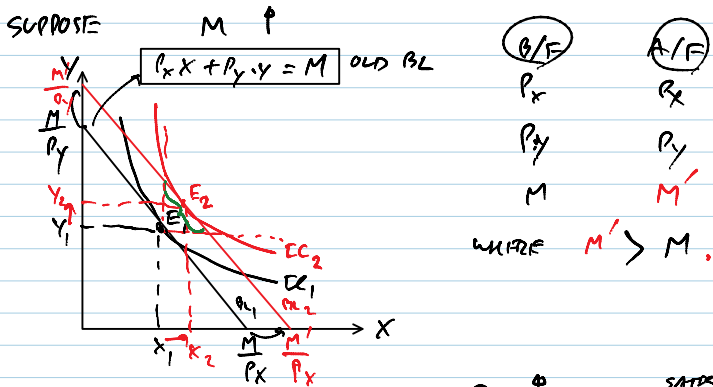


$x = ?$   
 $y = ?$  → MAX  $U$

- $P_x$
- $P_y$
- $M$

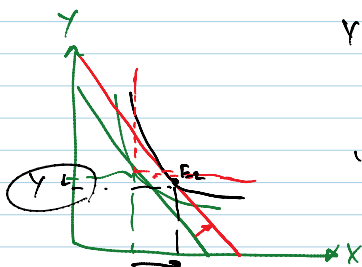
# WHAT IF  $P_x, P_y$ , OR  $M$  CHANGES?

I WHEN INCOME CHANGES.



INCREASE IN  $M \rightarrow Q_x \uparrow \rightarrow$  SATISFACTION LEVEL INCREASES  
 $Q_y \uparrow$

NOTICE THAT  $X$  IS A NORMAL GOOD  
 $Y$  IS A NORMAL GOOD



$X$  IS ANORMAL GOOD  
 $Y$  IS AN INFERIOR GOOD

SUMMARY

$M \uparrow \rightarrow Q_x \uparrow, Q_y \uparrow$  — I

$Q_x \uparrow, Q_y \downarrow$  — II

$Q_x \downarrow, Q_y \uparrow$  — III

X  $\begin{cases} Q_x \downarrow \\ Q_y \downarrow \end{cases}$  IMPOSSIBLE STATE

