Environmental and Resource Economics
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Economic Valuation of Environmental Goods and Services - Different Valuation Approaches - Part 5

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Total number of stakeholders who are getting benefit from that particular environmental group.

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And the paper, what I am going to share with you, the paper is this. I will just show you the paper. This is the paper I am talking about. So, this is the paper The Dichotomous Choice

Contingent Evaluation Method: An Example Application. So, I will share this paper with you. If you look at this paper, they have discussed in detail about, how to proceed with a dichotomous choice contingent evaluation method. Why it is called dichotomous choice? Because the respondents are given only two choices, either they can say yes or no, for a specific bid amount. Okay.

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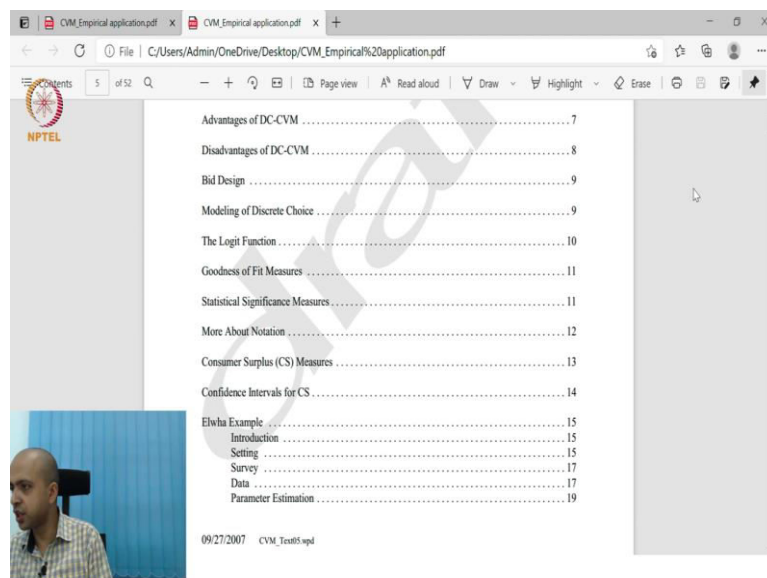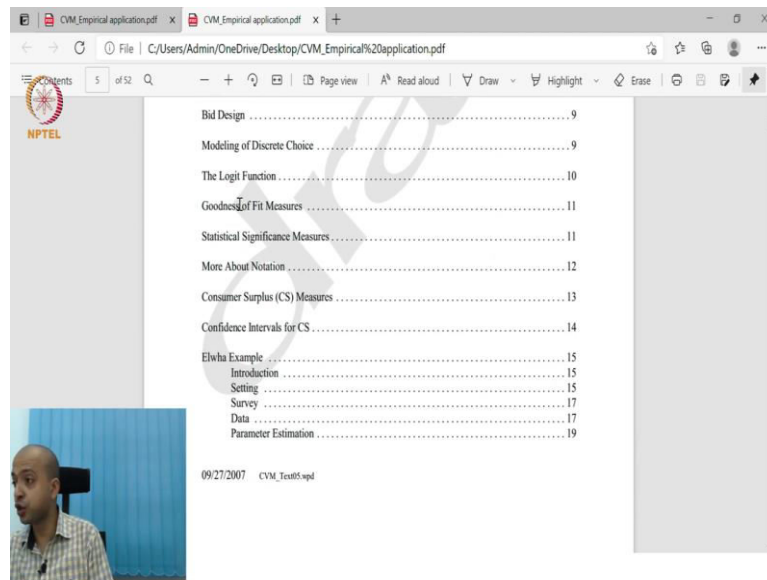
So they have discussed, how to select the sample. How to select the bid and what is basically the logit model. Then they have discussed the statistical person or the econometrics of logit model also, for example, Goodness of Fit, Statistical Significance Measure, so on and so forth, and how the willingness to pay is actually related to the consumer surplus. Okay. How

the willingness to pay is related to consumer surplus, everything is discussed in this model. Okay. That is the paper I am going to share with you.

So only thing is that you need to understand the econometrics of logit model that you should understand from my lecture of logit model. They have discussed everything. So, this is the reference you need to clearly understand. This is the reference. Dichotomous choice contingent valuation method. So, this is all about our estimation of empirical part of contingent valuation method, how to estimate willingness to pay.

