

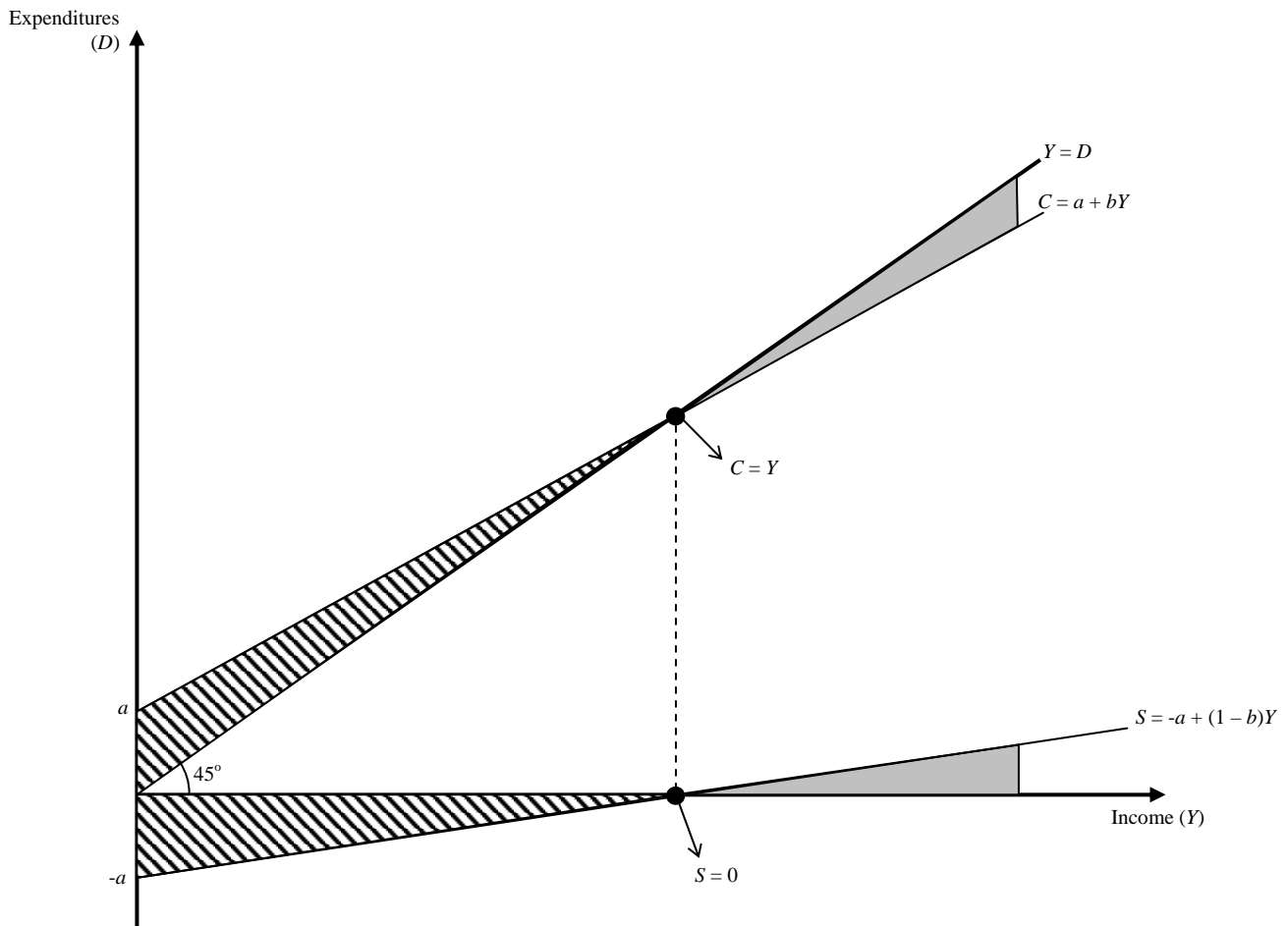
Macroeconomics Discussion Session Exercise #5

1. Identify the consumption function and the saving function. What is the slope of the consumption function? What is the y-intercept of the consumption function? What is the slope of the saving function? What is the y-intercept of the saving function?

Consumption function: $C = a + bY$ a is the y-intercept, b is the slope

Savings function: $S = -a + (1-b)Y$ $-a$ is the y-intercept, $(1-b)$ is the slope

2. Graphically illustrate dissaving, saving, and zero saving using both the relation between the consumption function and the 45 degree line and the saving function and the x-axis.



