

UN1105 Principles of Economics

Recitation 4: Consumer Theory, continued

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Fall 2020

Outline

- Review of Concepts
 - Indifference Curves
 - Demand Curves
- Analytical Questions
 - Q1: K&W Problem 10A.01
 - Q2: K&W Problem 10A.13
- Short-answer Questions
 - Q3: Substit. and Income Effects
 - Q4: Total and Marginal Utility
 - Q5: Marginal Rate of Substitution

Review of Concepts, Indifference Curves (i)

- An indifference curve (IC) is a contour line on a 3D utility hill.
A collection of ICs is known as an IC map.
- Properties of ICs:
 1. Key Properties: (a) Indifference curves never cross, and (b) More is better.
 2. Additional Assumptions: (a) Downward-sloping, and (b) Convex.
- Slope
 - The slope of an IC, which we refer to as the MRS, reflects the trade-off between the two goods whilst holding utility constant.
 - Mathematically: $MU_x \Delta Q_x + MU_y \Delta Q_y = 0 \Rightarrow \frac{\Delta Q_y}{\Delta Q_x} = -\frac{MU_x}{MU_y}$
 - The principle of diminishing marginal utility implies convexity.
- Extreme Cases:
 - Perfect substitutes: MRS is constant, regardless of the consumption bundle.
 - Perfect complements: Desire to consume the goods in a fixed ratio, regardless of their relative price.
- Income and Substitution Effects.
 - The substitution effect of a price change is the change in consumption that arises from the substitution of the good that is now relatively cheaper for the good that is now relatively more expensive, whilst holding utility constant.
 - The income effect of a price change is the change in consumption caused by the change in purchasing power arising from the price change.

Review of Concepts, Indifference Curves

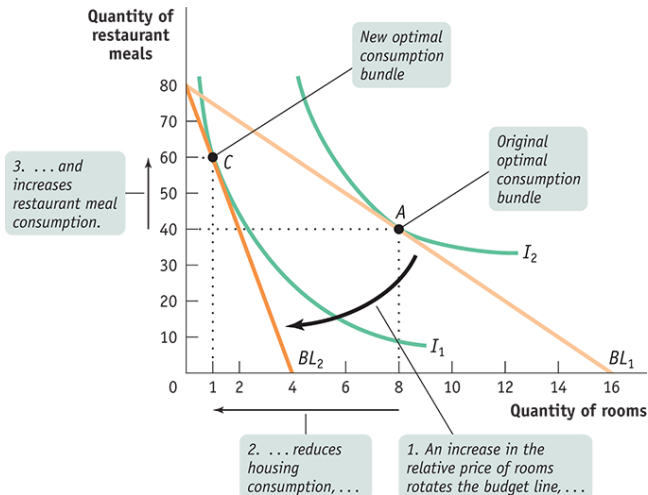


FIGURE 10A-13

Krugman/Wells, *Microeconomics*, 5e, © 2018 Worth Publishers

Review of Concepts, Indifference Curves

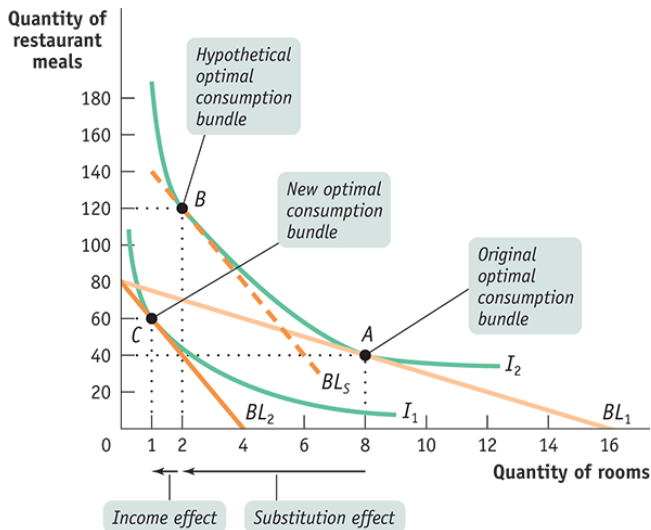


FIGURE 10A-17

Krugman/Wells, *Microeconomics*, 5e, © 2018 Worth Publishers

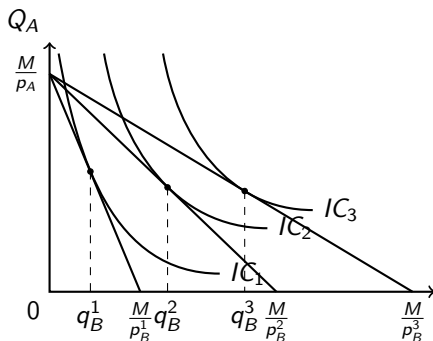
Review of Concepts, Demand Curves (i)

