Chapter 3

Consumer Behavior

Question:

- Mary goes to the movies eight times a month and seldom goes to a bar.
- Tom goes to the movies once a month and goes to a bar fifteen times a month.

- What determine consumers' choice?

Consumer Behavior

- Three steps involved in the study of consumer behavior
1. (   )
    - How and why people prefer one good to another
2. (   )
    - People have limited incomes

Consumer Behavior

3. Given preferences and limited incomes, what amount and type of goods will be purchased?
    - What combination of goods will consumers buy to maximize their satisfaction?

Consumer Preferences – Basic Assumptions

1. Preferences are (   ).
    - Consumers can rank market baskets.
2. Preferences are (   ).
    - If one prefers A to B and B to C, then one must prefer A to C.
3. Consumers *always prefer more* of any good to less.
    - The more, the better.
    - No satiation.

Indifference Curves

- Consumer preferences can be represented graphically using (   )
- Indifference curves represent all combinations of market baskets that the person is *indifferent to.*
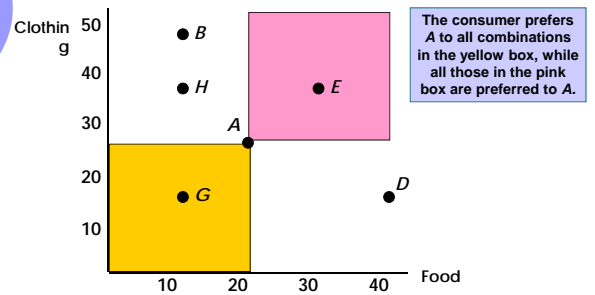- (   )

Indifference Curves: An Example

Market Basket	Units of Food	Units of Clothing
A	20	30
B	10	50
D	40	20
E	30	40
G	10	20
H	10	40

Indifference Curves: An Example

Clothing

The consumer prefers *A* to all combinations in the yellow box, while all those in the pink box are preferred to *A*.

Food

Indifference Curves: An Example

Clothing

- Indifferent between B, A, & D
- *E* is preferred to U_1
- U_1 is preferred to *H* & *G*
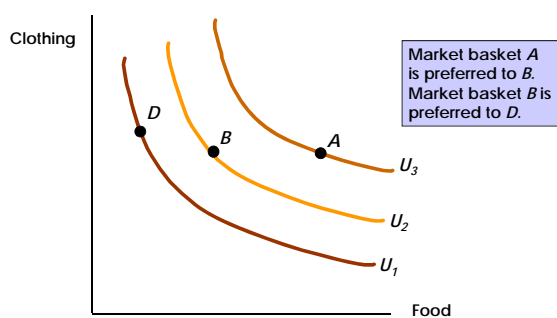
U_1

Food
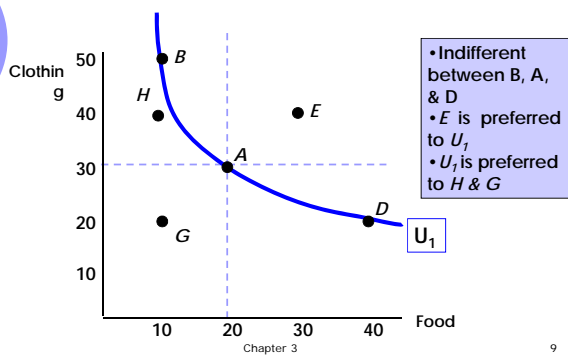
Indifference Curves

- Indifference curves slope downward to the right.
  - If it sloped upward it would violate the assumption that more is preferred to less.
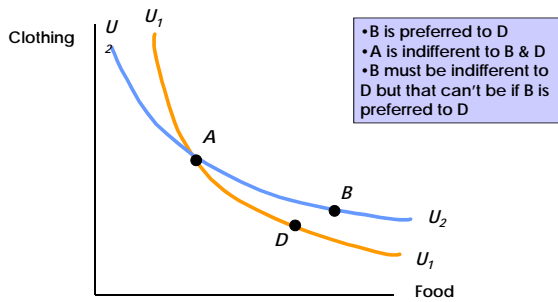
Indifference Map

Clothing

Market basket *A* is preferred to *B*. Market basket *B* is preferred to *D*.

U_3
U_2
U_1

Food

Indifference Maps

- Indifference curves can not cross
  - Why?