MONEY HAS TO BE SPENT ON SOME QUANTITY

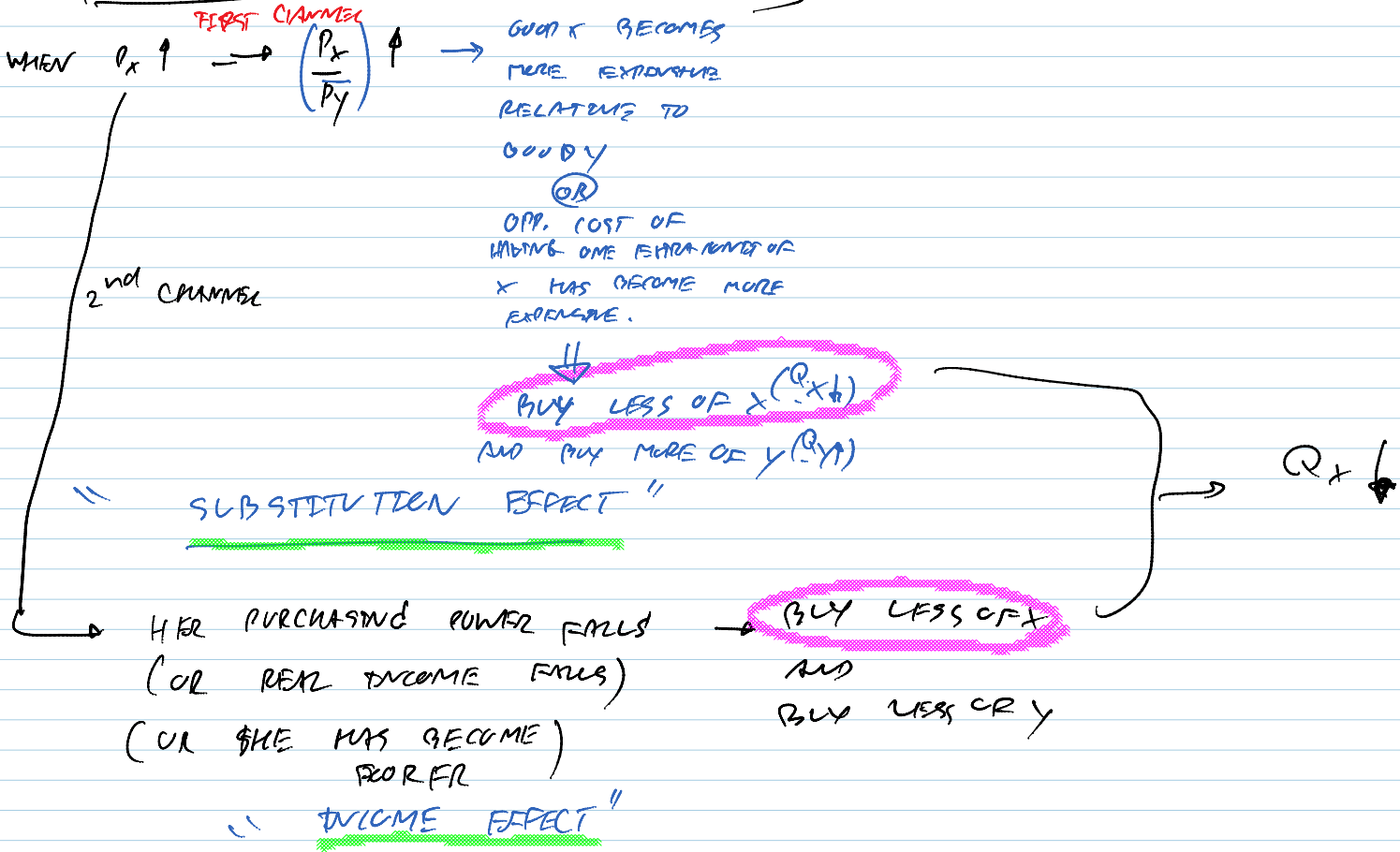
# # WHAT IF $P_x$ INCREASES?

BY LAW OF DEMAND, WHEN  $P_x \uparrow \rightarrow Q_x \downarrow$  (CETERIS PARABUS)

WHY?

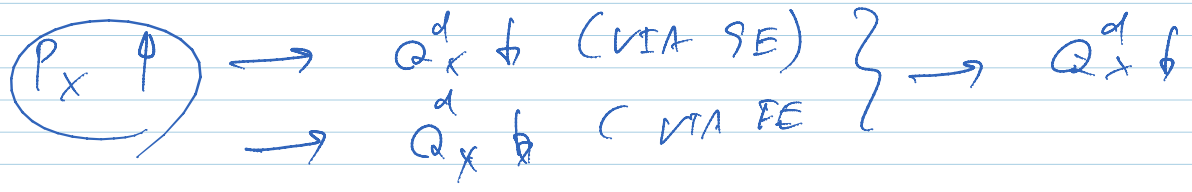
A SCIENTIFIC QUESTION?

WHAT FACTORS DRIVE THIS RESULT?



