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Exercise 4
Keynesian Cross and Fiscal Policy

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.

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.

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

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

   $G = 50$ $\quad\quad$ $T = 50$ (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 2.5 to find the new equilibrium output.

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)

exam

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.

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

5.3 Interpret the value of each of the multipliers.

Suppose that the full-employment output (Y_F) is 600;

5.4 What type of output gap is the economy currently experiencing?

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?

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

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

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

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.

* exam

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.

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

Suppose people decide to save more, increasing autonomous saving by 100.

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

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

7.5 Comment on your result.

Pimpitcha 0812

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

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

$\Delta Y = 25$

1.2 $\frac{\Delta Y}{\Delta T} = -3$

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

$\Delta T = 3$

1.3 $\frac{\Delta Y}{\Delta I} = \frac{10}{2}$

$= 5$

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

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

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3.6 Use the Balanced-Budget Multiplier (BBM) derived from Question ~~2.5~~ 3.5 to find the new equilibrium output.

3.1 $Y = AE$

$Y = C + I + G$

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

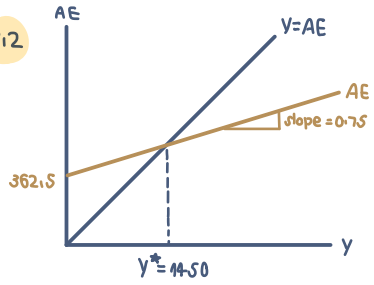
$Y = 400 + 0.75Y - 37.5$

$0.25Y = 362.5$

$Y = 1450$

$AE = 362.5 + 0.75Y$

3.2



3.3 $S + T = I + G$ —① (Leakage = Injection)

$Y - T = C + S$ —② (Saving function)

$Y - C = S + T$

$Y - C = I + G$

$Y - C = 50 + 50$

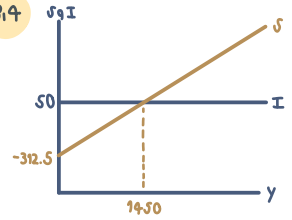
$Y - C = 100$

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

$0.25Y = 362.5$

$Y = 1450$ ※

3.4



saving function : $Yd = C+S$

$Y-T = C+S$

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

$S = -312.5+0.25Y$

3.5 $G\uparrow 50$, $T\uparrow 50$

$Y = AE$

$AE = C+I+(G+50)$

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

$AE = 450+0.75Y-75$

$AE = 0.75Y+375$

$Y = 0.75Y+375$

$0.25Y = 375$

$Y = 1500$

3.6 BBM = old Y^* + 50

= 1450 + 50

= 1500

Therefore, in order to build more road, G increase thier spending by 50, and lum-sump tax increase by 50. So, the eqbm output will increase 50.

exam

*(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.

$Y = AE$

$AE = C+I+G+X-M$

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

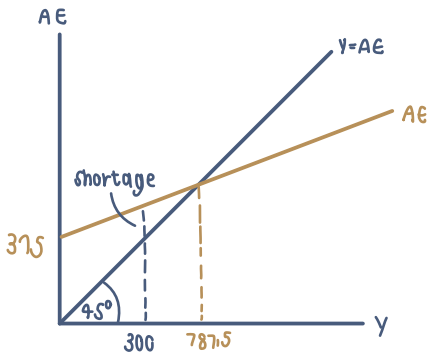
$AE = 350+0.7Y-35-0.1Y$

$AE = 0.6Y+315$

$Y = 0.6Y+315$

$0.4Y = 315$

$Y = 787.5$



In this case, at Y=300, Y<C+I, which mean aggregate expenditure is more than aggregate output.

To clarify, the inventories decline, encourage firm increase in production to move to eqbm at Y=787.5.

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

Investme Mutipliers $= \frac{\Delta Y^*}{\Delta I} = \frac{1}{1-MPC+MPM} = \frac{1}{1-0.7+0.1} = \frac{1}{0.4} = 2.5$

Government spending multipliers $= \frac{\Delta Y^*}{\Delta G} = \frac{1}{1-MPC+MPM} = \frac{1}{1-0.7+0.1} = \frac{1}{0.4} = 2.5$

Tax Multipliers $= \frac{\Delta Y^*}{\Delta T} = \frac{-MPC}{1-MPC+MPM} = \frac{-0.7}{1-0.7+0.1} = -1.75$

BBM $= \frac{\Delta Y^*}{\Delta G} + \frac{\Delta Y^*}{\Delta T} = 2.5 + (-1.75) = 0.75$

5.3 Interpret the value of each of the multipliers.

$\frac{\Delta Y^*}{\Delta I}$; when investment increase by 1 unit, output will increase 2.5 unit.