- $C > Y \Rightarrow S < 0$: Dissaving
- $Y > C \Rightarrow S > 0$: Saving

3. Prove that the $mps = (1-b)$.

$$\text{If: } Y = C + S$$

$$\text{Then: } \Delta Y = \Delta C + \Delta S$$

divide both sides by ΔY :

$$\Delta Y / \Delta Y = \Delta C / \Delta Y + \Delta S / \Delta Y$$

$$\Delta Y / \Delta Y = 1 \quad \Delta C / \Delta Y = mpc \quad \Delta S / \Delta Y = mps$$

$$\text{so: } 1 = mpc + mps$$

$$\text{therefore: } (1-mpc) = mps \quad \text{or} \quad mps = (1-b)$$

4. Algebraically derive the multiplier.

$$Y = C + I$$

$$C = a + bY$$

$$Y = a + bY + I$$

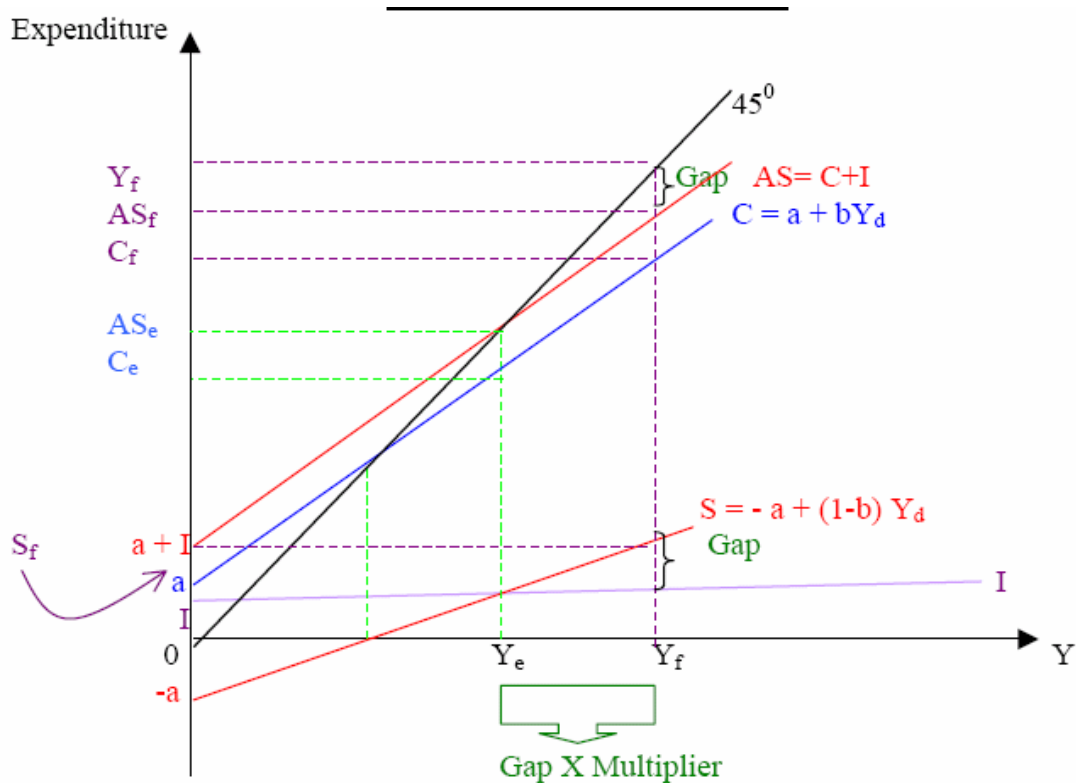
$$Y - bY = a + I$$

$$Y(1-b) = a + I$$

$$Ye = 1/(1-b) (a + I)$$

Where $1/(1-b) = \text{multiplier}$ and $(a+I) = \text{autonomous expenditures}$

5. Graph the investment function. Graph the aggregate spending function (no government, no foreign trade). Identify the slope and y-intercept of the AS function.
 Slope of AS function = mpc y-intercept of AS function = $a + I$



6. Given: $C = 200 + .8Y$ $I = 200$ $Y_f = 2400$

Calculate:

- $C_f = a + bY_f = 200 + .8(2400) = 200 + 1920 = 2120$
- $S_f = -a + (1-b)Y_f = -200 + (1-.8)2400 = -200 + 480 = 280$
- Value of the multiplier** = $1/(1-b) = 1/(1-.8) = 1/.2 = 5$
- $Y_e = 1/(1-b) (a + I) = 5 (400) = 2000$
- $C_e = a + bY_e = 200 + .8(2000) = 1800$
- $S_e = -a + (1-b)Y_e = -200 + (1-.8)2000 = 200$
- $AS@Y_f = C_f + I = 2120 + 200 = 2320$
- Recessionary gap** = $Y_f - AS@Y_f = 2400 - 2320 = 80 = (S_f - I) = 280 - 200 = 80 = (Y_f - Y_e)/\text{multiplier} = (2400 - 2000)/5 = 400/5 = 80$