Lecture1

Wednesday, August 20, 2014

11:00 AM

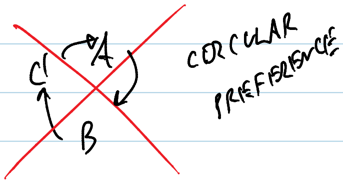
CONSUMER BEHAVIOR

PREFERENCES	AFFORDABILITY	CONSUMER'S UTILITY MAXIMIZATION
TOOLS: IC's	BUDGET LINE	CONTRAINT OPTIMIZATION

ASSUMPTIONS ABOUT CONSUMER'S PREFERENCES.

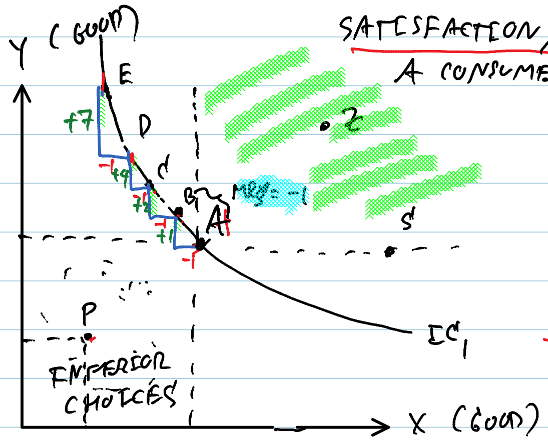
1. ? CAN RANK HIS PREFERENCES.
2. HE LOVES MORE OF GOODS RATHER THAN LESS.
3. HE LOVES VARIETY: AVERAGE IS PREFERED TO EXTREME.
4. TRANSITIVITY: IF A ≻ B AND B ≻ C, THEN A ≻ C.
   (≻ : IS PREFERED TO)

TO ENSURE CONSISTENCY OF PREFERENCE



ONCE THIS BUYER SATISFIED THESE 4 ASSUMPTIONS, WE SAID THAT " HIS PREFERENCE IS WELL-DEFINED.

AN INDIFFERENCE CURVE (= EQUAL UTILITY CURVE): {A SET / A COLLECTION / A FAMILY} OF ALL BASKETS OF CONSUMPTION THAT GIVES SAME SATISFACTION/UTILITY LEVEL TO A CONSUMER.



- GOOD → MORE IS BETTER
- BAD → LESS IS PREFERED TO MORE
- NEUTER

→ X & Y IN THIS PICTURE ARE "IMPERFECT SUBSTITUTES"

MARGINAL RATE OF SUBSTITUTION (MRS)

A RATE AT WHICH GOOD X CAN BE TRADED WITH GOOD Y SO THAT HIS UTILITY REMAINS UNCHANGED!

$$MRS_{XY} = \frac{\Delta Y}{\Delta X}\Bigg|_{\bar{U}}$$

SO THAT $\bar{U}$ – UTILITY REMAINS CONSTANT.

FROM A→B : $MRS = \frac{\Delta Y}{\Delta X} = \frac{+1}{-1} = -1$

FROM B→C : $MRS = \frac{\Delta Y}{\Delta X} = \frac{+2}{-1} = -2$

FROM C→D : $MRS = \frac{\Delta Y}{\Delta X} = \frac{+4}{-1} = -4$

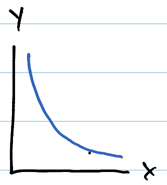
FROM D→E : $MRS = \frac{\Delta Y}{\Delta X} = \frac{+7}{-1} = -7$

W/O LOOKING AT THE SIGN AND CONSIDERING ONLY MAGNITUDE, WHEN LOOKING FROM LEFT TO RIGHT, MRS IS DIMINISHING (= FALLING)

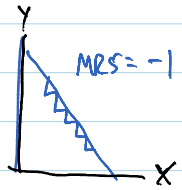
i.e., 7 → 4 → 2 → 1. (WHY?)

HW#1 WHY MRS IS DIMINISHING?

