05 May 2023 08:28 PM

Macroeconomics

Topic: Friedman's Permanent-Income hypothesis

income divided into two components

(i) permanent income (Y^P).

(ii) transitory income (Y^T)

Acc to friedman current income, $Y = Y^T + Y^P$

Logic: consumer spend their permanent income (Y_P) but they save most of their transitory income (Y_T)

$Y \uparrow > Y^P$

ie $Y_P/Y < 1 \downarrow$

$\therefore \boxed{C = \alpha Y^P}$ $\Rightarrow \alpha =$ fraction of permanent income consumed (ie, C/Y^P)

$Y \uparrow \Leftarrow Y^T$

$APC = C/Y = \alpha (Y^P/Y) \downarrow$

$\therefore$ APC depends on ratio of permanent income to current income.

current income, $Y = Y^T + Y^P$

i) in SR current income varies Y due to change in Y^T $\Rightarrow$ save $\uparrow$es

APC $\downarrow$se

ii) in LR current income varies Y, due to Y^P. and $C \propto Y^P$ $\Rightarrow$ APC is const for $\uparrow$se in Y.

Irving fisher's Intertemporal Choice:

or real rate of int on savings.

P1 ⇒ Y_1 $\quad C_1$ $\quad \Rightarrow S_1 = \boxed{Y_1 - C_1}$

P2 ⇒ Y_2 $\quad C_2$ $\quad \Rightarrow C_2 = S_1 + rS_1 + Y_2$

$$\boxed{C_2 = (1+r)S_1 + Y_2}$$

$$C_2 = (1+r)S_1 + Y_2$$

or, $C_2 = (1+r)(Y_1 - C_1) + Y_2$

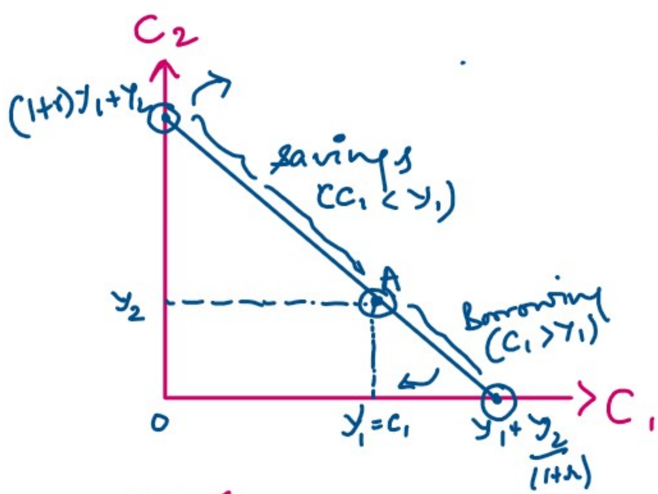
or, $C_2 = Y_1 + rY_1 - C_1 - rC_1 + Y_2$

or, $C_1 + C_2 + rC_1 = Y_1 + Y_2 + rY_1$

or, $C_1(1+r) + C_2 = Y_1(1+r) + Y_2$

or, $C_1 + \dfrac{C_2}{(1+r)} = Y_1 + \dfrac{Y_2}{(1+r)}$

⟶ intertemporal budget constraint



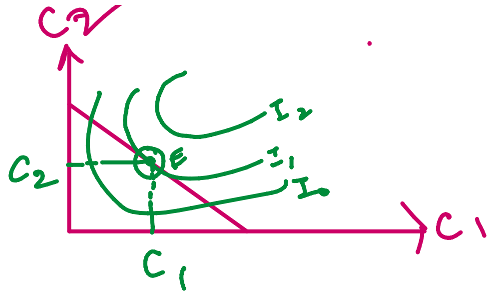
slope of ⇒

$$\frac{dC_1}{dC_2} + \frac{1}{(1+r)} = 0$$

$$\frac{dC_1}{dC_2} = -\frac{1}{(1+r)}$$

$$dC_2/dC_1 = -(1+r) < 0$$

slope of indiff curve = MRS



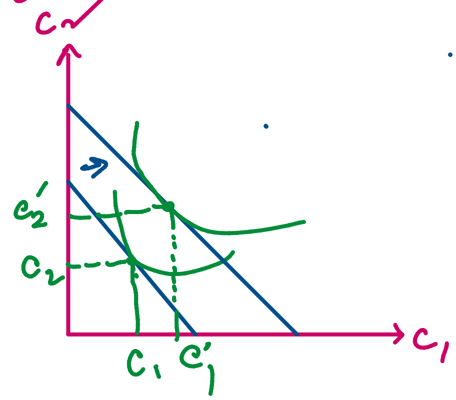
slope of indiff curve = MRS

for optimisation, consumer's equilibrium

$\boxed{MRS = 1+r}$

(tangency condition).

