pichaya 6404640788

1. Answer the following questions.
   - 1.1 Suppose Govt Multiplier is 5 and $\Delta G = 5$. Find ΔY.
   - 1.2 Suppose Tax Multiplier is -3 and $\Delta Y = -9$. Find ΔT.
   - 1.3 Suppose $\Delta Y = 10$ and $\Delta I = 2$. Find Investment Multiplier.

1.1) govt Multiplier $= \frac{\Delta Y}{\Delta G}$

$\frac{\Delta Y}{5} = 5$

$\Delta Y = 25$ ※

1.2) Tax multiplier $= \frac{\Delta Y}{\Delta T}$

$\frac{-9}{\Delta T} = -3$

$\Delta T = 3$ ※

1.3) investment multiplier $= \frac{\Delta Y}{\Delta I}$

$\frac{10}{2} = 5$ ※

2. From $Y = C + I + G$ where $C = C_0 + C_1(Y - T)$, find
   - 2.1 Equilibrium Output Y*
   - 2.2 $\Delta Y/\Delta I$
   - 2.3 $\Delta Y/\Delta G$
   - 2.4 $\Delta Y/\Delta T$
   - 2.5 Balanced-Budget Multiplier (BBM)
   - 2.6 Explain what the BBM is.

2.1) $AE = C + I + G$

$Y = AE \rightarrow$ eqbm

$Y^* = C + I + G$

$Y^* = C_0 + C_1(Y - T) + I + G$

$Y^* = C_0 + C_1 Y - C_1 T + I + G$

$Y - C_1 Y = C_0 - C_1 T + I + G$

$Y(1 - C_1) = C_0 - C_1 T + I + G$

$Y = \frac{1}{1 - C_1}(C_0 - C_1 T + I + G)$

2.2) $AE = C_0 + C_1 Y - C_1 T + I + G$

↳ slope of AE

as I is injection; $\frac{\Delta Y}{\Delta I} = \frac{1}{1 - \text{slope AE}} = \frac{1}{1 - C_1}$ ※

2.3) $\frac{\Delta Y^*}{\Delta G} = \frac{1}{1 - C_1}$

2.4) as T is leakage; $\frac{\Delta Y}{\Delta T} = \frac{-\text{MPC}}{1 - \text{slope AE}}$

$\therefore \frac{\Delta Y^*}{\Delta T} = \frac{-C_1}{1 - C_1}$

2.5) BBM

$\frac{\Delta Y^*}{\Delta G} + \frac{\Delta Y^*}{\Delta T} = \frac{1 - C_1}{1 - C_1}$

2.6) BBM is a change in aggregate output when both G and T increase by 1 unit.

3. Assume a closed economy with government. The country has the following components of aggregate expenditure.

$C = 300 + 0.75(Yd)$ $I = 50$

$G = 50$ $T = 50$ (lump-sum tax)

3.1 Use the Y = AE (standard) approach to find the equilibrium output.

3.2 Draw the Keynesian Cross, and find the intercept on the vertical axis and the slope of the AE schedule.

3.3 Use the Leakage = Injection (or saving/investment) approach to find the equilibrium level of output.
(Hint: the equilibrium condition is S + T = I + G, with Yd= Y – T = C + S)

3.4 Draw the saving/investment curve to show the equilibrium.

3.5 Suppose that the government decides to build more roads, raising government spending by 50 units, but this project is to be financed by the increase in net taxes of 50 units. Use the Y = AE (standard) approach to find the new equilibrium output.

