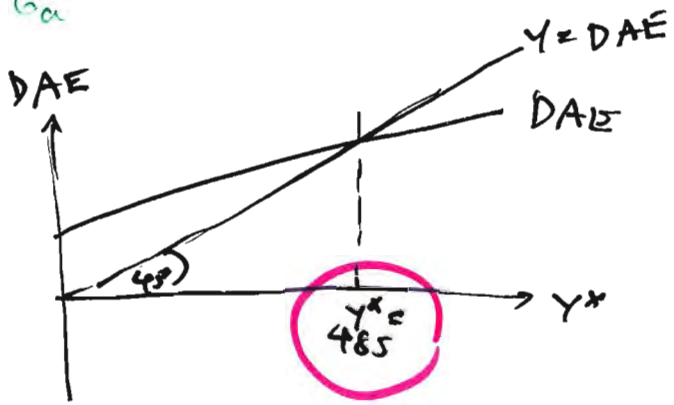
Topics

1. Numerical Examples
2. Adjustment Mechanism (Multiplier)
3. Equation Modification
   - $I = I_a + dY$
   - $T = T_a + tY$
   - Adding Govt's transfer (R)
4. Paradox of Thrift
5. Non-Keynesian Ideas
   - C : Life-Cycle
   - I :
     - PV, NPV
     - MEC or IRR
     - Accelerator Principles

Numerical Example : CASE #2: Closed Economy

$C = 100 + 0.6\,Y^d$; $T = 10$; $I = 40$; $G = 60$

$C = C_a + bY$; $T = T_a$; $I = I_a$; $G = G_a$



$$Y_e = \left(\frac{1}{1-b}\right)(C_a - bT_a + I_a + G_a)$$

$$= \left(\frac{1}{1-0.6}\right)(100 - 0.6\times 10 + 40 + 60)$$

$$= 485$$

$DAE = Y$

$Y = DAE$

$= C + I + G$

$= (C_a + bT_a + I_a + G_a) + bY$

$= 100 - 0.6\times 10 + 40 + 60 + 0.6\times 485$

$= 194 + 0.6 \times 485$

$Y^* = 485$

Injection = Leakage

$I + G = S + T$

$I_a + G_a = -C_a + (1-b)Y_e - (1-b)T_a + T_a$

$40 + 60 = -100 + (1-0.6)485 - (1-0.6)\times 10 + 10$

$100 = -100 + 6 + 194$

$100 = 100$

Autonomous Consumption Multiplier :

$$\frac{\Delta Y}{\Delta C_a} = \frac{1}{1-b} = \frac{1}{1-0.6} = 2.5$$

" Investment " :

$$\frac{\Delta Y}{\Delta I_a} = \frac{1}{1-b} = \frac{1}{1-0.6} = 2.5$$

" Govt " :

$$\frac{\Delta Y}{\Delta G_a} = \frac{1}{1-b} = \frac{1}{1-0.6} = 2.5$$

" Tax " :

$$\frac{\Delta Y}{\Delta T_a} = \frac{-b}{1-b} = \frac{-0.6}{1-0.6} = -1.5$$

Negative Value

Example If I_a Increases by 10 $\Rightarrow \Delta I_a = 10 \Rightarrow I_a = 50$

$$Y^*_{new} = \left(\frac{1}{1-b}\right)(C_a - b\,T_a + I_a + G_a)$$

$$= \left(\frac{1}{1-0.6}\right)(100 - (0.6 \times 10) + 50 + 60)$$

$$= \frac{1}{0.4} \times 204 = 510$$

$$\Delta Y = 510 - 485 = 25$$

$$\frac{\Delta Y}{\Delta I_a} = \frac{25}{10} = 2.5$$

Balance Budget Multiplier

G_a multiplier $= \frac{1}{1-b}$

T_a Multiplier $= \frac{-b}{1-b}$

If $\Delta G_a = \Delta T_a$

$$\Delta Y = \frac{1}{1-b}\Delta G_a + \left(\frac{-b}{1-b}\right)\Delta T_a$$

$$= \frac{1}{1-b}\Delta G_a + \left(\frac{-b}{1-b}\right)\Delta G_a$$

$$= \frac{(1-b)}{(1-b)}\Delta G_a = \Delta G_a$$

$$\Delta Y = \Delta G_a$$

Numerical Example : CASE #3 : OPEN ECONOMY

$C = 80 + 0.4\,Y^d$ ($80 \rightarrow C_a$, $0.4 \rightarrow b$)

