Theory of consumer choice

ROOM 1: Consumer's Preference (Tastes)

ROOM 2: Consumer's Affordability

ROOM 3: Consumer Choice

3 questions
1. What a consumer wants? → Preferences
2. What baskets of goods a consumer can afford? → Budget Constraint
3. Given Preferences (1) and Budget constraint (2), which basket maximize consumer's utility (or satisfaction)?

Main Concern

Suppose we have 2 goods: x (meals) & y (movies)

P_x, P_y, M

To maximize his utility, How many units of x and y he should choose optimally.

Mathematically,

Maximize $U(x, y)$ → objective function

Subject to budget constraint: $\underbrace{\underbrace{P_x \cdot x}_{\text{expenditure spent on good x}} + \underbrace{P_y \cdot y}_{\text{expenditure spent on good y}}}_{\text{total expenditure}} \leq M$ (money income)

$$\boxed{(x = ?,\ y = ?) \rightarrow \max U}$$

↓

consumer's utility maximization problem (UMP)

Actually, we have 2 approaches to answer the question above:

1. via Cardinal approach (OLD APPROACH)
   - Cardinal: measurable
   - Pioneered by Jeremy Bentham (Father of Utilitarianism (School of thought))
   - "Utility is measurable" (assumed)
2. via Ordinal approach (NEW APPROACH) OR MODERN ECONOMIC THEORY
   - Ordinal: ordering
   - "It is enough to study consumer's behavior if he/she can "rank" his/her preferences

Let's start w/ ORDINAL APPROACH:

- To study "Preferences", tool is "INDIFFERENCE CURVES"
- To study "Affordability", tool is "BUDGET LINES"
- To study "Choice", tool is "CONSTRAINT OPTIMIZATION"

1. Preferences (Tool is IC)

To start w/, we have to make some assumptions about consumer's preference as follows:

① He/she must be able to "rank"

(EX) When we offer a consumer 2 baskets: X & Y, he/she must be able to tell us one of the three possible answers:

IS PREFERRED TO

① She likes X more than Y : $X \succ Y \leftrightarrow U(X) > U(Y)$

② She likes Y more than X : $Y \succ X \leftrightarrow U(Y) > U(X)$

③ X and Y are indifferent : $X \sim Y \leftrightarrow U(X) = U(Y)$

② He/She loves variety (OR Averages are preferred to Extremes)

	FOOD	CLOTHES
	(F,	C)
basket X:	(0,	100)
basket Y:	(60,	40)
basket Z	(100,	0)

$Y \succ X$ and $Y \succ Z$ ✓

$\updownarrow$ $\updownarrow$

$U(Y) > U(X)$ $U(Y) > U(Z)$

③ He/She prefers more of the goods rather than less of the goods

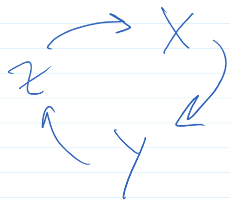
i.e., "More is preferred to less"

or

"More is better"

④ His/her preference is consistent. (Transitivity)

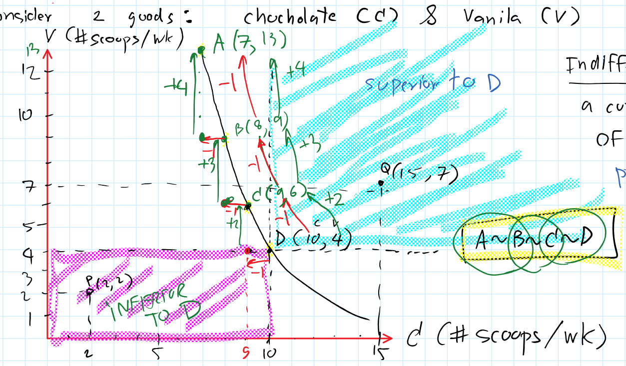
If $X \succ Y$ and $Y \succ Z$, then, to be consistent, it must be the case that $\underline{X \succ Z}$.



$X \rightarrow Y \rightarrow Z$

Indifference Curves

Consider 2 goods: chocholate (C) & Vanila (V)



Indifference curve:

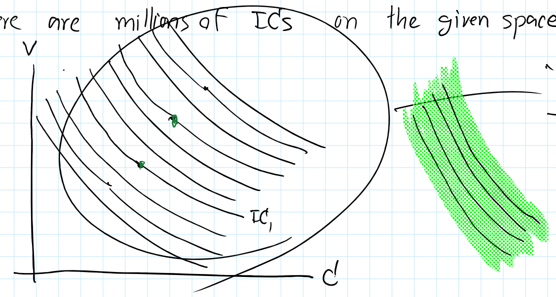
a curve contains all baskets of the two goods that provide the same satisfaction level to the consumer.

