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BACHELOR OF ECONOMICS
THAMMASAT UNIVERSITY

EE320(sec 046402)
Semester 1/2020

Quiz#2

Consider a simple Keynesian model:

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

$C = 10 + 0.8Y^d$

$Y^d = Y - T + R$

$T = 30$

$R = R_0$

$I = 25 + 0.1Y$

$G = G_0$

$X = 85$

$M = 40 + 0.2Y$

(1.) Simplify the model into a 2-variable system of equations where only Y and M are included as endogenous variables. Then rewrite the simplified model in the matrix for;;m.

(2.) Solve for equilibrium national income Y and import M by using Inverse matrix.

(3.) Let $R_0 = 20$ and $G_0 = 24$, what are the value of equilibrium Y, M, and trade balance $X - M$?

(4.) In the time of economic recession, government can increase government spending G_0 or increase government transfer R_0 to households.

(4.1) Do you think that the two policies will have the same impact to equilibrium national income? Please explain by using the concept of multipliers.

(4.2) Do you think that the two policies will have the same impact to equilibrium trade balance? Please explain by using the concept of multipliers.

(4.3) How do the multipliers relate to the elements of the inverse matrix?

(5.) Continuing from question (3.), if $\Delta G = 15$, what would be the new equilibrium income and trade balance.

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(1) $Y = 10 + 0.8(Y - 30 + R_o) + 25 + 0.1Y + G_o + 85 - M$

$Y = 10 + 0.8Y - 24 + 0.8R_o + 25 + 0.1Y + G_o + 85 - M$

$0.1Y + M = 0.8R_o + G_o + 96$ (1.)

$-0.2Y + M = 40$ (2.)

From (1.) & (2.)

$$\begin{bmatrix} 0.1 & 1 \\ -0.2 & 1 \end{bmatrix} \begin{bmatrix} Y \\ M \end{bmatrix} = \begin{bmatrix} 0.8R_o + G_o + 96 \\ 40 \end{bmatrix}$$

(2.)

$$\begin{bmatrix} Y \\ M \end{bmatrix} = \begin{bmatrix} 0.1 & 1 \\ -0.2 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 0.8R_o + G_o + 96 \\ 40 \end{bmatrix}$$

$$\begin{bmatrix} Y \\ M \end{bmatrix} = \frac{1}{0.1 + 0.2} \begin{bmatrix} 1 & -1 \\ 0.2 & 0.1 \end{bmatrix} \begin{bmatrix} 0.8R_o + G_o + 96 \\ 40 \end{bmatrix}$$

$$Y^* = \frac{0.8R_o + G_o + 96 - 40}{0.3}$$

$$M^* = \frac{0.2(0.8R_o + G_o + 96) + 4}{0.3}$$

(3.)

$$Y^* = \frac{0.8(20) + 24 + 96 - 40}{0.3} = 320$$

$$M^* = \frac{0.2(0.8(20) + 24 + 96) + 4}{0.3} = 104$$

$$X - M^* = 85 - 104 = -19$$

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4.

4.1 $\frac{\Delta Y}{\Delta G_0} = \frac{1}{0.3}$

$\frac{\Delta Y}{\Delta R_0} = \frac{0.8}{0.3}$

No, the impacts of the two policies on Y^* are different, because $\frac{\Delta Y}{\Delta G_0} \neq \frac{\Delta Y}{\Delta R_0}$

4.2 $\frac{\Delta(X-M)}{\Delta G_0} = \frac{-\Delta M}{\Delta G_0} = -\frac{0.2}{0.3}$

$\frac{\Delta(X-M)}{\Delta R_0} = \frac{-\Delta M}{\Delta R_0} = -\frac{0.2(0.8)}{0.3}$

No, the impacts of the two policies on Y^* are different; because $\frac{\Delta Y}{\Delta G_0} \neq \frac{\Delta Y}{\Delta R_0}$
R hasn't got a direct impact on Y^*, but has to work through an increase in consumption

4.3 Each element of the inverse matrix is multiplier or is a part of multiplier.

5. If $\Delta G = 15$ $\therefore$ $\Delta Y = \frac{15}{0.3} = 50$ $\therefore$ $Y^*|_{G_0'} = 320 + 50 = 370$

If $\Delta G = 15$ $\therefore$ $\Delta(X-M) = -\frac{0.2}{0.3} \times 15 = -10$

$\therefore$ $(X-M^*)|_{G_0'} = -19 - 10 = -29$