APEC 8001 Recitation

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September 17, 2020

Today's Agenda

1. Wealth Effects
2. Implications of Walras' Law
3. Quasiconcavity of Utility Functions
4. More Difficult Topics from Lectures 2 & 3
5. Questions

Wealth Effects

Remember that when we hold prices fixed at $\bar{p}$, we can understand the wealth effects on the goods in the demanded bundle

We say that a good is normal ***at a given*** $(\boldsymbol{p}, \boldsymbol{w})$ when the demand for the good increases (or stays the same) as wealth increases

And, if the good is normal ***for all*** $(\boldsymbol{p}, \boldsymbol{w})$, then the good is a ***normal good***

Similarly, a good is inferior ***at a given*** $(\boldsymbol{p}, \boldsymbol{w})$ when the demand for the good decreases as wealth increases

Now, for a good to be an ***inferior good***, it would have to be inferior ***at all*** $(\boldsymbol{p}, \boldsymbol{w})$, implying no matter what (p,w) is, if wealth increases, the consumer will demand less of it

Implications of Walras' Law

The Cournot aggregation condition states:
If the Walrasian demand function satisfies Walras' law, then for all p & w:

$$\sum_{l=1}^{L} p_l \frac{\partial x_l(p,w)}{\partial p_k} + x_k(p,w) = 0 \ \ \textit{for } k = 1, 2, \ldots, L$$

The Engel aggregation condition states:
If the Walrasian demand function satisfies Walras' law, then for all p & w:

$$\sum_{l=1}^{L} p_l \frac{\partial x_l(p,w)}{\partial w} = 1$$

Implications of Walras' Law

Some useful definitions to keep in mind:

- Price elasticity: $\epsilon_{lk}(p, w) = \frac{\partial x_l(p,w)}{\partial p_k} \frac{p_k}{x_l(p,w)}$
- Wealth elasticity: $\epsilon_{lw}(p, w) = \frac{\partial x_l(p,w)}{\partial w} \frac{w}{x_l(p,w)}$
- Budget share: $b_l(p, w) = \frac{p_l x_l(p,w)}{w}$

Quasiconcavity of Utility Functions

If we have convex preferences, then a utility function representing those preferences is quasiconcave.

A utility function $u()$ is ***quasiconcave*** if the set $\{y \in \mathbb{R}^L_+ : u(y) \geq u(x)\}$ is convex for all x

(i.e. $u(\alpha x + (1-\alpha)y) \geq min\{u(x), u(y)\}$ for any x, y and all $\alpha \in [0,1]$)

More Difficult Topics from Lectures 2 & 3

- Compensated Law of Demand
- Compensated Price Changes
- Price Effects

Compensated Price Changes

Given (p,w), when w changes to w' to compensate for p changing to p' we have the Slutsky wealth compensation: $\Delta w = \Delta p \cdot x(p, w)$

These prices changes, Δp, are called ***compensated price changes***

We can use these compensated price changes to show $x(p, w)$ satisfies WARP iff we have $(p' - p) \cdot [x(p', w') - x(p, w)] \leq 0$ for any compensated price change where $w' = p' \cdot x(p, w)$

Compensated Law of Demand

The compensated law of demand: $\Delta p \cdot \Delta x \leq 0$

Implication is if a price change is compensated for with a (hypothetical) change in wealth so that the consumer can continue to afford the optimal bundle of goods, then demand and price will move in opposite directions

Price Effects

To understand price effects, we fix wealth at $\bar{w}$ and hold all prices, except one, at $\bar{p}_l$, and observe how demand changes when a particular price changes

To understand own-price effects, we hold constant the prices for all other goods; to understand cross-price effects, we hold constant the price for the good we're assessing and the prices for all other goods except one

With own-price effects, we typically expect demand for a good to decrease as its price increases; however, it is possible for the demand to decrease as its price decreases and this is called a ***Giffen good***

Questions?

Any remaining questions?