Oct 29, 2019.

Today

1. Review U-max problem w/ SE. & IE.
2. Applications :
   - Giffen good
   - Subsidy
   - Vouchers
   - Work-leisure
   - Intertemporal consumption

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Consumer U-max problem

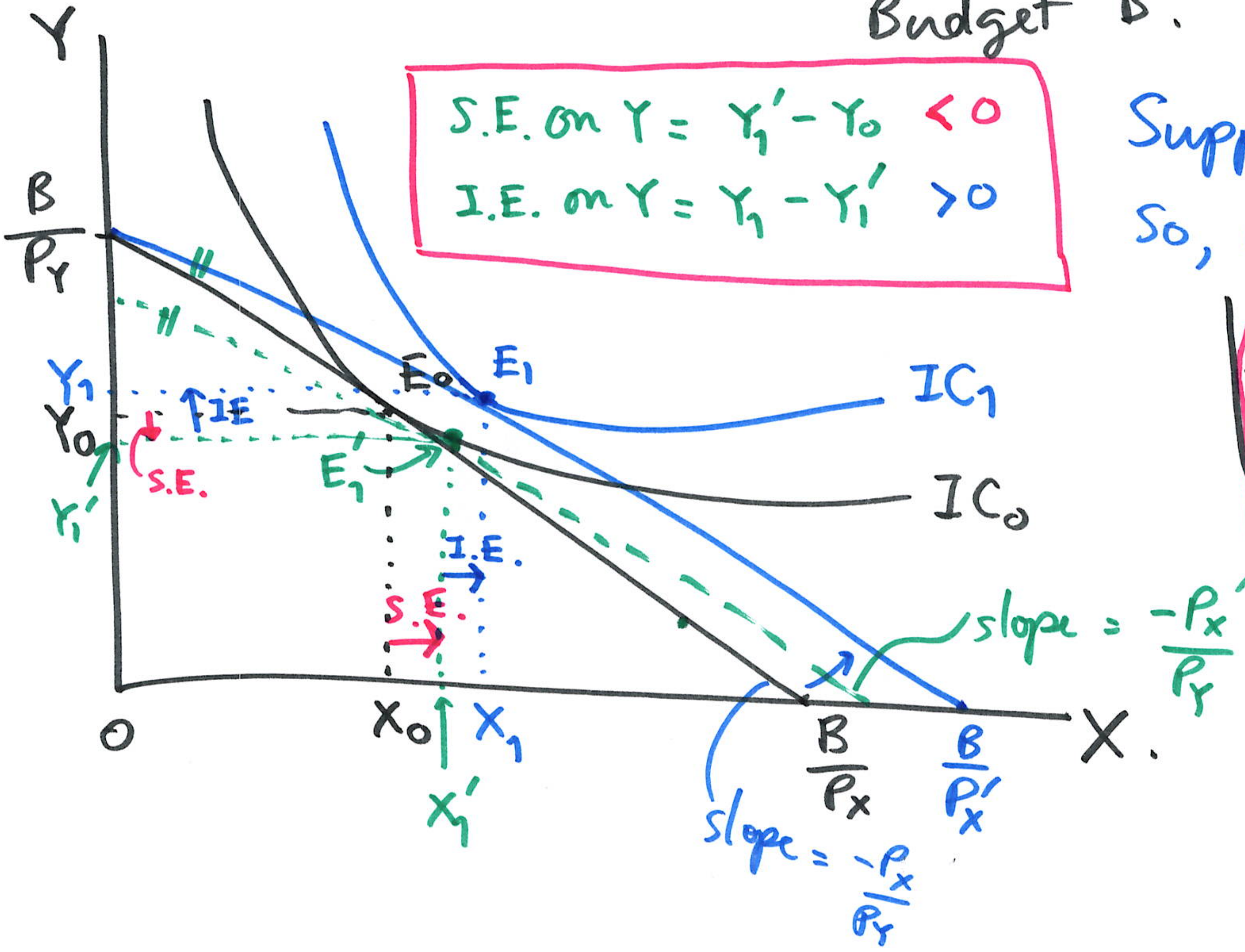
Given 2 goods : X & Y., Prices : P_X & P_Y

Budget B.