- (New material) Derivation of the individual demand curve.
 - How to go from consumer theory to demand curves?
 - We formally derive demand curves in UN3211.
 - For now, suppose a consumer has income M , which can be spent on two goods, A and B . We vary the price of B , holding all other factors constant, and examine how the optimal bundle changes.
- Aggregation of individual demand to market demand.
 - Horizontal summation: $Q(p) = \sum_{i=1}^N Q_i(p) = Q_1(p) + \cdots + Q_N(p)$
 - See recitation 1 for more details.

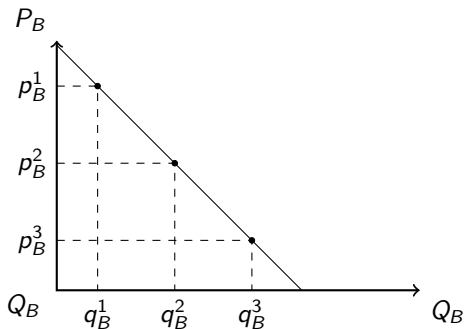
Review of Concepts, Demand Curves : Derivation

Figure 1: Derivation of the Individual Demand Curve

(a) Price-Consumption Path



(b) Demand Curve

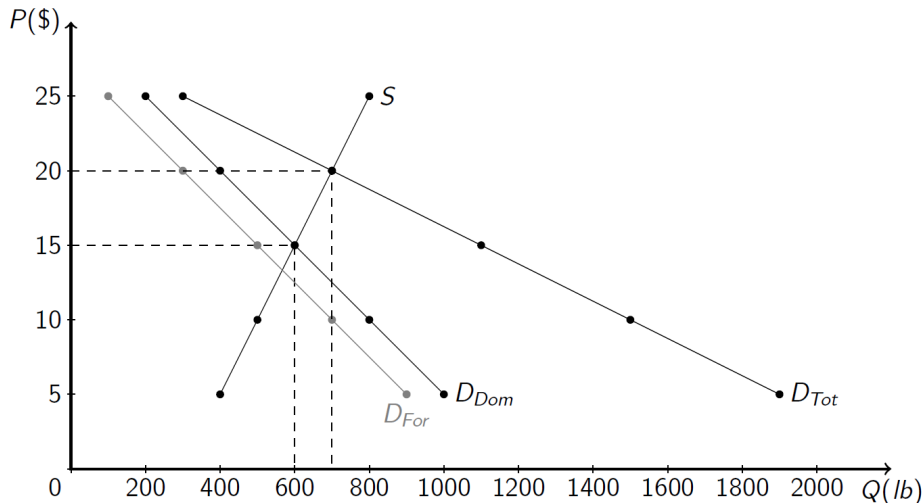


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Review of Concepts, Demand Curves , Aggregation

Figure 3: Maine Lobsters

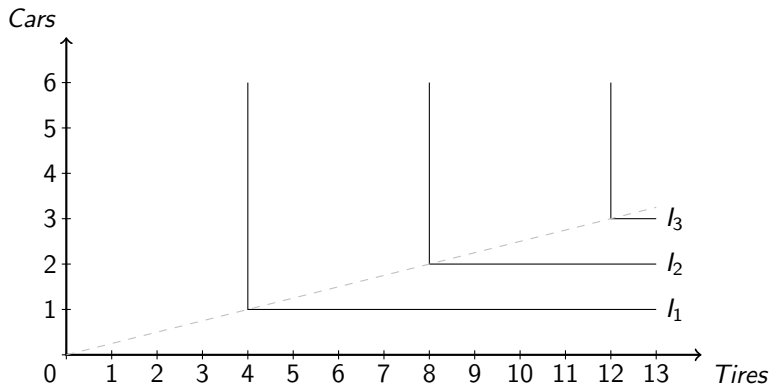


Analytical Questions, Q1: K&W Problem 10A.01

For each of the following situations, draw a diagram containing three of Isabella's indifference curves. Be sure to label and number the axes of your diagrams.

- (a) For Isabella, cars and tires are perfect complements, but in a ratio of 1:4; that is, for each car, Isabella wants exactly four tires. Place tires on the horizontal axis and cars on the vertical axis.

