Environmental and Resource Economics
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Economic Valuation of Environmental Goods and Services - Different Valuation Approaches – Part 7

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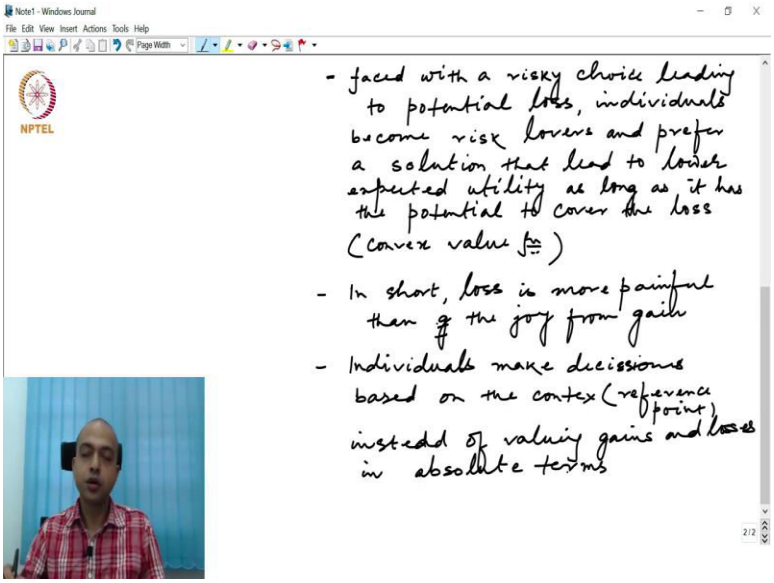

But when the individuals are faced with a potential loss, faced with a risky choice leading to potential loss, individuals become risk lovers. So, previous one, we said that individuals are potential; they are faced with a potential gain. This is a potential loss. Individuals become risk lovers, alright and prefer a solution that leads to lower expected utility as long as it has the potential to cover the loss which is basically based on a convex value function. And previous one is based on a concave value function. So this is based on a concave value function.

Individuals, they become. So that means based on the situation if you present a potential loss vis-a-vis potential gain then the risk proportion would become asymmetric. They do not behave symmetrically. When there is a potential gain then they become risk averse. When there is a potential loss then they become risk lover.

That means what is the implication of this? The implication is that individual derives less amount of utility for a potential loss, potential gain as compared to the dissatisfaction out of a potential loss. So potential gain gives the individual lower satisfaction, and potential loss gives the

individual more pain. So loss is more painful, in short. Or what we can say that, in short loss is more painful than gain, sorry, than the joy from gain.

So, what we can say that; individuals make a decision based on the context that means reference point instead of valuing them, valuing gain and losses in absolute terms. So these things would become more clear if we represent the Prospect Theory using a simple diagram.

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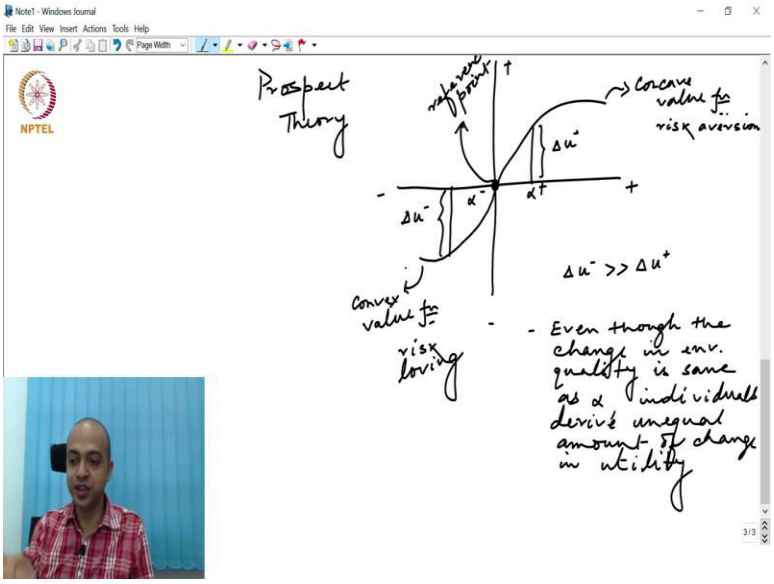

So this is the value function. Let us say this axis, this is positive and this is negative. So in the context of environmental valuation let us say that an improvement in environmental quality is represented a potential gain.

