Choice Slides

Econ 360

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BINGHAMTON UNIVERSITY
STATE UNIVERSITY OF NEW YORK

Learning Outcomes

- Predict a consumer's choice of bundle given **any** utility function and budget constraint.
  - Both algebraically and graphically.
- Identify marginal benefit and marginal cost within the utility maximization framework.

- Evaluate whether a given bundle is optimal for a consumer.

  - If not, describe a bundle the consumer would prefer over the given bundle.

Where We Are

- We can write budget constraints to represent the set of a consumer's affordable bundles.
  - Which means we also know the tradeoff a consumer **must** make between commodities.
- We know how we can represent a consumer's preferences based on an utility function.
  - Which means we also know the tradeoff a consumer **wants to** make between commodities.
- **Big Question**: How might we use these two tradeoffs to figure out a consumer's chosen bundle?

Using Tradeoffs

- Suppose Bill can purchase two goods, food and drinks, at Weis.
- Suppose the price of both food and drinks is $1.
- Suppose Bill has 2 food and 5 drinks in his shopping cart, which is all he can afford.
- If Bill spends an extra dollar on food, his utility will increase by 5. If Bill spends an extra dollar on drinks, his utility will increase by 2.
- **Question**: Is Bill's shopping cart optimal?
- **Question**: What other assumptions do you need to answer this question?

Using Tradeoffs

- **Assumption**: Bill's utility for food and drink is diminishing.
- **Answer**:No
- Bill would do better by increasing the amount of food, and decreasing the amount of drink.
- More food means less marginal utility, assuming diminishing marginal utility.
- And less drink means greater marginal utility, assuming diminishing marginal utility.

Using Tradeoffs

- Now suppose the price of food is $5 and the price of drinks is $2.
- How much does Bill's utility go up now when he spends an extra dollar on food vs drinks?
- Is Bill's shopping cart optimal?

Using Tradeoffs

- When Bill spends an extra \$1 on food, he can buy $\frac{1}{5}$ of food and his utility goes up by 1.
- When Bill spends an extra \$1 on drinks, he can buy $\frac{1}{2}$ of drink and his utility goes up by 1.
- **Therefore Bill cannot improve by reallocating, so he does have the optimal bundle**.

Using Tradeoffs

- **Question**: How can we write an equation to show the optimal bundle is where Bill's marginal utility from spending an extra dollar on either of the two goods is equal?

Bang 4 Buck

$$\frac{MU_{\text{food}}}{P_{\text{food}}} = \frac{MU_{\text{drinks}}}{P_{\text{drinks}}}$$

Rearranging Bang 4 Buck

$$\frac{MU_{\text{food}}}{P_{\text{food}}} = \frac{MU_{\text{drinks}}}{P_{\text{drinks}}}$$

$$\frac{MU_{\text{food}}}{MU_{\text{drinks}}} = \frac{P_{\text{food}}}{P_{\text{drinks}}}$$

$$\text{MRS} = \text{Ratio of the Prices}$$

- The MRS is the tradeoff Bill wants to make (based on his utility function).
- the Ratio of the prices is the tradeoff Bill has to make (based on prices).
- At the optimal bundle, they are equal!

Alternative explanation: MB=MC

- Bill has his optimal number of food/drinks when the **Marginal Benefit=Marginal Cost** of each item.
  - The Marginal Benefit is extra utility, or Marginal Utility.
  - The Marginal Cost is the cost of an additional food/drink, or the price.
- With two goods, Marginal Benefit=Marginal Cost must hold for both goods simultaneously.
- Therefore we can write two equations for the two goods and solve them.
- We will do so by dividing one equation by another.

