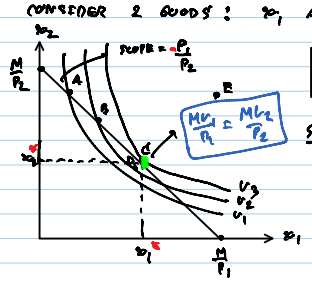
CONSUMER'S UTILITY MAXIMIZATION PROBLEM

CONSIDER 2 GOODS: x_1 AND x_2



UMP: MAX $U(x_1, x_2)$
S.T. $P_1x_1 + P_2x_2 = M$,

SOLUTION: AT TANGENCY POINT BET. IC AND BL.

AT C: (x_1^*, x_2^*)

MATHEMATICALLY, AT C:
SLOPE OF IC = SLOPE OF BL.

$MRS_{x_1x_2} = -\frac{P_1}{P_2}$

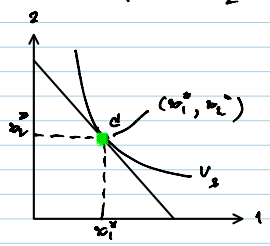
$-\frac{MU_1}{MU_2} = -\frac{P_1}{P_2}$

$\boxed{\frac{MU_1}{P_1} = \frac{MU_2}{P_2}}$

"TANGENCY CONDITION"

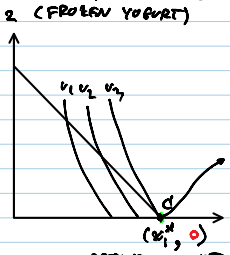
IT IMPLIES THAT "TO MAXIMIZE UTILITY GIVEN BUDGET CONSTRAINT, HE SHOULD ALLOCATE HIS BUDGET SUCH THAT "ONCE MONEY IS SPENT UP, LAST BAHT SPENT ON GOOD 1 AND LAST BAHT SPENT ON GOOD 2 GENERATE THE SAME MARGINAL UTILITY!

IF $\frac{MU_1}{P_1} > \frac{MU_2}{P_2}$, HE SHOULD BUY MORE OF good 1 AND LESS OF good 2.



- OPTIMAL BASKET CONTAINS MIXTURE OF THE TWO GOODS
- AT C: TANGENCY CONDITION HOLDS. $\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$
- WHEN AN OPTIMAL BASKET CONTAINS 2 GOODS, WE CALL "INTERIOR SOLUTION"

2 (FROZEN YOGURT)



- OPTIMAL BASKET CONTAINS ONLY GOOD 1 !
- AT C: TANGENCY CONDITION IS INVALID.

SLOPE OF IC > SLOPE OF BL

$|MRS| > \left|\frac{P_1}{P_2}\right|$

$\left|\frac{MU_1}{MU_2}\right| > \left|\frac{P_1}{P_2}\right|$

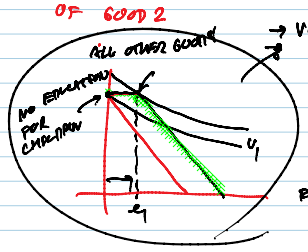
$\left|\frac{MU_1}{P_1}\right| > \left|\frac{MU_2}{P_2}\right|$

- WHEN AN OPTIMAL BASKET CONTAINS ONLY ONE OF THE TWO GOODS, WE CALL "CORNER SOLUTION"

Ex: $|MRS|$ AT POINT C = 10 $\Rightarrow$ $|MRS| = 10 > 2 = \left|\frac{P_1}{P_2}\right| = \frac{2}{1}$

IM WILLING TO WITHDRAW 1 UNIT OF GOOD 1 IF YOU COMPENSATE ME W/ 10 UNITS OF GOOD 2

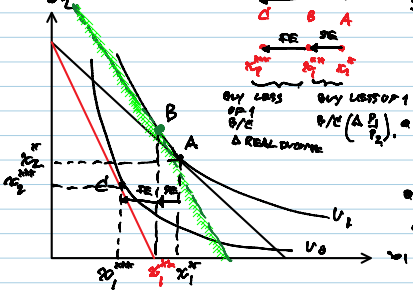
→ VOUCHER VS SUBSIDY



TANGENCY CONDITION: $\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$ IS A NECESSARY CONDITION BUT NOT SUFFICIENT TO GAURANTEE A SOLUTION.