So from here, from the reference point, this is known as the reference point. There is alpha amount of change in the environmental quality. So individuals derive this amount. This is alpha in positive direction. So this is the additional gain in utility. So this is delta u. I would say that.

But for same amount of, let us say, sorry, so for same amount of change in alpha negative that means negative direction; this is for a positive change and this is delta u for a negative change.

So from this diagram we can say that delta u is much greater than delta u for a positive change. So delta u basically indicates the change in utility that means satisfaction, the change in satisfaction, additional satisfaction what you get when there is a change in environmental quality in positive direction.

But when environmental quality detoriates, so that means reduction in environmental quality in negative direction, is known as potential loss, and the pain is more. That is why the amount of dissatisfaction is much more than the amount of satisfaction for a potential gain. This is known as loss aversion. This is also known as asymmetric risk aversion.

Why asymmetric risk conversion? Because you see this is a concave value function. And this is basically a convex value function. And concave value function is a representation of risk aversion. So individuals become risk averse. Concave value function is actually a representation of risk loving. So this is we can say that risk aversion, and this is risk loving.

So, even though the change is same, alpha, so what we can say that, even though the change in environmental quality is same as alpha, individuals derive unequal amount of change in utility. So this is the diagrammatic representation of Prospect Theory, and this is known as the reference point. This is known as the reference point.

So, individuals are taking the decision based on this reference point, positive direction and negative direction in which they are measuring the change, not measuring the value per se, that alpha, so that they are not taking their decision based on the absolute amount of change in environmental quality which is alpha here. Rather they are always taking the decision based on this reference point; whether if there is a change by alpha positive direction, what is the change in value, change in utility; that if there is a negative change in environmental quality what is the value, change in their utility. So this is known as Prospect Theory. This is based on Prospect Theory which is called the loss aversion which also so indicates the asymmetric form of risk aversion.

So, this loss aversion can very well explain why WTP for a positive change. so this we can think of the amount of WTP, so why WTP for a positive change in environmental quality is always lower than the WTA that means willingness to accept compensation for a negative change in environment quality that means for a deterioration in environmental quality. Individuals get more pain when they are subject to a degradation in environmental quality than enjoying additional satisfaction when there is a change in, there is an improvement in environmental quality.

This is true in our real life as well. We can give another example. Suppose we are entering into a shop or buying some goods or services. Just before entering the shop we see, when we open or

purse we see the 100 rupees was there in my purse is lost. So you will get some pain. You will get some pain for losing that 100 rupees.

Think about another situation. Just like entering into the shop you see 100 rupees lying just on your road. You will get some additional satisfaction. But if you compare these two situation you will see that when you lose the money you get more pain than the additional satisfaction or joy when you to get extra 100 rupees lying on your road.

So losing the money gives you more pain than the joy what you get when you get some additional money. Loss is always more painful than the gain. Loss is always more painful than the gain, and that can very well explain why there is a huge disparity between willingness to pay and willingness to accept which was not fully explained by the traditional economic factor Income Effect. This can explain.