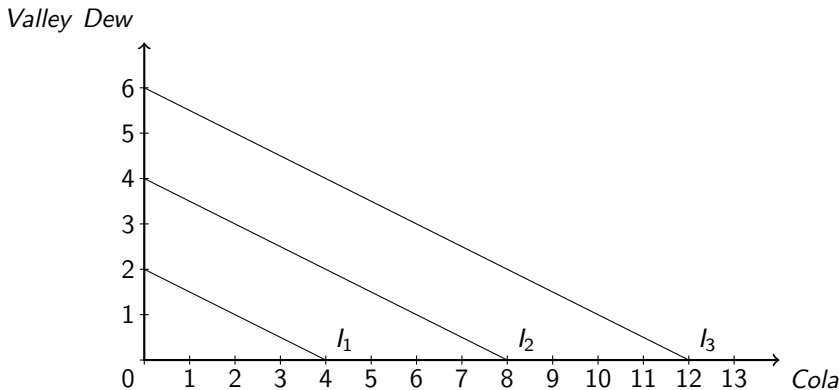
Figure 4: Cars and Tires



Analytical Questions, Q1: K&W Problem 10A.01

- (b) Isabella gets utility only from her caffeine intake. She can consume Valley Dew or cola, and Valley Dew contains twice as much caffeine as cola. Place cola on the horizontal axis and Valley Dew on the vertical axis.

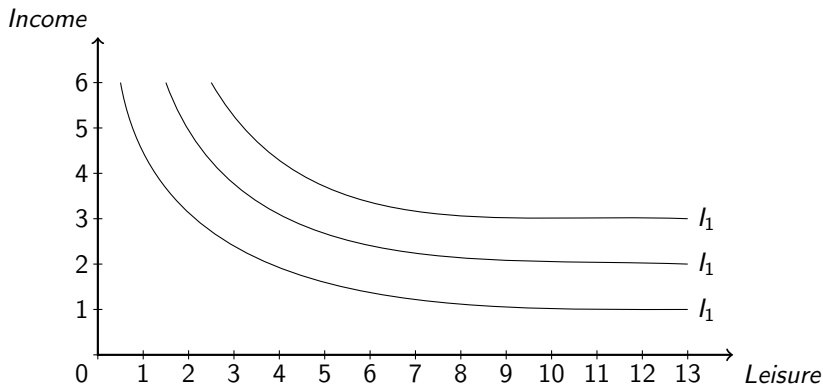
Figure 5: Cars and Tires



Analytical Questions, Q1: K&W Problem 10A.01

- (c) Isabella gets utility from consuming two goods: leisure time and income. Both have diminishing marginal utility. Place leisure on the horizontal axis and income on the vertical axis.

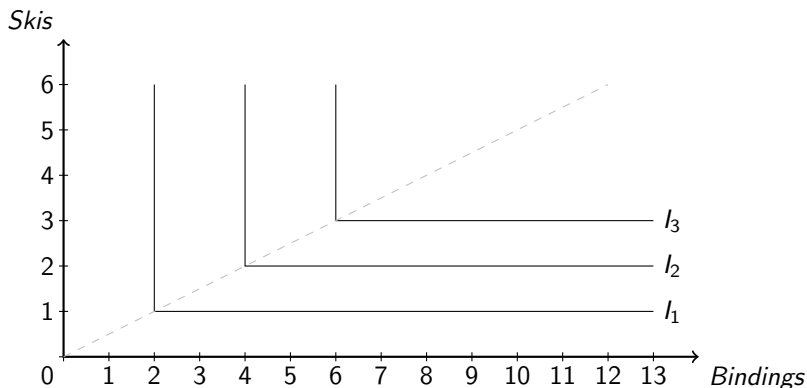
Figure 6: Income and Leisure



Analytical Questions, Q1: K&W Problem 10A.01 (ii)

- (d) Isabella can consume two goods: skis and bindings. For each ski she wants exactly one binding. Place bindings on the horizontal axis and skis on the vertical axis.

