Preference Slides

Econ 360

Summer 2025

BINGHAMTON UNIVERSITY
STATE UNIVERSITY OF NEW YORK

Learning Outcomes

- Apply mathematical notation for expressing preferences between options.
- Evaluate whether a consumer's preferences are rational using key definitions.
- Predict a consumer's choices using observed behavior and identifying choices which would represent irrational and rational preferences.

Where Are We?

- What we DO know:
  - We can use prices and wealth to identify the **affordable** or **feasible** options.
  - We know the tradeoff the consumer HAS to make between two goods based on the prices.
- What we DO NOT yet know:
  - What the consumer actually prefers out of the affordable bundles. (These slides)
  - The tradeoff the consumer wants to make between two goods based on preferences. (Next slides)

Key Economic Assumption: Rationality

- We will not make any judgments about what a consumer "should" do or if a consumer's preferences are "good" or "bad".
- Instead, we will assume that a consumer will always pick their most preferred option from the set of affordable or feasible options.
- I.e. Suppose my two options are to either eat broccoli or eat a burger.
  - If I choose to eat a burger, we assume I prefer a burger to broccoli.
  - The fact that broccolis is the healthier option does not matter.
  - I might have really preferred a 5 course meal, but that was not affordable to me.
  - My preferences are about feasible options, not all options.
- We will revisit this topic of "revealed preferences" a bit later.

Preference Relations

- **Preference Relations** are ordinal comparisons that state the order in which bundles are preferred.
  - We cannot say things like “this bundle is twice as good as this other bundle”.
- We use preference relations to compare any two bundles of goods x and y.
  - **Strict preference**: x is more preffered than y.
  - **Indifference**: x is exactly as preferred as y.
  - **Weak preference**: x is at least as preferred as y.

Preference Relations

- Suppose my two bundles are again about my meal options.
- Bundle x is a healthy meal of a soup and a sandwhich, while bundle y is a fast food meal of a burger and french fries.
  - If I strictly prefer the healthy meal to the fast food meal, I would write $x \succ y$.
  - If I weakly prefer the healthy meal to the fast food meal, I would write $x \succsim y$.
  - I am indifferent between the healthy and the fast food meal, I would write $x \sim y$.
- $\succ$ indicates strict preference.
- $\succsim$ indicates weak preference.
- $\sim$ indicates indifference.

Preference Relations: Implications

- To be indifferent between x and y, you would both weakly prefer x to y AND weakly prefer y to x.
  - Therefore $x \succsim y$ and $y \succsim x \implies x \sim y$.
  - In math, this is roughly equivalent to $a \geq b$ and $b \geq a \implies b = a$.
- If you strictly prefer x to y, then it must be that you weakly prefer x to y, but you do NOT weakly prefer y to x.
  - Therefore $x \succsim y$ but NOT $y \succsim x \implies x \succ y$.
  - In math, this is roughly equivalent to $a \geq b$ but NOT $b \geq a \implies a > b$.

Rational Preference Relations

- **Goal**: Represent a consumer's preferences to make predictions about their choices.

- What would make it impossible for us to accurately predict their choices?
  - If preferences are not **rational** we cannot make predictions.

Rational Preference Relations

- What does it mean intutively for a consumer to not be rational?
  1. The consumer does not have an opinion when given two or more feasible options.
     - **Note**: Indifference is an option. Not having an opinion is the consumer shrugging and saying “I have no idea how to compare these two things”.
  2. The consumer’s choices do not match what we would predict given their other choices.
     - For example, if the consumer picks a over b, and picks b over c, but then picks c over a, this would be inconsistent.
  3. The consumer’s choices imply that one bundle is strictly preferred to itself.
- More formally, a rational preference relation is complete, transitive, and reflexive.

Rational Preference Relations: Completeness

- **Completeness**: For any two bundles x and y, one or both of the following statements MUST be true.
  1. $x \succsim y$
  2. $y \succsim x$
- If both statements are true, then $x \succsim y$ and $y \succsim x$ implies $x \sim y$.
- Again, "complete" just means you always have an opinion between any two bundles.

Transitivity

- **Transitivity**: For any three bundles, if:
  1. x is at least as preffered as y ($x \succsim y$) and
  2. y is at least as preferred as z ($y \succsim z$),
  3. then it must be the case that $x \succsim z$.
- This basically means that a consumer is internally consistent.
- Example:
  - If I prefer doing work on a computer to doing work on an iPad,
  - and I prefer doing work on an iPad to doing work on a phone,
  - then surely I should prefer doing work on a computer to doing work on a phone.
- This is similar to transitivity in math, where if $a \geq b$ and $b \geq c$, then $a \geq c$.

Reflexivity

- **Reflexivity**: Any bundle x should be exactly as good as itself, or $x \sim x$.