3.6 Use the Balanced-Budget Multiplier (BBM) derived from Question 2.4 to find the new equilibrium output.

3.1) $Y = AE$ → eqbm condition

$Y = C + I + G$

$Y = 300 + 0.75(Y-50) + 50 + 50$

$Y = 300 + 0.75Y - 37.5 + 50 + 50$

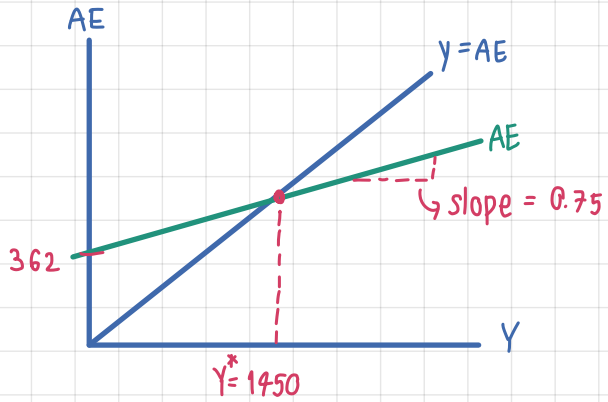
$Y - 0.75Y = 362.5$

$0.25Y = 362.5$

$Y^* = 1450$

$AE = 362.5 + 0.75Y$

3.2)



3.3) $S+T = I+G$ ① (leakage = injection)

$Y-T = C+S$ ② (saving function)

②; $Y-C = S+T \rightarrow = I+G$

$Y-C = I+G$

$Y-C = 50+50$

$Y-C = 100$

$Y-(300+0.75Y_d) = 100$

$Y-(300+0.75(Y-50)) = 100$

$Y-(300+0.75Y-37.5) = 100$

$Y-300-0.75Y+37.5 = 100$

$0.25Y = 362.5$

$Y^* = 1450$ ※

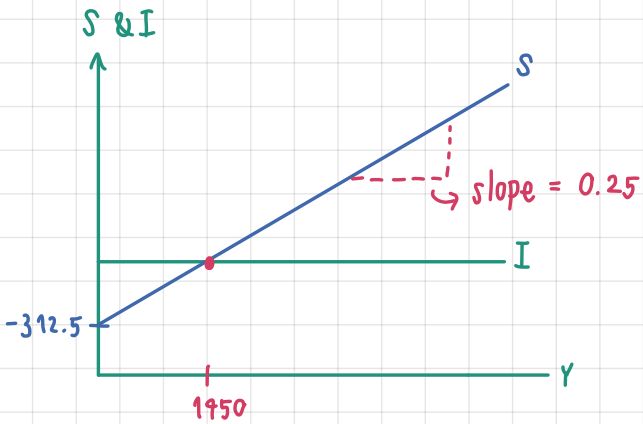
3.4) saving function

$Y-T = C+S$

$Y-50 = 300+0.75(Y-50)+S$

$S = -300+0.75Y-37.5+Y-50$

$S = -312.5+0.25Y$ ※



3.5) $G\uparrow = 50 + 50 = 100$

$T\uparrow = 50 + 50 = 100$

new $Y^* = ?$

$AE = C + I + G$

$Y = 300 + 0.75(Y - 100) + 50 + 100$

$= 300 + 0.75Y - 75 + 150$

$Y = 375 + 0.75Y$

$0.25Y = 375$

$Y^* = 1500$ ※

3.6) use BBM to find new Y^*

$$BBM = \frac{1 - C_1}{1 - C_1}$$

$$= \frac{1 - 0.75}{1 - 0.75}$$

$= 1$

when $G \& T \uparrow 1 \rightarrow Y \uparrow 1$

$G \& T \uparrow 50 \rightarrow Y \uparrow 50$

new eqbm $= 1550$ ※

4. From $Y = C + I + G + (X - M)$
where $C = C_0 + C_1(Y - T)$ and $M = M_0 + M_1(Y)$, find

4.1 Equilibrium Output Y*
4.2 $\Delta Y/\Delta I$
4.3 $\Delta Y/\Delta G$
4.4 $\Delta Y/\Delta T$
4.5 Balanced-Budget Multiplier (BBM)

