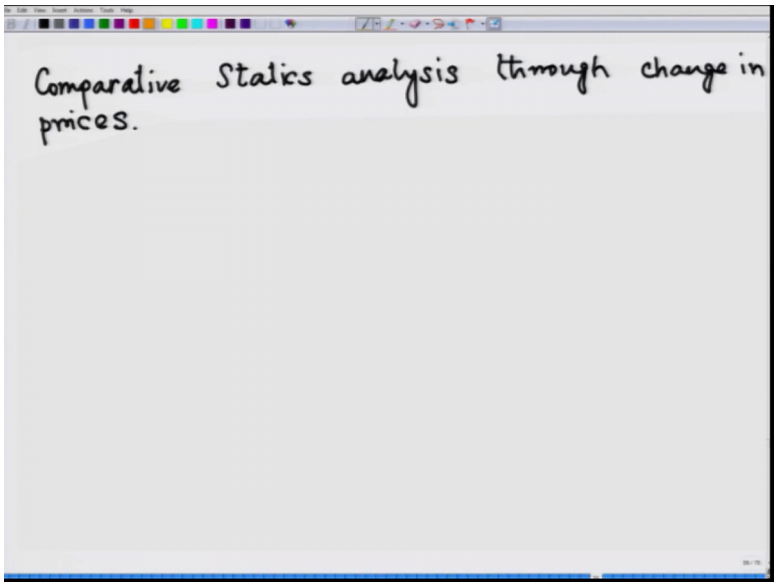

Now, we are going to introduce a concept called Price Consumption Curve, which we will display another type of comparative statics analysis and these comparative statics are analysis are due to change in prices.

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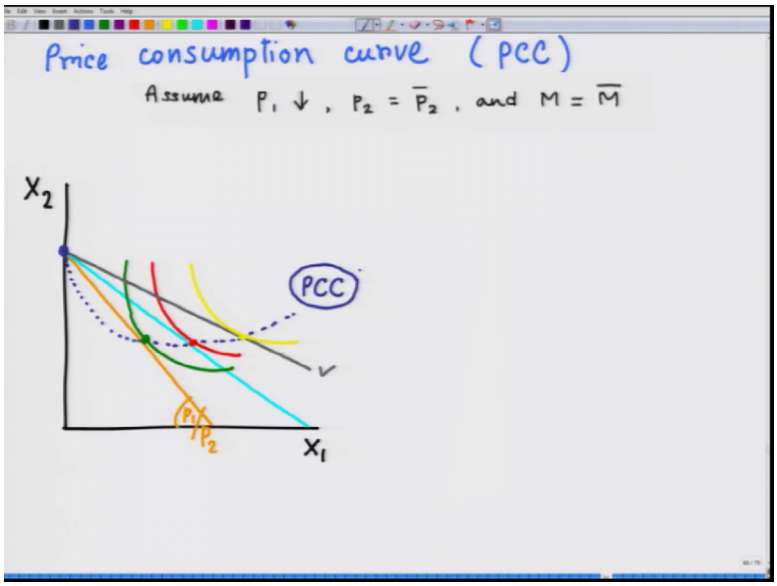

So, in that case, we get what is known as price consumption curve. So, a price consumption curve is basically the locus of consumer equilibrium points with varying price level of one commodity with constant money income and constant price of the other commodity.

This is abbreviated as PCC. So now, let us have a quick look at the diagram which we will find the price consumption curve. So, we can assume price of commodity 1 has gone down, while the price of the other commodity stays constant and money income does not change either. Now let us look at the graph. So, let us start with an initial budget line. Now if price of commodity 1 falls, then what do we expect? We know that the slope of the absolute value of the slope of budget line is the relative price ratio right.

So, if P 1 falls then basically the budget line will become a flatter one. So, we are going to deal with a flatter budget line. So, the budget line will rotate from it is intercept on X 2 axis, and it will have a higher intercept on the X 1 axis. Because with a lower price of commodity 1, the consumer is permitted to purchase more units of commodity 1. Now of course, we are going to superimpose the indifference map on this budget line diagram.