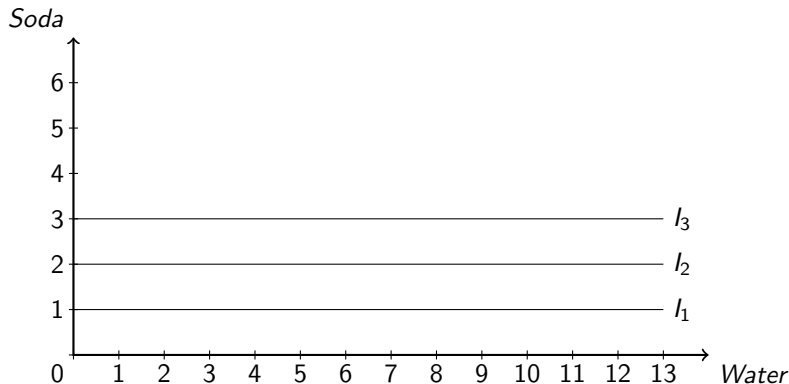
Figure 7: Skis and Bindings



Analytical Questions, Q1: K&W Problem 10A.01 (ii)

- (e) Isabella gets utility from consuming soda. But she gets no utility from consuming water: any more, or any less, water leaves her total utility level unchanged. Place water on the horizontal axis and soda on the vertical axis.

Figure 8: Soda and Water



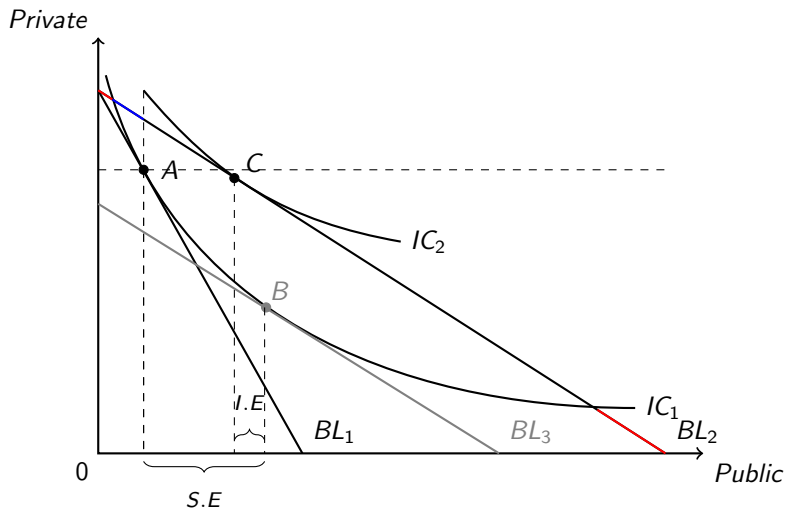
Analytical Questions, Q2: K&W Problem 10A.13(i)

Katya commutes to work. She can either use public transport or her own car. Her indifference curves obey the four properties of indifference curves for ordinary goods.

- (a) Draw Katya's budget line with car travel on the vertical axis and public transport on the horizontal axis. Suppose that Katya consumes some of both goods. Draw an indifference curve that helps you illustrate her optimal consumption bundle.
- (b) Now the price of public transport falls. Draw Katya's new budget line.
- (c) For Katya, public transport is an inferior, but not a Giffen, good. Draw an indifference curve that illustrates her optimal consumption bundle after the price of public transport has fallen. Is Katya consuming more or less public transport?
- (d) Show the income and substitution effects from this fall in the price of public transport.

Analytical Questions, Q2: K&W Problem 10A.13(ii)