DUE DATE: FRIDAY 22ND AUGUST (IN CLASS)

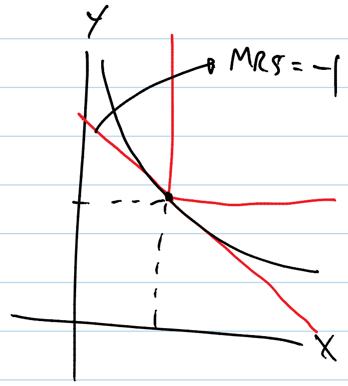


IMPERFECT SUBSTITUTES



PERFECT SUBSTITUTES

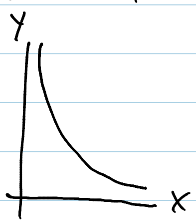
PERFECT COMPLEMENTS

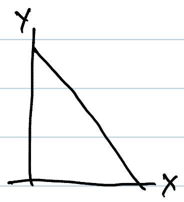


PROPERTIES OF ICs

ASSUME THAT X & Y ARE GOODS ("MORE IS BETTER" ASSUMPTION APPLIES)

(1) AN IC MUST BE DOWNWARD SLOPING.

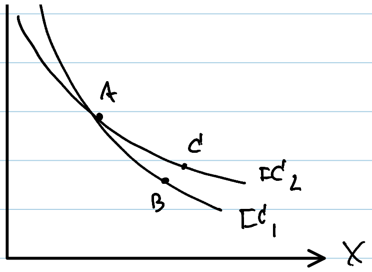




(2) ICs (FROM THE SAME INDIFFERENCE MAP) CANNOT CROSS.

CONSIDER IC_1: A ~ B (SINCE A AND B ARE ON THE IC_1) — ~ IS INDIFFERENT TO

CONSIDER IC : A ~ C (SINCE A AND ...



ARE ON THE IC_1)

CONSIDER IC_2: $A \sim C$ (SINCE A AND C ARE ON THE SAME IC, IC_2)

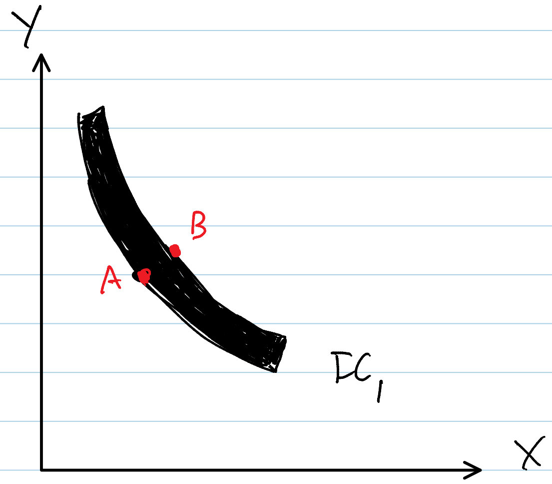
BY TRANSITIVITY, WHEN $A \sim B$ AND $A \sim C$, THEN $B \sim C$.

HOWEVER, BY "MORE IS BETTER" ASSUMPTION, SINCE C HAS MORE OF X & Y, THEN $C \succ B$

WHEN WE LET TWO ICs CROSS, IT LEADS TO A CONTRADICTION (B/C EITHER $B \sim C$ OR $C \succ B$ IS TRUE)
CANNOT BE TRUE AT THE SAME TIME,

TO AVOID THIS CONTRADICTION, ICs MUST NOT CROSS.

3. AN IC CANNOT BE THICK.



PROOF BY CONTRADICTION:
LET IT THICK AND SEE IF A CONTRADICTION ARISES.

22.08.14

UTILITY FUNCTIONS REPRESENTS A PREFERENCE RELATION $\succsim$

IF AND ONLY IF:

$$x' \succ x'' \iff U(x') > U(x'')$$
$$x' \prec x'' \iff U(x') < U(x'')$$
$$x' \sim x'' \iff U(x') = U(x'').$$

PREFERENCE RELATION & UTILITY

UTILITY IS AN ORDINAL (i.e., ORDERING) CONCEPT.