Alternative explanation: MB=MC

$$MU_{\text{food}} = P_{\text{food}} \tag{1}$$

$$MU_{\text{drinks}} = P_{\text{drinks}} \tag{2}$$

$$\implies \frac{MU_{\text{food}}}{MU_{\text{drinks}}} = \frac{P_{\text{food}}}{P_{\text{drinks}}} \tag{3}$$

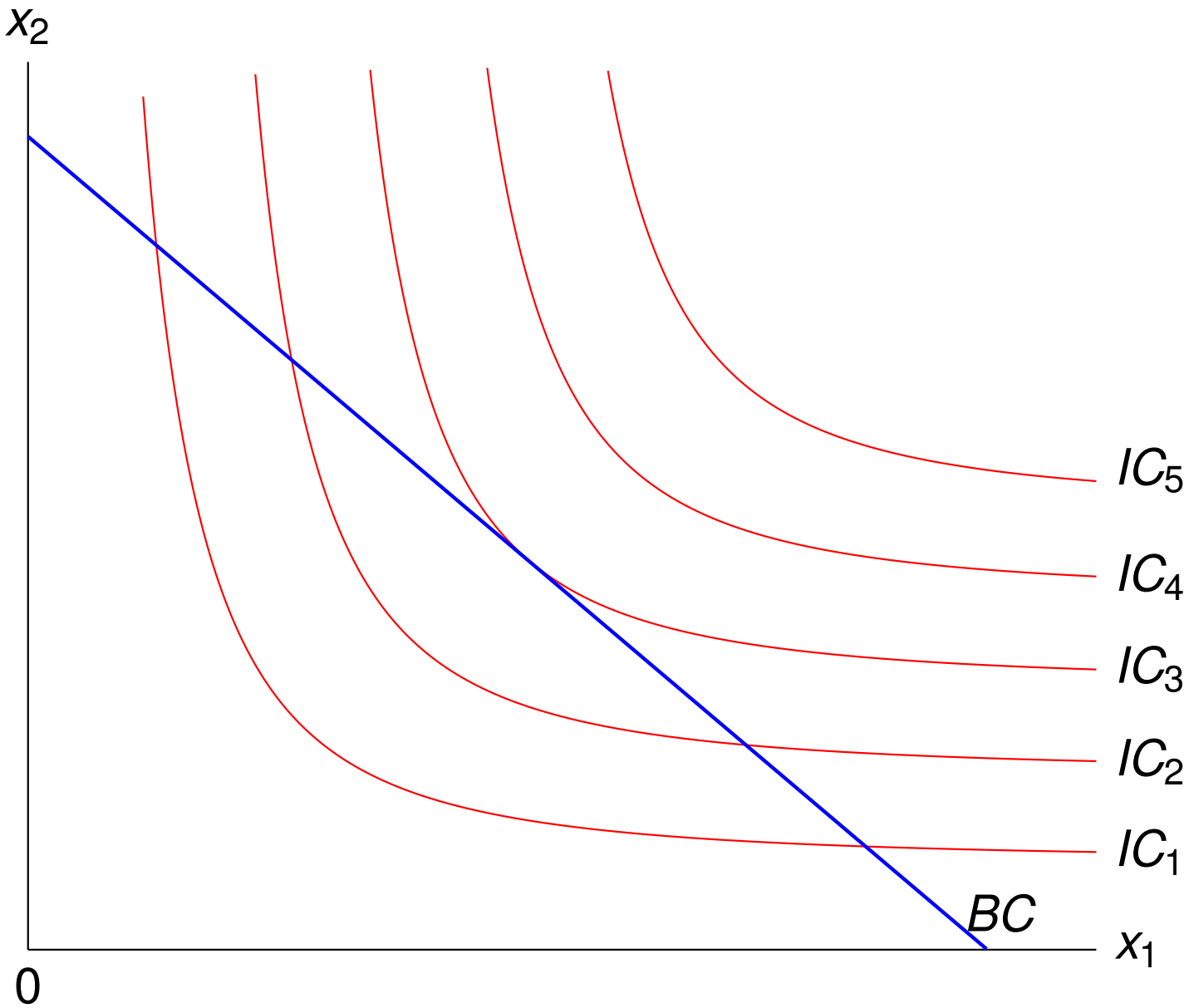
$$\text{MRS} = \text{Ratio of the Prices} \tag{4}$$

- Which is the same result we had before!

