Behavioral and Personal Finance
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Module - 01
Behavioral Economics and Finance
Lecture - 07
Non–Expected Utility Preferences

Welcome back to the course Behavioral and Personal Finance. Smoking is injurious to health have you heard this before of course, you have, but you must have seen people around you smoking very often, what do you think would be driving their behavior, do you think they do not know if smoking is injurious to health. Well of course, many a times we know that some things are going to harm us still we behave in a certain fashion.

This is because we tend to be biased or influenced by certain circumstances and that drives our behavior in a particular fashion. Now, that is where you can relate to what the expected utility theory is not meeting it is goal. Expected utility theory suggest that peoples behaviors should be driven by the objective framework of utility derived from all choices and then they go to the best choice that they have.

Whereas, in reality we observe that our choices are driven by different heuristics and biases including our personal experiences societal factors and of course, cognitive issues. Today we are going to discuss about the issues that expected utility theory is suffering from and how a an improvised approach known as the prospect theory can address the issues related to expected utility theory.

I am Abhijeet Chandra and this is the course Behavioral And Personal Finance where we are going to discuss Non-Expected Utility Theory Preferences in the context of decision making framework.

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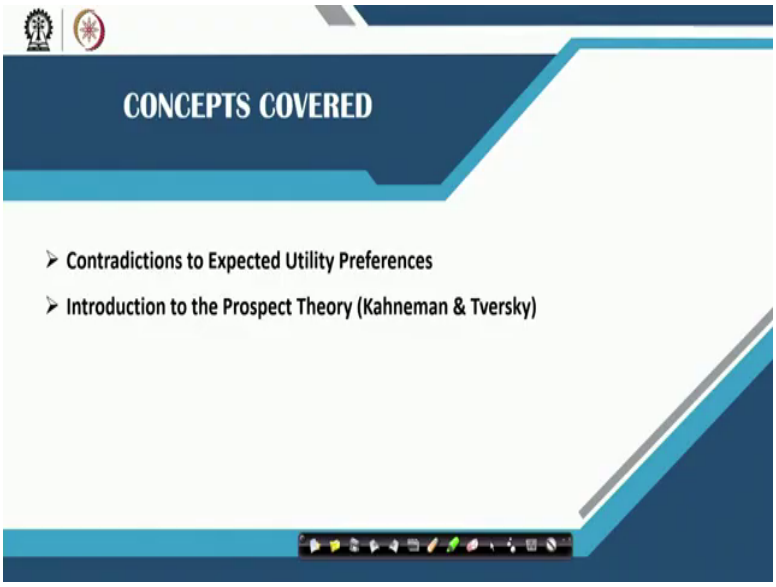

This session will focus on the contradictions of expected utility preferences which means the issues that expected utility preferences are not related with it is original idea and how the behavior of people are driven by different issues. We will also discuss briefly about the prospect theory which was proposed by Daniel Kahneman and Amos Tversky, the prospect theory addresses the issues faced by the utility theory.

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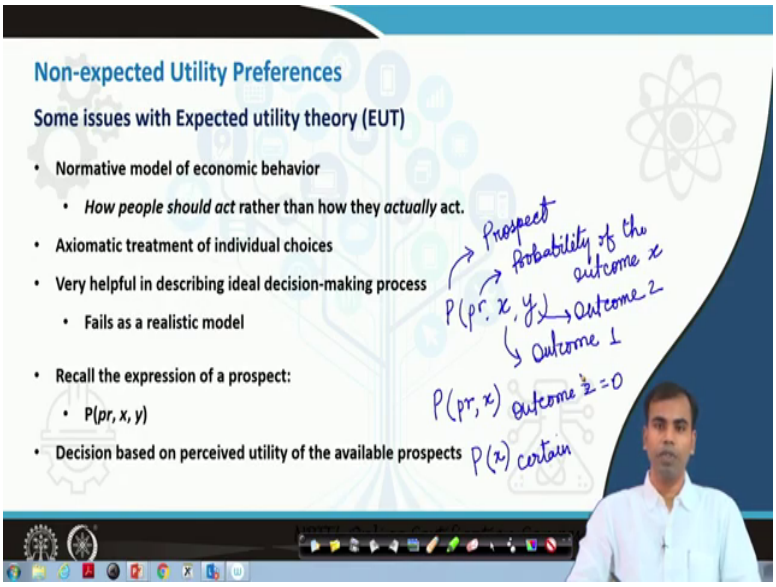

Let us begin with some theoretical issues that expected utility theory faces, we understood that expected utility theory is basically a normative framework of decision making where it is based on how people should ideally behave. Whereas, in real world we know that people fail to behave in an ideal way and their behavior might be far away from the ideal or the real realistic framework which they can understand.

