

Discussion Handout 6

1 Topics

- Utility maximization
- Substitution and Income Effects
- Demand Curve Derivation
- Engel Curve (and its derivation)

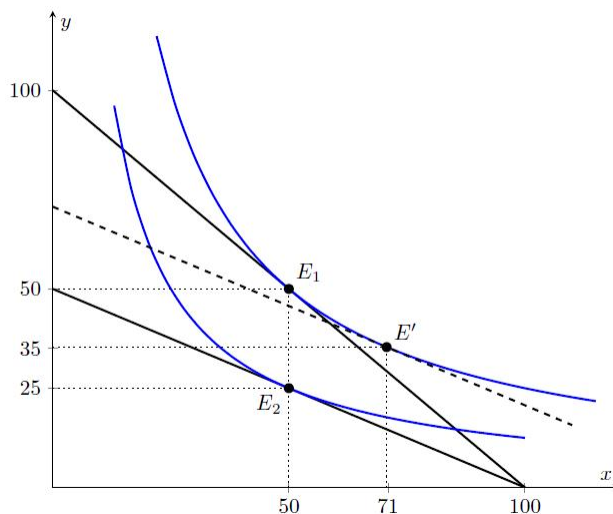
2 Problems

Exercise 1 (Consumer Theory Without Graphs) Bucky is a utility maximizer. Bucky has \$80 to spend on Badger basketball tickets and economics textbooks. Given that the price of basketball tickets is \$10 and economics textbooks is \$10 in addition to the data in the table:

Quantity	TU tickets	MU tickets	MU/\$	TU econ texts	MU econ texts	MU/\$
1	25			40		
2	45			70		
3	60			95		
4	70			115		
5	75			130		
6	77			140		
7	76			145		

1. How many tickets and textbooks should Bucky purchase?
2. What is Bucky's total utility from the purchase?
3. What is Bucky's saturation point for basketball tickets?

Exercise 2 Suppose 2Chainz has preferences between two chains (x) and (y), as represented in the graph below. Point E_1 is 2Chainz's initial consumption bundle. Then,



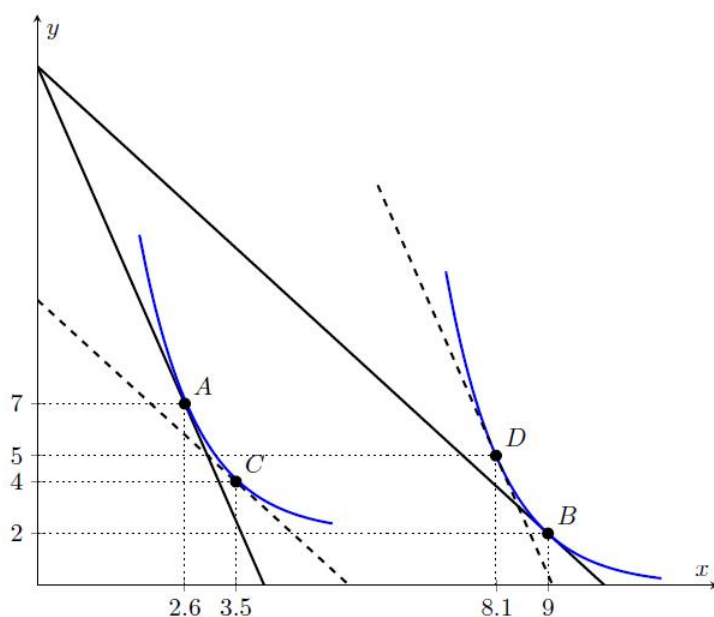
the price of chain 'y' increases, causing 2Chainz to consume at point E_2 . Point E' is the intermediate point between these two consumption bundles that is used to decompose the price (total) effect into income and substitution effects(it is therefore sometimes called a decomposition basket).

1. Will the substitution effect for chain 'x' be positive or negative? What about the income effect? Which effect is dominant? Explain.
2. Will the substitution effect for chain 'y' be positive or negative? What about the income effect? Which effect is dominant? Explain.
3. Compute the magnitude of these effects by completing the table below.

	Substitution effect	Income effect	Price (total) effect
Pointwise	E_1 to E'	E' to E_2	E_1 to E_2
Chain 'x'			
Chain 'y'			

4. Assuming a linear demand curve for chain 'y', what will this demand curve look like?
5. For 2Chainz is chain 'x' a normal or inferior good? What about chain 'y'? Justify your answer.

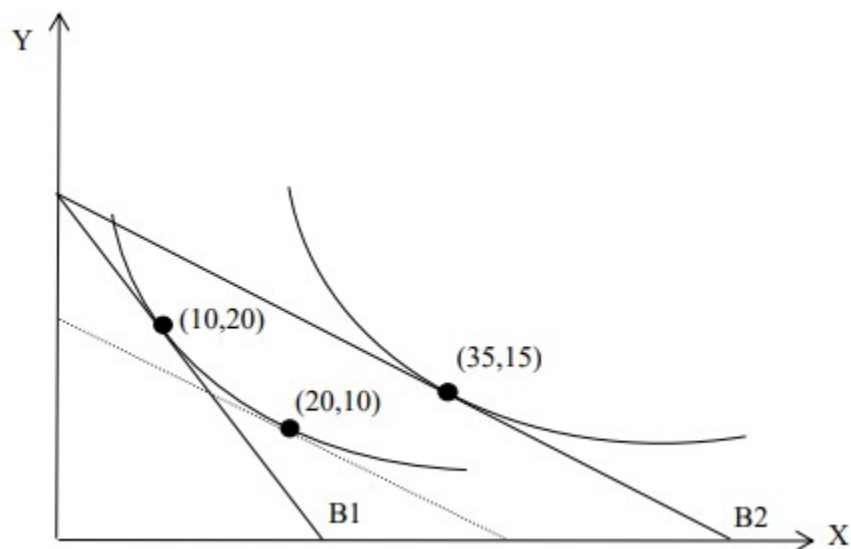
Exercise 3 Professor Hansen has recently taken a liking to 1970's R&B/Soul music. She has preferences for Al Green albums (X), and Stevie Wonder albums (Y), which are represented in the graph below. Use it to answer the following questions.