$\frac{\Delta Y^*}{\Delta G}$; when government spending increase by 1 unit, output will increase 2.5 unit.

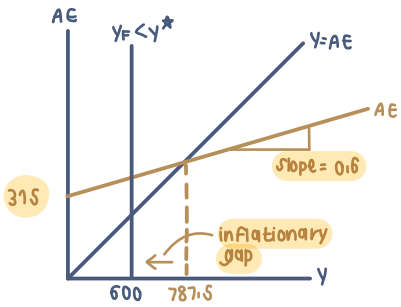
$\frac{\Delta Y^*}{\Delta T}$; when tax increase by 1 unit, output will decrease by 1.75 units.

BBM ; when govt. and tax are increased equally by 1 unit, output will increase by 0.75 unit.

Suppose that the full-employment output (Y_F) is 600;

5.4 What type of output gap is the economy currently experiencing?

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



$AE = 0.6Y + 315$

Unemployment rate is below the natural rate of unemployment, which mean we are in inflationary gap. In this time, the economy is growing too fast and over employed. So that, the policy solution is to raise tax and cut govt. spending to be $Y = Y_F$.

over-capacity
(787.5 ผลิตได้มากกว่า → $U < U_N$)
demand มากไป / large aggregate expenditure

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?

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

$\Delta Y^* = -187.5$ (ลด output)

5.6 $\frac{\Delta Y^*}{\Delta G} = 2.5$

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

$\Delta G = -75$

5.7 $\frac{\Delta Y^*}{\Delta T} = -1.75$

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

$\Delta T = 107.142$

5.8 $\frac{\Delta Y^*}{\Delta I} = 2.5$

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

$\Delta I = -75$

5.9 $BBM = \frac{\Delta Y^*}{\Delta G} + \frac{\Delta Y^*}{\Delta T}$

$0.75 = \frac{\Delta Y^*}{\Delta G} + \frac{\Delta Y^*}{\Delta T}$

ΔG & $\Delta T = \frac{-187.5}{0.75}$

ΔG & $T = -250$ ← ลดอย่างละ

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.

– when economy is bad, output is low, so tax and import are small automatically. Therefore, people have more income to spend, which help boost the economy in the bad time.

* exam

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.

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

Suppose people decide to save more, increasing autonomous saving by 100.

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

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

7.5 Comment on your result.

7.1

$Y = AE$ | $Y = C + I$

$Y = C + S$ | $Y = 200 + 0.5Y + 50$

$Y = C - 200 + 0.5Y$ | $0.5Y = 250$

$C = 200 + 0.5Y$ | $Y^* = 500$

7.2

$S = -200 + 0.5Y$

$S = -200 + 0.5(500)$

$S = -200 + 250$

$S^* = 50$

7.3

$S = I$

$S + 100 = I$

$-100 + 0.5Y = 50$

$0.5Y = 150$

$Y^* = 300$

7.4

New eqbm. of saving

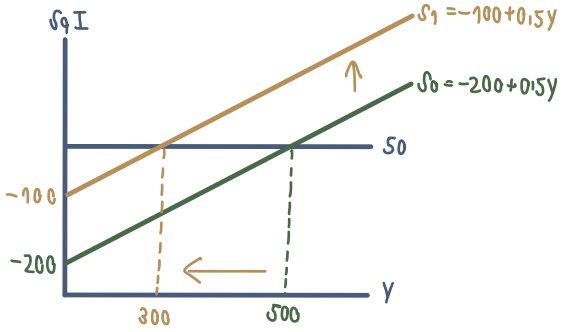
$S = -100 + 0.5Y$

$S = -100 + 0.5(300)$

$S = -100 + 150$

$S^* = 50$

7.5



Result: Paradox of shift: People save more → economy slow down → less income to people

People save more by 100 ($S_0 \rightarrow S_1$)

Output decrease by 200 ($500 \rightarrow 300$)

↓

Due to less money change hand in economy