Choice with multiple alternatives

Specification of the deterministic part

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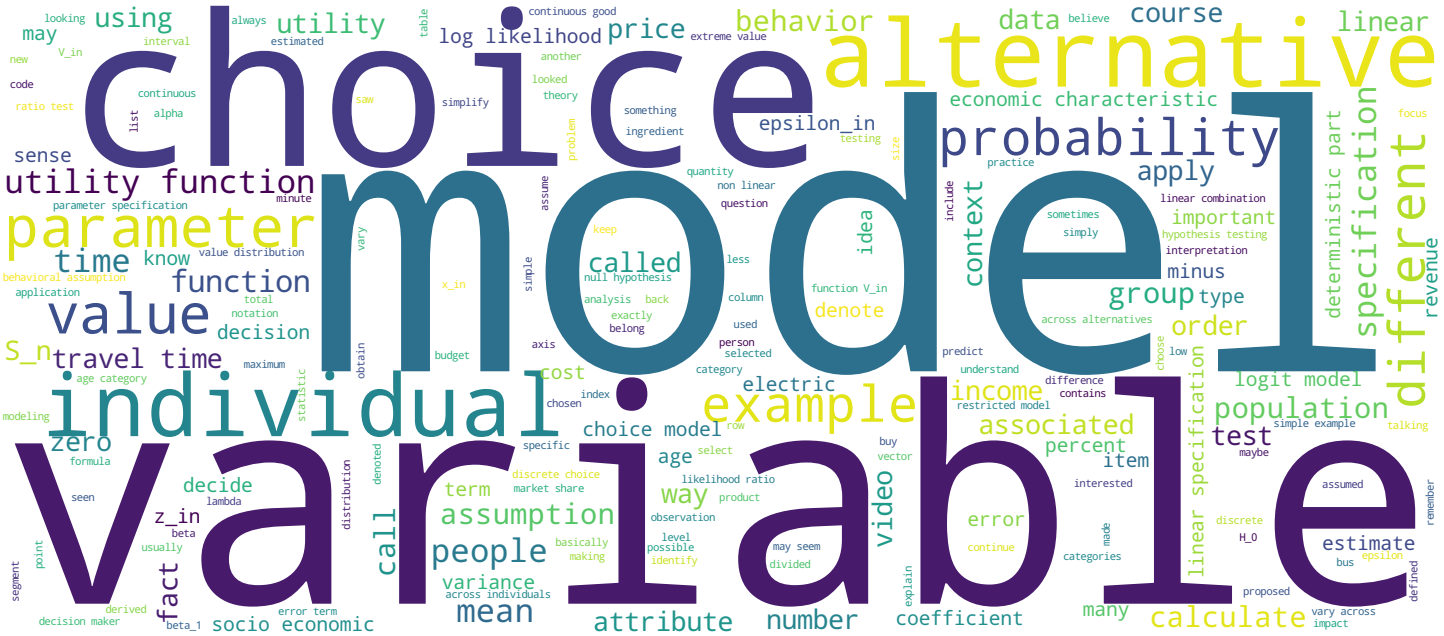
Introduction to choice models

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE



Search MOOC

Video

EPFL

Systematic part of the utility function

For all $i \in \mathcal{C}_n$

$$U_{in} = V_{in} + \varepsilon_{in}$$

- What is $\mathcal{C}_n$?
- What is ε_{in}?
- What is V_{in}?

So we continue our analysis of the logit model for multiple alternatives. We have three ingredients. So we already looked at the choice set, where we talked about the fact that it is universal or individual specific. We looked at the epsilon_in, the error term, where we assumed that they are i.i.d. extreme value distribution. And from this assumption we derived the model, we derived the concrete logit model. And now we will focus on the last part: the deterministic part of the utility function V_in. And this is an important part because this is where we will translate our behavioral assumptions about the choice into mathematical expressions. So what we will try to do in this video is to get a sense of how we can code our assumptions using this V_in function.

Notes

Summary

0m 04s

Systematic part of the utility function

$$V_{in} = V(z_{in}, S_n)$$

- z_{in} is a vector of attributes of alternative i for individual n
- S_n is a vector of socio-economic characteristics of n

So this function V_in is actually a function of the variables that we are considering. We call these variables the explanatory valuables because these are the variables that explain the choice, and we identify two categories of variables. The first category are the attributes of the alternative. We will denote them by z_in. We have two indices, because they vary across alternatives and they vary also across individuals. The second set of variables is denoted by S_n. They are the socio-economic characteristics of individual n. These variables do not vary across alternatives i. So this is why S_n has only one index n. So the utility function, the deterministic part of the utility function, will be a function of all these variables: the z_in and the S_n.