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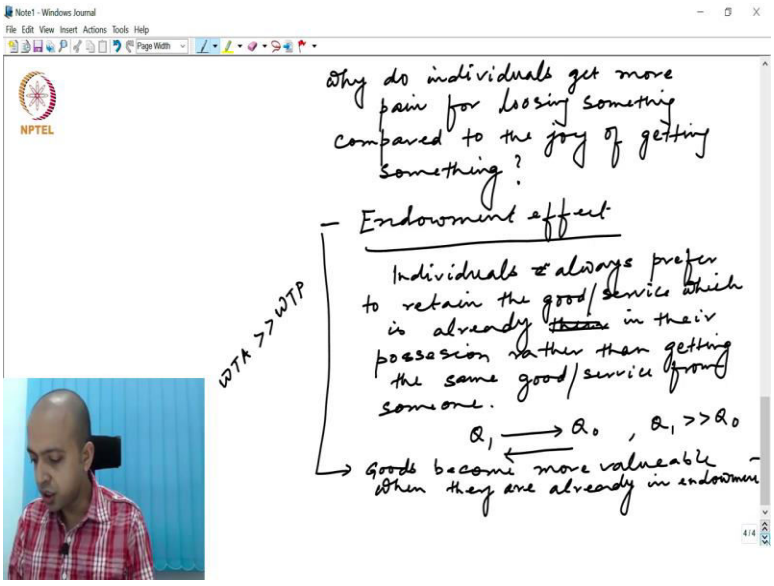

Now why this happens? Why this type of loss aversion happens? Why do individuals get more pain for losing something compared to joy of getting something? And this can be explained by another effect called Endowment Effect. That is also given by the behavioral economist.

Endowment effect, so this Endowment effect basically says, when the goods are under possession; if the individuals are already having certain goods and services and if the individuals

are already enjoying certain goods and services then they would always like to retain that rather than expressing their interest to get the same commodity or service from somewhere else.

So Endowment Effect basically says individuals always prefer to retain the good or service which is already there, which is already in their possession rather than getting the same good or service from somewhere else, getting or acquiring.

So for example let us talk about this pen. This pen is already there in my possession for so many months or years. So I always like to retain this pen. I would always love to retain this pen rather than getting the same pen from somewhere else if it was not there in my possession.

So if you try to translate this into this type of preference in monetary terms that means, if the pen was there already in my possession I would like to retain it. So that means if you ask me to sell this pen I would say that I need, let us say, 1000 rupees. 1000 rupees I will demand from you if you ask me sell me this pen which has already been there in my possession for so many months or years, from which I have been deriving utility.

But if you ask the question differently. Let us say the same pen you are asking me how much you would you like to pay for buying this pen? Probably I will say some 100 rupees or 150 rupees. So that means the willingness to pay and willingness to accept, there is a huge difference between them.

Why it is happening? It is happening because of this Endowment Effect. I would always like to prefer to retain this good if it is, it has been there already in my permission rather than buying this pen from somewhere else or someone else. And that same thing happens in the context of environmental valuation also.

If I was enjoying a specific amount of environmental quality, in terms of the diagram if you go back what we were discussing earlier, let us say I am already enjoying and improved environmental quality let us say that is Q1. And then there is a reduction in environmental quality which is Q0, where Q1 is greater than Q0. So when I am already, when I have already been enjoying improved environmental quality then I would demand more compensation to accept this negative change rather than if there is a change from Q0 to Q1.

So when environmental quality improve from Q0 to Q1 my willingness to pay would be much lower than this context when there is a negative change in environmental quality. So this can be purely explained by Endowment Effect. So goods become, so Endowment Effect can also be say that goods become, goods or services become more valuable when they are already in endowment.

So this Endowment Effect can also explain why individual gets more pain while losing it. So when I am already enjoying better environmental quality, if there is a degradation I will get more pain. So I will demand more compensation rather than a situation when there is a improvement in environmental quality. I will definitely gain additional satisfaction. I will definitely become happy.

But this joy due to improvement in environmental quality would be lower than the pain what I would have got because of this change in environmental quality in a negative direction. So, this Endowment Effect which can also explain the loss aversion; which actually can explain the huge disparity between willingness to accept and willingness to pay. This is another reason.