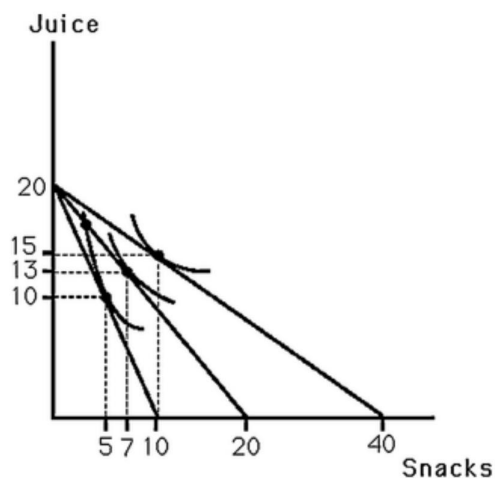
1. Are Al Green albums (X) a normal or inferior good for Prof. Hansen? What about Stevie Wonder albums (Y)? Explain.
2. Suppose Prof. Hansen is initially consuming at point A. Then the price of Al Green albums (X) decreases, causing her to consume at point B. To determine income and substitution effects, which intermediate point should be used to yield the correct result? C or D? Are both okay? (Hint: old utility, new prices.)
3. Suppose Prof. Hansen is initially consuming at point B. Then the price of Al Green albums (X) increases, causing her to consume at point A. To determine income and substitution effects in this case, which intermediate point should be used to yield the correct result? C or D? Are both okay? (Hint: old utility, new prices.)

3 Multiple Choice Questions

Exercise 4 Use the following information to answer the next two questions. Alice consumes only goods X and Y. The following graph represents Alice's utility maximization problem following an decrease in the price of X, changing her budget line from B1 to B2.



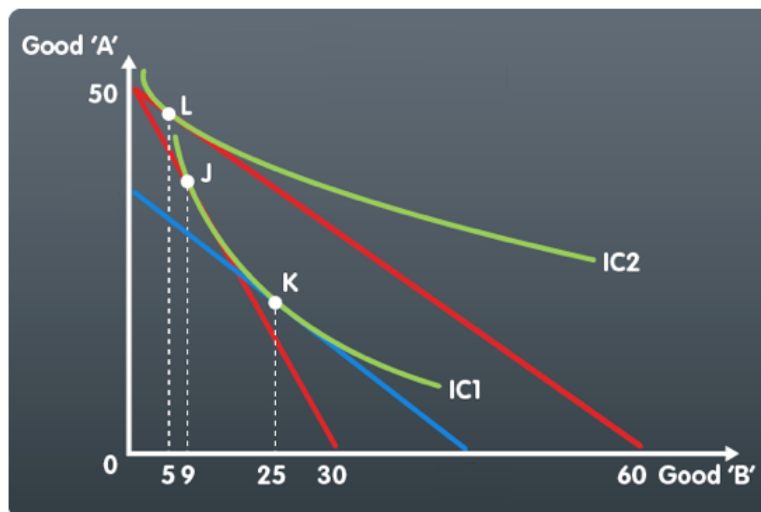
- Which of the following statements describes Alice's income and substitution effects given the above information and graph?
 - Income effect is 5 units of Y; and Substitution effect is 10 units of Y.
 - Income effect is -10 units of Y; and Substitution effect is 5 units of Y.
 - Income effect is 10 units of Y; and Substitution effect is -5 units of Y.
 - Income effect is 5 units of Y; and Substitution effect is -10 units of Y.
- Now suppose that the initial price of good X is $P_{X1} = \$2$, the new price is $P_{X2} = \$1$, and the price of good Y is $P_Y = \$3$. Suppose that in order to purchase X with the lower price, Alice has to buy a coupon. What is the maximum amount that Alice would be willing to pay for that coupon? (Hint: The greatest amount would be when she retains her old utility level with the new price)
 - \$100
 - \$80
 - \$50
 - \$30



Exercise 5 The above figure shows Lily's indifference curves for juice and snacks. Also shown are three budget lines resulting from different prices for snacks. She has \$20 to spend on these goods. Which one of the following point is on Lily's demand curve for snacks?

- (a) $p=\$2$, $q=7$
- (b) $p=\$2$, $q=10$
- (c) $p=\$1$, $q=7$
- (d) $p=\$1$, $q=10$

Exercise 6 Use the following information to answer the next two questions. The following graph¹ describes the situation where the price of good B went down. IC1 indicates the indifference curve before the price change and IC2 indicates the indifference curve after the price change.



1. Which of the following statements describes the income effect?
 - (a) The income effect is -20 units of Good B.
 - (b) The income effect is -16 units of Good B.
 - (c) The income effect is -4 units of Good B.
 - (d) The income effect is 16 units of Good B.
2. Which of the following statements is/are true?
 - I. The price elasticity of demand is negative.
 - II. The price elasticity of demand is positive.
 - III. The income elasticity of demand is negative.
 - IV. The income elasticity of demand is positive.
 - (a) I and III only
 - (b) I and IV only
 - (c) II and III only
 - (d) II and IV only

¹Graph from Econfix (<https://econfix.wordpress.com/2016/09/23/indifference-curves-and-giffen-goods/>)