جامعة محمد خيضر

كلية العلوم الاقتصادية و التجارية و علوم التسيير

السنة الثانية محاسبة: السداسي الأول (2024–2025) مقياس: الاقتصاد الكلي 1

Exercises on : The Keynesian Model of General Economic Equilibrium

تمارين خاصة بال: النموذج الكينزي في التوازن الاقتصادي العام

Exercise 01:

1. Prove that the marginal propensity to consume (MPC) is equal to b=0.8:

$C1=100+0.8Y1$ .....(1) $C2=100+0.8Y2$ .....(2)

By subtracting equation 1 from equation 2, we obtain :

$C2-C1=\Delta C=100+0.8Y2-100-0.8Y1=0.8(Y2-Y1)=\Delta C \Rightarrow 0.8(\Delta Y)=\Delta C \Rightarrow \frac{\Delta C}{\Delta Y}=0.8$

2. calculate the equilibrium income Y^*.

$APC=\frac{C}{Y}=0.9$, WE KNOW THAT: $MPC=\frac{\Delta C}{\Delta Y}=b=0.8$

$C=100+0.8\,Y$

$\frac{C}{Y}=\frac{100}{Y}+\frac{0.8\,Y}{Y}$ since $\frac{C}{Y}=APC=0.9$, THEN:

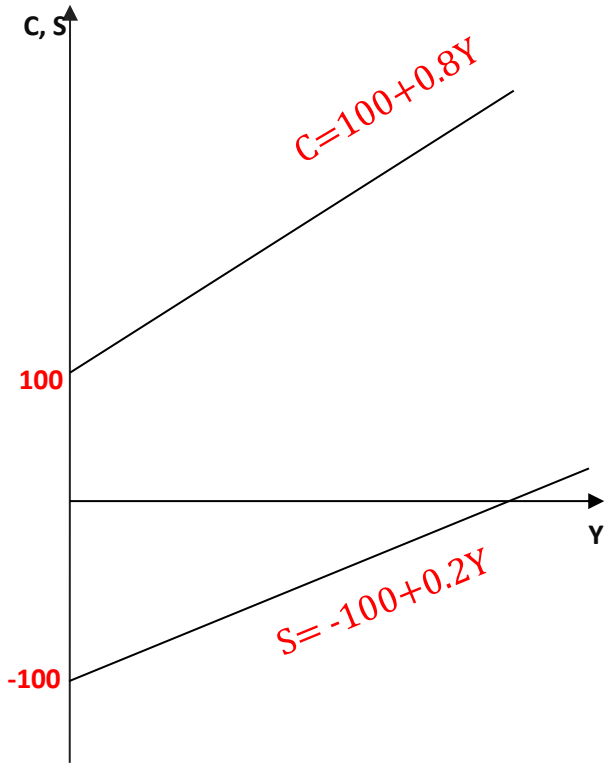
$0.9=\frac{100}{Y}+0.8 \Rightarrow 0.9-0.8=\frac{100}{Y} \Rightarrow 0.1\,Y=100 \Rightarrow Y=100/0.1=1000$

3. Find the savings function, and prove that the marginal propensity to save (MPS) equals to: 1-b:

$Y=C+S \Rightarrow S=Y-C \Rightarrow S=Y-(a+by) \Rightarrow S=Y-a-b\,Y \Rightarrow S=-a+(1-b)\,Y$

S= - 100 = 0.2 Y

Graphic:



Exercise 02:

- **Find exactlly the numbers of the consumption finction C=a+bY?**

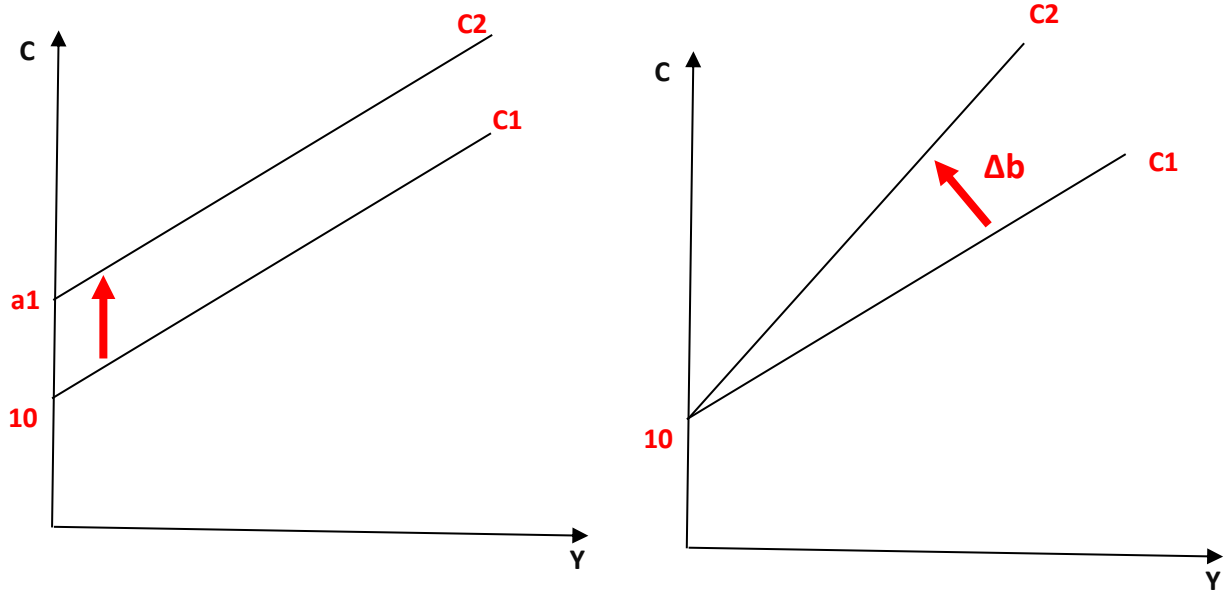
  According to the graphic : a = 10

$\frac{\Delta C}{\Delta Y} = \frac{46-10}{60-0}\frac{36}{60}$ = **0.6 = b** ⇒ **C = 10 + 0.6 Y**

- **Explain the marginal propensity to consume (MPC).**

  MPC is the slope of C and it shows which proportion of extra income is consumed

- **Graphically, explain what happen if: a rises; b rises?**

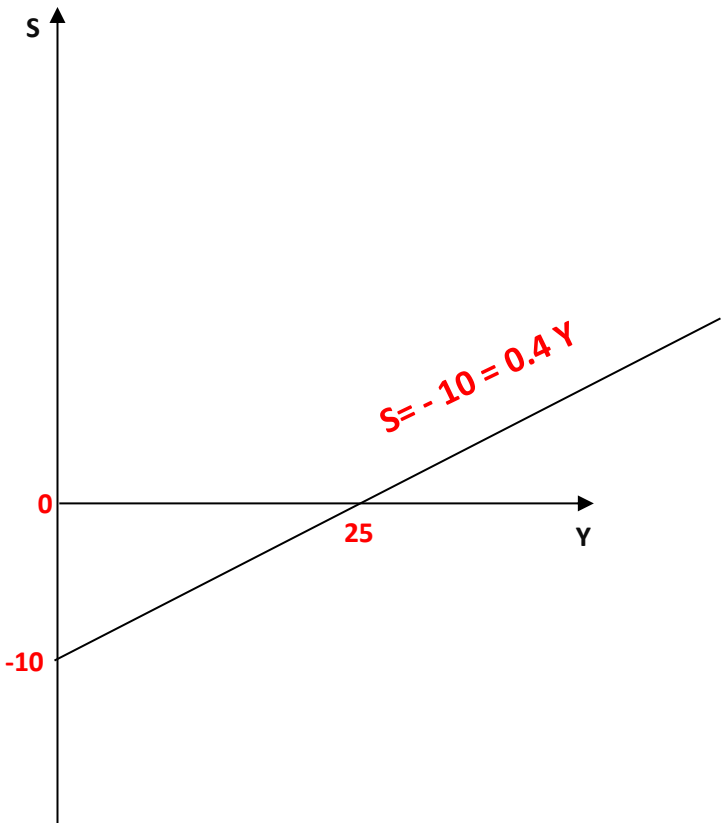


- **How much is the marginal propensity to save (MPS)?**

$Y = C + S \Rightarrow S = Y - C \Rightarrow S = Y-(a + by) \Rightarrow S = Y - a - b\,Y \Rightarrow S = -a + (1-b)\,Y$

S= - 10 = 0.4 Y

- **Find the saving finction? Graph it?**



- **Explain why the sum of MPC and MPS equals to 1.**

Y = C+S ⇒ ΔY = ΔC+ΔS

By dividing both sides by ΔY we obtain :

$$\Rightarrow \frac{\Delta Y}{\Delta Y} = \frac{\Delta C}{\Delta Y} + \frac{\Delta S}{\Delta Y} \Rightarrow \frac{\Delta C}{\Delta Y} = \text{MPC}, \frac{\Delta S}{\Delta Y} = \text{MPS} \Rightarrow \text{MPC+MPS} = 1$$

