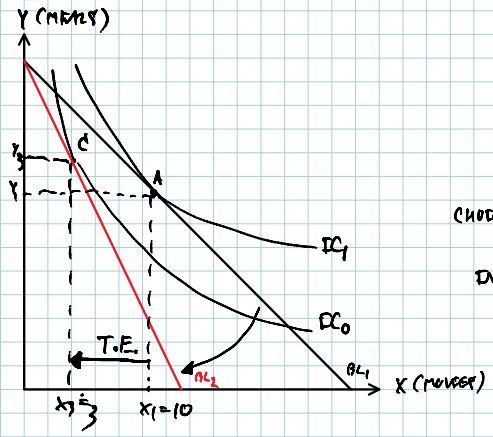
* EFFECT OF A PRICE CHANGE ON CONSUMER'S CHOICE



OLD SITUATION	NEW SITUATION
P_x	P_x' WHERE $P_x' > P_x$
P_y	P_y
M	M
CHOICE: $A(X_1, Y)$	CHOICE: $C(X_3, Y_3)$

INCREASE IN P_x LOWERS HIS UTILITY !

THE MOVEMENT FROM A TO C (OR FROM $X_1 \to X_3$) IS CALLED "TOTAL EFFECT" (OF AN INCREASE IN P_x).

TOTAL EFFECT: CHANGE IN QUANTITY DEMANDED (CONSUMED) (PURCHASED) RESULTING FROM A CHANGE IN PRICE OF A GOOD (HERE, ↑ IN P_x)

Q: CAN WE DELIVER AN ECONOMIC EXPLANATION TO EXPLAIN WHY HE BUYS LESS OF GOOD X (MOVIE TICKET) WHEN PRICE OF GOOD X RISES?

A: THE REASON IS ABOUT SUBSTITUTION EFFECT & INCOME EFFECT

LET'S SEE ...

> TOTAL EFFECT (T.E.) = SUBSTITUTION EFFECT (S.E.) + INCOME EFFECT (I.E.)

LINE OF REASONING:

WHEN P_x ↑ → $\left(\frac{P_x}{P_y}\right)$ ↑ ≡ OPPORTUNITY COST OF GOOD X INCREASES ≡ GOOD X HAS BECOME MORE EXPENSIVE RELATIVE TO GOOD Y → Q_x^d ↓ (= HE BUYS LESS OF X DUE TO $\Delta\left(\frac{P_x}{P_y}\right)$) [S.E.]

WHEN P_x ↑ → HIS PURCHASING POWER ↓ (OR HIS REAL INCOME ↓) → HE BECOMES POORER → Q_x^d ↓ (HE BUYS LESS OF X DUE TO Δ IN PP) [I.E.]

VIA S.E. and VIA I.E. → Q_x^d ↓ [T.E.]

SUMMARY

T.E. = S.E. + I.E.

ΔQ_x^d = ΔQ^d + ΔQ_x^d VIA

TOTAL EFFECT = S.E. + I.E

ΔQ^d_x = $\Delta Q^d_{x,\text{VIA S.E.}}$ + $\Delta Q^d_{x,\text{VIA I.E.}}$

(-7) $(?)$ $(?)$

FROM THE PICTURE:

$x_3 = 3 \leftarrow x_1 = 10$

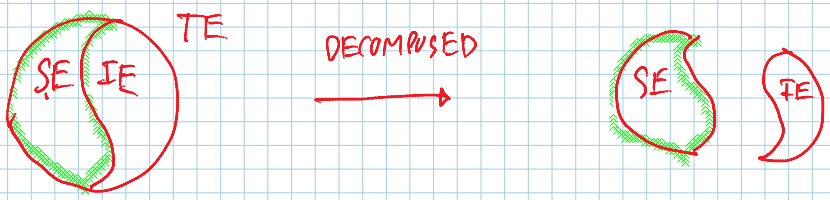
(C) -7 (A)

FORMAL DEFINITION OF S.E. & I.E.

SUBSTITUTION EFFECT $\left(\Delta Q^d_{x,SE}\right)$ = CHANGE IN QUANTITY {CONSUMED / DEMANDED / PURCHASED} OF GOOD X DUE TO CHANGE IN RELATIVE PRICE, HOLDING REAL INCOME OR UTILITY CONSTANT.

INCOME EFFECT $\left(\Delta Q^d_{x,I.E.}\right)$ = CHANGE IN QUANTITY {CONSUMED / DEMANDED / PURCHASED} OF GOOD X DUE TO CHANGE IN PURCHASING POWER (REAL INCOME), WHEN HE FACES WITH NEW RELATIVE PRICE.