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Now we have estimated this model, using closed ended referendum as I said earlier. Closed ended referendum. And in this closed ended referendum, what is the problem? We have a problem of partial observability. So, this is the problem, partial observability. Why partial observability problem?

Because your willingness to pay is actually that the amount for which you are asking the respondent this Ai, is less than equals to maximum willingness to pay. So, I am asking the respondent, are you willing to pay some 100 rupees for this particular change in the quality of environment. If the respondent say yes, the story ends there. So, that means I will just note down his response and story ends there, in this closed ended referendum. But then the respondents would have been ready to pay even higher that hundred rupees that I am not able to capture. Because of that the closed ended referendum suffers from this partial observability problem.

Now, to overcome that, to overcome the partial observability problem of this closed ended referendum, sometimes we use the open-ended referendum also. Open-ended referendum. Now, what is this open ended referendum? Let us say I am asking the i'th household or individual about a specific bid amount Ai. Let us say that is called rupees 100 and if the individual is saying yes, let us say the individual saying yes.

So, next step, I will ask are you ready to pay some Ai, prime amount equals to, let us say rupees 150. The individual say again yes. So, if the individual say yes for this Ai equals to 150 rupees, I will ask the individual are, you ready to pay Ai double prime, which is let us say 200. So, I will keep on increasing the bid, till the respondent say no.

So that means next stage I will ask the individual Ai this and there the individual may say no. So, when I ask 100, the individual say, yes, I will increase the value to 150, the respondents say, yes, I will again increase the value to 200, the respondents say, yes, I will say this is 250 actually, I will increase the value to 250 and the individual say, no. So, that means I will note down this 200, as his maximum willingness to pay.

Similarly, if the individual let us say, I start with a specific value let us say this is 250, and the individual say, no. So, what I will do in the next stage, I will reduce the value to 200. The individual still say, no. Then I will reduce the value to 150. The individual still say, no. Then I will reduce the value to 100. And the individual may say, yes. So, I will note down this value. Here I will note down this value.

So that is, that is the mechanism of open-ended. So, that means, if the respondent say yes for a specific bid amount, I will keep on increasing the bid, till the respondent say no. Then I will take the previous bid, where he said yes or if the respondent said no for a specific bid amount then subsequently, in successive rounds, I will keep on reducing the bid amount till the point, individual say yes.

So I will note down that value as his willingness, his or her willingness to pay. This is the mechanism of open-ended referendum. Now open-ended referendum even though, it overcomes the problem of partial observability problem in closed end referendum, open-ended referendum also suffers from some limitations. What are those?

So, these are problems of open-ended referendum. Now open-ended referendum, it has, it is subjected to three types of bias. What are those? Number one is hypothetical bias. This hypothetical bias is actually common for, any type of CVM study. Hypothetical bias we have already explained in our previous class that it is related to the creation of hypothetical market. That means if the researcher fails to create that hypothetical market properly, then the respondents are not convinced. They will randomly say yes or no, to a specific bid amount and that bid amount and the estimates derived from that model, would not be reliable.

So that means any type of CVM study, since it is based on a hypothetical market, success of this type of study, depends crucially on, how efficient you are in creating this type of hypothetical market. Right. So, inappropriately creating hypothetical market, leads to hypothetical bias, which is common for to CVM, whether it is open ended or closed ended. Open or closed ended. So, that is common, the hypothetical bias.

Then second one is called strategic bias. And strategic bias, they are of two types. Now why that strategic bias problem arises in the context of CVM? See in CVM, we construct a hypothetical market and then we ask the respondent, whether they are willing to pay some amount? But this is not actual payment. They are only showing their willingness. Right.

When it comes to actual payment, whether they will pay or not that is a different story. Since it does not involve actual payment, the respondents may respond strategically. Respondents may respond strategically, which leads to trust strategic bias. So, what I am saying, respondents may respond strategically. Okay.

The first one is called warm-glow effect. Okay. Warm glow effect. So, the respondents may over bid to just impress the interviewer. Okay. Whatever amount I say, would you like to pay 100? Yes. Would you like to pay 150? Yes. Would you like to pay 200? Yes. So, I may simply over bid. Because it is, it does not involve any actual payment. Okay. So, over bidding to impress the interviewer.