Indifference Maps

Clothing

U_2 U_1

A

B

D

U_2

U_1

Food

- B is preferred to D
- A is indifferent to B & D
- B must be indifferent to D but that can't be if B is preferred to D
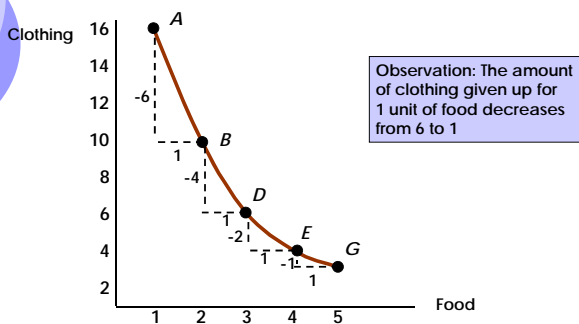
Indifference Curves

- The shape of indifference curves describes how a consumer is willing to substitute one good for another
  - A to B, give up 6 clothing to get 1 food
  - D to E, give up 2 clothing to get 1 food
- The more clothing and less food a person has, the more clothing they will give up to get more food

Indifference Curves

Clothing

16 A
14
12 -6
10   B
8   1
     -4
6   D
    1
4 -2   E   G
       1 -1
2   1

1   2   3   4   5   Food

Observation: The amount of clothing given up for 1 unit of food decreases from 6 to 1
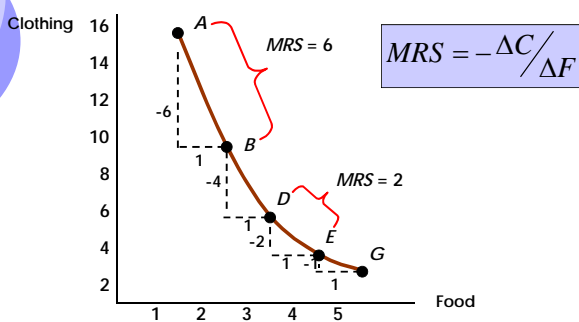
Indifference Curves

- We measure how a person trades one good for another using the *marginal rate of substitution (MRS)*
  - The amount of one good a consumer will give up to obtain more of another good.
  - It is measured by (   ).

Marginal Rate of Substitution

Clothing

16 A
14   MRS = 6
12
10 -6
8   B
    1
6   -4   D
       1
4 -2   E   G
       MRS = 2
2   1 -1
           1

1   2   3   4   5   Food

$$MRS = -\frac{\Delta C}{\Delta F}$$

Marginal Rate of Substitution

- Indifference curves are convex (to the origin)
  - As more of one good is consumed, a consumer would prefer to give up fewer units of a second good to get additional units of the first one.

Marginal Rate of Substitution

- The MRS decreases as we move down the indifference curve
  - Along an indifference curve there is a *diminishing marginal rate of substitution*.
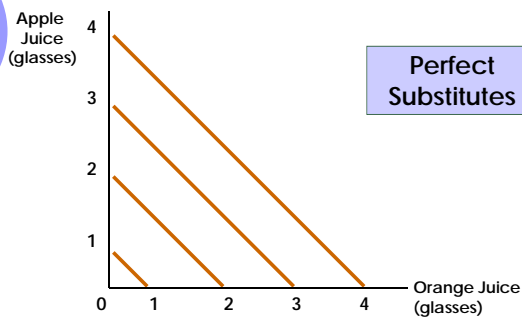 - The MRS went from 6 to 4 to 1

Marginal Rate of Substitution

- Perfect Substitutes
  - Two goods are perfect substitutes when the marginal rate of substitution of one good for the other is constant.
  - Example: a person might consider apple juice and orange juice perfect substitutes

Consumer Preferences

Apple Juice (glasses) / Orange Juice (glasses)
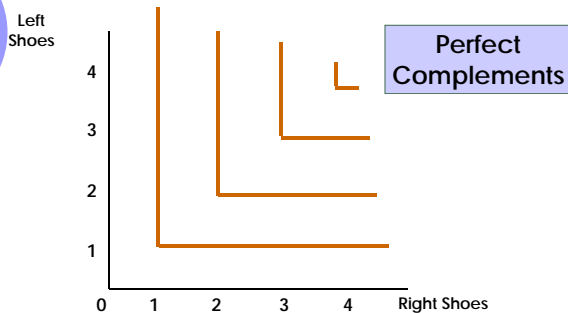
Perfect Substitutes

Consumer Preferences

- Perfect Complements
  - Two goods are perfect complements when the indifference curves for the goods are shaped as right angles.
- Example: An additional left shoe gives her no extra satisfaction unless she also obtains the matching right shoe.

Consumer Preferences

Left Shoes / Right Shoes

Perfect Complements

Consumer Preferences

- Utility
  - A numerical score representing the satisfaction.