TOTAL EFFECT OF PRICE CHANGE = SUBSTITUTION EFFECT + INCOME EFFECT

OR TE = SE + IE



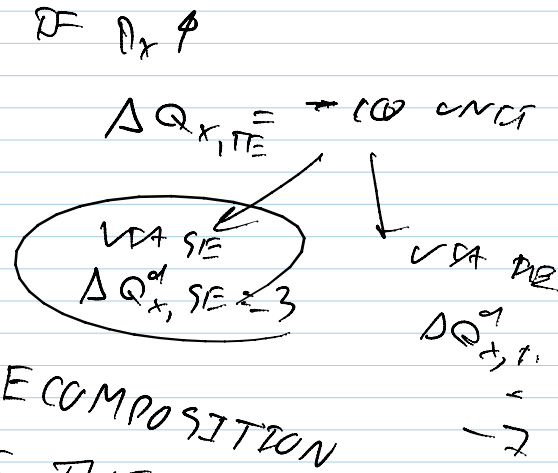
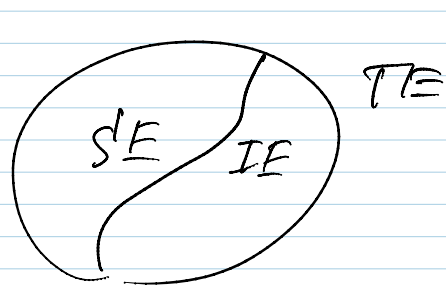
SUBSTITUTION EFFECT: CHANGE IN QUANTITY DEMANDED OF A GOOD DUE TO

OF A GOOD  
 CHANGE IN RELATIVE PRICE,  
 HOLDING UTILITY CONSTANT.

INCOME EFFECT ; CHANGE IN QUANTITY  
 DEMANDED DUE TO  
 CHANGE IN PURCHASING POWER  
 (OR REAL INCOME) AT  
 THE NEW RELATIVE PRICE  
 SHE IS NOW FACING.

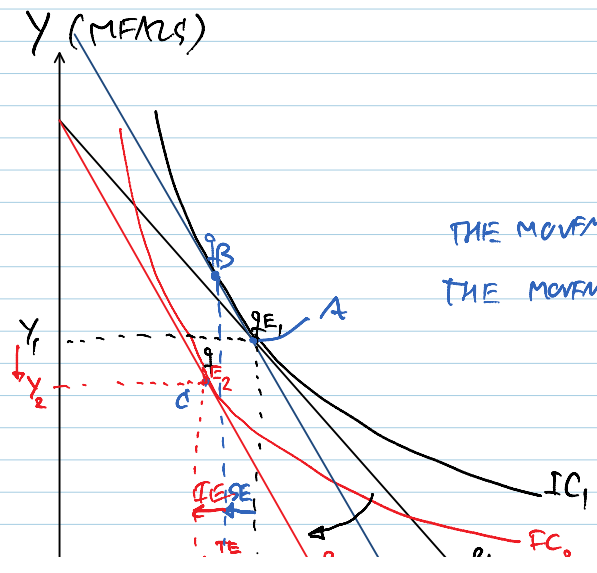
IN SHORT,

$$\Delta Q_{X, TE}^d = \Delta Q_{X, SE}^d + \Delta Q_{X, IE}^d$$



THIS PROCESS IS CALLED "DECOMPOSITION  
 OF THE TWO  
 COMBINED EFFECTS"

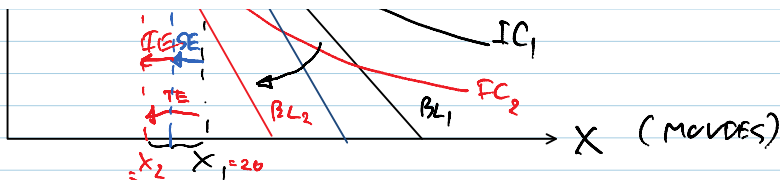
TO SEE THE PURE SUBSTITUTION EFFECT,  
 WE HAVE TO "ELIMINATE INCOME EFFECT."