Notes

Summary

1m 00s

Functional form: linear utility

Notation

$$x_{in} = (z_{in}, S_n)$$

Linear-in-parameters utility functions

$$V_{in} = V(z_{in}, S_n) = V(x_{in}) = \sum_k \beta_k (x_{in})_k$$

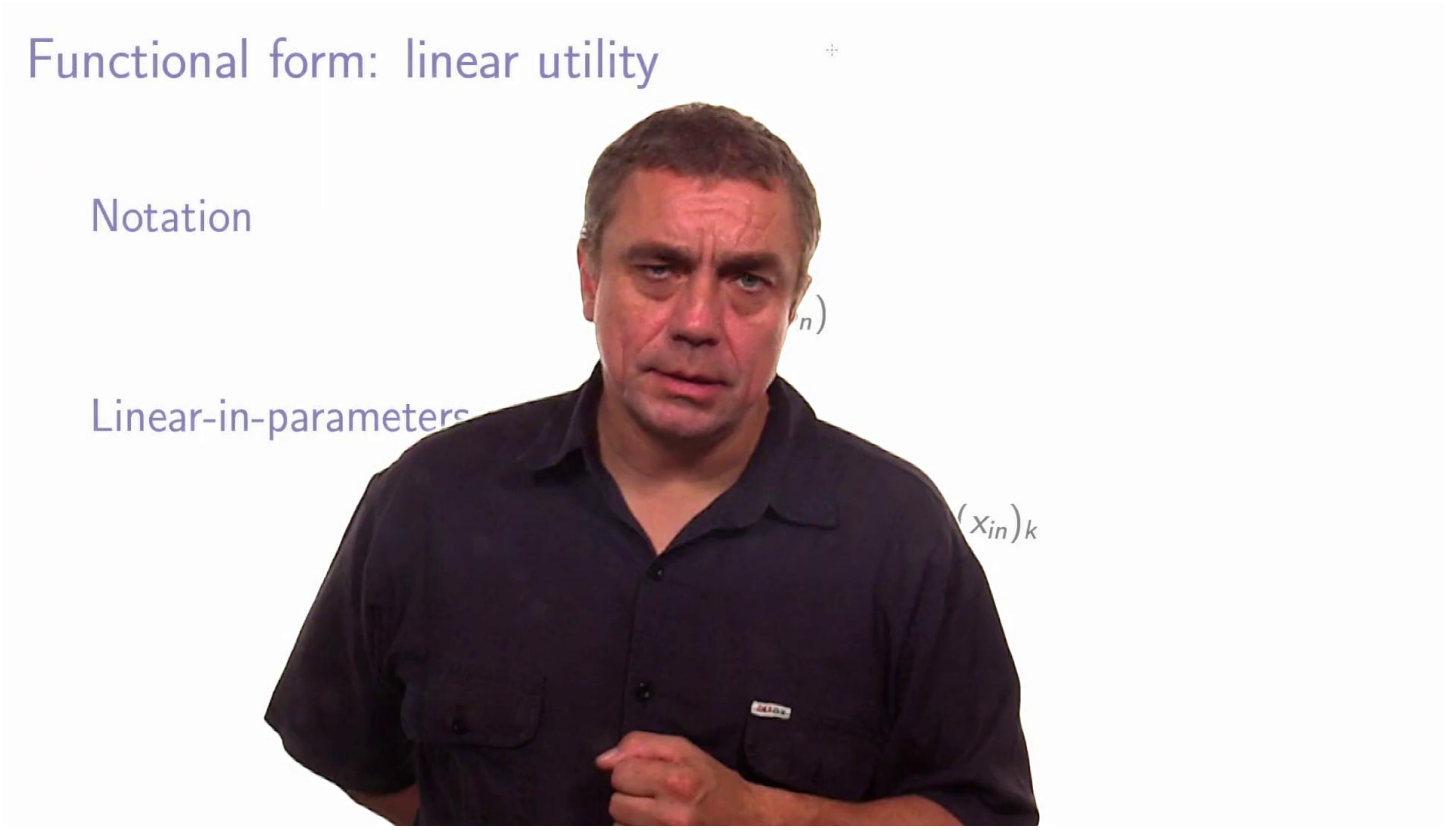
Not as restrictive as it may seem

But what function? What is the functional form? The first thing we will do to simplify the notation is that we will put together all these variables, z_in and S_n, into one vector that I call x_in. This will simplify my notations. So when I don't need to make the distinction between the attributes and the socio-economic characteristics, I call them x which is the general variable of the model. The most common specification of the utility function is what we call a linear-in-parameter specification. In this case, V_in is simply a linear combination of these variables. And the coefficients of this linear combination, that we denote here by beta_k, are actually parameters, unknown parameters, that we will have to estimate using observations. Well, using a linear representation may seem kind of arbitrary. Life is not linear. And actually we are talking about choice, about behavior. It's relatively difficult to believe that behavior can be modeled using a linear specification. Well, as we will see, making this assumption, which is mathematically convenient, is not as restrictive as it may seem. And we will see why.

Notes

Summary

1m 55s



Before we look into the details, I ask you to do the quiz which is proposed on the webpage, so that you can get a sense of the interpretation of this linear-in-parameter specification. And then, go to the next video where we will look into the advanced details.

Notes

Summary

3m 15s