We also understand that expected utility theory is basically axiomatic treatment of choices which is based on assumptions such as constant rational choices and preferences based on the probabilities associated with it. Expected utility theory is very helpful in decision making, but we have seen through various examples that it fails to cater to the realistic approach of decision making process, wherein our behavior might not be very consistent which could be reflected in our preferences as well.

If you could recall the typical way to find the value or let us say utility of the choices or the options that we have is through a simple expression which is given here that is basically the prospect which has certain probability of different outcomes. So, in the given example here we have a prospect that has a probability of pr and the outcomes are x and y.

So, if we denote it in a more quantitative way the prospect can be illustrated with some numerical example like this. So, if I say prospect is given as probability and outcomes of x and y which means this is basically our prospect this is probability of the first outcome. So, this is basically your first outcome and y is outcome 2.

If we denote it in a way where there is no outcome 2 which means prospect is given as probability and outcome x which means in this case outcome is outcome 2 is basically 0 and if the prospect is denoted as P as p of x which means this is certain outcome, which implies that the prospect x has 100 percent certainty which means there is no uncertainty involved and you are likely to get it for sure.

This is the way we denote the different prospects under expected utility theory framework. We have already learned how do we find the utility associated with these prospects where we assign the probability or we get the probability from our experiences and the probability can be used to find the wealth value of outcomes x and y.

We have learnt that the value of these prospects are driven by the probability and under different circumstances the situations or the conditions that we face might drive the value or the wealth that we are attaching with these prospects might be differing. Let us go through few examples which will indicate where and how we deviate from the expected utility theory.

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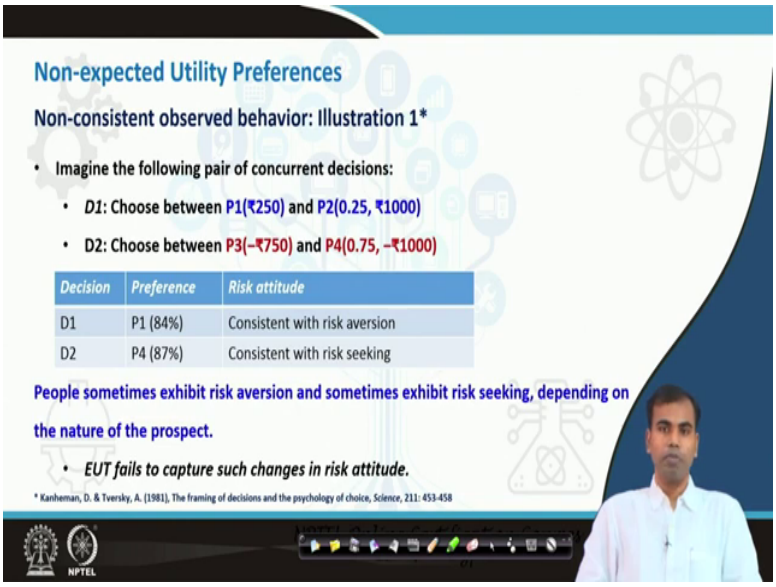

So, the first example of non consistent observed behavior of individuals is drawn from one of the seminal research work of Daniel Kahneman and Amos Tversky. Here the example presents 2 different decision choices. As you see you have to make decisions with respect to the 2 concurrent situations, decision 1 involves 2 prospects P 1 and P 2, where P 1 includes a sure shot gain of 250 rupees and P 2 includes a 25 percent probability of getting 1000 rupees. In another case the decision 2 involves 2 prospects again P 3 and P 4, P 3 has a sure shot loss of 750 and P 4 has a loss of 1000 with a probability of 75 percent.