4.1) $Y^* = C_0 + C_1(Y - T) + I + G + X - (M_0 + M_1 Y)$

$Y^* = C_0 + C_1 Y - C_1 T + I + G + X - M_0 - M_1 Y$

$Y - C_1 Y + M_1 Y = C_0 - C_1 T + I + G + X - M_0$

$Y(1 - C_1 + M_1) = C_0 - C_1 T + I + G + X - M_0$

$$Y = \left(\frac{1}{1 - C_1 + M_1}\right)(C_0 - C_1 T + I + G + X - M_0)$$

4.2) $$\frac{\Delta Y}{\Delta I} = \frac{1}{1 - C_1 + M_1}$$

4.3) $$\frac{\Delta Y}{\Delta G} = \frac{1}{1 - C_1 + M_1}$$

4.4) $$\frac{\Delta Y}{\Delta T} = \frac{-C_1}{1 - C_1 + M_1}$$

4.5) $$\frac{\Delta Y}{\Delta G} + \frac{\Delta Y}{\Delta T} = \frac{1 - C_1}{1 - C_1 + M_1}$$

5. Assume an open economy with government. The country has the following components of aggregate expenditure.

$C = 200 + 0.7(Yd)$ $I = 75$ $G = 75$

$T = 50$ $X = 50$ $M = 50 + 0.1Y$

5.1 Use the Y = AE approach to find the equilibrium. Is Y = 300 an equilibrium? If it is not, explain the adjustment process towards equilibrium.

$AE = 200 + 0.7(Y - 50) + 75 + 75 + 50 - (50 + 0.1Y)$

$= 200 + 0.7Y - 35 + 200 - 50 - 0.1Y$

$Y = 315 + 0.6Y$

$0.4Y = 315$

$Y^* = 787.5$ ※

y = 300 is not the eqbm.

To adjust towards 787.5, we need to produce more because there's demand > supply which cause shortage. The inventories will be decreased.

5.2 Based on what you have ~~derived in Question 4,~~ calculate the investment, government spending, tax, and balanced-budget multipliers.

investment: $\frac{\Delta Y^*}{\Delta I} = \frac{1}{1-0.7+0.1} = \frac{1}{0.4} = 2.5$; when $I \uparrow 1 \rightarrow Y^* \uparrow 2.5$

Govt: $\frac{\Delta Y^*}{\Delta G} = \frac{1}{1-0.7+0.1} = \frac{1}{0.4} = 2.5$; when $G \uparrow 1 \rightarrow Y^* \uparrow 2.5$

Tax: $\frac{\Delta Y^*}{\Delta T} = \frac{-0.7}{0.4} = -1.75$; when $T \uparrow 1 \rightarrow Y^* \downarrow 1.75$

BBM: $\frac{1-C_1}{1-C_1+M_1} = \frac{1-0.7}{1-0.7+0.1} = \frac{0.3}{0.4} = 0.75$; whe G & T $\uparrow 1 \rightarrow Y^* \uparrow 0.75$

