PRINCIPLES OF BEHAVIORAL ECONOMICS

Prof. Sujata Kar

Department of Management Studies
IIT Roorkee

Week 10

Lecture 10

Hello, this is Lecture 10 of the topic on behavioral economics. In this lecture or module, we are going to talk about the axioms and assumptions of the neoclassical model. So, in the previous module, we introduced the basic structure of the neoclassical model. In fact, we went for a generalized one and then a more specific one related to consumer behavior. And now we will be examining the various axioms and assumptions that go behind the model structure.

First, we present some of the axioms. In discussing the foundation of the NM, in particular in terms of how it relates to consumer preferences, it is essential to distinguish between the basic axioms of the model and other auxiliary assumptions that often accompany it. While the former are fundamental to the model, the latter are somewhat flexible and vary in different circumstances. So, we do not need all the assumptions at all places, but axioms should be there.

This distinction is relevant in discussing the weaknesses of the neoclassical model. There are four main axioms relating to consumer preferences. First of all, completeness. A person can compare any two consumer bundles, X and Y. Such a comparison must lead to one of three possible mutually exclusive outcomes: First of all, basket X is preferred to basket Y, and as we discussed previously, this would be denoted as (x1, x2) preferred to (y1, y2). It's possible that basket Y is preferred to basket X.

And we write it as y1, y2 preferred to x1, x2, and this is also possible that the consumer is indifferent between the two baskets, and this is how we write it. So, what it basically says is that the completeness principle refers to all possible preferences. It covers all possible preferences, which is basically if I have been given two different baskets consisting of several commodities, then I'll have a very clear choice about which basket to go for. If I am given 10 such baskets, then also I'll be able to rank each one of them very clearly—

which one I prefer and which one I do not prefer. And when I say I'm indifferent, it's not a lack of preference.

Indifference is also one kind of preference. So one must be very clear about being indifferent, being preferred, or rather preferring one particular basket over another basket. The next one is transitivity. If three different baskets X, Y, and Z are considered, a consumer who prefers basket X to basket Y. So X is preferred to Y, and Y is preferred to Z, then this implies that he must prefer X to Z. If this is fulfilled, then we call that his preference is actually transitive.

This is written with proper notations here.

$X > Y, \quad Y > Z$, then $X > Z$

Similarly, if a consumer is indifferent between basket X and basket Y, and he is also indifferent between basket Y and basket Z, then he must be indifferent between basket X and basket Z. The third assumption of reflexivity says that any bundle is at least as good as itself, which is basically $x1, x2$ is greater than or equal to $x1, x2$. This axiom is generally regarded as being trivial. If $x1, x2$ is revealed directly or indirectly preferred to $y1, y2$, and the two bundles are not the same.

Then it cannot happen that $y1, y2$ is revealed directly or indirectly preferred to $x1, x2$. So, this is the assumption of revealed preference. This axiom can come either in strong or weak form. When we write it as $x1, x2$ weakly preferred to $y1, y2$, then this is weak revealed preference; otherwise, the preference is strong.

In addition to the above axioms, there are four other main assumptions, often referred to as principles, which frequently accompany the neoclassical model. First of all, these assumptions are particularly relevant in situations where there is uncertainty. The expected utility theory of the neoclassical tradition is relevant in such situations. Expected utility theory was given by—or rather, was elaborated by—von Neumann and Morgenstern. We will again talk about expected utility theory and how certain observations are violated later.

EUT involves certain additional assumptions apart from the ones discussed below. So, first of all, Tversky and Kahneman claim that the following substantive assumptions can be ordered in terms of a hierarchy of increasing importance as far as their normative appeal is concerned. So, we begin with the assumption of cancellation. This is the principle that any state of the world that results in the same outcome regardless of one's choice can be canceled or ignored.

It is sometimes referred to as a minimal approach to decision-making, as opposed to a topical or comprehensive approach. For example, suppose I say that I like coffee when it is a sunny day. I also say that I like coffee when it is a rainy day. So, this implies that weather conditions are actually not guiding my preference for coffee. So, I can cancel the impact of weather on my preference for coffee.

So, this is what the cancellation approach ideally implies. Then, we talk about the assumption of dominance. This condition is simpler and stronger than the first one and therefore is more fundamental to the standard model. It states that if option X is better than option Y in one state and at least as good in all other states, then option X is dominant over option Y and should be chosen.