Now, if you analyze these two decision choices and then come to a conclusion or come to your; come to your analysis you would realize that your behavior is different when it comes to sure short gain or rather when it comes to gains and it is some completely different when the outcomes are in terms of losses.

Since we are referring to the research done by the Kahneman and Tversky I would present the numbers that they found. The numbers in the experiment that they have realized are as follows for decision 1 most of the people in fact, to the extent of 84 percent of the people experimented in this process went for prospect 1 which basically indicates their risk aversion attitude that we have already discussed earlier.

In case of decision 2, 87 percent of the people whom they experimented preferred the prospect 4 which is basically contradicting with risk aversion essentially it is risk seeking behavior. Now what is happening here, as I said we behave in a risk averse way when we faced with certain choices or gains, but we behave in a risk seeker away when we are faced with losses, which means our behavior across losses and gains are not consistent.

So, we prefer to take risk when we are faced with losses and we prefer to be a risk averse when we are faced with gains. This comes to an important conclusion of what we are going to discuss as prospect theory. The conclusion is people sometimes exhibit risks aversion and sometimes exhibit risk seeking behavior depending on the nature of the prospect.

As we have seen these two prospects have different natures and that is why people whom Kahneman and Tversky experimented they exhibit different behavior under different circumstances. This is where expected utility theory failed to capture the realistic behavior, under expected utility theory the choices that people would be making should be consistent because the ultimate utility derived from these choices are same in both prospects.

In decision 1 the ultimate utility would be 250 that is gain and indecision 2 the ultimate utility is 750 in both prospects 3 and prospect 4 as losses. So, the behavior of people making choices should be consistent across these prospects, but in reality it is not so, that we have just observed.

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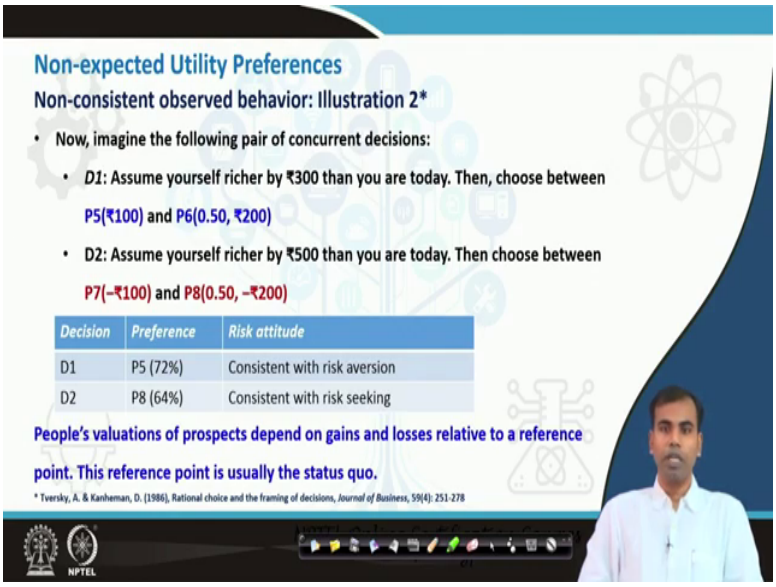

Another example of non consistent observed behavior has been drawn from another piece of research by Daniel Kahneman and Amos Tversky again I am taking the numbers and example drawn from that research and present it here, just go through the choices that you have here and then think about it for a second.

Now, the choices here that we have are again D 1 and D 2 which are basically decision choices 1 and 2, decision choice 1 says that you consider yourself richer by 300 rupees than you are today, which means if you have x amount of wealth today the next period which is let us say tomorrow you are x plus 300 rupees and then you have to make a choice. The choice is P 5 that is prospect 5 and prospect 6, prospect 5 has a sure short gain of 100 rupees, prospect 6 has a sure short a gamble of 200 rupees with a 50 percent of probability.

In another decision choice you are supposed to be richer by 500 rupees than you are today and then you are faced with 2 prospects P 7 and P 8, where P 7 is a sure shot loss of 100 rupees and P 8 has a loss of 200 rupees with a 50 percent probability. Now this is an interesting situation where the level of wealth or the change in the level of wealth becomes more critical about what decision you make.