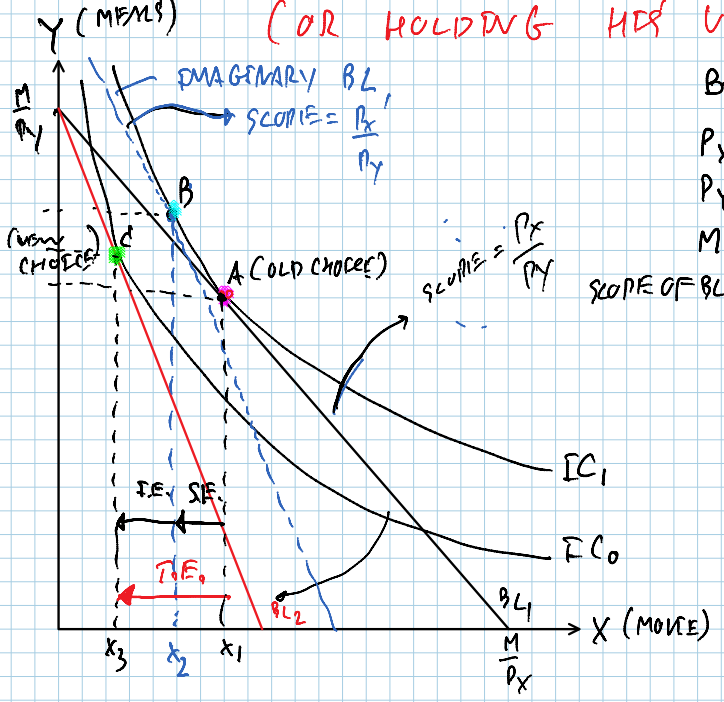
NOW, WE ARE GOING TO "BREAK DOWN" OR "DECOMPOSE" TOTAL EFFECT INTO SUBSTITUTION EFFECT AND INCOME EFFECT.



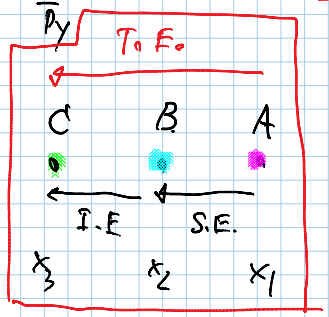
OUR STRATEGY TO DECOMPOSE T.E. IS THAT WE ARE GOING TO "ELIMINATE" OR "GET RID OF" I.E. SO THAT WE CAN SEE "PURE SUBSTITUTION EFFECT"; HOW MANY UNITS OF X HE BUYS LESS PURELY BECAUSE Δ IN $\frac{P_x}{P}$ (OR PURELY BECAUSE OF THAT THE FACT

Δ IN $\frac{P_x}{P_y}$ (OR PURELY BECAUSE OF THAT THE FACT THAT GOOD X BECOME MORE EXPENSIVE), HOLDING HIS REAL INCOME CONSTANT.

(OR HOLDING HIS UTILITY CONSTANT)



B/F	A/F
P_x	P_x' WHERE $P_x' > P_x$.
P_y	P_y
M	M
SLOPE OF $BL_1 = -\frac{P_x}{P_y}$	SLOPE OF $BL_2 = -\frac{P_x'}{P_y}$



WHEN P_x RISES, THE BUDGET LINE ROTATES INWARD FROM BL_1 TO BL_2. NEW CHOICE IS AT C. HIS UTILITY REDUCES. (HE IS NOW AT IC_0.)

MOVEMENT FROM A → C : TOTAL EFFECT : $\Delta Q_x^d = x_1 - x_3$

TO ELIMINATE I.E. (IN ORDER TO SEE PURE SUBSTITUTE EFFECT), WE ASK THE FOLLOWING QUESTION: AT THE NEW RELATIVE PRICE HE FACES ($\frac{P_x'}{P_y}$), HOW MUCH INCOME WOULD HE NEED SO THAT HE GETS BACK TO THE ORIGINAL IC?

GRAPHICALLY, WE DO THIS:

(A HYPOTHETICAL BL)

WE CONSTRUCT AN IMAGINARY BUDGET LINE W/ 2 PROPERTIES

(1) PARALLEL TO THE NEW BUDGET LINE (HERE, BL_2)

&

(2) TOUCH W/ THE ORIGINAL INDIFFERENCE CURVE (HERE, IC_1)

THE MOVEMENT FROM A → B : SUBSTITUTION EFFECT (S.E.)

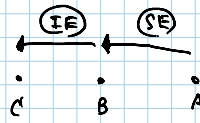
THE MOVEMENT FROM B → C : INCOME EFFECT (I.E)

FRANK "MICROECONOMICS AND BEHAVIOR"

SO FAR, THE ABOVE CASE IS WHEN X IS A NORMAL GOOD.