Suppose P_X ~~increases~~ decreases.

So, $P_X' < P_X$

$$\boxed{\begin{aligned} &\text{S.E. on } Y = Y_1' - Y_0 < 0 \\ &\text{I.E. on } Y = Y_1 - Y_1' > 0 \end{aligned}}$$



⇒ Substitution effect on X

$= X_1' - X_0 > 0$

⇒ Income effect on X

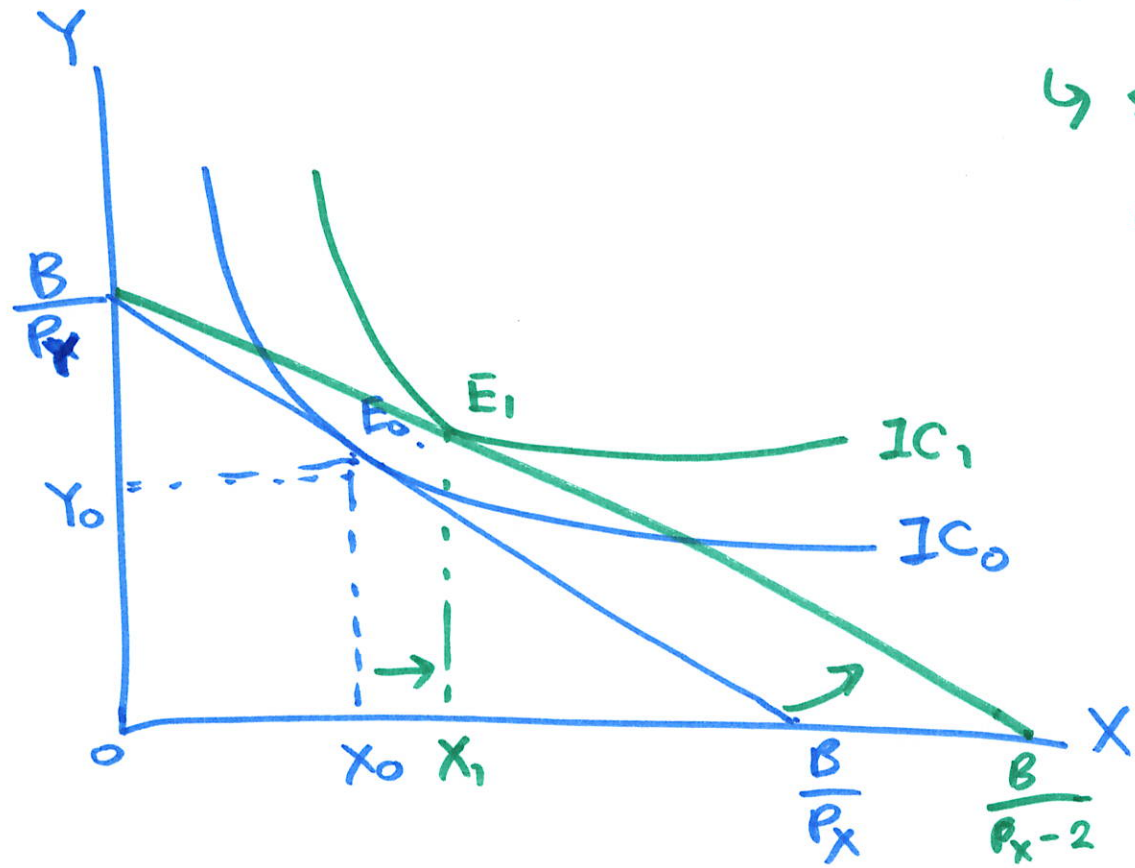
$= X_1 - X_1' > 0$

Steps

1. Start with the original BL & IC. Call the optimal point E_0 (X_0, Y_0).
2. Determine the impact of the change (say $P_x \downarrow$) on the BL.
3. Identify the new optimal point. Call E_1 (X_1, Y_1).
4. Draw a hypothetical BL that has the same slope as the new BL. (ie slope $= \frac{-P_x'}{P_Y}$). Call the tangency with the original IC E_1'. (X_1', Y_1')
5. S.E. on $X = X_1' - X_0$; IE on $X = X_1 - X_1'$

Application : Subsidy.