So, the consumers equilibrium is going to be obtained at the tangency point as we have done earlier also, now there will be another tangency point here. And if we assume further price falls, then we can have more flat budget lines like this one. And then of course, we can have another indifference curve and another tangency point like this.

So now the price consumption curve we will start from this initial intercept of the budget line the intercept on the y axis or the X 2 axis, and it will move downwards, it will join all these created equilibrium points, and locus of this new consumer equilibrium points is called price consumption curve.

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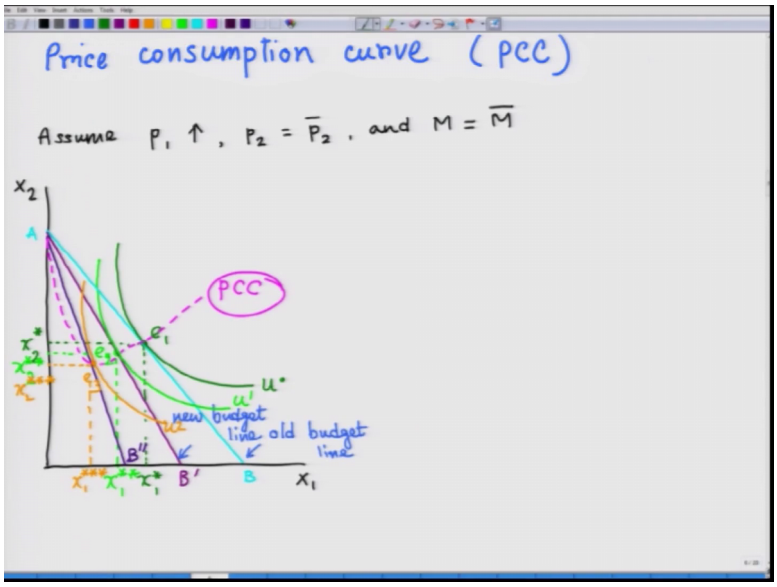

So now we are going to assume price of commodity 1 to go up, while the price of the other commodity stays constant, and money income does not change either. Now let us look at the graph. So, we start with the initial budget line, say A B. So, with a high price the consumer will be able to purchase lower units of commodity 1. So, that means, we are expecting a lower level of intercept along the axis of commodity 1.

So, with a price rise the budget line we will now rotate from this point A it will rotate inwards, and this time it will create a lower intercept along the X 1 axis, what will happen on the optimal consumption level of commodity 1 and commodity 2? To see that, we have to superimpose the indifference map. So, let us start with this initial level of utility, and this is the level of utility that the consumer used to get, when the price was lower price of commodity 1 was lower, and you can see, this will be like X star 1 and X star 2. Now note as the price of commodity 1 has gone up, the relative price ratio has actually gone up. So, the budget line has become steeper, right.

So, this A B line A B prime new budget line is a steeper budget line. So, this is the old or previous budget line, and this one is new budget line. So, as the budget line has become

steeper, the new budget line A B prime will make tangency with another indifference curve. Say, u 1 and the new equilibrium point could be this. So, let me name this E 2, the second equilibrium let me name the first equilibrium is E 1. So, here you can see as the price of commodity 1 has gone up, there is an impact on the consumption of both the goods. New level of commodity consumptions is X 1 double star and X 2 double star.

If there is a further shift; so, if there is a further rise in price of commodity 1, then the budget line will become even more steeper and we will get a lower intercept A and the new budget line will be A B double prime. So, we are expecting another tangency point to the indifference curve with this new budget line something like this. We can say this is utility level 2 and here is where the new equilibrium is, it is equilibrium E 3. So, one can see that at this new optimal choice made by the consumer, the consumer actually has lowered the consumption of both the commodities, now the commodity 1s consumption has gone down to X 1 triple star, and the consumption of 2 has gone down to X 2 triple star as well.