Suppose you are walking on the road and suddenly you finds a note of 500 rupees lying on the road now; that means, the level of your wealth is increased by 500 rupees today. If you observe your spending behavior might be influenced by that additional 500 rupees that you have just got.

Similar situations might be seen in casinos, if you know people who have won certain bets in casinos or in a lottery suddenly start behaving in a different way with their money, that is also in a crude way known as house money effect where you get some money for free and then the behavior the tendency of spending money or taking risk is completely changed for you.

Here if you have calculated the value of these two prospects for decision 1 and 2 other prospects for decision 2 you must have understood what I intend to show. Again I am showing the numbers given in the research done by Kahneman and Tversky, the number show for decision 1 about 72 percent of people experimented go for prospect 5 which is again consistent with risk aversion behavior and for decision 2 about 64 percent of people go for prospect 8 which is related to the risk seeking behavior.

Now, again what is going on here, if you think through it you would realize that depending on the change in level of wealth your behavior might be influenced in terms of taking risk. The conclusion here from this piece of research is peoples evaluation of prospects depend on gains and losses relative to a reference point and that reference point could be possibly their status quo.

We also know this reference point in a different context as anchor, you must recall the example where I had discussed about peoples tendency to stick to a stock or shares whose

value is decreasing, despite the fact that they are losing money they do not want to sell this stock because they are stuck with a price at which they had purchased and that is why they do not want to deviate from that particular anchor and in the process they are making losses and losing money.

This is coming from the same phenomenon which we have just shown through this example. We all have a reference point and our decisions about taking a particular choice or taking a particular prospect is driven by whether we are gaining or losing from that particular reference point and that reference point could ideally be the status quo, which implies that we do not want to deviate from the status quo and if we are deviating how much we are deviating will determine whether we are going to take how much of risk that is fine.

Now, let us go through another piece of observed behavior where we would try to show how the non consistent behavior of decision makers might determine the level of risk that they might be taking.

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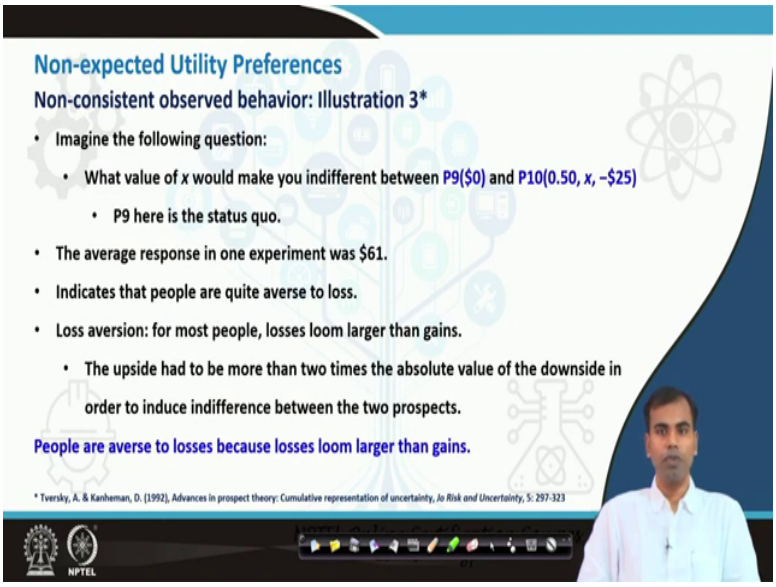

This piece of example or this idea is also drawn from one of the research studies done by Daniel Kahneman and Amos Tversky and this example is as follows. Suppose you are given the following situation and the situation is you have to choose between 2 prospects P 9 which is a sure short gain of 0 dollars, which means you are not going to get anything and P 10 where you have a gamble that has 50 percent probability of getting x dollars and remaining 50 percent probability of losing 25 dollars.

Now the question here is what should be the value of x that you would want to trade this for? If you see P 9 which is no gain or no loss is the status quo and as indicated earlier most of us do not want to deviate from the status quo and if we are deviating our choices would be driven by gains and losses.

Now, this piece of research indicates that people are averse to losses because losses loom larger than gains that is the outcome and the explanation here is the average response in this experiment that we had just shown whether to choose between P 9 and P 10 peoples choices are going towards the value close to 61 dollars and that is of course, driven by the utility framework. If you could recall we know there is something called certainty equivalent which is basically the value where people are indifferent between a sure short choice and a risky choice.