IT CAN BE APPLIED W/ INTERIOR SOLUTION ONLY!

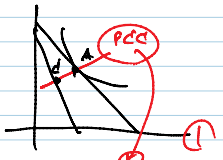
EFFECT OF PRICE CHANGE ON CONSUMER CHOICES



INITIALLY, A IS A CONSUMER EQUILIBRIUM: $A(x_1^{old}, x_2^{old})$

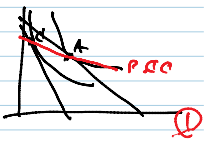
SUPPOSE P_1 RISES ...

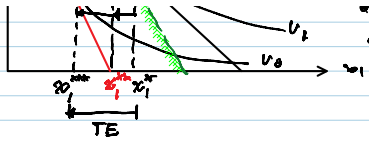
- BL ROTATES INWARD AND NEW EQUILIBRIUM IS AT $(C(x_1^{new}, x_2^{new}))$.
- CONSUMER IS WORSE OFF
- HE BUYS LESS OF 1 AND 2 (IN THIS CASE)
- TOTAL EFFECT OF PRICE CHANGE ON



$\varepsilon^P > 1$

$\varepsilon' < 1$





• CONSUMER ↔ WORSE OFF

• HE BUYS LESS OF 1 AND 2 (IN THIS CASE)

• TOTAL EFFECT OF PRICE CHANGE ON x_1 : x_1^{**} ← x_1^* TE

$\Sigma' < 1$

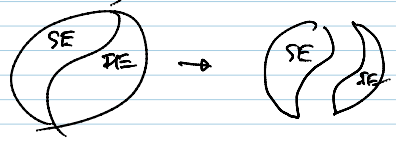
• HE BUYS LESS OF GOOD 1 B/C OF 2 OPPOSING FORCES:

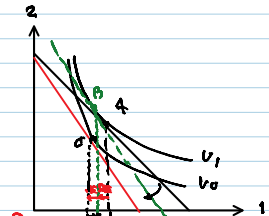
$P_1 \uparrow$ → $\frac{P_1}{P_2} \uparrow$ ≡ GOOD 1 BECOMES MORE EXPENSIVE RELATIVE TO GOOD 2 → $Q_{x_1} \downarrow$ (SUBSTITUTION EFFECT)

→ HIS PURCHASING POWER FALLS (OR HIS REAL INCOME FALLS) & SINCE x_1 IS A NORMAL GOOD → $Q_{x_1} \downarrow$ (INCOME EFFECT)

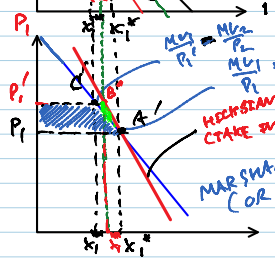
$Q_{x_1} \downarrow$

TE = SE + IE





OLD $\frac{P_1}{P_2}$ NEW $\frac{P_1'}{P_2}$ WHERE $P_1' > P_1$



$\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$

$\frac{MU_1}{P_1} = \frac{MU_2}{P_2}$

HICKSIAN DEMAND CURVE (TAKE INTO A/C ONLY SE)

MARSHALLIAN (OR ORDINARY) DEMAND CURVE (TAKE INTO A/C BOTH INCOME EFFECT AND SUBSTITUTION EFFECT OF PRICE CHANGE)

NEXT CLASS, READ

SLUTSKY EQUATION ✱ IN ADVANCE