

# Intermediate Microeconomics. Lecture 7

## Income effect

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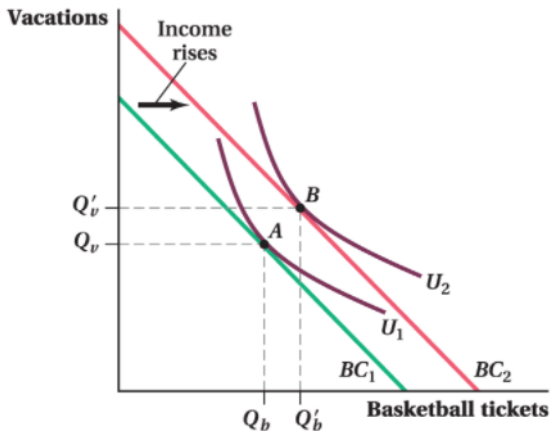
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Summer 2021

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- 1 Normal and Inferior Goods
- 2 Income Elasticities
- 3 The Income Expansion Path
- 4 The Engel Curve

# Response to an Increase in Income



Goolsbee et al., *Microeconomics*, 3e, © 2020 Worth Publishers

**Figure:** Consumer's Response to an Increase in Income

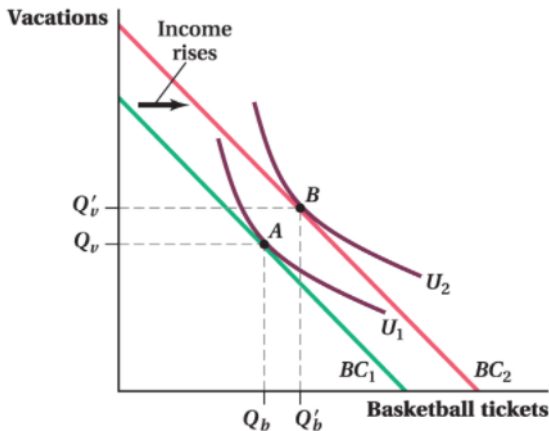
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# Normal and Inferior Goods

- Economists call a good for which consumption rises when income rises a **normal good**
- For a normal good, the income effect is positive
- A good for which consumption decreases when income rises is an **inferior good**

# Normal and Inferior Goods



Goolsbee et al., *Microeconomics*, 3e, © 2020 Worth Publishers

**Figure:** Consumer's Response to an Increase in Income When One Good Is Inferior

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# Income Elasticities and Types of Goods

- Income elasticity measures the percentage change in the quantity consumed of a good in response to a given percentage change in income

$$E_I^D = \frac{\Delta Q}{\Delta I} \cdot \frac{I}{Q}$$

- The first ratio in the income elasticity definition is the income effect shown in the equation above  $\frac{\Delta Q}{\Delta I}$ 
  - For normal goods:  $\frac{\Delta Q}{\Delta I} > 0$
  - For inferior goods:  $\frac{\Delta Q}{\Delta I} < 0$
- Necessity goods:  $0 \leq E_I^D \leq 1$
- Luxury goods:  $E_I^D \geq 1$



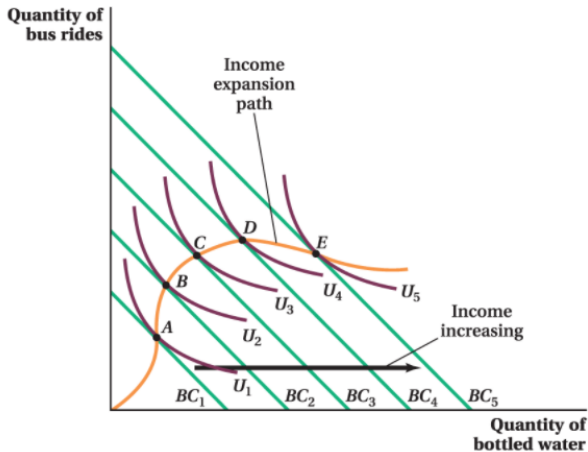
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# The Income Expansion Path

- Imagine repeating the analysis in the previous section for every possible income level, starting with 0
  - For a given set of prices and a particular set of preferences, find the utility-maximizing bundle for every possible budget constraint
  - Each constraint corresponds to a different income level
- If we draw a line connecting all the optimal bundles it would trace out the income expansion path

# The Income Expansion Path



Goolsbee et al., *Microeconomics*, 3e, © 2020 Worth Publishers

**Figure:** Income Expansion Path

# The Income Expansion Path

- The income expansion path is a curve that connects a consumer's optimal bundles at each income level
- This curve always starts at the origin because when income is zero, the consumption of both goods must also be zero
- When both goods are normal goods, the income expansion path will be positively sloped because consumption of both goods rises when income does
- Remember that whether a given good is normal or inferior can depend on the consumer's income level

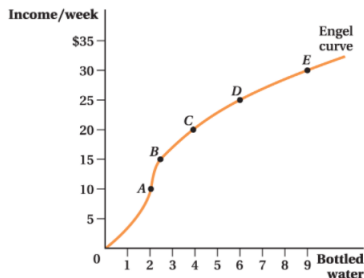
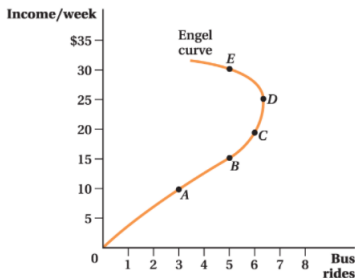
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# The Engel Curve

A better way to see how the quantity consumed of one good varies with income is to take the information conveyed by the income expansion path and plot it on a graph with income on the vertical axis and the quantity of the good in question on the horizontal axis

# The Engel Curve



Goolsbee et al., *Microeconomics*, 3e, © 2020 Worth Publishers

**Figure:** Engel Curves Show How Consumption Varies with Income

# The Engel Curve

- Engel curves show the relationship between the quantity of a good consumed and a consumer's income
- If the Engel curve has a positive slope, the good is a normal good at that income level
- If the Engel curve has a negative slope, the good is an inferior good at that income



## Example

Annika spends all of her income on golf and pancakes. Golf fee is \$10 per round. Pancake mix is \$2 per box. When Annika's income is \$100 per week, she buys 5 boxes of pancake mix and 9 rounds of golf. When Annika's income rises to \$120 per week, she buys 10 boxes of pancake mix and 10 rounds of golf. Determine whether each of the following statements is true or false

- Golf is a normal good, and pancake mix is an inferior good. **FALSE**
- Golf is a luxury good. **FALSE**

$$E_I^D = \frac{\Delta Q}{\Delta I} \cdot \frac{I}{Q} = \frac{1}{20} \cdot \frac{100}{9} = \frac{5}{9} < 1$$

# Example

- Pancakes are a luxury good. **TRUE**

$$E_I^D = \frac{\Delta Q}{\Delta I} \cdot \frac{I}{Q} = \frac{5}{20} \cdot \frac{100}{5} = 5 > 1$$