

Exercise 3

Keynesian Cross and the Multiplier

1. The Keynesian consumption function assumes that $0 < \text{MPC} < 1$; what is the basis for such assumption?
2. Assume a CLOSED economy with NO government. Let the autonomous consumption be 200 and MPS be 0.3. Draw and write equations for both saving and consumption functions.
3. Let the saving function be $S = -150 + 0.35Y$. Find and draw the consumption function.
4. How do the followings affect the AE graph (i.e. explain how the graph changes) and the equilibrium output?
 - All firm managers decide to buy fewer machines.
 - The government decides to build more roads.
 - The citizens decide to save more at all income levels.
 - The citizens decide to save larger proportion of income.
 - The government decides to raise tax.
5. In the Keynesian Cross Model, suppose that aggregate output is greater than aggregate expenditure. Explain the adjustment process towards the equilibrium.
6. Let $C = 60 + 0.6Y$ and $I = 20$. Find the equilibrium output with the saving/investment approach.
7. Let $S = -60 + 0.4Y$ and $I = 20$. Find the equilibrium output with the standard approach. Now, suppose I increases by 20. Find the new equilibrium and the investment multiplier.
8. With the multiplier effect, an injection of money (for example, investment) can lead to a greater proportional increase in output. Explain how this can happen.
9. How is the investment multiplier related to MPC? Explain the intuition behind such relationship. (Hint: Question 9)
10. What is the Paradox of Thrift? Explain it with diagram.

- we can't consume more than our income $\rightarrow$ proportion of income that we use to consume
1. The Keynesian consumption function assumes that $0 < MPC < 1$; what is the basis for such assumption?
 $\hookrightarrow$ amount of C depends on Y

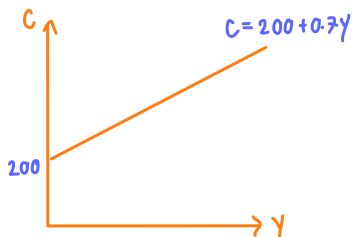
MPC is always less than 1 because MPC is the fraction that determines how much we spend when we earn income. When someone earns income, they must not spend it

2. Assume a CLOSED economy with NO government. Let the autonomous consumption be 200 and MPS be 0.3. Draw and write equations for both saving and consumption functions.