Suppose the gov't gives a $2 per-unit subsidy for good X. Everything else constant.



$P_X' = P_X - 2$.

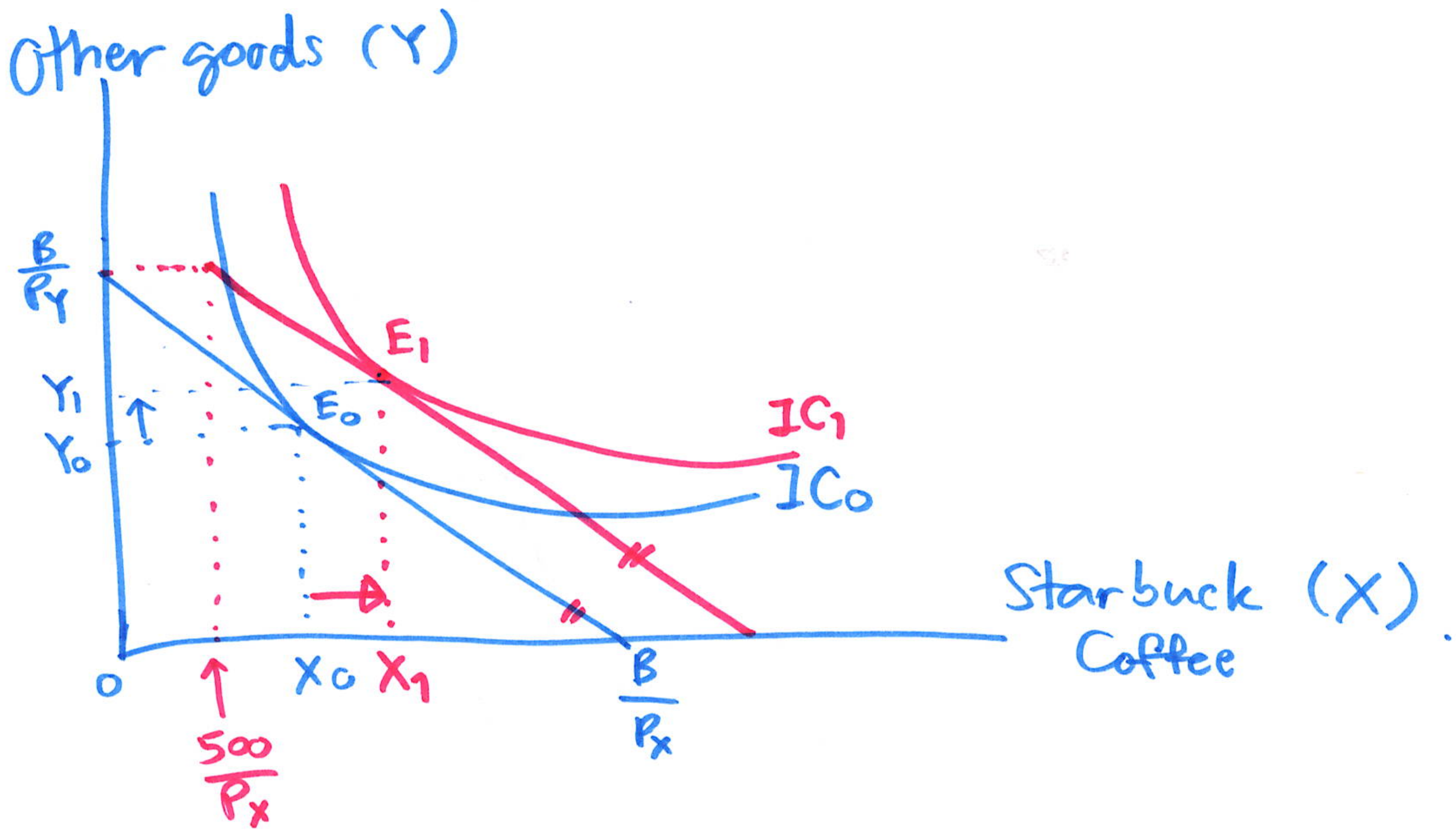
↳ same effect as a reduction in P_X.