5.3 Interpret the value of each of the multipliers.
Suppose that the full-employment output (Y_F) is 600;

$\frac{\Delta Y^*}{\Delta I} = 2.5$; $\Delta Y = 600$ $\Delta I = 1500$

$\frac{\Delta Y}{\Delta G} = 2.5$; $\Delta Y = 600$ $\Delta G = 1500$

$\frac{\Delta Y}{\Delta T} = -1.75$; $\Delta Y = 600$ $\Delta T = -1050$

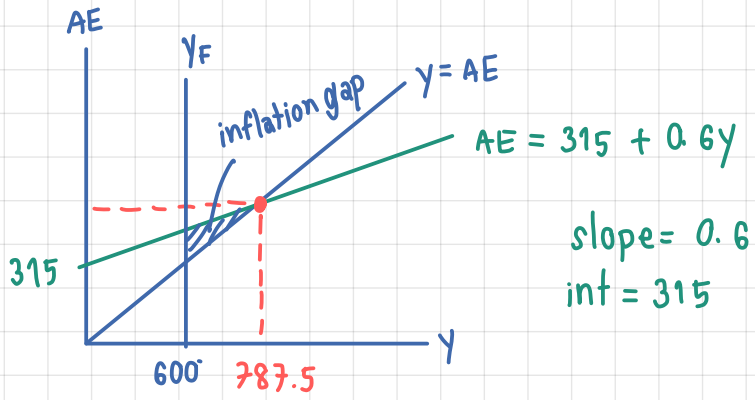
BBM = 0.75

$\Delta Y = 600$ ΔG & $\Delta T = 450$

5.4 What type of output gap is the economy currently experiencing? $y^* = 787.5 > y_F = 300$

It is inflation gap because the market demand exceed the aggregat output. the economy is growing too fast, and the FOP are over-employed.

5.5 Draw the Keynesian Cross. Identify its slope and intercept. Also, illustrate the output gap.



Now, government wants to correct the output gap by moving the economy to the full-employment level, and is considering different policies.
(Hint: use the multipliers from Question 5.2 to answer the following questions)

5.6 If the government wants to adjust **only its spending (G)**, how much G should be changed?

$y^* = 787.5 \rightarrow y_F = 600 \; ; \Delta Y^* = -187.5$

$\frac{\Delta Y^*}{\Delta G} = 2.5 \; ; \; \frac{-187.5}{\Delta G} = 2.5 \qquad \Delta G = -75$

∴ when y decreas 187.5, G should be decreas. 75

5.7 If the government wants to adjust **only its net taxes (T)**, how much T should be changed?

$\frac{\Delta Y^*}{\Delta T} = -1.75$

$\frac{-187.5}{\Delta T} = -1.75$

$\Delta T = 107.14$

∴ Tax should be increase by 107.14

5.8 If the government wants to boost **only investment (I)**, how much I should be changed?

$$\frac{\Delta Y^*}{\Delta I} = 2.5$$

$$\frac{-187.5}{\Delta I} = 2.5$$

$\Delta I = -75$ ∴ when y decrease 187.5, I should be decreased by 75

5.9 If the government wants to implement a balanced-budget policy, what should the government do with G and T?

BMM = 0.75

$$\frac{-187.5}{\Delta G} = 0.75$$

$\Delta G = -250$

$\Delta T = -250$

∴ G & T should be decreased by 250 ✱

6. Explain the role of Import as an automatic stabilizer. If the government wants to further stabilize the economy, is there anything that the government can do with its tax system? Explain.

- The role of an automatic stabilizer is to reduce fluctuation of the economy by preventing output too high in expansion and too low in recession
- The government can stabilize the economy by decreasing tax when economy is in recession and increasing tax while expansion time.

7. Let S = -200 + 0.5Y and I = 50, be the saving function and investment.

7.1 Use the saving/investment approach to find the equilibrium output.

$$Y = AE$$
$$S = I$$
$$-200 + 0.5Y = 50$$
$$0.5Y = 250$$
$$Y^* = 500$$ ※

7.2 Find the equilibrium saving. (Hint: substitute Y* into S)

$$S^* = -200 + 0.5(500)$$
$$S^* = 50$$ ※

Suppose people decide to save more, <u>increasing autonomous saving by 100</u>.

7.3 Use the saving/investment approach to find the new equilibrium output.

$$S = -100 + 0.5Y$$
$$S = I$$
$$-100 + 0.5Y = 50$$
$$0.5Y = 150$$
$$Y^* = 300$$

7.4 Find the new equilibrium saving. (Hint: substitute new Y* into S)

$$S = -100 + 0.5(300)$$
$$S^* = 50$$

7.5 Comment on your result.

eqbm saving is equal eventhough autonomous saving increasing by 100. From the paradox of thrift, when people start to save more, it leads to slow down in economy and people will have less income which makes amount of saving remain the same.