EX: IF $U(x) = 6$ AND $U(y) = 2$

IT MEANS THAT x IS STRICTLY PREFERRED TO y

BUT x IS NOT PREFERRED 3 TIMES AS MUCH AS IS y.

EX: CONSIDER BUNDLES $(4,1)$, $(2,3)$ AND $(2,2)$

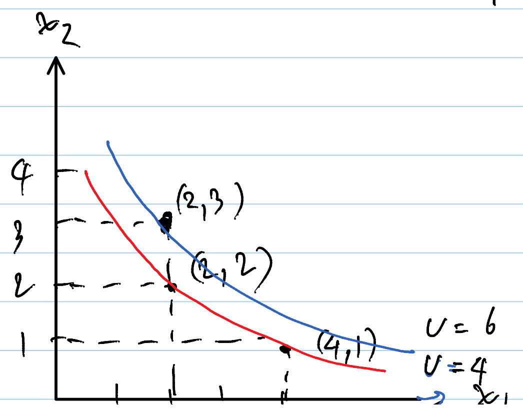
SUPPOSE $(2,3) \succ (4,1) \sim (2,2)$.

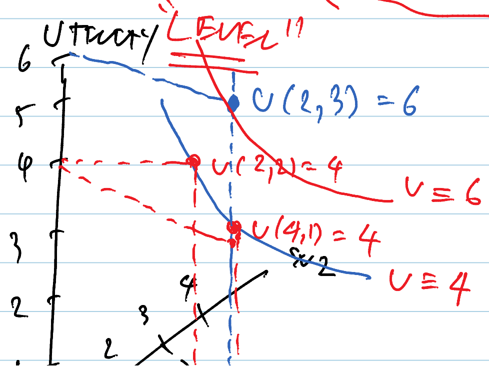
IT IMPLIES THAT $U(2,3) > U(4,1) = U(2,2)$.

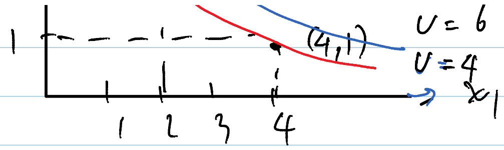
ALSO, $U(x_1, x_2) = x_1 \cdot x_2$. → MATLAB, MATHEMATICA, MAPLE

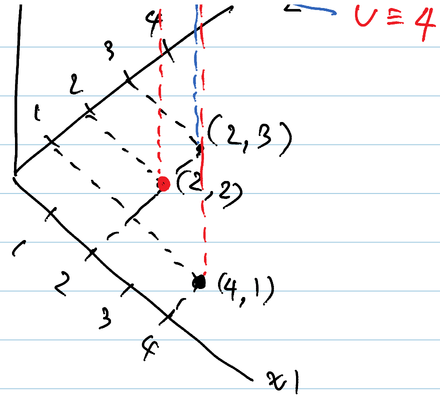
$$\left.\begin{aligned} U(2,3) &= 2\cdot 3 = 6 \\ U(4,1) &= 4\cdot 1 = 4 \\ U(2,2) &= 2\cdot 2 = 4 \end{aligned}\right\} \quad U(2,3) = 6 > U(4,1) = U(2,2) = 4$$

UTILITY "LEVEL"