⇒ X^* increases

but Impact on Y is arbitrary.

Application : Voucher

Suppose you receive ฿500 starbuck coupon; everything else constant.



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<u>Application</u> : Work-leisure Analysis

Consumer's utility depends on consumption of all goods (c) and leisure (l). Constraint is time.

↳ Leisure : $l = 24 - L$, where L = labor (working hours).

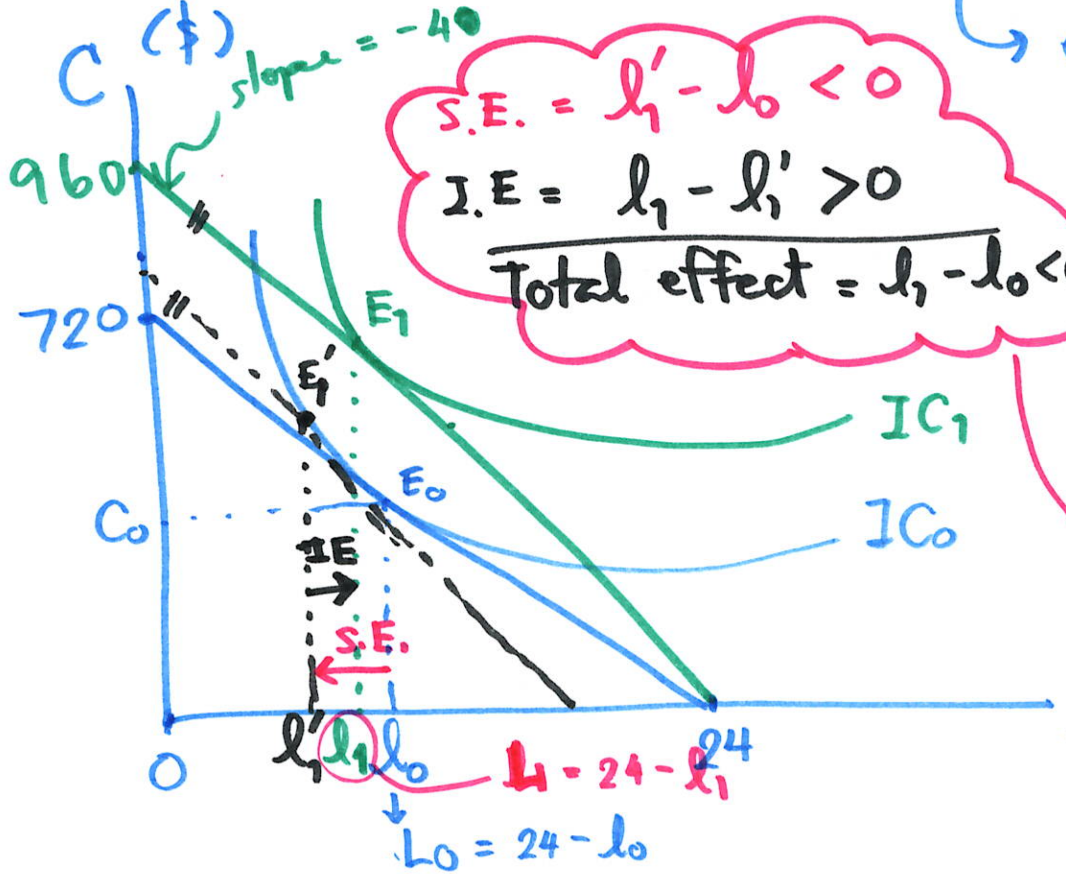
↳ earn wage (w) per hour.

Suppose $w = \$30/\text{hour}$.

↳ $\max c = \$30 \times 24 = \$720$

Suppose $w' = \$40/\text{hour}$.

↳ $\max c = \$960$



$S.E. = l_1' - l_0 < 0$

$I.E = l_1 - l_1' > 0$

$\text{Total effect} = l_1 - l_0 < 0$

S.E. > I.E → less leisure

→ more Labor.