Now, to generate price consumption curve, one has to join this equilibrium points. We have to start from this point A, because if price of one is so high, then the consumer may not be able to purchase any unit of commodity 1. So, it has to start from that point A. And then it will come down wards it will touch E 3, and it will pass through E 2 and E 1 and then move upward. So, price consumption curve is basically the locus of all equilibrium points when price of a commodity change. We have obtained price consumption curve from varying the budget line of a consumer.

Now we are going to study various shapes of price consumption curve. Note that price consumption curve always we will start from the intercept along the vertical axis. Because, if the price of commodity 1 is infinitely high, then the consumer will not purchase even a single unit of commodity 1, he or she will spend the entire money on commodity 2. After that if price of one falls, then the consumer will divert some amount of money from consumption of 2 towards consumption of 1, and hence consumption of commodity 2 will fall and consumption of community will keep on increasing.

So, initially the price consumption curve will always be downward sloping. But does it mean that it the price consumption curve is downward sloping all the times? The answer is no. So, depending upon various values of own price elasticity the price consumption

curve can take various shapes. Now we are going to study 4 such cases. So now, we are going to study shapes of price consumption curve.

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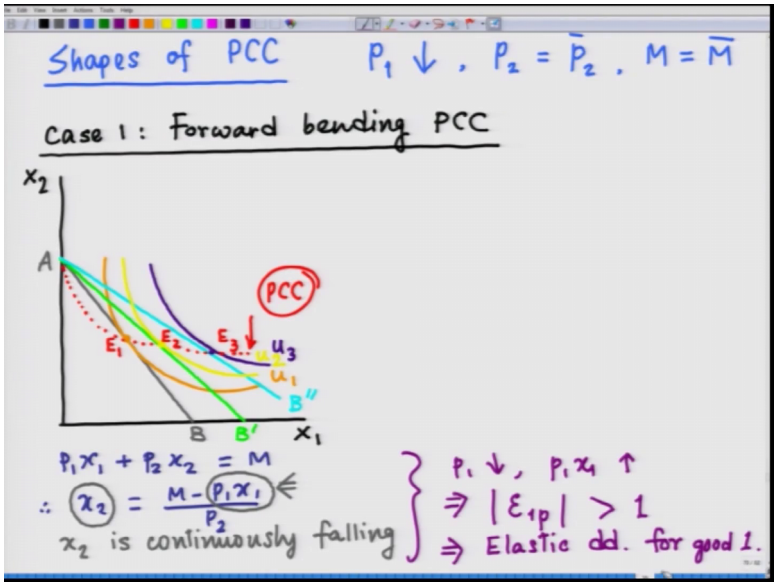

And throughout this analysis we are going to assume that price of commodity 1 has fallen. Price of commodity 2 remains same, and money income also remains the same. So now, let us list down these cases one by one case number 1 which is forward bending PCC.

So, just in this case I am going to draw the indifference curves and the budget lines in great detail. To save time in the next cases, I am only going to draw the final shape of PCC. So, please note how I am going to draw. So, let us start with the initial budget line. Say A B, then suppose there are price falls for commodity 1. So, after first round of price fall the budget line becomes flatter, and the budget line becomes A B prime.

So, the budget line rotates along point A. Now there is a further fall in price of commodity 1, budget line becomes even more flatter and we get A B double prime as the budget line. Now as the price keeps on falling, the budget lines we will create new tangency point with the indifference curves, right.

So now let us go into superimpose these indifference curves. So, the initial budget line A B makes a tangency with this indifference curve depicting utility level u 1. Now as price has fallen, the consumer now has made a tangency point between this budget line A B

prime with this in indifference curve depicting utd level u 2. Now as the price of commodity 1 has fallen further, the new budget line has now created tangency with, wait a minute. Now as the price consumption has to bend forward I had assumed that point of tangency beforehand so that I can easily draw the graph and now let us assume that at that selection point there is a tangency between the budget line A B double prime and that denotes a utility level u 3.

