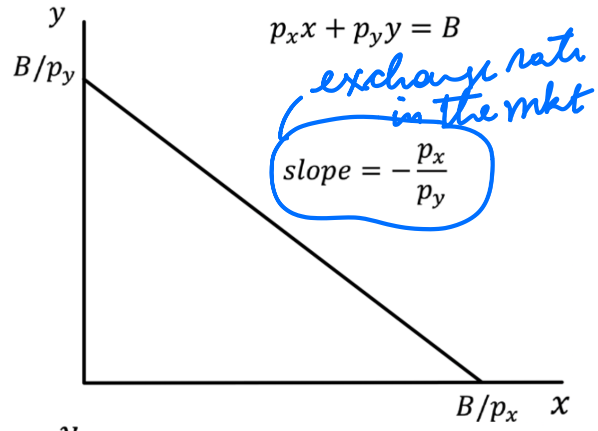
Chapter 12 Consumption: Equilibrium

Consumer's Problem The consumer wants to maximize satisfaction (utility) by deciding what and how much to consume under a limitation of income

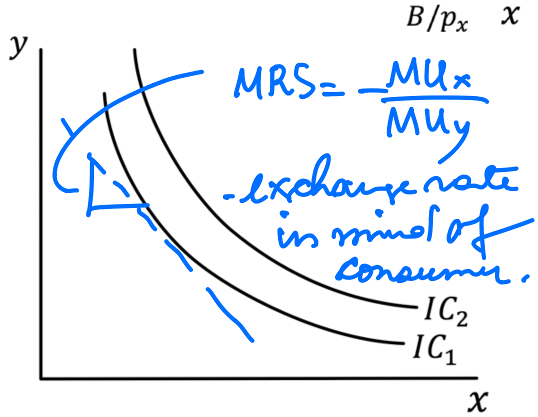


Budget Line

- Every point on the budget line is a bundle the consumer can afford.
- Slope of budget line

$$relative\ price\ x\ interms\ of\ y = -\frac{p_x}{p_y}$$

$$= exchange\ rate\ of\ x\ in\ terms\ of\ y\ in\ the\ market$$



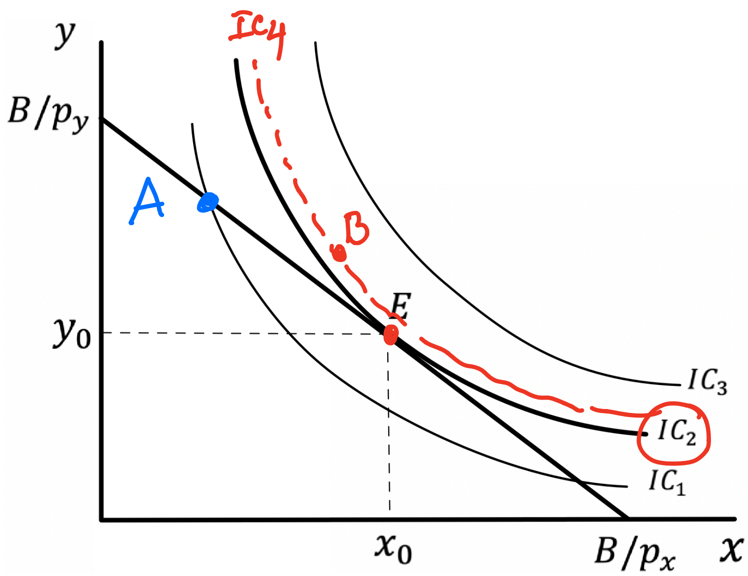
Indifference Curve (IC)

- Each IC shows all the bundles that give the same satisfaction.
- Higher IC means higher satisfaction.
- Slope of IC at (x_0, y_0) is

$$MRS = -\frac{MU_x(x_0, y_0)}{MU_y(x_0, y_0)}$$

$= exchange\ rate\ of\ x\ in\ terms\ of\ y\ in\ the$ **mind of consumer**

Equilibrium of Consumption Problem The consumer wants to maximize satisfaction (utility) by deciding what and how much to consume under a limitation of income



A is affordable but gives lower satisfaction that E because A is on a lower IC_1 (lower than IC_2)

E is on the highest IC (IC_2) affordable because if you are at B – get higher satisfaction than at E – because B is on a higher IC. But B is not affordable because it is above the

The equilibrium is at point $E = (x_0, y_0)$ because

1) E is on the budget line—E is affordable

Budget line given

2) E is on the highest IC (IC_2) the consumer can reach.

