1.2.2) Comparative Static analysis in Math framework

Having solved for the equilibrium solution, what economists usually ask is what would happen to the equilibrium if something, previously assumed to be fixed, has changed.

Example 1.C (cont.): National income model

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HOME WORK

- From the example 1.B, it is straightforward to solve for all the endogenous equilibrium solutions, Y^*, C^*, Y_d^*.

$$Y_d^* = Y - T_0$$

$$C^* = a + b(\underbrace{Y - T_0}_{Y_d^*})$$

$$Y = C + I + G = a + b(Y - T_0) + I_0 + G_0$$

$$= a + bY - bT_0 + I_0 + G_0$$

$$Y - bY = a - bT_0 + I_0 + G_0$$

$$Y = \frac{1}{1-b}(a - bT_0 + I_0 + G_0)$$

- Numerically, if a = 1, T_0 = \$0 I_0 = \$1, G_0 = \$1 and b = 0.5, this yields us,

$$Y = \frac{1}{1-b}(a - bT_0 + I_0 + G_0)$$

$$= \frac{1}{1-0.5}(1 - 0.5(0) + 1 + 1)$$

$$= \frac{1}{0.5}(3)$$

$$Y = 6$$

Question: What if G is now changed to \$2, how big is the change in Y* and C*?

Answer:

New Y* = 8 ➔

A \$1 increase in G causes an increase in Y* by 2 = 8 - 6

$$Y_1 = \frac{1}{1-b}(a - bT_0 + I_0 + G_0)$$
$$= \frac{1}{1-0.5}(1 - 0.5(0) + 1 + 1)$$
$$= \frac{1}{0.5}(3)$$
$$Y_1 = 6$$

$$Y_2 = \frac{1}{1-b}(a - bT_0 + I_0 + G_0)$$
$$= \frac{1}{1-0.5}(1 - 0.5(0) + 1 + 2)$$
$$= \frac{1}{0.5}(4)$$
$$Y_2 = 8$$

In the later part, we will try to figure out the value of *multiplier* when we don't assign any numerical values of exogenous variables.

- The idea is simple. *We just apply the derivative method to the equilibrium solution function.*
- That is, we calculate the value of $\frac{\partial Y^*}{\partial I_0}, \frac{\partial Y^*}{\partial G_0}, \frac{\partial Y^*}{\partial a}, \frac{\partial Y^*}{\partial b}$.