Utility

- *(   )*
  - ○ Formula that assigns a level of utility to individual market baskets
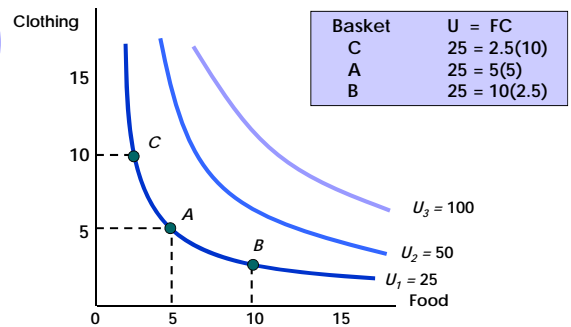 - ○ If the utility function is

$$U(F,C) = F + 2C$$

Utility - Example

Market Basket	Food	Clothing	Utility
A	8	3	8 + 2(3) = 14
B	6	4	6 + 2(4) = 14
C	4	4	4 + 2(4) = 12

Utility - Example

- Baskets for each level of utility can be plotted to get an indifference curve
  - ○ To find the indifference curve for a utility of 14, we can change the combinations of food and clothing that give us a utility of 14

Utility - Example

Basket	U = FC
C	25 = 2.5(10)
A	25 = 5(5)
B	25 = 10(2.5)

$U_3 = 100$
$U_2 = 50$
$U_1 = 25$

Utility - Example

- Draw the indifference curves of following utility functions.

- U (X, Y) = 5 XY
- U (X, Y) = 10 (X + Y)
- U (X, Y) = 5 min (X, Y)

Utility

- Although we numerically rank baskets and indifference curves, numbers are ONLY for ranking
- A utility of 4 is not necessarily twice as good as utility of 2
- There are two types of ranking
  - ○ Ordinal ranking
  - ○ Cardinal ranking

Utility

- *Ordinal Utility Function*
  - Places market baskets in the order of most preferred to least preferred, but it does not indicate how much one basket is preferred to another.
- *Cardinal Utility Function*
  - Utility function describing the extent to which one market basket is preferred to another.

Budget Constraints

- ( )
  - All combinations of two commodities for which total money spent equals total income.
  - We assume only 2 goods are consumed, so we do not consider savings

The Budget Line

- Let F equal the amount of food purchased, and C is the amount of clothing.
- Price of food = P_F and price of clothing = P_C
- Then P_F F is the amount of money spent on food, and P_C C is the amount of money spent on clothing.

The Budget Line

- The budget line then can be written:

$$P_F F + P_C C = I$$

Budget Constraints
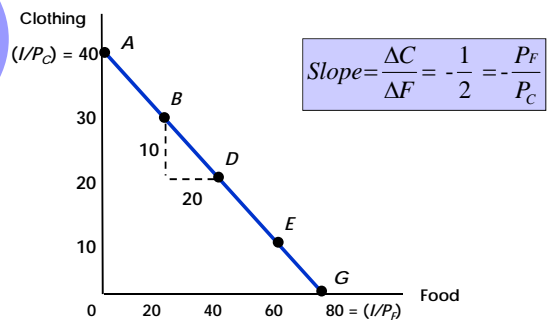
Market Basket	Food P_F = $1	Clothing P_C = $2	Income I = P_FF + P_CC
A	0	40	$80
B	20	30	$80
D	40	20	$80
E	60	10	$80
G	80	0	$80

The Budget Line

$$Slope = \frac{\Delta C}{\Delta F} = -\frac{1}{2} = -\frac{P_F}{P_C}$$

The Budget Line

- The slope indicates the rate at which the two goods can be substituted without changing the amount of money spent.
- We can rearrange the budget line equation to make this more clear

Chapter 3

The Budget Line

$$I = P_X X + P_Y Y$$
$$I - P_X X = P_Y Y$$
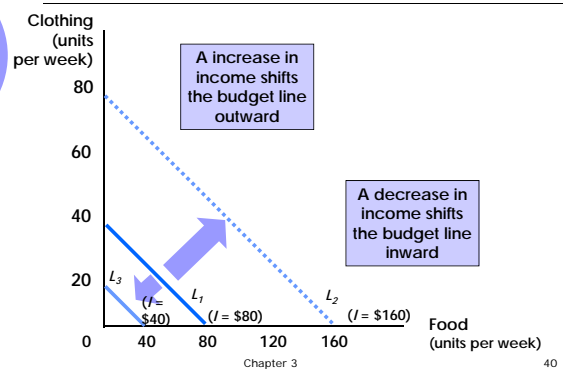$$\frac{I}{P_Y} - \frac{P_X}{P_Y} X = Y$$

