

Chapter 14 Substitution and Income Effects

When price p_x changes, the consumer adjusts both the consumption of x and y . These adjustments of the quantities consumed can be broken down into two parts:

1. Substitution Effect
2. Income Effect

This is because when price p_x decreases, it causes two changes:

- a) relative price— x becomes relatively cheaper
- b) real income—consumer feels richer when price p_x decreases.

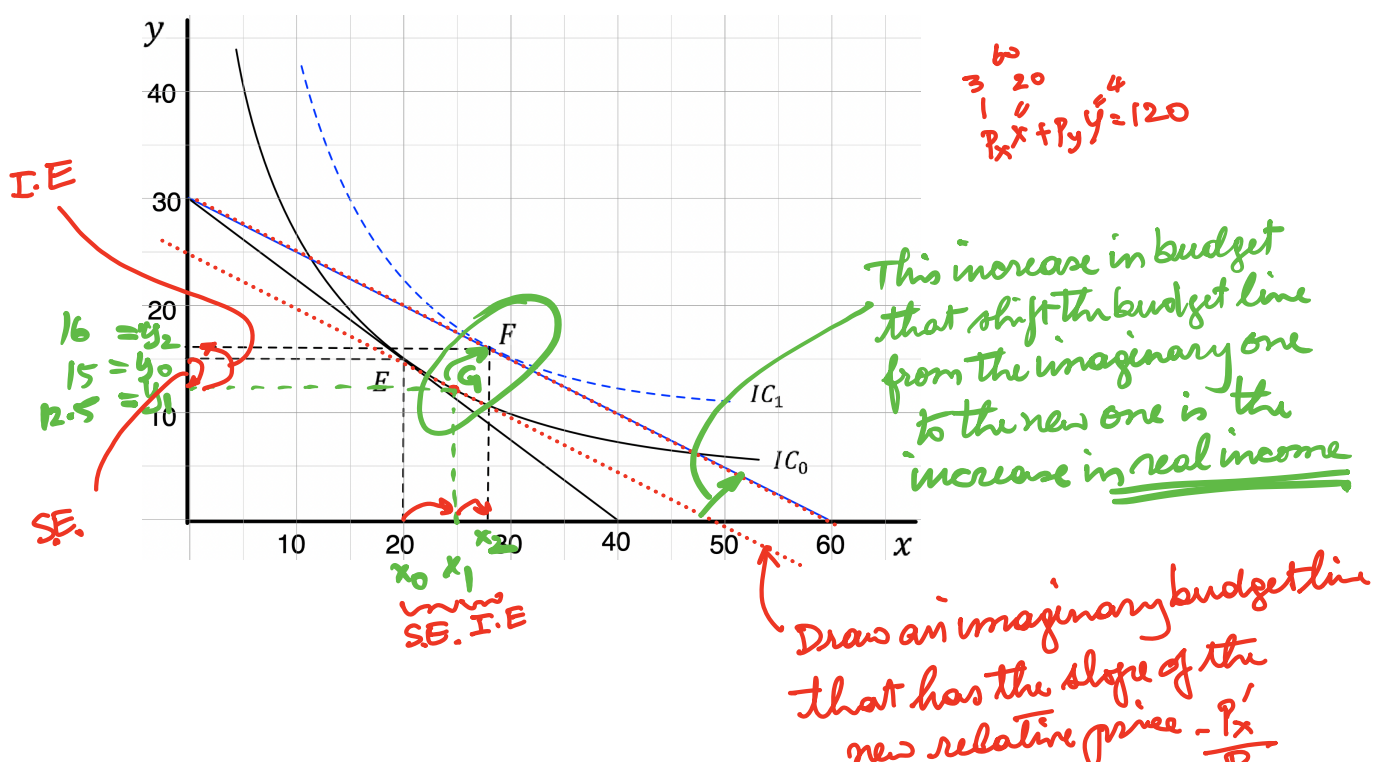
Substitution Effect = Changes of consumption of x and y as a result of the change in the relative price while keeping real income constant.

Income Effect = Changes of consumption of x and y as a result of the change in the real income with new relative price.

- To determine the Substitution Effect, we have to keep real income constant.
- Real income constant $\Leftrightarrow$ Same satisfaction level
 $\Leftrightarrow$ Stay on same Indifference Curve

Substitution Effect and Income Effect There are 4 possible cases:

1. p_x decreases from $p_x = 3$ to $p'_x = 2$.



- The equilibrium point changes from $E = (x_0, y_0)$ to $F = (x_2, y_2)$. In this case, when p_x decreases, the consumer buys more of y . This means x and y are complementary.
- The relative price changes from $\frac{p_x}{p_y} = \frac{3}{4}$ to $\frac{p'_x}{p_y} = \frac{2}{4}$
- To keep the same satisfaction with the new relative price $\frac{2}{4}$ draw an imaginary budget line with slope $\frac{p'_x}{p_y}$ to be tangent with the original Indifference Curve IC_0 .
- The Substitution Effect is:

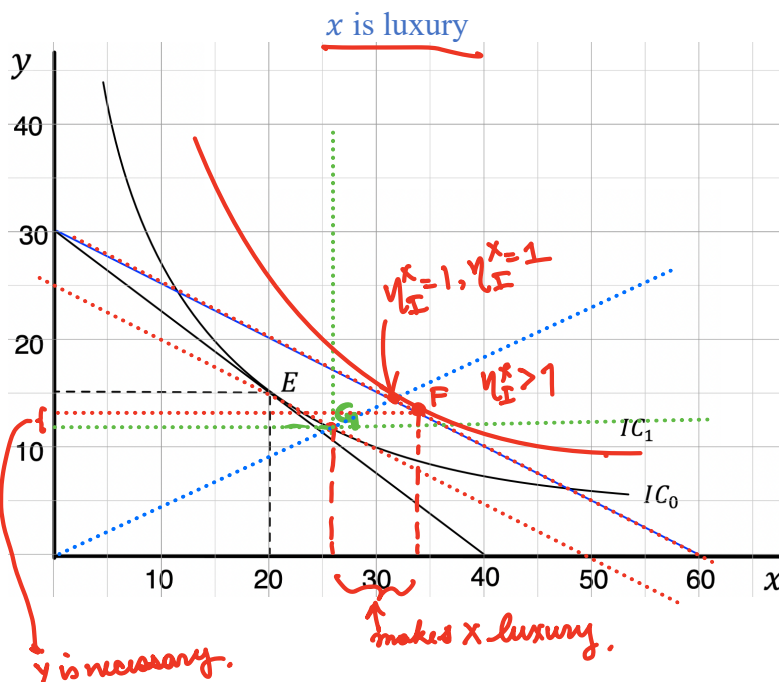
$$S.E. = \begin{cases} \Delta x = x_1 - x_0 = 26 - 20 = 6 > 0 \\ \Delta y = y_1 - y_0 = 12.5 - 15 < 0 \end{cases}$$

- When price changes in such a way that x is relatively less expensive, the Substitution Effect is always such that $\Delta x > 0$ and $\Delta y < 0$. Why? — because of diminishing MRS.
- Income Effect can be found by moving the imaginary budget line to be tangent with the new budget line.

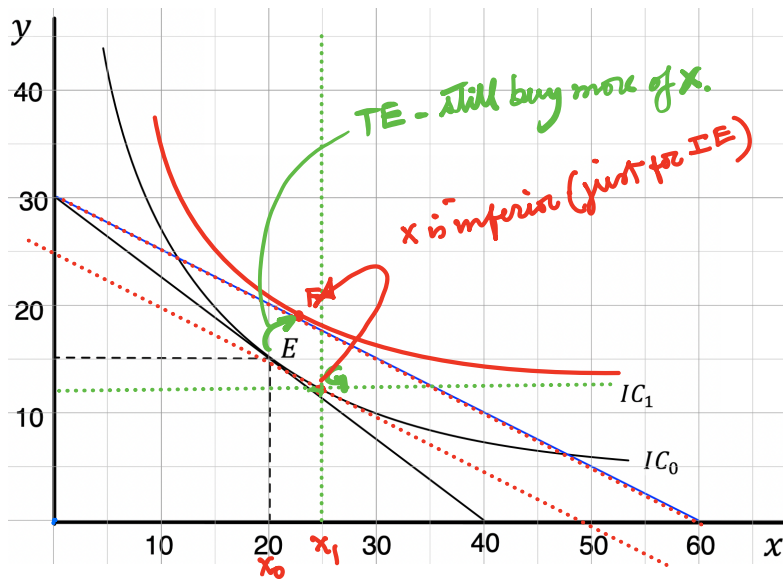
$$I.E. = \begin{cases} \Delta x = x_2 - x_1 = 28 - 26 = 2 \\ \Delta y = y_2 - y_1 = 16 - 12.5 = 3.5 \end{cases}$$

- According to the resulting $I.E.$, x and y are normal goods because as the real income increases, the consumer consumes more of both x and y .
- Total Effect = $T.E. = S.E. + I.E.$

$$\begin{cases} \Delta x = (x_1 - x_0) + (x_2 - x_1) = x_2 - x_0 \\ \Delta y = (y_1 - y_0) + (y_2 - y_1) = y_2 - y_0 \end{cases}$$
- In the following graphs, draw IC_1 in such a way that x is luxury and inferior.

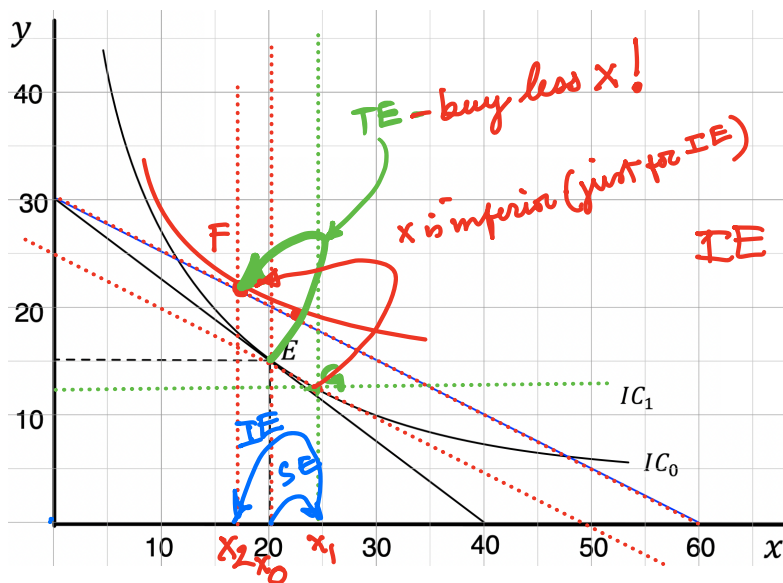


x is inferior



- Can x be so inferior such that when the price p_x decreases, the consumer buys less of x ?

x is Giffen good



G to F , x is inferior.
But in this case x is
Giffen good because
SE is outweighed
by IE.

- This means that when price p_x decreases, the consumer ends up buying less of x . Thus, this violates the Law of Demand even when the consumer is being rational.

Here since P_x changes, y can't be giffen good.