B • ~~F~~ is on a higher IC but it is not affordable

A • ~~G~~ is affordable because it is on the budget line but it is on a lower IC than IC_2.

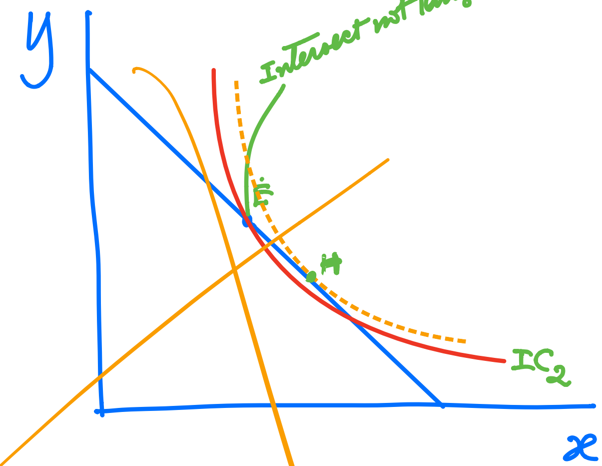
At the equilibrium point E, the indifference curve IC_2 is tangent to the budget line. Thus, at point E the

at E —

$$Slope\ of\ IC_2 = Slope\ the\ budget\ line$$

$$-\frac{MU_x(x_0,y_0)}{MU_y(x_0,y_0)} = -\frac{p_x}{p_y}$$

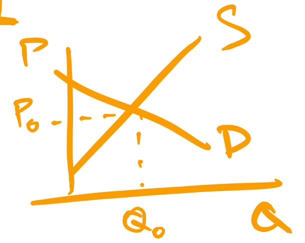
$$\left.\begin{matrix} Exchange\ rate\ between \\ x\ and\ y \\ in\ consumer'mind \end{matrix}\right\} = \left\{\begin{matrix} Exchange\ rate\ between \\ x\ and\ y \\ in\ the\ market \end{matrix}\right.$$



$-\frac{MU_x}{MU_y} = -2$ willing to exchange 2 of y for 1 more x

$-\frac{P_x}{P_y} = \frac{-10}{10} = -1$

• If $\frac{MU_x(x_0,y_0)}{MU_y(x_0,y_0)} \neq \frac{p_x}{p_y}$, the consumer can attain higher satisfaction by buying more (or less) of x and less (or more) of y.



Eq cond — Excess D = 0.
$Q_D = Q_S$.

Equilibrium Conditions: Consumer has equilibrium at $E = (x_0, y_0)$ with the following conditions:

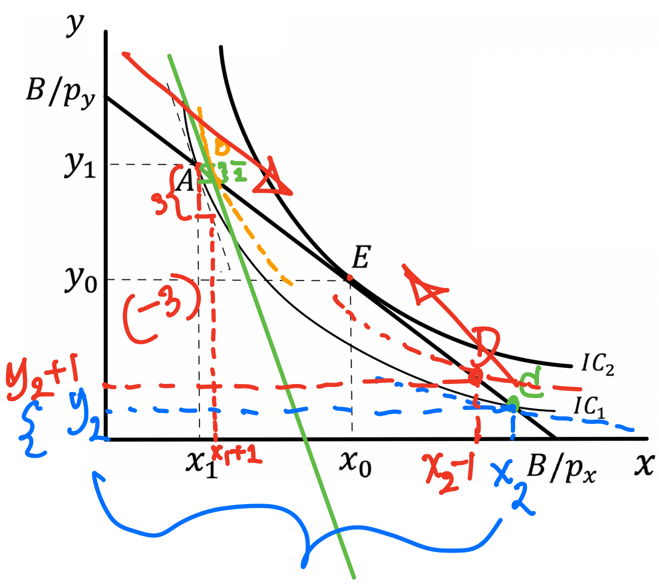
1) $p_x x_0 + p_y y_0 = B \Leftrightarrow E$is affordable.