Budget Constraints

- The Budget Line
  - The vertical intercept (I/P_C), illustrates the maximum amount of C that can be purchased with income I.
  - The horizontal intercept (I/P_F), illustrates the maximum amount of F that can be purchased with income I.
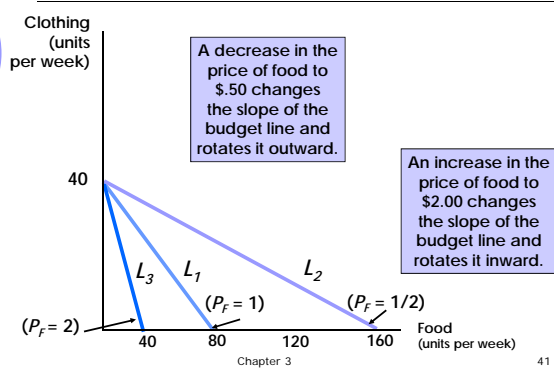
The Budget Line - Changes

Clothing (units per week)

A increase in income shifts the budget line outward

A decrease in income shifts the budget line inward

L_3 (I = 40) L_1 (I = 80) L_2 (I = 160)

Food (units per week)

The Budget Line - Changes

Clothing (units per week)

A decrease in the price of food to $.50 changes the slope of the budget line and rotates it outward.

An increase in the price of food to $2.00 changes the slope of the budget line and rotates it inward.

L_3 L_1 L_2

(P_F = 2)   (P_F = 1)   (P_F = 1/2)

Food (units per week)

Consumer Choice

- Given preferences and budget constraints, how do consumers choose what to buy?
- Consumers choose a combination of goods that will maximize their satisfaction, given the limited budget available to them.
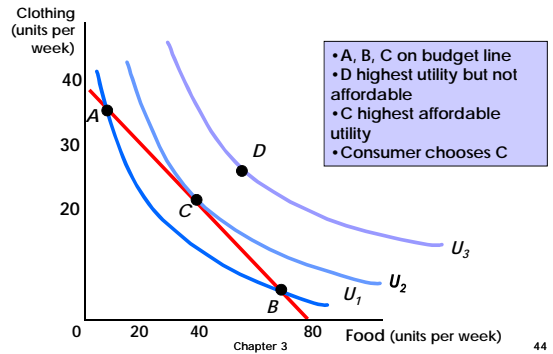
Consumer Choice

- The maximizing market basket must satisfy two conditions:
1. It must be located on the budget line.
2. It must give the consumer the most preferred combination of goods and services.

Consumer Choice

- A, B, C on budget line
- D highest utility but not affordable
- C highest affordable utility
- Consumer chooses C

Consumer Choice

- Consumer wants to choose highest utility within their budget
- In previous graph, point C is where the indifference curve is just tangent to the budget line
- Slope of the budget line equals the slope of the indifference curve at this point

Consumer Choice

- Recall, the slope of an indifference curve is:

$$MRS = -\frac{\Delta C}{\Delta F}$$

Further, the slope of the budget line is:
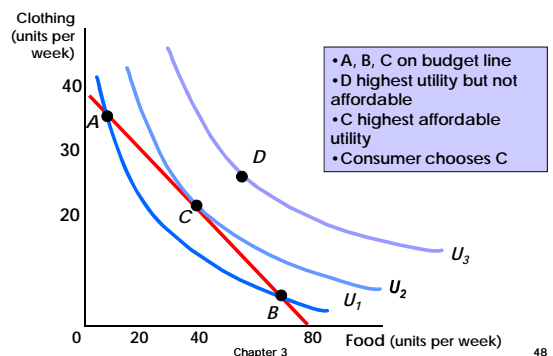
$$Slope = -\frac{P_F}{P_C}$$

Consumer Choice

- Therefore, it can be said at consumer's optimal consumption point,

$$MRS = \frac{P_F}{P_C}$$

Consumer Choice

- A, B, C on budget line
- D highest utility but not affordable
- C highest affordable utility
- Consumer chooses C

Marginal Utility and Consumer Choice

- Formally:

$$0 = MU_F(\Delta F) + MU_C(\Delta C)$$

No change in total utility along an indifference curve. Trade off of one good to the other leaves the consumer just as well off

Marginal Utility and Consumer Choice

- Rearranging:

$$-(\Delta C / \Delta F) = MU_F / MU_C$$
$$Since$$
$$-(\Delta C / \Delta F) = MRS \ of \ F \ for \ C$$
$$We \ can \ say$$
$$MRS = MU_F/MU_C$$

Marginal Utility and Consumer Choice

- When consumers maximize satisfaction:

$$MRS = P_F/P_C$$

Since the MRS is also equal to the ratio of the marginal utility of consuming F and C

$$MU_F/MU_C = P_F/P_C$$

Marginal Utility and Consumer Choice

- Rearranging, gives the equation for utility maximization:

$$MU_F / P_F = MU_C / P_C$$