THERE, WE SEE THAT S.E & I.E WORK IN THE SAME DIRECTION:

WHEN P_x ↑,



TODAY,

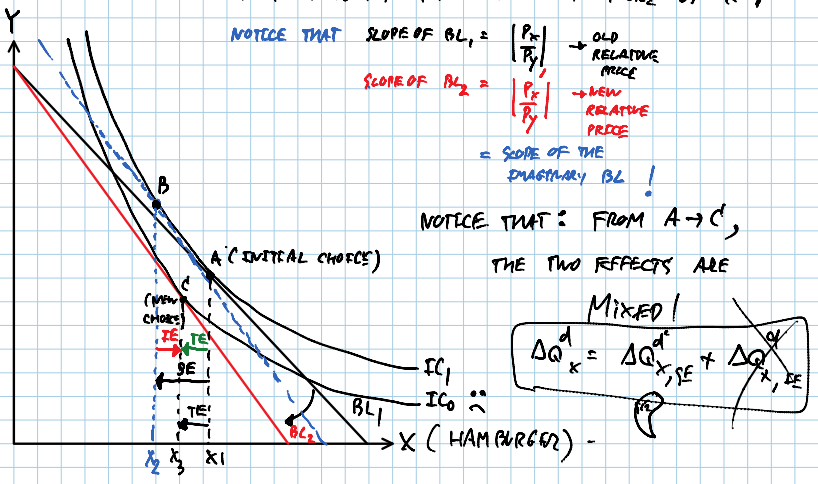
CASE 2 WHEN GOOD X IS AN INFERIOR GOOD.

INFERIOR GOOD: X IS AN INFERIOR GOOD WHEN ↑M INDUCES THE BUYER TO BUY LESS OF GOOD X AND ↓M INDUCES HIM TO BUY MORE OF X.

NOTICE THAT SLOPE OF $BL_1 = \left|\frac{P_x}{P_y}\right|$ → OLD RELATIVE PRICE

SLOPE OF $BL_2 = \left|\frac{P_x}{P_y}\right|$ → NEW RELATIVE PRICE

= SLOPE OF THE IMAGINARY BL !



NOTICE THAT: FROM A → C, THE TWO EFFECTS ARE MIXED!

$\Delta Q^d_x = \Delta Q^{d^c}_{x,SE} + \Delta Q^{d^c}_{x,IE}$

SUPPOSE P_x ↑.

RESULT #1 BL ROTATES INWARD FROM BL_1 TO BL_2: X BECOMES MORE EXPENSIVE RELATIVE TO Y.

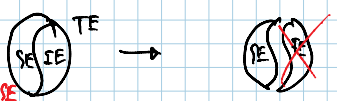
RESULT #2 AT NEW CHOICE: C', HE BUYS LESS OF X IN RESPONSE TO AN INCREASE IN P_x. (TOTAL EFFECT: TE)

$x_3 \leftarrow x_1$ (TE)

HIS UTILITY FALLS!

(NOW HE IS ON A LOWER IC!)

RESULT #3 (ON SE AND I.E)



DECOMPOSE TO "BREAK DOWN" T.E INTO S.E AND IE, OUR STRATEGY IS THAT WE WILL "ELIMINATE" INCOME EFFECT SO THAT WE CAN SEE PURE Substitution EFFECT!

↑P_x → $\left(\frac{P_x}{P_y}\right)$ ↑ → Q^d_x ↓ (S.E.): IN THE PICTURE:

SE: B (x_2) ← A (x_1)

CAUSE HIS PURCHASING POWER TO FALL & SINCE X IS AN INFERIOR GOOD → Q^d_x ↑ (I.E.): IN THE PICTURE

IE: a → d

SINCE S.E > IE. ($\downarrow Q^d_x$) ($\uparrow Q^d_x$)

THEN

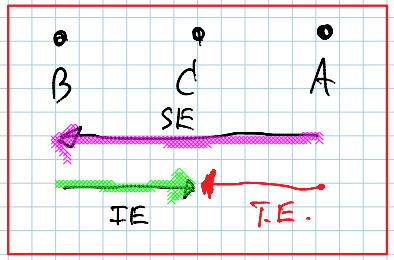
PURCHASING POWER TO FALL OR HIS REAL INCOME FALLS

IS AN INFERIOR GOOD

IE → a B, c (x_2) (x_3)