- D ≻ P
- Q ≻ D

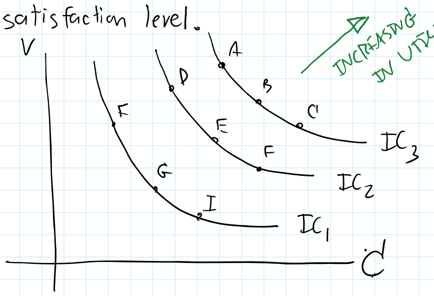
Properties of IC's

① IC's are downward sloping.

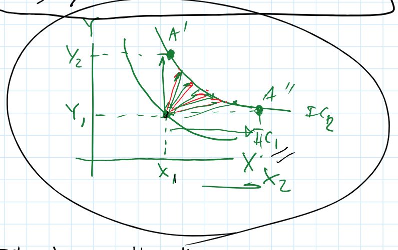
② There are millions of IC's on the given space:



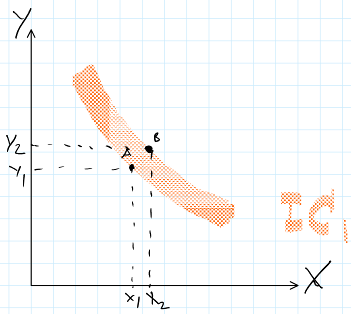
③ The higher the IC's towards NE direction, the higher satisfaction level.



$U_{on\ IC_3} > U_{on\ IC_2} > U_{on\ IC_1}$



④ An IC is not thick. In other words, an IC is a thin line.



Proof by Contradiction; let's make a thick IC and see if something goes wrong...

Student A

Since A and B are on the same IC then, A ~ B

Student B

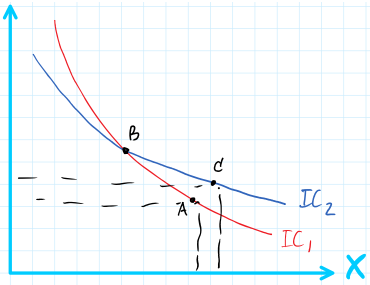
Since B has more of the two goods compare to basket A, then B ≻ A.

Since either A~B or B ≻ A can be true. Both statements cannot be true at the same time.

This is called "Contradiction" which emerges when thick IC is allowed.

If we want to avoid such contradiction, don't make a thick IC!

⑤ IC's from the same indifference map "DO NOT CROSS."



Proof by contradiction: make them cross and see what happens...

On IC_1: Since A and B are on the same IC, namely IC_1, then $A \sim B$.

On IC_2: Since B and C are on the same IC, namely IC_2, then $B \sim C$.

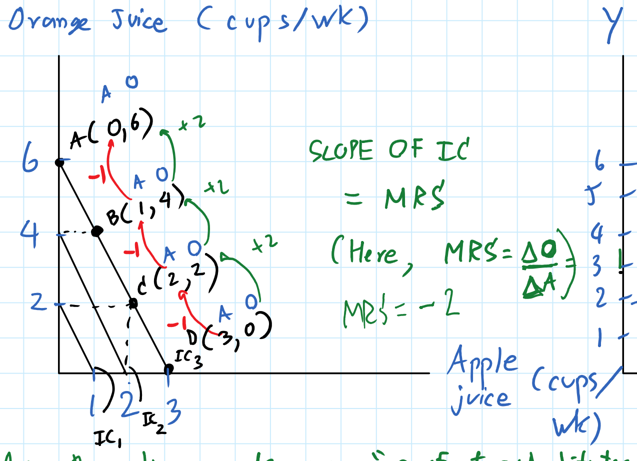
By transitivity, when $A \sim B$ and $B \sim C$, then $A \sim C$. — STATEMENT ①

Since C contains more of x and Y, then, By more-is-better assumption, $C \succ A$ ⟷ ②

Again, contradiction emerges when we allow for crossing IC's.

To avoid this contradiction, don't make crossing IC's.