$I = 50 \rightarrow I_a$

$G = 30 \rightarrow G_a$

$X = 40 \rightarrow X_a$

$M = 20 + 0.16\,Y$ ($20 \rightarrow M_a$, $0.16 \rightarrow m$)

$T = 10 \rightarrow T_a$

$$Y^* = \left(\frac{1}{1+m-b}\right)\left(C_a - b\,T_a + I_a + G_a + X_a - M_a\right)$$

$$= \left(\frac{1}{1+0.16-0.4}\right)\left(100 - (0.4)\times 10 + 50 + 30 + 40 - 20\right)$$

$$Y^* = 231.5789$$

INJECTON

$$I + G + X = I_a + G_a + X_a$$

$$= 50 + 30 + 40$$

$$= 120$$

LEAKAGE

$$S + T + M$$

$$= -C_a - (1-b)\,T_a + (1-b)\,Y^* + T_a + M_a + m\,Y$$

$$= -80 - (1-0.4)\times 10 + (1-0.4)\times 231.5789 + 10 + 20$$

$$= -80 - 6 + 138.95 + 10 + 20 + 37.05 + 0.16\,(231.5789) + 10$$

$$= 120$$

Adjustment Mechanism (Multiplier)

Suppose $\Delta I_a = 10$ and $b = 0.6$ (or mpc = 0.6)

A B C D E

$\Delta I_a = \$10 \Rightarrow DAE \uparrow \rightarrow Y \uparrow \rightarrow C \uparrow, S \uparrow \rightarrow DAE \uparrow \rightarrow Y \uparrow \rightarrow C \uparrow, S \uparrow \rightarrow DAE \uparrow \rightarrow Y \uparrow \rightarrow C \uparrow, S \uparrow \rightarrow DAE \uparrow \rightarrow Y \uparrow \rightarrow C \uparrow, S \uparrow \rightarrow \dots$

1st-round

Construction company earns $10 and used this amount to pay as:
- Raw Material
- Salary
- Company profit

So, DAE ↑ (because DAE = C + I + G)

and since Y = DAE

Y ↑

2nd-round

Since $C = C_a + bY$

IF Y ↑ ⇒ C ↑

$\Delta Y = \$10 \Rightarrow \Delta C = 10 \times 0.6$ (mpc)

Since DAE = C + I + G

$\Delta C \uparrow \Rightarrow \Delta DAE \uparrow$

10×0.6

since Y ⇒ DAE

$\Delta DAE \uparrow \Rightarrow \Delta Y \uparrow$

$\hookrightarrow \Delta Y = 10 \times 0.6$

3rd round

Since $C = C_a + bY$

$\Delta Y \Rightarrow \Delta C$

$10 \times 0.6 \Rightarrow 10 \times 0.6 \times 0.6$ (mpc)

Since DAE = C + I + G

$\Delta C \uparrow \rightarrow \Delta DAE \uparrow$

$10 \times 0.6 \times 0.6 \rightarrow 10 \times 0.6 \times 0.6$

Since Y ⇒ DAE

$\Delta DAE \uparrow \rightarrow \Delta Y \uparrow$

$\downarrow$

$10 \times 0.6 \times 0.6$

4th-round

Since $C = C_a + bY$

$\Delta Y \Rightarrow \Delta C$

$10 \times (0.6)^2 \Rightarrow 10 \times (0.6)^2 \times 0.6$ (mpc)