B/F :  $P_x, P_y, M \rightarrow (x_1, y_1)$   
 A/F :  $P'_x, P_y, M \rightarrow (x_2, y_2)$

WHERE,  
 $P'_x > P_x$

THE MOVEMENT FROM A  $\rightarrow$  B : SE  
 THE MOVEMENT FROM B  $\rightarrow$  C : IE



$$\Delta Q_{X, SE}^d = x_2 - x_1 \quad (\text{BUY LESS OF } X)$$

$$= 15 - 20$$

$$= -5 \rightarrow \Delta Q_{X, SE}^d = ?$$

$$\Delta Q_{X, IE}^d = ?$$

TO ELIMINATE IE, WE ASK A QUESTION

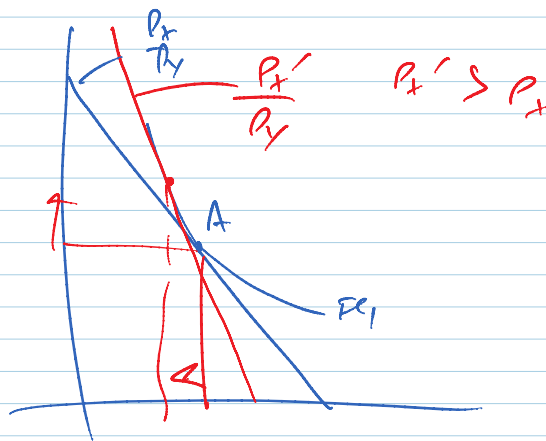
" HOW MUCH MONEY HER MOM HAS TO GIVE TO THE GIRL WHEN PRICE OF X RISES SO THAT SHE GETS BACK TO THE ORIGINAL INDIFFERENCE CURVE "

TECHNICALLY, WE HAVE A CONSTRUCT A HYPOTHETICAL BUDGET LINE THAT HAS 2 PROPERTIES:

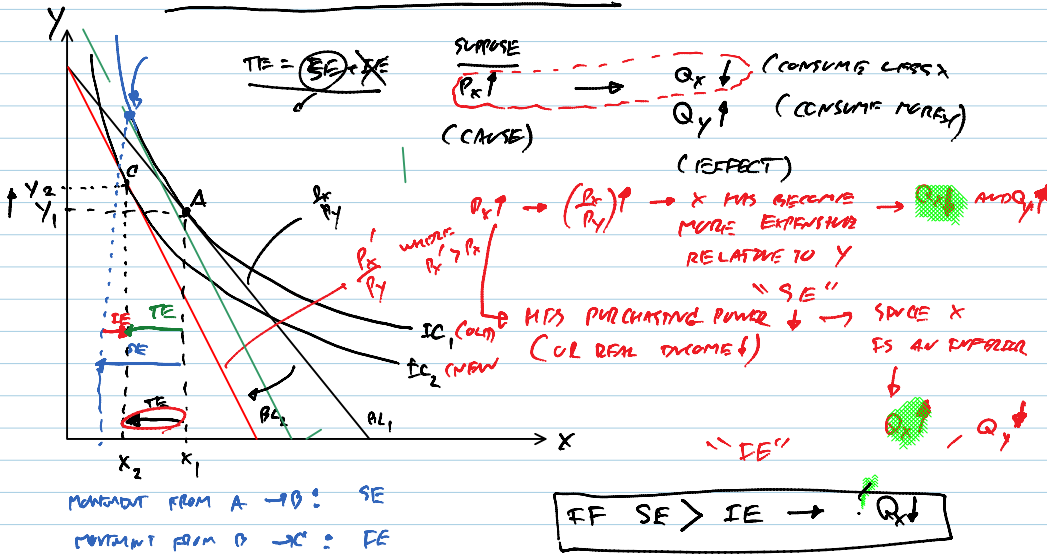
- ① TANGENT W/ THE OLD IC
- ② HAS THE SAME SLOPE AS  $BL_2$

ONCE THIS GIRL HAS ARRIVED AT A POINT ON OLD IC, WE CAN SAY THAT HER REAL INCOME OR PURCHASING POWER IS PURE UNCHANGED. AND NOW WE CAN OBSERVE SE!!!

SE: AMOUNT OF X (MOVIES) THAT SHE BUYS LESS PURELY BECAUSE CHANGE IN RELATIVE PRICE.