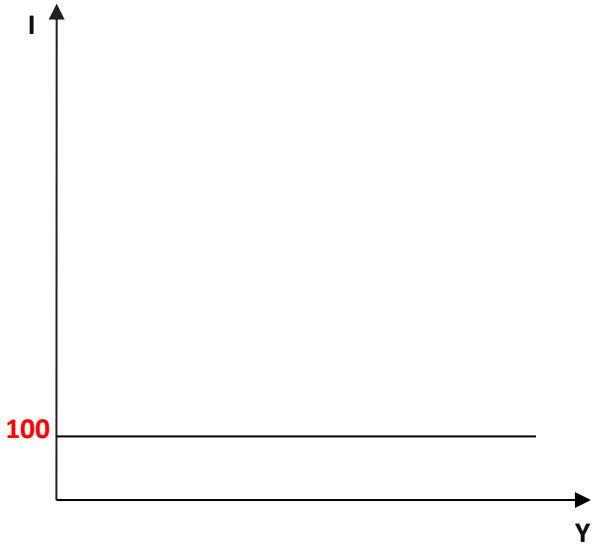
ΔC

Exercise 03 :

Using the data from the exercise 01:

$C = 100 + 0.8Y$

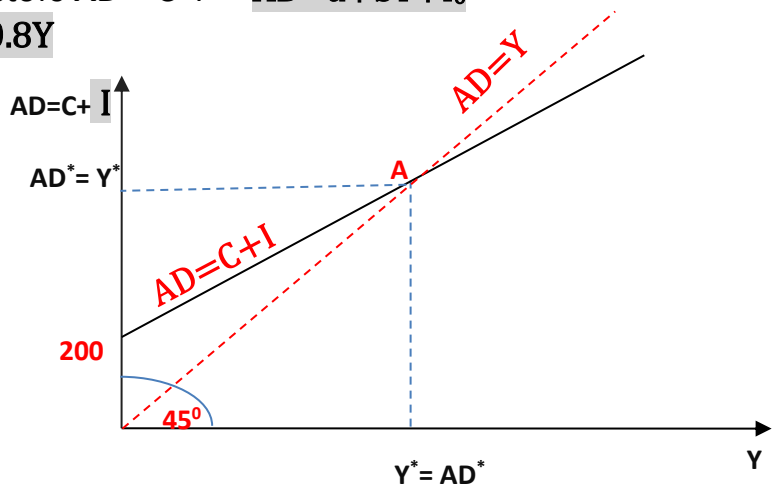
- **assume that I=100, illustrate this in a graph ?**



- **Find the agregate demand ? graph it ?**

The agregate demand with two sectors **AD** = C+I ⇒ $AD = a + bY + I_0$

⇒ **AD = 100 +0.8Y +100** ⇒ $AD = 200 + 0.8Y$



- **Draw the line 45^0, and explain it ?**

The 45o-line shows equal values for planned AD and Y (output, income).

- **illustrate the equilibrium graphically ?**

The point A on the graph is the equilibrium piont, when AD=AS=Y, the aggregate demand equal the aggregate supply.

- **calculate the equilibrium income Y^* using the method of Aggregate Supply = Aggregate Demand**

$$AD = Y \Rightarrow Y = C + I \Rightarrow Y = a + bY + I_0 \Rightarrow Y - bY = a + I_0 \Rightarrow (1-b)Y = a + I_0 \Rightarrow \mathbf{Y^* = \frac{a + I^\circ}{1 - b}}$$

$200+0.8Y=Y \Rightarrow Y-0.8Y=200 \Rightarrow (1-0.8)Y=200 \Rightarrow Y^*=200/0.2=1000$

calculate the equilibrium income Y^* using the method of investment=saving :I=S

$I=S \Rightarrow I_0 = -a +(1-b)Y \Rightarrow (1-b)Y = I_0 + a \Rightarrow Y^* = \frac{a+I^\circ}{1-b}$

- If I increases to 200, calculate the multiplier? Calculate the new Y^*

$\Delta I = 100$

$Y_2 - Y_1 = \frac{a+I`}{1-b} - \frac{a+I^\circ}{1-b} = \frac{a+I^\circ+\Delta I}{1-b} - \frac{a+I^\circ}{1-b} \Rightarrow \frac{a+I^\circ}{1-b} + \frac{\Delta I}{1-b} - \frac{a+I^\circ}{1-b} \Rightarrow \Delta Y = \frac{\Delta I}{1-b}$

$\Delta Y = \frac{1}{1-b} * \Delta I \Rightarrow \Delta Y = \frac{1}{0.2} * 100 = 500$