So, here we have 2 prospects P 9 and P 10 and you need to find at what value of x the ultimate utility derived from the gamble which is prospect 10 will be as much as the value of prospect 9 which is 0 gain 0 loss.

So, the value that was concluded through the experiment done by Kahneman and Tversky is 61 dollars and that is where they actually come with a quantitative figure that the upside of the prospect or the losses or gain had to be more than 2 times the absolute value of the downside in order to induce the indifference between 2 prospects, which implies that if you have 2 prospects and you need to see whether you are losing money or gaining money that in case of losses it has impact to the extent of more than 2 times.

Now, you can simply relate this with any typical example of our behavior, let us say we have some money in our wallet and on an unfortunate day we lost 100 rupees. Now you can understand the pain or the grief that you have because of losing that 100 rupees, on a different lucky day you found 100 rupees lying on the road you must be feeling happy.

So, this piece of research indicates that the happiness or the places that you have obtained by getting 100 rupees for free is actually less than the loss or the grief or the sadness that you have obtained because of losing hundred rupees.

So, that is what they mean to say when they say the upside had to be 2 point more than 2 times of the downside value downside absolute value of the prospect. This piece of research is another important inference that would lead us to an important discovery or rather I would

say important theory of an improvisation over expected utility theory that is known as prospect theory given by Kahneman and Tversky.

Through these 3 examples we have learnt that peoples behavior would be different under losses and gains and that behavior would be driven relative to a reference point which could be their status quo and we understood that losses loom larger than gains.

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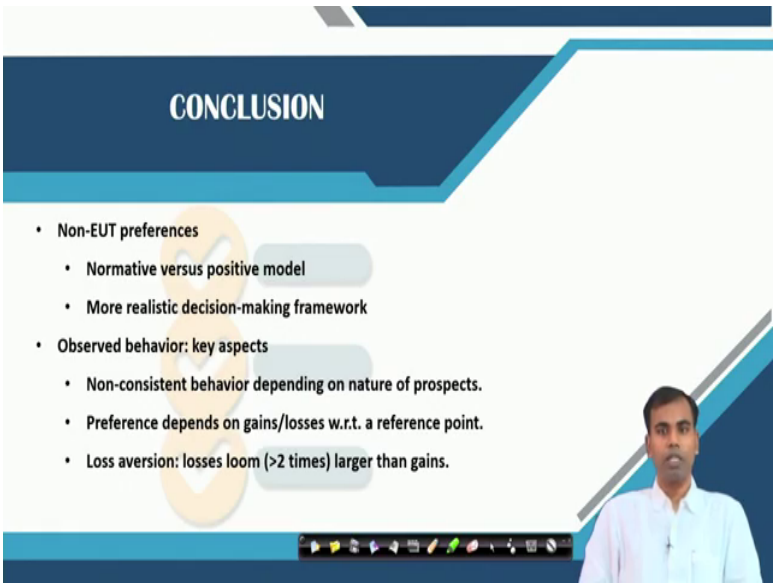

So, far we discussed in this session that expected utility theory is basically a normative framework of decision making, where it explains how people should ideally behave not how people actually behave.

It is not very realistic in terms of decision making processes whereas, when Kahneman and Tversky started proposing prospect theory over a expected utility theory in terms of a better

decision making framework they try to show how people should people actually behave and whether their decisions are not driven by the utility alone rather it is driven by different other factors including the nature of the prospects, which means whether it is a gain or a loss.

The extent of the gain and loss which is basically deviation from a reference point and which one has more impact on our decision whether it is loss that is driving our decision in a different way or it is gain. So, we come to a conclusion that there are 3 key notable behavior patterns one people have different risk choices under losses than under gains, which means if we face with losses our choices would be completely different from the situation when we face gains.

Our choices are driven by losses and gain of course, but this should be with reference to a status quo or as we will discuss later anchoring, which implies that we always have some anchor in our mind from where we try to relate our decisions when it comes to make risky or certain choices.

And finally, we know that losses have more impact about more than 2 times higher than the gains that have impact on our decision making. With this I conclude this session next session we will focus on the more details about prospect theory given by Kahneman and Tversky.

Thank you.