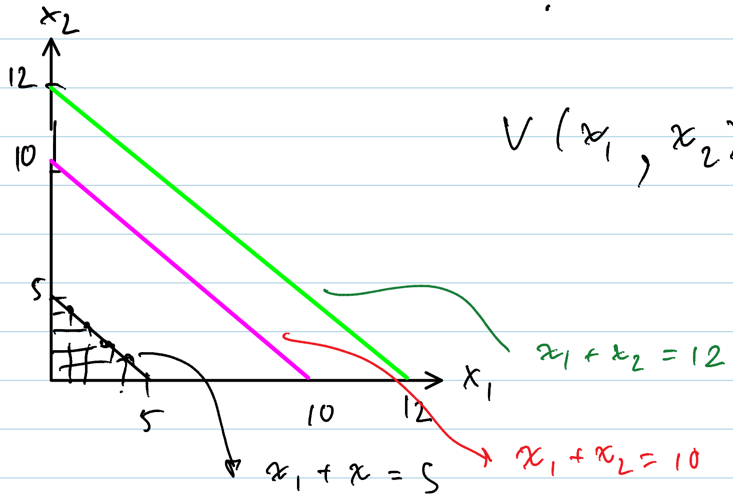






- $\boxed{V(x_1, x_2) = x_1 + x_2}$

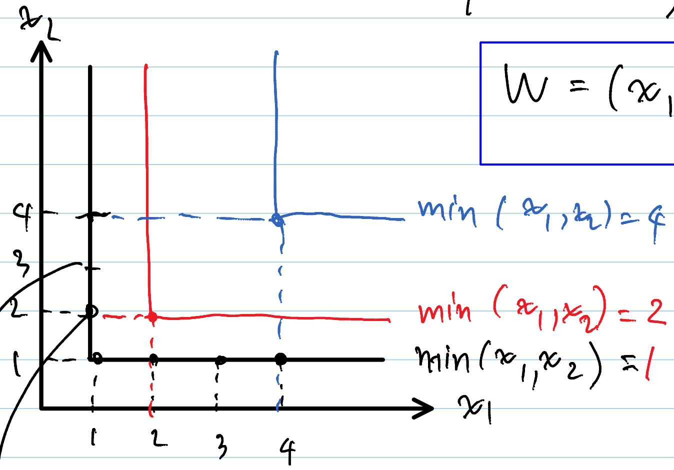
WHAT DO THE IC'S FOR THIS "PERFECT SUBSTITUTES" UTILITY FUNCTION LOOK LIKE?



$$V(x_1, x_2) = x_1 + x_2$$

- $W(x_1, x_2) = \min\{x_1, x_2\}$ → LEONTIEF UTILITY FUNCTION.

$$\boxed{W = (x_1, x_2) = \min(x_1, x_2).}$$



(1,1) → min(1,1) = 1

(1,2) → min(1,2) = 1

(1,3) → min(1,3) = 1

(2,1) → min(2,1) = 1

$(3,1) \rightarrow \min(3,1) = 1$

- MONOTONIC TRANSFORMATION

EX: $U(x_1, x_2) = x_1 \cdot x_2$

CONSIDER $(2,5)$, $(2,3)$, $(6,1)$

$U(2,5) = 2 \cdot 5 = 10$
$U(2,3) = 2 \cdot 3 = 6$
$U(6,1) = 6 \cdot 1 = 6$

- $U(2,5) = 10 > U(2,3) = U(6,1) = 6$
- $\boxed{(2,5) \succ (2,3) \sim (6,1)}$
- THEREFORE $U(x_1, x_2) = x_1 \cdot x_2$ "REPRESENTS" PREFERENCE RELATION STATED ABOVE.

SUPPOSE $V = U^2$.

SO, $V = (x_1 \cdot x_2)^2 = x_1^2 \cdot x_2^2$.

$(2,5) \rightarrow V = 2^2 \cdot 5^2 = 4 \cdot 25 = 100$,
$(2,3) \quad V = 2^2 \cdot 3^2 = 4 \cdot 9 = 36$.
$(6,1) \quad V = 6^2 \cdot 1^2 = 36 \cdot 1 = 36$.

SO, WE HAVE $(2,5) \succ (2,3) \sim (6,1)$.

THEREFORE, $U = x_1 \cdot x_2$ AND $V = x_1^2 \cdot x_2^2$ REPRESENTS THE SAME PREFERENCE RELATION

- $W = 2U + 2$

$W = 2(x_1 \cdot x_2) + 2$

$(2,5) \rightarrow W = 2(2 \cdot 5) + 2 = 22$
$(2,3) \rightarrow W = 2(2 \cdot 3) + 2 = 14$
$(6,1) \rightarrow W = 2(6 \cdot 1) + 2) = 14$

SO $(2,5) \succ (2,3) \sim (6,1)$

AGAIN $W = 2U + 2$ REPRESENTS THE SAME PREFERENCE RELATION AS $U = x_1 \cdot x_2$ AND $V = x_1$