So again, I take a very simple example. The states could be like rainy days and sunny days. I can also include days where there is a blizzard, then snowy days, which are neither rainy nor sunny. So, these are all possible states. Now, if I say that I like coffee over tea, in rainy days, I like coffee over, or I like coffee as much as tea in sunny days.

Then, basically, tea is a dominated preference; coffee is the dominant preference. So, again, it is actually regardless of the weather conditions—I have a strong preference for coffee over tea. Assumption 3: Extensionality. The neoclassical model generally assumes that people have the same attitude toward a particular object and attribute the same value to it. However, that object is described given a certain level of information about it.

Thus, people should have the same attitude toward a particular kind of packaged meat, whether it is described as 5% fat or as 95% fat-free. This is again related to the reflexivity axiom. Talking about the fourth assumption—invariance—this condition is essential for any normative theory. It states that different representations of the same choice problem should yield the same preference. This, therefore, rules out framing effects.

So, in the previous assumption—or in the context of the previous assumption—we mentioned that we can basically frame the fat content of packaged meat differently. This can be written as 5% fat, or this can also be written as 95% fat-free. So, this is a very simple example of a framing effect. How am I going to frame it? There can be more appealing and more detailed impacts through framing.

Now, this invariance assumption states that the relation of preference should not depend on the description of the options or on the method of elicitation. That relates to two different things: description invariance and procedure invariance. Again, to give a very small

example, many of us are familiar with this concept: if there is a glass half full of water, then there will be some individuals who would perceive it as half empty, and then there would be some individuals who would perceive it as half full. So, this depends on your perspective.

Those who would call it half empty may be considered a little more pessimistic compared to those who would consider or perceive it as half full. They are supposed to be more optimistic. So, we can frame things differently, which completely depends on or rather influences the perception of individuals. The invariance condition is absolutely necessary for any normative theory. There is also the assumption in the standard model that consumers maximize utility.

This is usually taken as both a descriptive and a normative statement because people do behave in this way—that is one implication— and they ought to behave in this way to maximize their welfare—that is the other implication. So, 'people do behave in this way' is the descriptive part of it, and 'people ought to behave in this way to maximize utility' is the normative part of it. This normative aspect is related to the concept of rationality. Certain other assumptions invoked in particular situations and empirical evidence on their violations are discussed in detail in later modules.

However, we need to be aware of the differing status of these assumptions. Some are not really necessary components of the neoclassical model and can easily be relaxed without compromising the model. For example, the neoclassical model is sometimes said to involve assumptions regarding three characteristics of indifference curves. The first of these has already been stated as an axiom, which basically talks about the transitivity of preferences. So, three important characteristics: one is transitivity.

The second characteristic is that the curves are downward-sloping. This implies that more of a good is always preferred to less of a good. So, as I was drawing the indifference curve or trying to explain the slope of the indifference curve, I mentioned that since more of one commodity is always good, if I only increase the amount of X consumed, this is going to increase my utility. So, to maintain the same utility, I need to reduce the amount of Y. And this is how the indifference curve analysis is based on the assumption

that more of a good is always preferred to less of a good. This principle is referred to as the monotonicity of preferences and can be expressed in technical terms as, if $(x1, x2)$ is a bundle of goods and $(y1, y2)$ is another bundle with at least as much of both goods and more of one, then $(y1, y2)$ would strictly be preferred to $(x1, x2)$. Alternatively, we can say

that the utility associated with (y1, y2) would be higher than the utility associated with (x1, x2).

The assumption that follows directly from the definition of a good is that it is a commodity where more of it is preferred to less. Some commodities, like pollution and garbage, are referred to as 'bads'. The assumption of monotonicity is not essential to the standard model. For example, when people reach satiation, the principle no longer applies. The third characteristic of indifference curves is that they are convex to the origin.