So now note that these tangency points E 1 E 2 E 3 are all consumer's equilibrium points depending upon the price of commodity 1 the consumer is facing. So now, to have the price consumption curve, we know that we have to start from point A, we need to move downwards first. Then we will join a with E and then we need to join E 2, E 2, E 1 to E 2 and then E 2 to E 3 and so on so forth. So, if we get a price consumption curve like that. Then this price consumption curve is downward sloping and it is forward bending. Now let us see e under what circumstances this will be the case. So, let us look at the budget constraint again to have the answer. So, let us look at the budget constraint of the consumer. So, it is P 1 X 1 plus P 2 X 2 equals to m.

So, M is the money income and P 1 X 1 plus P 2 X 2 is basically the expenditure on commodities 1 and 2. Let us rewrite these as M minus P 1 X 1 over P 2. So, as price of one falls of course, there will be an impact on X 1 commodity consumption for good one. And that is why this is going to be impacted. Depending upon how this impact is we get different levels of X 2. So, depending upon the value or the behavior of P 1 X 1 with respect to price 1 change, we see that X 2 can change. So, here in this case we see X 2 is continuously falling. Now as X 2 is continuously falling and X 1 is continuously rising, when is that possible? If you look at the budget constraint equation you can see this is only possible when P 1 X 1 is rising, right.

So, with a fall in price one if P 1 X 1 is rising; that means, we are dealing with elastic demand function. So, let me jot down these things for greater understanding. So, here P 1 is falling, we see X 2 is continuously falling as a result that can only happen when P 1 X 1 is rising. And that implies that we are observing a demand function for commodity 1 such that this is the own price elasticity mod value of that is higher than 1. So, that means, we are working with an elastic demand function for good one.

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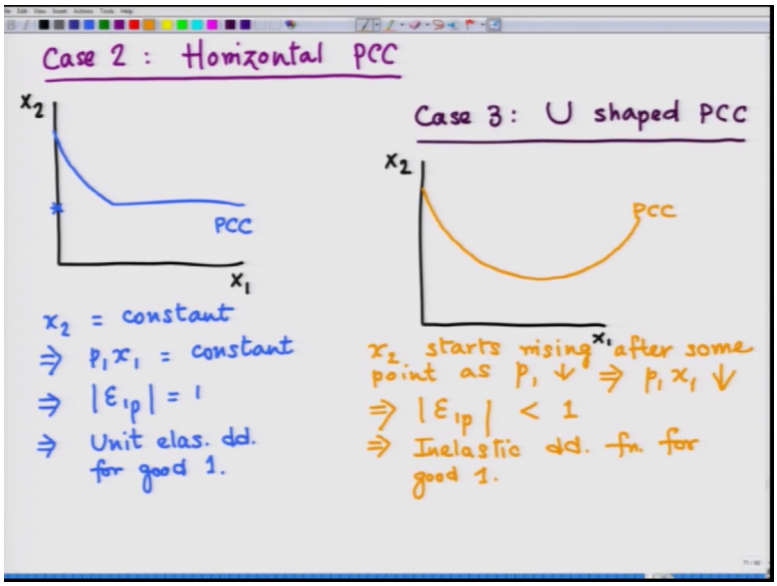

Now, let us move on to case number 2. In case number 2, we are going to study the case of first falling and then horizontal PCC. So, here we are not going to, here we are not going to draw the individual indifference curves and the budget lines to save time. So, I will straight away just you know draw the shape and then we are going to discuss.

So, we are expecting something like this, first falling, and then it is becoming parallel to the X 1 axis. Now what does that mean? That means that after some level of consumption the consumption of X 2 does not change anymore, right. So, X 2 becomes constant. So, that means, that from the budget equation P 1 X 1 becomes constant as well. Now if with a fall in P 1, P 1, X 1 becomes constant what does it imply? It implies that the own price elasticity takes value 1. It implies that we are working with a demand function, which shows unitary elasticity. So, let us jot down these things.

Now, we are going to study case number 3. And that is the case of u shaped PCC. So, again we are going to have diagram X 1 and X 2. So, if we are working with U shape then; that means that price consumption curve first falls, it reaches a minimum and then it starts to rise again. So, this will be the PCC. Now when is that possible? That means, if we see this kind of shape; that means, that X 2 starts rising after some point as P 1 falls. Now that can only happen if P 1 X 1 falls as a result of fall in price of commodity 1. So, what does that imply? It implies that we are dealing with a demand function whose

absolute value of own price elasticity is less than 1. So, that means, we are working with inelastic demand function for good one.