$(L_1 > L_0)$

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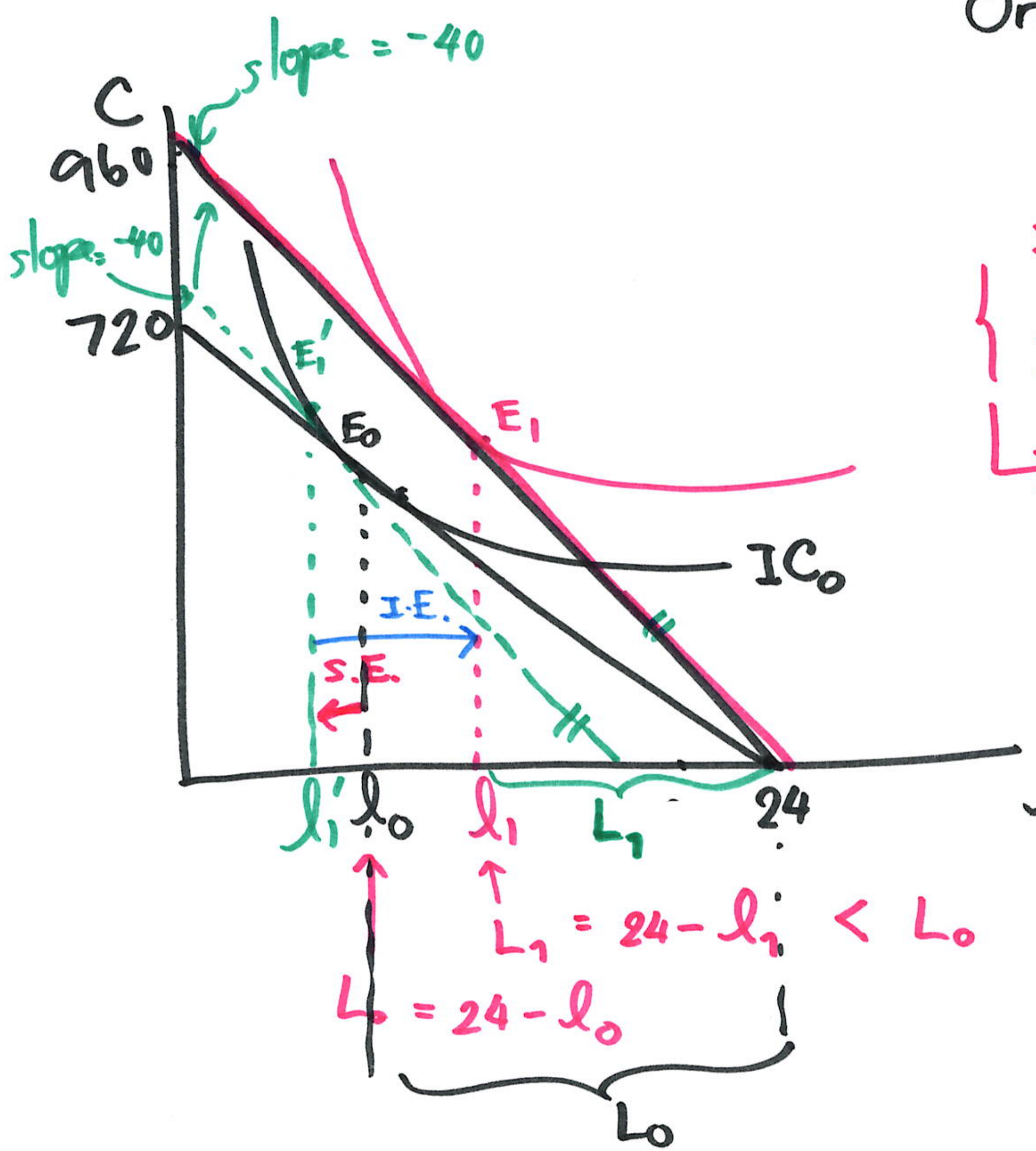
Work - Leisure when I.E. > S.E.

Original $w = \$30$ / hour

New $w' = \$40$ / hour.



S.E. on $l = l_1' - l_0 < 0$.

I.E. on $l = l_1 - l_1' > 0$.

$\hookrightarrow |\underbrace{l_1 - l_1'}_{IE}| > |\underbrace{l_1' - l_0}_{S.E.}|$

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Application : Intertemporal consumption

Let C_0 = consumption when young } Live for 2 periods.