Again, I drew them like this, so they are convex to the origin. This is sometimes referred to as the assumption of convexity of preferences, but it is not really an essential assumption either, since it follows from the law of diminishing marginal utility. So if the law of diminishing marginal utility is not present, then convexity will also not be present. And, of course, we have special cases of indifference curves when the indifference curves are actually straight lines. This law, that is, the law of diminishing marginal utility, states that as more of a good is consumed within a certain time period,

additional units of consumption will eventually yield less marginal utility. Basically, I think we have already talked about it—that if I consecutively keep on eating ice cream, then, of course, after the first one, the second one, the third one, I may not be willing to have the fourth one. And as I eat one ice cream after another, then, of course, my craving for ice cream, my liking for ice cream, keeps on decreasing. The additional utility generated by additional ice creams declines.

The law is in the nature of an empirical regularity rather than being an assumption in analysis. So this has been regularly observed empirically. That's why it need not be an assumption, or maybe it can be considered as an assumption because it is most often observed. It is this characteristic of convexity which also helps in deriving the inverse relationship between price and quantity demanded in the conventional demand curve. Those who are trained in economics might already be familiar with this.

I do not, right now, have the scope or the time to explain such things. Without stability across equivalent descriptions and equivalent elicitation procedures, a person's preferences cannot be represented as utility maximization in the standard expected utility theory framework. Now, we talk about some important terms related to the neoclassical model. Before discussing the weaknesses of the standard model in terms of consumer preference, it will help to clarify the situation

if we give definitions of four items or terms that are involved in the decision-making process. They are attitude, value, preference, and choice. Basically, how these concepts, specifically attitude and value, are treated in neoclassical modeling. It should be stated at the start that the definitions that follow are not universally agreed upon or followed by either economists or psychologists, but they are widely shared. So, for example, when we talk about attitude, this has been usefully defined as a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor.

This concept has a broader range of applications than the concept of preference. Attitude is a broader concept. Attitudes relate to any entity that people can like or dislike. Entities include physical objects, living beings, and abstract concepts involving anything that can elicit an affective response. It is important to realize that objects of attitudes are mental representations, not objective states or affairs.

This means that attitudes are based on beliefs. Realizing this helps us understand the violation of the invariance and extension principles. People have a different mental representation of meat with 5% fat compared to meat that is 95% fat-free. They are the same thing. Still, they will have different mental representations for different people or individuals.

A related characteristic of attitudes is that they tend to involve judgment by prototype. An example involves duration neglect. People tend to recall past experiences in terms of a prototypical moment rather than as the total experience. As most of us would be familiar with the fact—or when I say this, many of you will be able to relate— that when we consider or think about a good relationship, in our memory, we will be able to cherish the time we spent together.

So, the relations that are cherished will give us positive thoughts. The relationships that we do not like, which probably no longer exist, are going to give us negative thoughts. For those relations or about those relations, we probably recall most of the instances that were not really nice or good. So this is how we tend to become judgmental, or these individual instances that we happen to remember are called prototypical experiences or moments. Thus, they may ignore the length of an unpleasant experience like a colonoscopy, recalling instead the moment of most intense pain.

So these are just examples of how people go for prototypical moments. The second concept or term is value. This is a problematic term because it is widely used in two different senses.

In one sense, our values determine our attitudes, while in the other sense, our attitudes determine our values. In the first sense, values refer to tastes, likes, or dislikes.

So when values determine our attitudes, they are actually impacting our tastes, likes, or dislikes. We may have a taste for cauliflower, a taste for roller coasters, or a taste for making charitable donations. Thus, values in this sense at times also include moral values. Basically, when we refer to the last one—the charitable donations. The second sense of the term value refers to the quantitative evaluation that results from an attitude.

So when attitudes direct values or help us in forming values, then we have another concept of value. The determination of value involves judgment. The sense of the term value is what economists conventionally mean by the term utility, whether referring to experienced or decision utility. These terms will be discussed in more detail in the following sections and modules. And then we have the third term, which is preference.

As we have already discussed, economists are conventionally more concerned with preferences. In particular, so-called revealed preferences—we have already briefly mentioned or talked about this theory—while psychologists may be more concerned with attitudes. In the neoclassical model, it is assumed that attitudes determine preferences, but that might not always be true or hold all the time. And finally, the last term is choice, which involves an action on the part of the subject or consumer involving some kind of decision. The standard model generally assumes that choice is simply revealed preference.

We will see, however, that preferences and choices are not necessarily identical and that choices need not reflect attitudes and judgments. So with this, I conclude this module. These are the references that have been primarily used or may be part of other references. The primary reference has been the book by Wilkinson and Klaes. Thank you.