WARP Slides

Econ 360

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BINGHAMTON UNIVERSITY
STATE UNIVERSITY OF NEW YORK

Learning Outcomes/Goals

1. Algebraically/Graphically determine whether a consumer's choices represent rational behavior.

2. Define the Weak Axiom of Revealed Preference (WARP).
   - **Note**: The Strong Axiom of Revealed Preference (SARP) is outside the scope of this class but may come up in future classes.

Where We Are/Going

- We know how to find a consumer's optimal choice given prices and income.
- We also can figure out how this optimal bundle changes when prices and income change.
- But how can we figure out if an optimal bundle after a price change and/or income change is rational?

An Intuitive Example: Pie

- Bill walks into a diner to order a slice of pie.
- The waiter gives Bill the list of pies, which today is Apple or Blueberry pie.
- Bill orders Apple.

An Intuitive Example: Pie

- The waiter quickly returns, and tells Bill he forgot to mention the diner also still has slices of cherry pie available.
- Bill decides to switch his order from Apple pie to **Blueberry** pie.
- The waiter is very confused but brings Bill his Blueberry pie.
- **Question**: Why is the waiter so confused?

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Bill's Choices and Revealed Preference

- Consider Bill's behavior when he thought only Apple and Blueberry pie were available.
- By choosing Apple, Bill **revealed** to us that *Apple* $\succ$ *Blueberry*.
- Then when a third pie entered the choice set, Cherry, Bill picking Blueberry revealed that *Blueberry* $\succ$ *Apple*.
- This is a preference reversal. If Bill really preferred Blueberry why did he not pick it when it was available to him the first time?!

Example 2: Saving and Borrowing

- Suppose Anne receives 2 paychecks in a given month, each for $1000 dollars.
- When Anne gets paycheck number 1, she can either
  1. Loan some of her paycheck to a friend, and receive the loan plus interest with her second paycheck.
  2. Borrow from a friend, and have to repay the loan plus interest out of her second paycheck.
- Suppose the interest rate is 10%, and Anne decides to borrow from a friend.
- Suppose the interest rate changes to 5%, and Anne decides to loan money to a friend instead of borrow money.
- **Question**: Is this consistent with our model of rational behavior?

Example 2: Saving and Borrowing

- **No**.
- If Anne wanted to borrow at 10%, then a reduction in the interest rate means she would need to repay less money in interest to her friend.
- She should be more willing to borrow at 10% than at 5%.
- This is also a WARP violation.

Applying WARP to Consumer Choice

- How can we apply this to the Utility Maximization Problem we have been working with?
- The Budget Constraint $p_1 x_1 + p_2 x_2 \leq w$ tells us which bundles are affordable to a consumer.
- If there is a change in prices and/or income, we can figure out which bundles were available to the consumer under which prices/income.
- We can then determine if a consumer violated WARP or not!

An Example Problem

- Suppose there are 2 goods x_1 and x_2 with prices p_1 and p_2, and Barb has an amount of money to spend w.
- On Day 1, prices are $(1, 1)$ and Barb purchases the bundle (2,2).
- On Day 2, prices are $(1, 3)$ and Barb purchases the bundle (1,2).
- **Question**: Do Barb's choices violate WARP?

An Example Problem

- Suppose there are 2 goods x_1 and x_2 with prices p_1 and p_2, and Barb has an amount of money to spend w.
- On Day 1, prices are $(1, 1)$ and Barb purchases the bundle (2,2).
- On Day 2, prices are $(1, 3)$ and Barb purchases the bundle (1,2).
- Barb's Day 1 bundle would cost \$8 dollars at Day 2 prices.
- Barb's Day 2 bundle would cost \$3 dollars at Day 1 prices.
- If we assume Barb had just enough money to purchase her bundle on each day:
  - Barb had \$4 on Day 1.
  - Barb had \$7 on Day 2.
- So on Day 1, both Barb's Day 1 bundle and Barb's Day 2 bundle was affordable.
- On Day 2, only Barb's Day 2 bundle was affordable.
- Therefore, Barb **did not** violate WARP.

An Example Problem

- Not to worry–we will do more examples in class.

- Think about how we might draw this using a graph.