consumption function

$$C = a + bY$$

$$C = 200 + 0.7Y$$



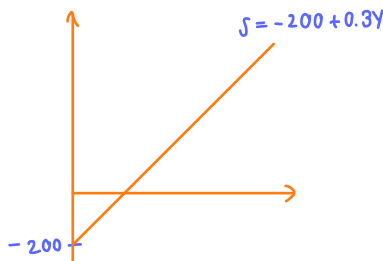
saving function

$$S = Y - C$$

$$S = Y - 200 + 0.7Y$$

$$S = 0.3Y - 200$$

$$Y = S + C$$



3. Let the saving function be $S = -150 + 0.35Y$. Find and draw the consumption function.

$$Y = C + S$$

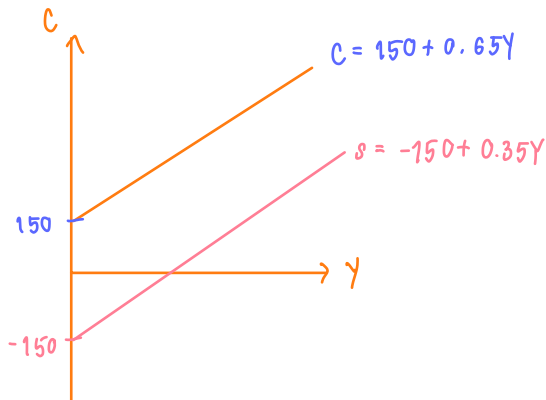
$$C = Y - S$$

$$C = Y + 150 - 0.35Y$$

$$C = 150 + 0.65Y$$

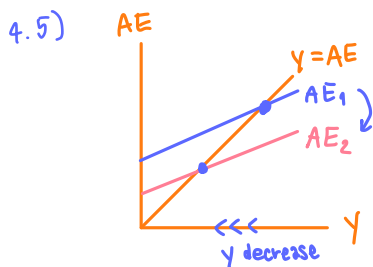
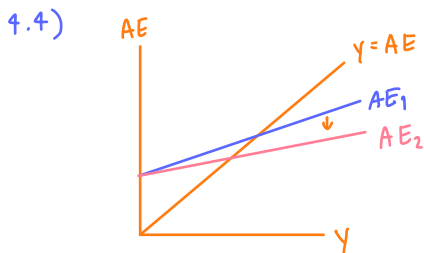
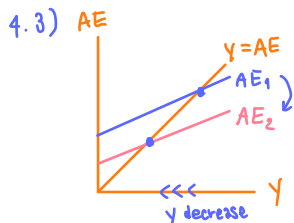
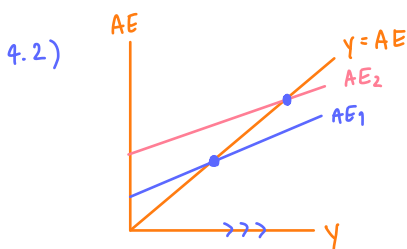
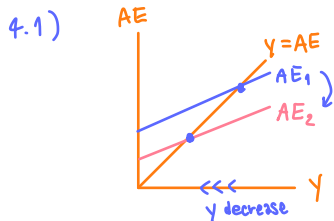
$$C_0 = 150$$

$$C_1 = 0.65$$



4. How do the followings affect the AE graph (i.e. explain how the graph changes) and the equilibrium output?

- All firm managers decide to buy fewer machines. $I \downarrow \rightarrow AE \downarrow$
- The government decides to build more roads. $G \uparrow \rightarrow AE \uparrow$
- The citizens decide to save more at all income levels. $C = a + bY \rightarrow \uparrow \rightarrow AE \downarrow$
- The citizens decide to save larger proportion of income. $C = a + bY \rightarrow \uparrow \rightarrow AE \downarrow$ slope
- The government decides to raise tax. $T \uparrow \rightarrow C \downarrow \rightarrow AE \downarrow$



5. In the Keynesian Cross Model, suppose that aggregate output is greater than aggregate expenditure. Explain the adjustment process towards the equilibrium.

when $Y > AE$, there will be a lot of inventories. Thus the firms will reduce production to adjust towards eqbm.

6. Let $C = 60 + 0.6Y$ and $I = 20$. Find the equilibrium output with the saving/investment approach.

$$S = Y - C$$

$$S = Y - (60 + 0.6Y)$$

$$S = 0.4Y - 60$$

$$S = I \quad ; \quad \text{leakage} = \text{inject}$$

$$0.4Y - 60 = 20$$

$$0.4Y = 80$$

$$Y^* = 200 \quad *$$

7. Let $S = -60 + 0.4Y$ and $I = 20$. Find the equilibrium output with the standard approach.
Now, suppose I increases by 20. Find the new equilibrium and the investment multiplier.

① find Y^* ($S = I$)

$$-60 + 0.4Y = 20$$

$$Y^* = 200$$

② $I \uparrow 20$ find new Y^*

$$-60 + 0.4Y = 40$$

$$Y^* = 250$$

③ investment multiplier

$$\frac{\Delta Y^*}{\Delta I} = \frac{50}{20} = 2.5 \quad *$$

8. With the multiplier effect, an injection of money (for example, investment) can lead to a greater proportional increase in output. Explain how this can happen.

$$I = 100 \rightarrow Y_A =$$

$$I \uparrow \rightarrow AE \uparrow \rightarrow Y \uparrow$$

$$MPC = 0.5$$

$$MPC = 0.8$$

$$\begin{array}{c} 100 \\ \swarrow \quad \searrow \\ C_A = 50 \quad S_A = 50 \\ 80 \quad 20 \\ | \\ Y_B = 50 \\ 80 \end{array}$$

"expenditure of someone will be someone's income"

The more ppl. spend, the more money in the flow. When the firms gain more income, they will produce more to meet the demand.

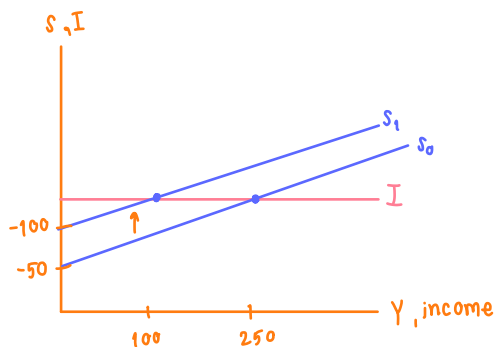
9. How is the investment multiplier related to MPC? Explain the intuition behind such relationship. (Hint: Question 9)

$$\text{investment multiplier} = \frac{1}{1 - \text{MPC}}$$

∴ Higher MPC will make investment multiplier increase.

For example, when ppl. spend more, the firms will invest more.
This lead to increase aggregate demand.

10. What is the Paradox of Thrift? Explain it with diagram.



The paradox of Thrift state that increasing in autonomous saving leads to lower aggregate expenditure, then decrease in aggregate output.

$$S \uparrow \text{ AE} \downarrow \text{ Y} \downarrow$$