ECON 100A - Section Notes
September 3, 2025
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Announcements

- Tomorrow (Friday 5th) **deadline sign-up presentation slot**
- The first Reading Response is due on Thursday, September 11, at 11:59 pm. We will be working on this next week: Tuesday, September 9. Be there :)
- You will be responding to Thaler, Richard. 2016. "Behavioral Economics: Past, Present, and Future." American Economic Review, 106 (7): 1577-1600. Pdf linked in the course pack. **Please read it before coming to section next week, this is essential** !

Main Notions Covered

From Ariel Rubinstein (2012): Preferences on a set X is a binary relation $\succ$ on X satisfying:

- Completeness: For any x, y $\in$ X, x $\succ$ y or y $\succ$ x
- Transitivity: For any x, y, z $\in$ X, if x $\succ$ y and y $\succ$ z, then x $\succ$ z

We say that the function U : X $\to$ R represents the preference $\succ$ if for all x and y in X, x $\succ$ y if and only if U(x) > U(y). If the function U represents the preference relation $\succ$, we refer to it as a utility function and we say that $\succ$ has a utility representation.

When defining a preference relation using a utility function, the function has an intuitive meaning that carries with it additional information. In contrast, when the utility function is formed in order to represent an existing preference relation, the utility function has no meaning other than that of representing a preference relation. Absolute numbers are meaningless in the latter case; only relative order has meaning. Indeed, if a preference relation has a utility representation, then it has an infinite number of such representations, as the following simple claim shows: Claim: If U represents $\succ$, then for any strictly increasing function f : R $\to$ R, the function V (x) = f(U(x)) represents $\succ$ as well.

Let $u : X_+ \subset R^2_+ \to R$ be a utility index. For any utility level $\bar{u}$, the indifference curve at $\bar{u}$ is the *level set* $I(\bar{u}) = \{(x_1, x_2) \in X_+ : u(x_1, x_2) = \bar{u}\}$. It collects all bundles yielding the same utility; graphically, it is a contour (level) curve of u.

The MRS of good 1 for good 2 is the willingness to trade good 2 for an extra unit of good 1 while holding utility constant: if u is differentiable and $u_2 > 0$,

$$du = u_1\,dx_1 + u_2\,dx_2 = 0 \quad \Rightarrow \quad \left.\frac{dx_2}{dx_1}\right|_{du=0} = -\frac{u_1}{u_2}.$$

Define

$$\text{MRS}_{12} \equiv \frac{u_1}{u_2} \geq 0 \quad \text{(for good–good cases)},$$

so the *slope* of an indifference curve is $-\text{MRS}_{12}$. Example: If $u(x_1, x_2) = x_1^\alpha x_2^\beta$ with $\alpha, \beta > 0$, then

$$u_1 = \alpha x_1^{\alpha-1} x_2^\beta, \quad u_2 = \beta x_1^\alpha x_2^{\beta-1} \Rightarrow \text{MRS}_{12} = \frac{u_1}{u_2} = \frac{\alpha}{\beta}\frac{x_2}{x_1}.$$

Practice

1. Briefly revise (a) What it means for preferences to be monotonic. (b) What it means for preferences to be convex.

2. Explain in simple terms what it means exactly for a utility function to 'represent preferences' over bundles of goods.

Now take $\sim$ 10 minutes to work on these exercises individually, then turn to your neighbors and discuss your responses in small groups for a few minutes. We will then come together to work through them as a class, with groups sharing their progress/responses.

3. For the following utility function: $u(x_1, x_2) = 2x_1 + x_2$

   (a) Sketch three of Jim's indifference curves, for the utility levels u = 2, u = 4, and u = 6. Clearly indicate which curve represents which utility level. Label any intercepts on each one.

   (b) What is Jim's marginal rate of substitution in this example? In simple terms, explain what the magnitude of his marginal rate of substitution means in this example. In simple terms, explain how and why his marginal rate of substitution is related to the marginal utility of each good.

   (c) Do any of these utility functions also represent Jim's preference ordering? $u1 = x1 + x2; u2 = -2x1 - x2; u3 = 2x1x2$. If so, which one(s) and why? If not, why not?

Discussion Prompts

What are some standard assumptions that economics often make about people's preferences? How reasonable do you think those assumptions are? Brainstorm some examples in which you think one of the assumptions is really plausible or really implausible.