2) $\frac{MU_x(x_0,y_0)}{MU_y(x_0,y_0)} = \frac{p_x}{p_y}$, or equivalently $\frac{MU_x(x_0,y_0)}{p_x} = \frac{MU_y(x_0,y_0)}{p_y}$

10 5
= 2 = 1

• $\frac{MU_x(x_0,y_0)}{p_x} = \frac{MU_y(x_0,y_0)}{p_y}$ means that the utility from the last baht spent on x is equal to that spent on y.

Another Explanation for Equilibrium at E: The equilibrium must be at point $E = (x_0, y_0)$ because if it is anywhere else on the budget line like at point A the consumer can attain a higher utility level.



Moving from A to B.
- higher satisfaction
- But is B the best the consumer can do?
- is B the equilibrium?

No. since at B we still have $\frac{MU_x}{MU_y} > \frac{P_x}{P_y}$

– keep increasing x and reducing y until we reach E where $\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$.

At A, slope of IC_1 is more than the slope of the budget line (in absolute value). That is, we have at $A = (x_1, y_1)$,

$$\underbrace{\frac{MU_x(x_1,y_1)}{MU_y(x_1,y_1)}}_{B} > \underbrace{\boxed{\frac{p_x}{p_y}}}_{1}.$$

- For ease of explanation, let us assume that $\boxed{\frac{MU_x(x_1,y_1)}{MU_y(x_1,y_1)} = 3}$ and $\frac{p_x}{p_y} = 1$. The consumer can consume one more unit of x by sacrificing just 1 unit of y. – in the market.
- Since $\boxed{\frac{MU_x(x_1,y_1)}{MU_y(x_1,y_1)}} = 3$, in the mind of the consumer, at A he is willing to sacrifice 3 units of y for 1 unit of x to have the same satisfaction.
- By sacrificing only 1 unit of y, instead of 3 units, the consumer thus can be on a higher IC.
- The consumer can repeat this until the point of consumption reaches E, where the exchange rate between x and y in the market is now equal to exchange rate in the mind of the consumer.

At C. $\frac{MU_x(x_2,y_2)}{MU_y(x_2,y_2)} < \frac{P_x}{P_y}$

0.2 < 1

1 more unit of x willing to sacrifice 0.2 unit of y

But in the mkt. 1 x for 1 y.

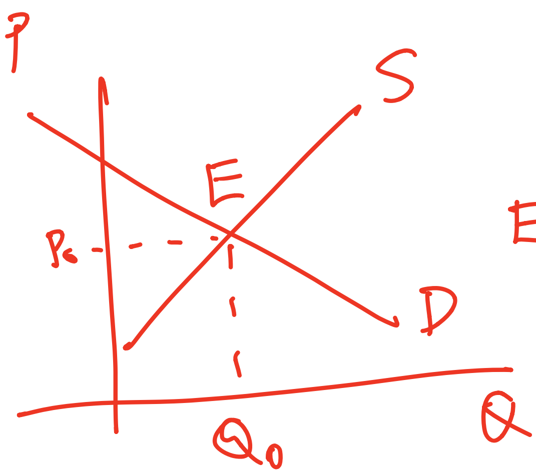
∴ not consume more of x.

more of y. in the market 1 more y ⇒ 1 less of x

1 unit of x ⇒ 0.2 unit of y.

5 units of x ⇐ 1 unit of y

At C. consumer is willing to have 1 more of y and sacrifice 5 units of x



Eq Condition at P0.

$\boxed{Q_D = Q_S}$.

Excess D = 0.