① change in income



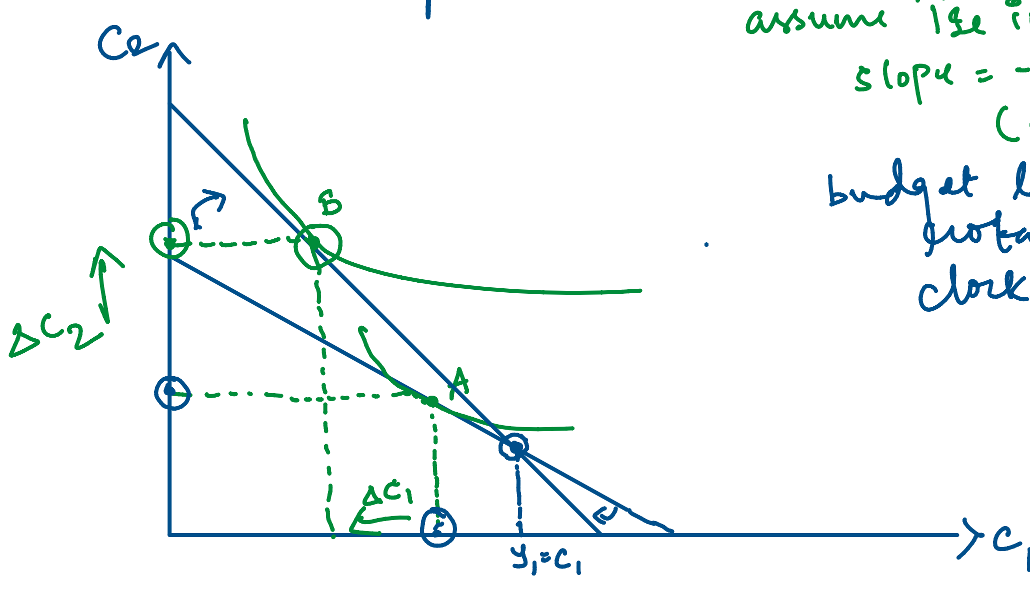
② change in real rate of interest (r).

assume ise in r.

slope = −(1+r) ise

(steeper).

budget line rotates clockwise.



STATISTICS

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Confidence Interval.

Case 2 :- confidence limit for μ, when σ is unknown.

sample mean $\bar{x}$ and $s'^2 = \frac{1}{n-1}\sum(x_i-\bar{x})^2$

& $s = \frac{1}{n}\sum(x_i-\bar{x})^2$

Test stat: $t = \dfrac{\bar{x}-\mu}{s'/\sqrt{n}}$

$$P\left[t_{1-\alpha/2,\,n-1} \le \frac{(\bar{x}-\mu)\sqrt{n}}{s'} \le t_{\alpha/2,\,n-1}\right] = 1-\alpha$$

$$P\left\{\underbrace{\bar{x} - \frac{s'}{\sqrt{n}}\, t_{\alpha/2,\,n-1}}_{\text{Lower}} \le \mu \le \underbrace{\bar{x} + \frac{s'}{\sqrt{n}}\, t_{1-\alpha/2,\,n-1}}_{\text{upper}}\right\} = 1-\alpha$$

Case 3 : for σ, with μ known. $Z = \dfrac{\bar{x}-\mu}{\sigma/\sqrt{n}}$

Test stat: $\dfrac{\sum(x_i-\mu)^2}{\sigma^2} \sim \chi^2_{(n)}$

$$P\left[\chi^2_{1-\alpha/2,\,n} \le \frac{\sum(x_i-\mu)^2}{\sigma^2} \le \chi^2_{\alpha/2,\,n}\right] = 1-\alpha$$

$$P\left[\frac{\sum(x_i-\mu)^2}{\chi^2_{\alpha/2,\,n}} \le \sigma^2 \le \frac{\sum(x_i-\mu)^2}{\chi^2_{1-\alpha/2,\,n}}\right] = 1-\alpha.$$

Case 4: for σ, when μ is unknown.

test stat: $\dfrac{\sum(x_i-\bar{x})^2}{\sigma^2} = \dfrac{(n-1)s'^2}{\sigma^2} \sim \chi^2_{(n-1)}$