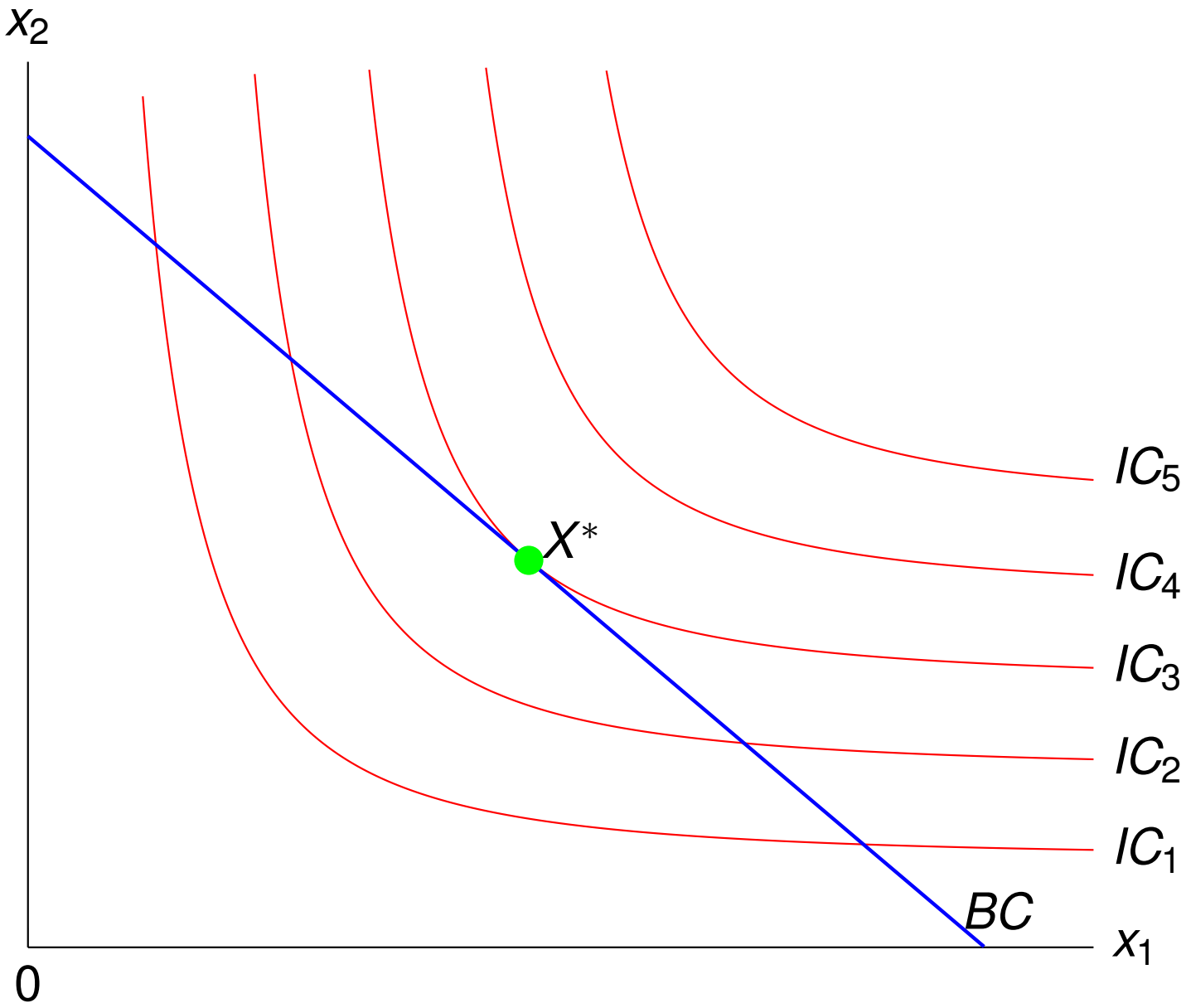
Thinking Graphically

- We know that the MRS is the slope of the indifference curve.
- We also know that the Ratio of the Prices is the slope of the budget constraint.
- Therefore the optimal bundle seems to be where the slope of the budget constraint and the indifference curve are equal.
- **Question**: What assumptions do we need in order for this to be true?

Thinking Graphically-Finding Optimal Bundle



Thinking Graphically-Finding Optimal Bundle



Assumptions

- We **assumed** that Bill's preferences are well-behaved.
  - Bill has convex preferences (liked combinations).
  - Bill has monotonic preferences (more is better).
- But how does our problem change if this is not true?

Corner Solutions: Intuition

- Suppose Bill likes Coca-Cola and Pepsi, but Bill likes Pepsi more.