Since DAE = C + I + G

$\Delta C \uparrow \rightarrow \Delta DAE \uparrow$

$10 \times (0.6)^3 \rightarrow 10 (0.6)^3$

Since Y ⇒ DAE

$\Delta DAE \uparrow \rightarrow \Delta Y \uparrow$

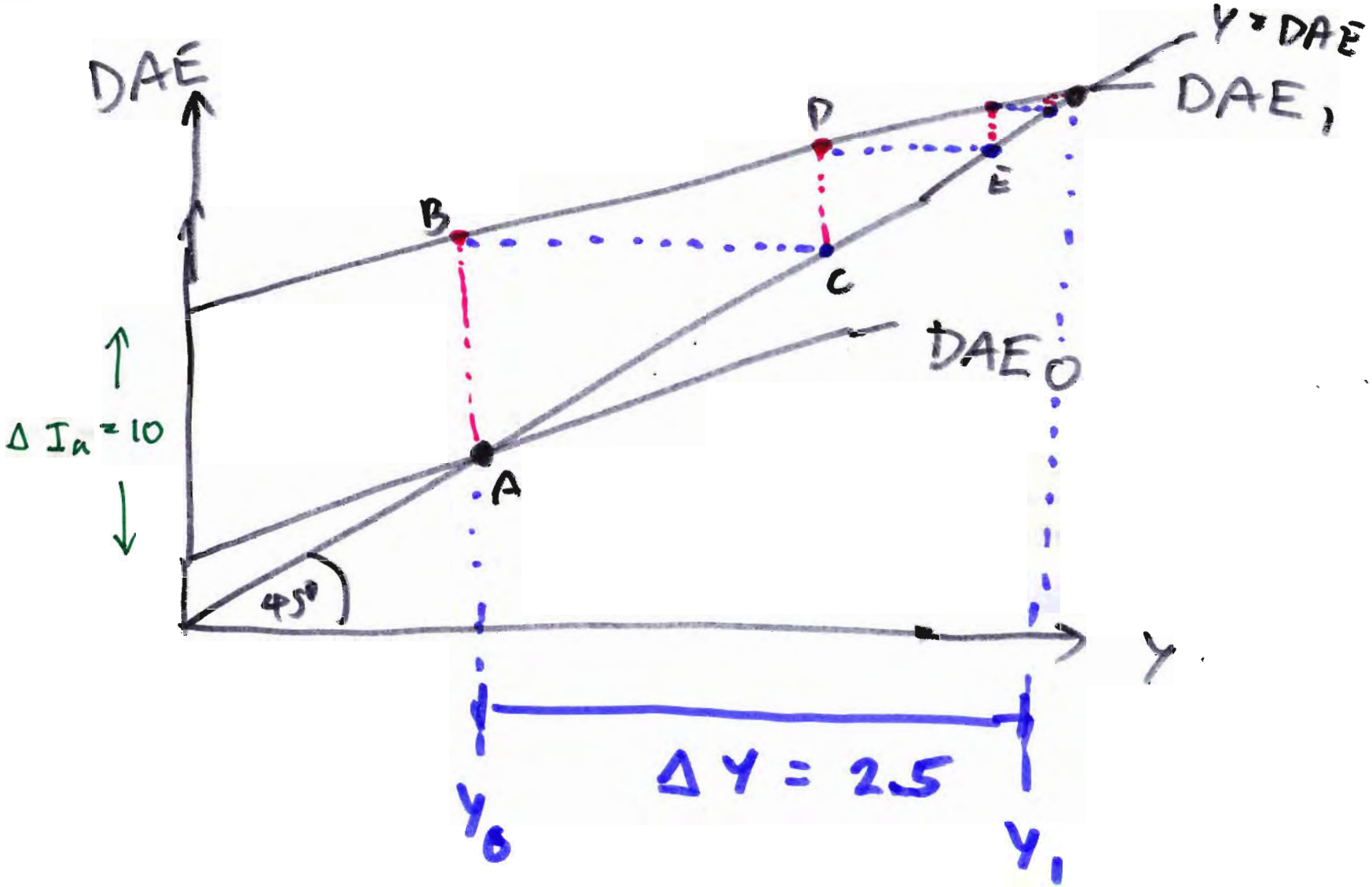
$\downarrow$

$10 (0.6)^3$

$$\frac{\Delta Y}{\Delta I_a} = \frac{1}{1-b}$$

$$\Delta Y = \underbrace{10}_{\Delta I_a} + 10(0.6) + 10(0.6)^2 + 10(0.6)^3 + \dots$$

$$= 10 \times \frac{1}{1-b} = = 10 \times 1/0.4 = 25$$


DAE
Y = DAE
DAE₁
D
E
B
C
DAE₀
ΔIa = 10
A
45°
Y
ΔY = 2.5
Y₀
Y₁