Now, we are going to look at the final case 4.

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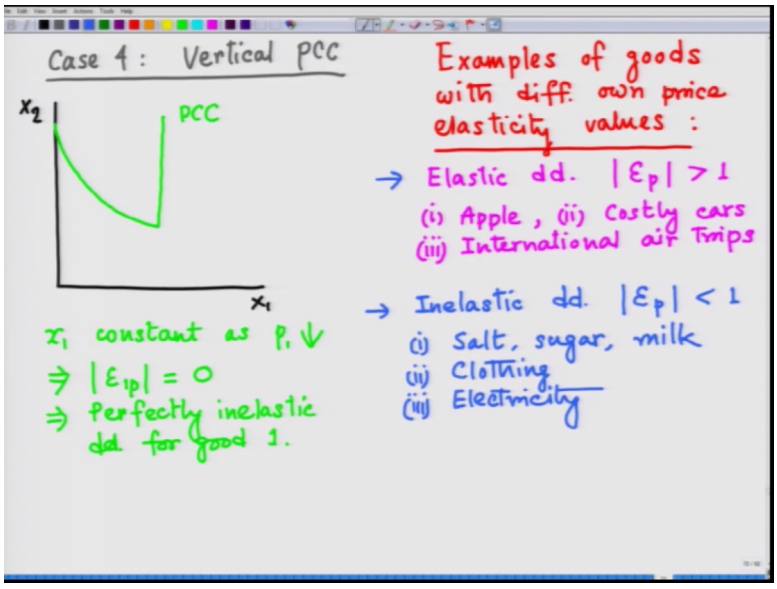

And in the case 4, we are going to talk about first falling and then the vertical price consumption curve. So, let us draw such a diagram. So, here we are talking about a PCC which first falls, and then after some point the consumption of commodity 1 does not change anymore with a fall in price of that commodity. But consumption of commodity 2 keeps on rising and hence we get this kind of a shape. Now what does that mean? X 1 becomes constant the consumption of commodity 1 becomes constant as price falls. Now what does that mean? It means that from the budget equation we observe P 1 X 1 does not change with a fall in P 1.

So, that means, that we are working with the case of perfectly inelastic demand. So, although there is a fall in price, the demand for commodity 1 does not change at all. So, we are working with elasticity value own price elasticity value equal to 0 for commodity 1. So, let us note it down the result. So now, as we have seen 4 different shapes depending upon the values of own price elasticity's, let us also find some examples of commodities which fit well with these different cases. So, we are basically listing down some goods for which we can expect various values of on price elasticity. So, we are going to give you examples, who is basically display the range of possibilities.

Note that the goods that we are going to lease, they are not the only examples you know there can be many many other goods. But you know these are just for illustration purpose, right. So, we are first going to talk about elastic demand. So, that means, we are talking about this own price elasticity mod value of that takes value greater than 1. What would be the examples? It can be a fruit like apple, then there can be another example like this costly cars. Another example could be international air trips.

Now we are going to give you some example of the other part which is in elastic demand. So, for that the mod value of one price elasticity is less than 1. What would be different examples? The examples could be some commodities which we use on a daily basis, like salt, sugar, milk. Then there could be clothing also because it is a necessity item for all of us.

Then the third item would be electricity as example of inelastic demand. Now what would be an example of unit elastic demand? It is very difficult to get such a real life example. It is also difficult to get example for perfectly inelastic demand the 4th case that we have seen. But still there can be some examples for which you can think that elasticity value may be close to 0. So, let us you know take the example of some lifesaving drugs. Once upon a time when insulin was the only medicine for diabetic patients, insulin was the commodity for which the demand was perfectly inelastic. So, in the next lecture, we are going to continue this discussion on the impact of price change on a consumers equilibrium and demand. Next in the next lecture we are going to study what is known as price effect, it is decomposition via Slutsky equation.