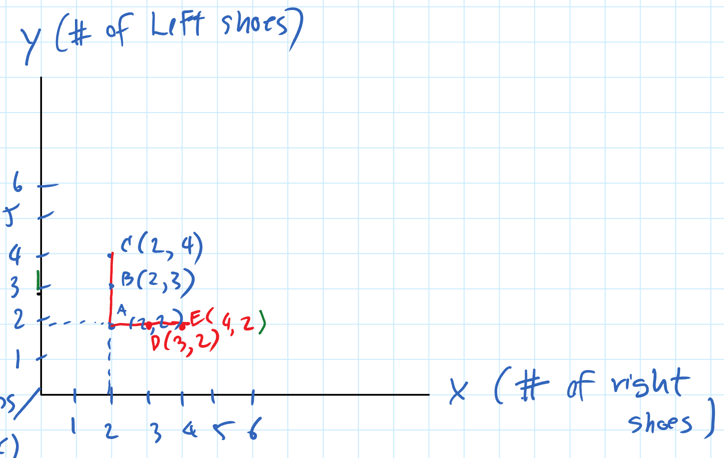
Two extreme examples of IC's



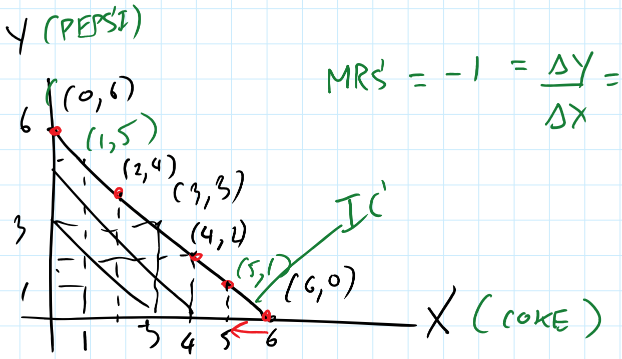
SLOPE OF IC
= MRS

(Here, $MRS = \frac{\Delta O}{\Delta A}$)

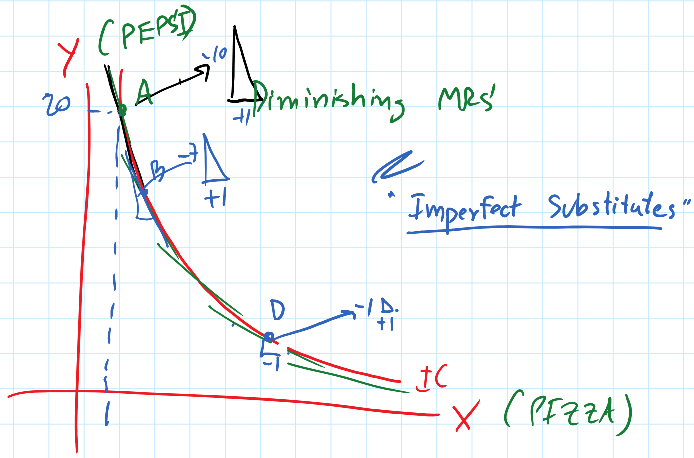
$MRS = -2$



When the two goods are "perfect substitutes", IC's are straight line.



$MRS = -1 = \frac{\Delta Y}{\Delta X} = \frac{-1}{+1}$



MRS = Marginal Rate of Substitution

⇓

the rate at which a buyer is willing to trade one good for another so that his utility remains constant. (or remains the same.)

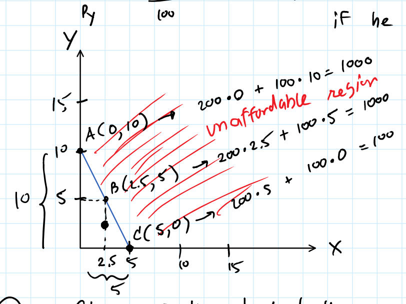
Budget Constraint

Consider 2 goods : Good X & Good Y

P_X = 200 baht/unit
P_Y = 100 baht/unit
M = 1000 baht/week

$\frac{M}{P_X} = \frac{1000}{200} = 5$ ⇒ max. amount of good x the buyer can buy if he buys no Y.

$\frac{M}{P_Y} = \frac{1000}{100} = 10$ ⇒ max amount of good Y that buyer can buy if he buys no x.



Budget Line contains

all consumption basket where money is spent up.

① Slope of the budget line = $-\frac{10}{5} = -2$ → opportunity cost of good x measured in terms of good Y.

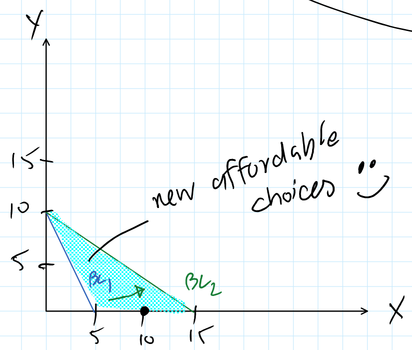
−2Y ⟶ +1X

② • He cannot afford any consumption baskets outside his BL.
• If he spends on the baskets on BL, no money left.
• If he buys any basket inside the BL, he will have some money left.

③ Suppose P_X becomes cheaper...

B/F	→	A/F
$P_X = 200$		$P_X' = 100$
$P_Y = 100$		$P_Y = 100$
$M = 1000$		$M = 1000$

$\frac{M}{P_X} = \frac{1000}{200} = 5$ ⟶ $\frac{M}{P_X'} = \frac{1000}{100} = 10$



• when $P_X \downarrow$, BL rotates outward from BL_1 to BL_2

• OLD SLOPE = $-\frac{P_X}{P_Y} = -\frac{200}{100} = -2$

NEW SLOPE = $-\frac{P_X'}{P_Y} = -\frac{100}{100} = -1$

opp. cost of X becomes cheaper.