C_1 = " ——— when old.

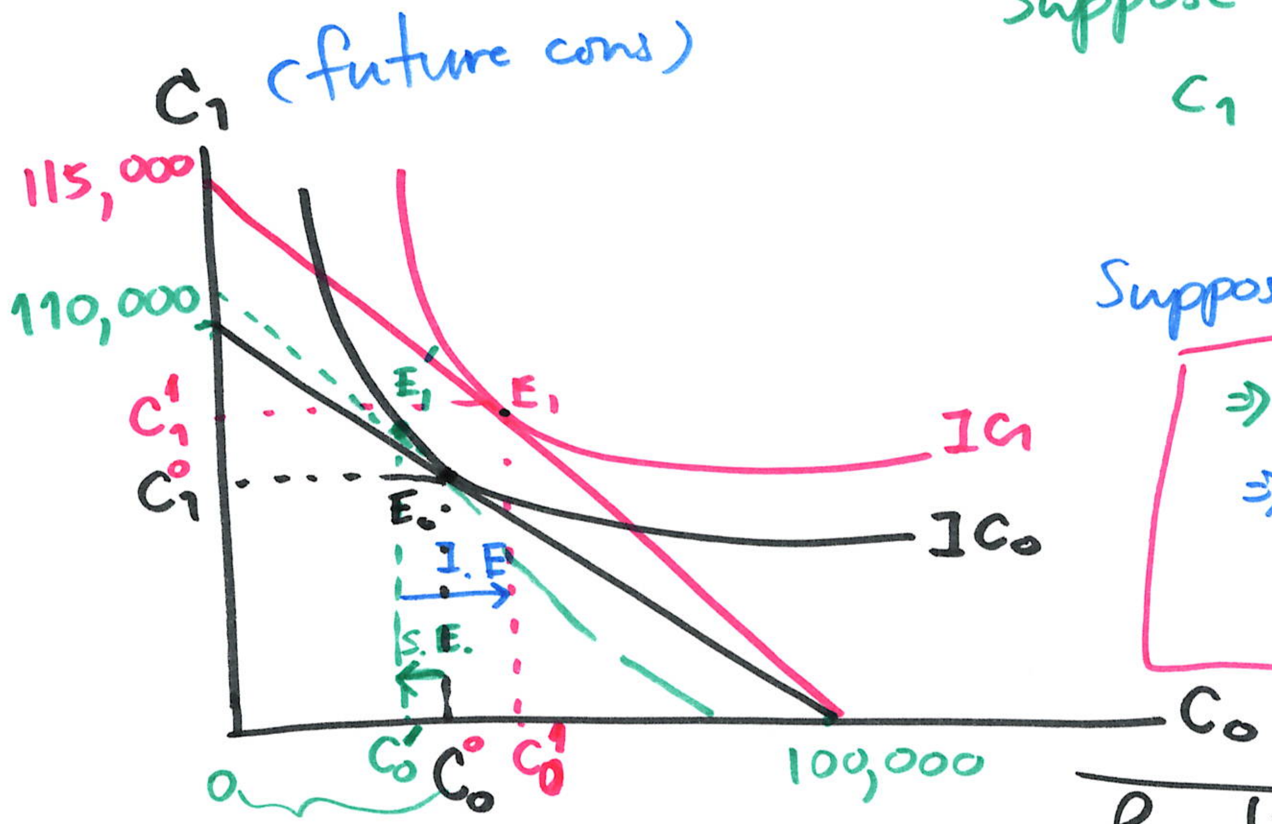
Let interest rate = $r\%$. (saving rate), say $r = 10\%$.

Suppose $C_0 = 100{,}000$

$C_1 = C_0 + (r\% \times C_0)$

$= (1 + r\%)\, C_0$

Suppose $r \uparrow$ to $r' = 15\%$.



$\Rightarrow$ S.E. on $C_0 = C_0' - C_0^0 < 0$

$\Rightarrow$ I.E. on $C_0 = C_0^1 - C_0' > 0$.

Total effect $= C_0^1 - C_0^0$

Practice : What if S.E > I.E ?