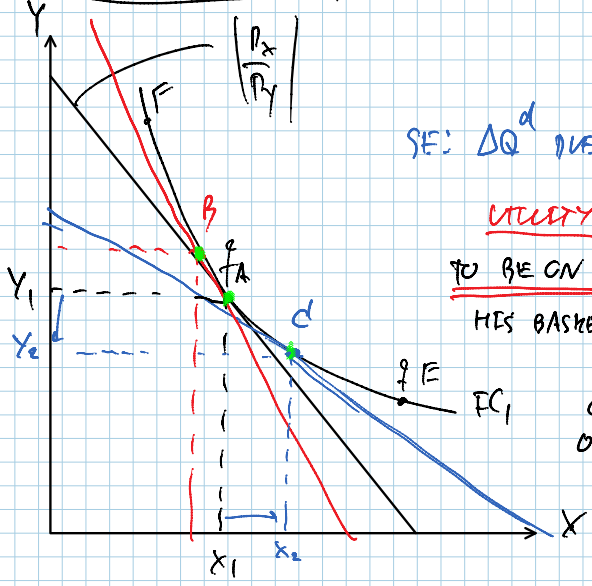
THEN Q^d_x (T.E.)

OBSERVE THAT (1) S.E AND I.E WORKS' AGAINST EACH OTHER WHEN X IS AN INFERIOR GOOD,



TE = SE + IE

SPECIAL NOTE ON S.E.

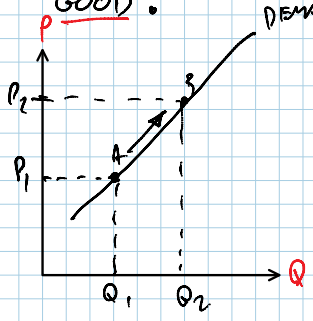


SE: ΔQ^d DUE TO $\Delta \frac{P_x}{P_y}$, HOLDING UTILITY CONSTANT

TO BE ON IC_1, HE MUST ADJUST HIS BASKET BY BUYING MORE OF THE GOOD THAT BECOMES CHEAPER AND BUYING LESS OF THE GOOD THAT BECOMES MORE EXPENSIVE.

THIS IS "SUBSTITUTION EFFECT"

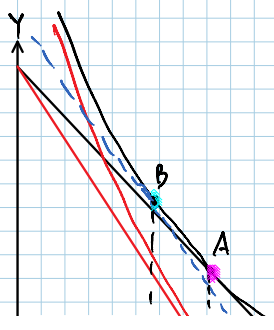
CASE 3 WHEN X IS A GIFFEN GOOD OR SUPER INFERIOR GOOD.



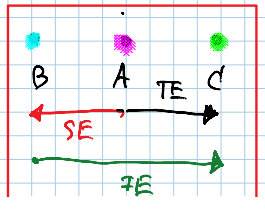
DEMAND CURVE WHEN X IS A GIFFEN.

X IS A GIFFEN GOOD WHEN A BUYER BUYS MORE OF X WHEN P_x RISES, VICE VERSA.

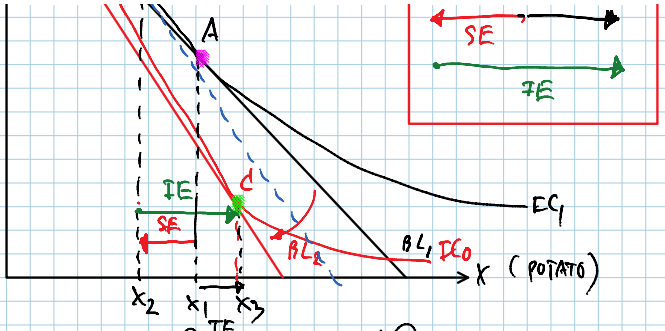
SO, A GIFFEN GOOD "VIOLATES" LAW OF DEMAND !



AT A: $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$



SE < IE FOR GIFFEN GOOD



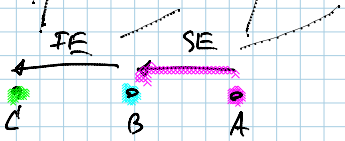
FOR GIFFEN GOOD CASE.

RESULT HI ④ P_x → Q_x^d ④ TE (AS X IS A GIFFEN GOOD)

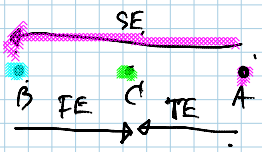
AT NEW CHOICE : C // HE BUYS MORE OF X !

WHEN P_x ↑

① FOR NORMAL GOOD

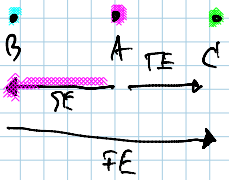


② FOR INFERIOR GOOD



SE > IE

③ FOR SUPER INFERIOR GOOD



IE > S.E.