And that leads to warm glow effect. Why it is called warm-glow? That means by showing 'yes' for any amount you ask, I am just showing that how careful I am to the environment. So, I am like to impress the interviewer, with overbidding. So, this relates to over bidding to impress the interviewer. Okay.

And second bias is, free riding problem. So,me respondents, some households, they may feel, if I say yes, for a specific bid amount, then it is actually I need to pay. Because if I say yes, then they will note down my response and who knows maybe next month itself, the government will impose or local municipality may impose, some amount of tax on electricity bill or water or whatever.

So, then they may say, that they may feel, let me show no. Because anyway, if the service is provided then they cannot exclude me just because I am not paying anything. Right. Okay. So, then they try to under bid, to enjoy free riding. So, this is under bidding, under bidding to free ride.

So, you understand the logic. So,me respondents, they say yes to any amount you ask and the objective is to impress the respondents. Okay. To give a warm glow, to make them understand that I am very much careful about the environment. They just like that they say yes to any amount you ask. That is called warm glow effect. So, they over bid. Which leads to a positive kind of bias.

Some household this, they feel if they say yes, then they have to actually pay that amount. Government or local authorities may impose some amount of tax or something on them. So, then they feel to under bid just to free ride. That leads to some kind of negative bias. So, in aggregate, in aggregate this positive and negative bias may cancel each other. May cancel each other. There is a possibility. But we cannot rule out the possibility of strategic bias. Which actually related to, how respondents they place strategically, with these responses.

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Then third type of bias that is also involved in open-ended referendum. This is called embeddedness. Embeddedness, okay. Or sometimes it is called embedding effect or part whole bias, right. What is this? So first I will say with an example. See when I ask the respondent your willingness to pay, let us say, for protecting a wetland. For protecting a wetland, let us say equals to rupees 150, okay.

Now willingness to pay for protecting four wetlands should then be 150 into 4 equals to rupees 600. Is not it? I asked the respondent, what is your willingness to pay for protecting one wetland in let us say in your neighborhood area? So he say 150. Now I am asking, ok, you are ready to pay 150 rupees for protecting one wetland. Let us say in your locality, there are four such wetlands, so it would be, so following this logic, his willingness should be for four wetland, should be 600 rupees.

But in reality, a big but in reality, the individual's willingness to pay, for protecting four wetlands, maybe rupees 150 or little more, say rupees 160. That means there is insignificant difference. There is insignificant difference between the two WTP's. WTP value for protecting one wetland and WTP for protecting four wetlands, there is insignificant difference. That is, that problem is called embeddedness. See willingness to pay values, are derived from a specific preference. WTP values are derived from a specific preference.

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So, that means insignificant difference between WTP of four wetlands and WTP for one wetland. Which implies 'more is not better'. 'More is not better'. But this more is better, is the assumption that we make about the individual's preference or utility function, to derive this type of utility measures. So, when this is violated that means we can say that individuals willingness to pay are not coming from the standard preference that we have assumed earlier.

So that means WTP values are not coming from the standard utility function, which assumes 'more is better'. If that is the case, then we cannot actually rely much on the willingness to pay value, estimated from this open-ended referendum. So, this is also another problem is open-ended referendum, which is called embeddedness or part whole bias. Why it is called part whole bias?

Because we believe, one wetland is actually a part of four wetland. Or for example let us say I am talking about biodiversity, okay. A biodiversity of a forest consisting of several flora, fauna, many things, all right. So, for example I am asking the respondent, what is your willingness to pay, for protecting one species, let us say deer, in a forest? And the individual is saying 150 rupees.

Now I am asking, okay, what is your willingness to pay for protecting the entire biodiversity of the forest, which consisting of consists of many species like deer? Then they are saying, no, no, it is 150 rupees only. That means individual is not able to differentiate a part with the whole. That means individual's willingness to pay for a part is not significantly different from

individual's willingness to pay for a whole. That is why it is also known as part whole bias embedded or embeddedness.

So, these are all the problems of the open-ended referendum contingent valuation method. There are some other issues related to contingent evaluation method and to overcome these problems, later on environmental economists, they started using Choice Experiment. So, we will discuss choice experiment in our next class. Thank you.