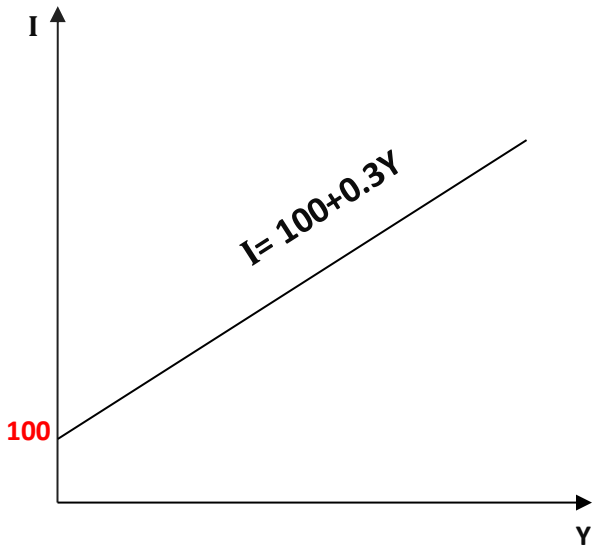
$\frac{1}{1-b} = \frac{1}{0.2}$ *is the multiplier*

$Y_2 = Y^* + \Delta Y \Rightarrow Y_2 = 1000+500 = 1500$

Exercise 04:

Using the data from the exercise 02: C = 10 + 0.6 Y

- Assume that the investment: I= 100+0.3Y, illustrate this in a graph?



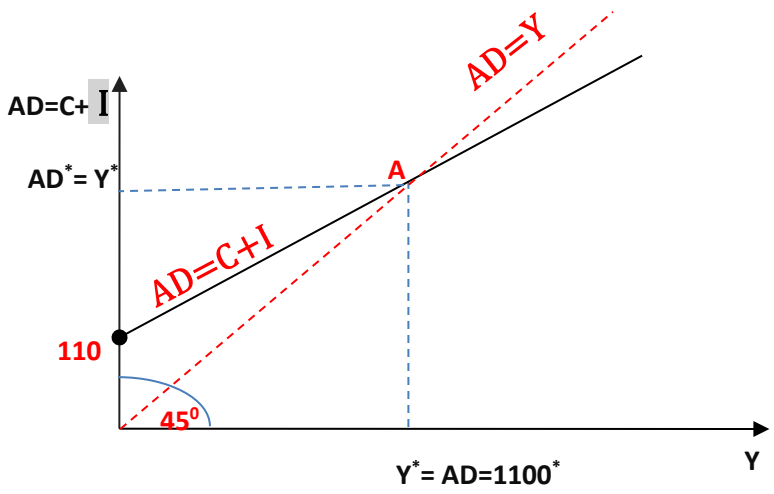
find the agregate demand ? graph it ?

$AD=C+I \Rightarrow AD=a+bY+I_0+rY$

$\Rightarrow AD=a+ I_0+(b+r)Y$

$\Rightarrow AD = 10+100+(0.6+0.3)Y$

$\Rightarrow AD=110+(0.9)Y$



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$$AD=AS=Y \Rightarrow Y= a+ I_0+(b+r)Y \Rightarrow Y-(b+r)Y =a+ I_0 \Rightarrow (1-b-r)Y=a+ I_0$$

$$\Rightarrow Y^*=\frac{a+ I^\circ}{1-b-r} \Rightarrow Y^*=\frac{10+ 100}{1-0.6-3}$$

$$Y^*=1100$$

calculate the equilibrium income Y^* using the method of investment=saving :I=S

$$I=S \Rightarrow I_0+rY= -a +(1-b)Y \Rightarrow (1-b)Y -rY= I_0 +a \Rightarrow Y^* = \frac{a+I^\circ}{1-b-r}$$

- **if I increases by 50, calculate the multiplier? Calculate the new Y^***

$$\Delta I = 50$$

$$Y_2 - Y_1 = \Delta Y = \frac{a+I`}{1-b-r} - \frac{a+I^\circ}{1-b-r} = \frac{a+I^\circ+\Delta I}{1-b-r} - \frac{a+I^\circ}{1-b-r} \Rightarrow \frac{a+I^\circ}{1-b-r} + \frac{\Delta I}{1-b-r} - \frac{a+I^\circ}{1-b-r}$$

$$\Rightarrow \Delta Y=\frac{\Delta I}{1-b-r}$$

$$\Rightarrow \Delta Y=\frac{1}{1-b-r} * \Delta I \Rightarrow \Delta Y = \frac{1}{0.1} * 50=500$$

$$\frac{1}{1-b-r} = \frac{1}{0.1} \textit{ is the multiplier}$$

$$\Rightarrow Y_2 = Y^*+ \Delta Y \Rightarrow Y_2 = 1100+500 =1600$$