# WHEN X IS AN INFERIOR GOOD.



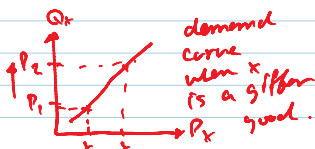
WHEN X IS AN INFERIOR GOOD, IF  $P_X \uparrow \rightarrow Q_X^d \downarrow$

[ SINCE SE STILL DOMINATES IE. ]

THE LAW OF DEMAND STILL HOLDS.

# WHAT IF  $IE > SE$  ?

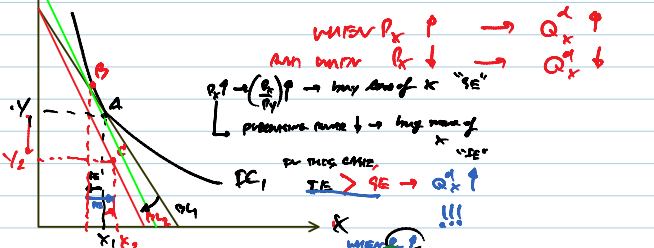
ANSWER: IF  $IE > SE$ , X IS CALLED



"GIFFEN GOOD" OR "SUPERIOR INFERIOR GOOD"

violated!!!

# WHEN X IS A GIFFEN GOOD



- WHEN X IS AN INFERIOR  $\rightarrow Q_X \downarrow$  } LAW OF DEMAND HOLDS
- WHEN X IS AN INFERIOR  $\rightarrow Q_X \downarrow$  }
- WHEN X IS A GIFFEN (SUPERIOR INFERIOR)  $\rightarrow Q_X \uparrow$  } LAW OF DEMAND IS VIOLATED.

ROBERT H. FRANK "MICROECONOMICS AND BEHAVIOR" "IRELAND" 13<sup>th</sup> century "POTATO SPIRIT" "DUTATO SPIRIT"

WHEN  $P_{POTATO} \uparrow \rightarrow Q_{POTATO} \uparrow$   
 $(IE) > (SE)$

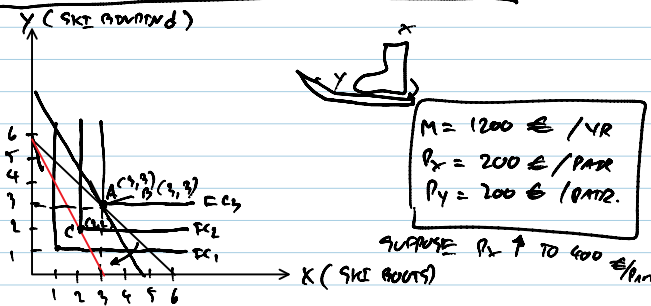
TO HAVE A GIFFEN GOOD, IT MUST BE THE CASE THAT

- SE IS VERY TINY SO THAT IE COULD WIN EASILY.
- EXPENDITURE TOWARD THE GOOD

TO HAVE A DEFERRED GOOD, IT MUST BE THE CASE THAT

- ① SE IS VERY TINY SO THAT DE COULD WIN EASILY.
- ② EXPENDITURE TOWARD THE GOOD MUST BE IN HIGH PROPORTION TO INCOME

# SE AND IE FOR PERFECT COMPLEMENTS



$M = 1200 \text{ € / yr}$   
 $P_x = 200 \text{ € / pair}$   
 $P_y = 200 \text{ € / pair}$

suppose  $P_x \uparrow$  to 400 €/pair

$A(3,3) \rightarrow C(3,3) \Rightarrow TE$

$A(3,3) \rightarrow B(2,2) \Rightarrow SE = 0$

$B(2,2) \rightarrow C(3,3) \Rightarrow IE$

WHEN THE TWO GOODS ARE " PERFECT COMPLEMENTS "

$TE = SE + IE \Rightarrow$  ONLY "INCOME EFFECT" PLAYS THE ROLE.

IT IMPLIES THAT

IF THIS GUY COULD HAVE HAD THE SAME PURCHASING POWER TO MAINTAIN HIS SAME UTILITY LEVEL, HE WOULD CHOOSE TO CONSUME THE ORIGINAL BASKET (3,3)