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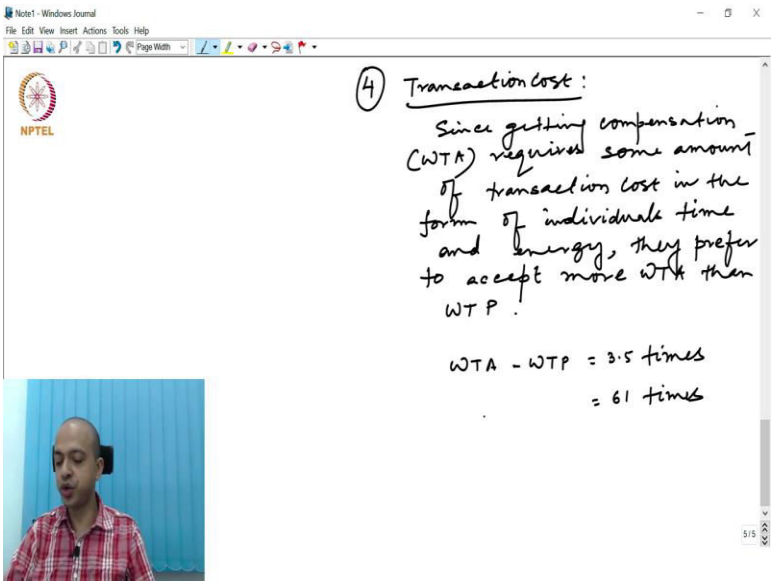

So that means so far we have explained how many explanation? Firstly we said that Income effect, firstly we explained that goods are imperfectly substitute, environmental quality and income they are imperfectly substitute. Indifference curve is convex to the origin. That is one reason that you can put forward to explain the disparity between WTP and WTA.

Second reason we say that, in the context of WTP when it is payment individuals are subject to income, but when it is accept compensation individuals are not subjected to any type of Income Effect. So this Income Effect can also explain the huge disparity between WTP and WTA. But they cannot fully explain the huge difference what we generally observe in real life.

Because of that, behavioral economists, they came up with Prospect Theory loss aversion. So that means individuals prefer loss and gain differently based on their context. Based on their context they put more value towards loss and they put less value towards potential gain, and as a result of which the value function becomes concave and convex depending on the context referred as reference point.

And this loss aversion is based on the Endowment Effect also. When the goods are already in someone's endowment they always try to retain that goods or services rather than obtaining or acquiring them from someone else.

Now, fourth reason we can put forward is transaction cost to explain the disparity. When there is a negative change in environmental quality we are asking the individuals how much would you like to accept compensation. Now to get that compensation, probably individual has to spend some amount of time, some amount of energy. Because compensation means; individual, sometimes it needs lot of paperwork also.

Let us say that individual has to go to the local municipality, local corporation to get some kind of compensation for a negative change. Most of the times, any form of compensation requires more paper work, more time than when you are paying, it has nothing. When it is payment, payment is instantaneous. But getting compensation requires more time. It involves some amount of transaction cost.

Because of this, to compensate with this transaction cost individual try to get more amount in compensation than this payment. So since getting compensation in the form of WTA, willingness to accept requires some amount of transaction cost in the form of individual's time and energy they prefer to accept more WTA than WTP to compensate with this transaction process. So these are the reasons that can explain the huge disparity between willingness to pay and willingness to accept.

So theoretically, the disparity between willingness to pay and willingness to accept is 3.5 times. But sometimes this willingness to pay the difference becomes 61 times. In empirical literature, empirical studies there are cases where the willingness to accept is 61 times higher than willingness to pay.

So that is what, willingness to accept as a measure of economic valuation is less reliable compared to willingness to pay. We have to be very, very careful while using these two concepts in empirical studies when we employ because the difference is huge which cannot be explained theoretically.

Willingness to accept is 61 times higher than willingness to pay. And that is why willingness to pay concept is much popular in the context of Contingent Valuation Method, CVM, while valuing non-marketed goods and services. So with this we are closing our discussion today. And in next session we will be talking about Choice Experiment to overcome these problems of Contingent Valuation Method. Thank you.