Figure 9: Private vs. Public Transport



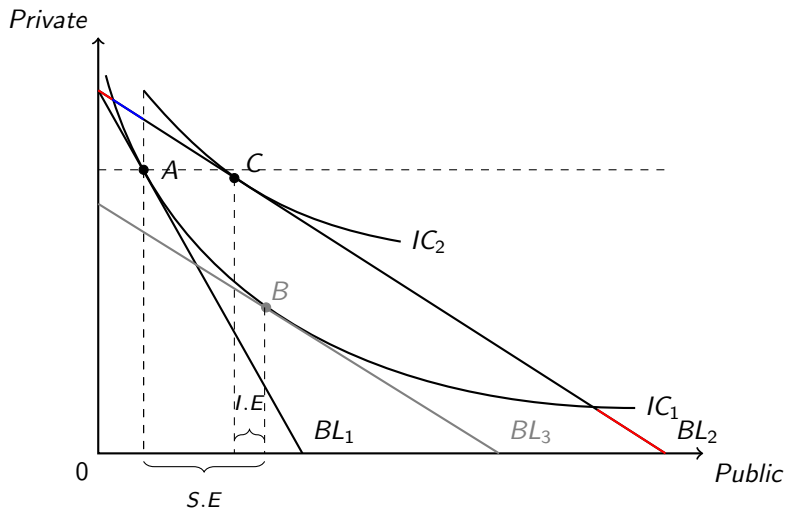
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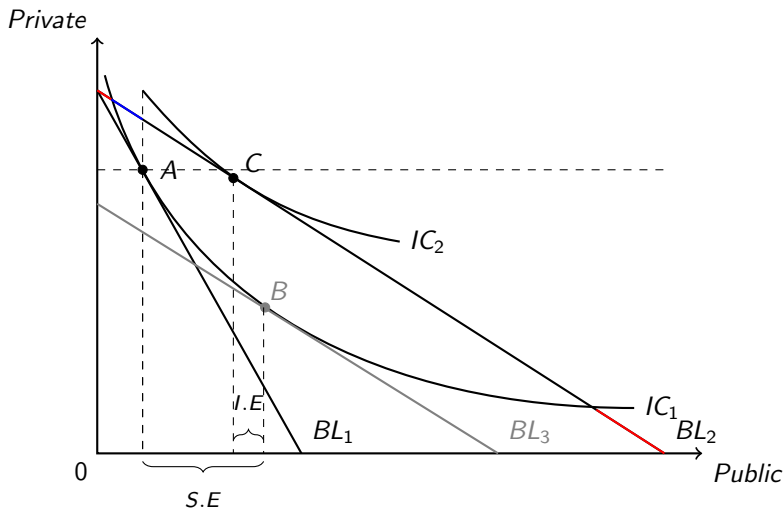
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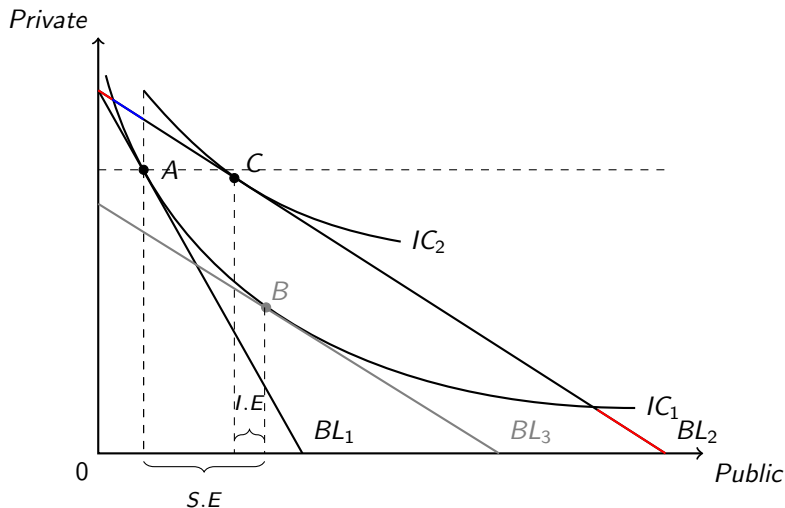
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Short-answer Questions, Q3: Substit. and Income Effects

The rising price of gasoline has caused your parents to use public transportation, rather than drive to work. They have also decided to cancel a cross-country trip for a family reunion. Are there substitution and income effects here? Explain.

Yes. The substitution effect is at work because public transportation has become (relatively) cheaper than driving to work. So they will take more trips on public transportation and buy less gasoline. The income effect is also at work because the increase in the price of gasoline has reduced their purchasing power. Because their income does not go as far, the plans for attending the family reunion have been canceled, which further decreases their gasoline consumption.

Short-answer Questions, Q4: Total and Marginal Utility

You have an economics test tomorrow and you think that you might need to stay up all night to study for it. Your professor argues against pulling this all-nighter because he thinks there is a point where more studying (and less sleeping) can actually do more harm than good. Using the concepts of total and marginal utility, explain your professor's position.

Your professor is arguing that, beyond a certain number of hours, more studying will actually decrease your total utility - a lack of sleep could prevent quick access to the material you already know. If you study too much, marginal utility may become negative (or at least lower than the marginal utility from sleeping), and you will have a lower score on the test. Your professor would argue that you should stop studying before marginal utility from studying dips below the marginal utility from sleeping.

Short-answer Questions, Q5: Marginal Rate of Substitution

Explain the concept of the marginal rate of substitution. Provide an intuitive rather than mathematical reason it is believed to be diminishing as a consumer moves down an indifference curve.

The marginal rate of substitution (MRS) tells us how many units of good Y a person is willing to give up to get one more unit of good X, holding utility constant. Along an indifference curve, as a person consumes more and more of good X and gives up less and less of good Y, the MRS falls. Intuitively, the person has very few units of good Y left, making him or her quite reluctant to part with any more of good Y to get more units of good X, which he or she now has in abundance.