- Bill is always willing to trade 2 Coca-Colas for 1 Pepsi.
  - Coca-Cola and Pepsi are perfect substitutes for Bill.
- Now suppose the prices of Pepsi and Coca-Cola at the grocery store are equal.

- **Question**: How much Coca-Cola will Bill buy?

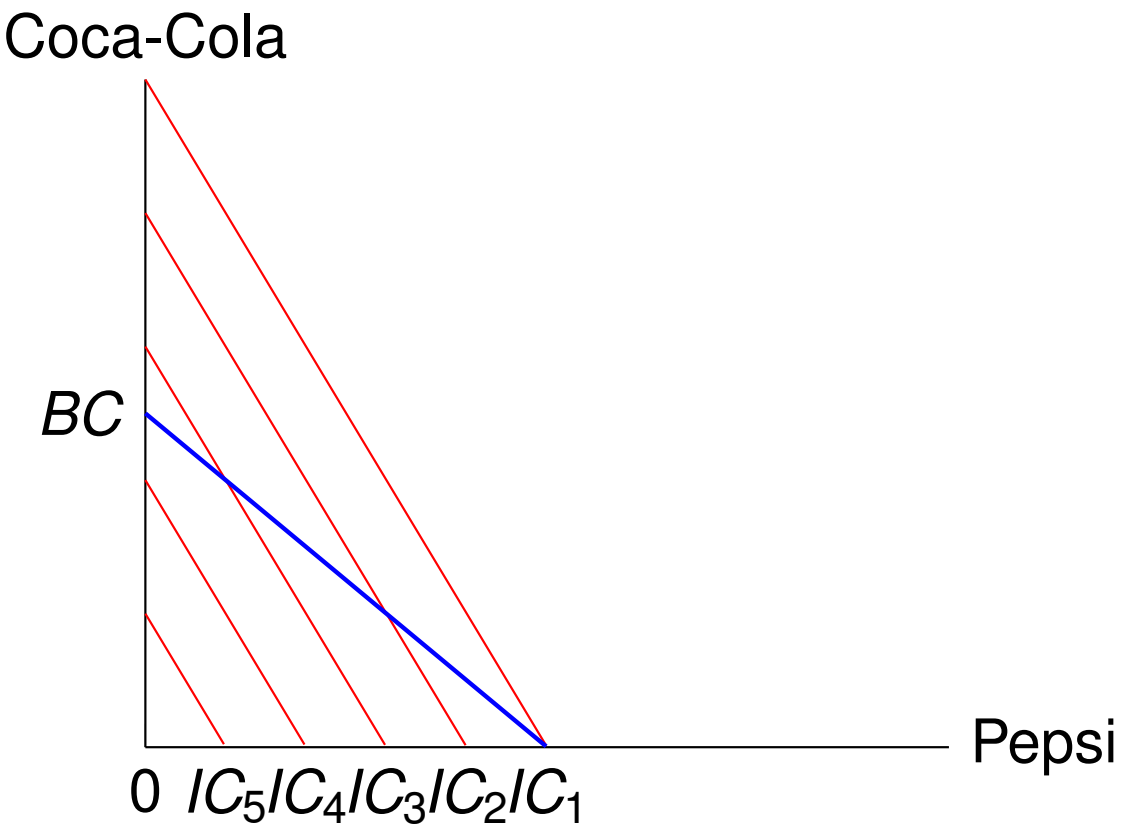
Corner Solutions: Intuition

- **Answer**: 0!
  - Bill can always increase his utility by buying more Pepsi than he can with Coca-Cola, so Bill spends all his money on Coca-Cola.
- This is what we call a **Corner Solution** because the consumer purchases 0 of one commodity.
- As opposed to our first example, where Bill bought some food and some drink, which was an **Interior Solution**.
- We also assumed Bill would spend all his money, or that the **Budget Constraint binds**.

Perfect Substitutes: Graphed

Question: If Bill has $5, and the price of Coca-Cola and Pepsi is $1, can you show on a graph why Bill only buys Pepsi?

Perfect Substitutes: Graphed



- Here the ICs look like Budget Constraints because Bill's tradeoff, or MRS, is constant just like a line!

Perfect Substitutes: Graphed