

3. National Income and Equilibrium Determination (Part 3)

EE 212

Case & Fair, ch. 8; LCR, ch. 23-24

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- ➊ Introduction (Part 1)
- ➋ Composition of desired aggregate expenditure (DAE) (Part 1)
 - 2.1 Desired aggregate consumption expenditures and consumption theories
 - 2.2 Desired aggregate investment expenditure
 - 2.3 Desired aggregate government expenditure
 - 2.4 Desired aggregate net exports
 - 2.5 Desired aggregate expenditure
- ➌ Equilibrium national Income (Part 2)
- ➍ Changes in equilibrium national income and the multiplier (Part 3)
- ➎ Inflationary and deflationary gap (Part 3)
- ➏ Paradox of Thrift (Part 3)

4. Changes in equilibrium national income and the multiplier

- Changes in equilibrium take place when?
- Graphically Illustration

- Using the previous example.

$$C = 60 + 0.8Y^d$$

$$I = 35$$

$$G = 15$$

$$T = 20 + 0.2Y$$

$$X = 36$$

$$M = 10 + 0.24Y$$

- $Y_E^* = \dots\dots\dots$

- What is new Y_E^* if C_0 (autonomous consumption) is increased from 60 to 70? ($C = 70 + 0.8Y^d$)

- **“A Multiplier”** is a factor that measures how much an endogenous variable changes in response to a change in some exogenous variables.
- In DAE model, it is
- From the example, the multiplier for autonomous consumption or “consumption multiplier” is 1.
- Basically, this is because

1. Closed Economy Without Financial Institution Multiplier

- $Y = \dots\dots\dots$

- Autonomous Consumption Multiplier : $\frac{\Delta Y}{\Delta C_0} = \dots\dots\dots$,

If $C_0 \uparrow$ by 1 unit, $Y \uparrow$ by $\dots\dots\dots$ unit.

- Autonomous Investment Multiplier : $\frac{\Delta Y}{\Delta I_0} = \dots\dots\dots$

If $I_0 \uparrow$ by 1 unit, $Y \uparrow$ by $\dots\dots\dots$ unit.

2. Closed Economy Without Government Multiplier

- $I = I_0 + d.Y$
- $Y = \dots\dots\dots$

- Autonomous Consumption Multiplier : $\frac{\Delta Y}{\Delta C_0} = \dots\dots\dots$,

If $C_0 \uparrow$ by 1 unit, $Y \uparrow$ by $\dots\dots\dots$ unit.

- Autonomous Investment Multiplier : $\frac{\Delta Y}{\Delta I_0} = \dots\dots\dots$

If $I_0 \uparrow$ by 1 unit, $Y \uparrow$ by $\dots\dots\dots$ unit.

- If $d = 0$, $\frac{\Delta Y}{\Delta C_0} = \dots\dots\dots$, $\frac{\Delta Y}{\Delta I_0} = \dots\dots\dots$.

3. Closed Economy With Government Multiplier

- assume $I = I_0 + d.Y$, $T = T_0$
- $Y =$

- Autonomous Consumption Multiplier : $\frac{\Delta Y}{\Delta C_0} =$,
- Autonomous Investment Multiplier : $\frac{\Delta Y}{\Delta I_0} =$,
- Autonomous Government Spending Multiplier : $\frac{\Delta Y}{\Delta G_0} =$,
- Autonomous Tax Multiplier : $\frac{\Delta Y}{\Delta T_0} =$
- If $d = 0$, multipliers?

4. Open Economy Multiplier

- let's assume $I = I_0 + d.Y$, $T = T_0$
- $Y =$

- Autonomous Consumption Multiplier : $\frac{\Delta Y}{\Delta C_0} = \quad ,$
- Autonomous Investment Multiplier : $\frac{\Delta Y}{\Delta I_0} = \quad ,$
- Autonomous Government Spending Multiplier : $\frac{\Delta Y}{\Delta G_0} = \quad ,$
- Autonomous Tax Multiplier : $\frac{\Delta Y}{\Delta T_0} =$
- Open economy multiplier is closed economy multiplier.
Why?

- A balanced (fiscal) budget is a (fiscal) budget with government revenues equal to government expenditures.
- A budget deficit is a (fiscal) budget with government revenues is than government expenditures.
- A budget surplus is a (fiscal) budget with government revenues is than government expenditures.
- Balanced budget multiplier
 - $\Delta G = \Delta T$. Government increases its spending(G) by ΔG units balancing it by an increase in taxes (T) by ΔT units.
 - Let ΔB be a balanced-budget change in government spending. How does this affect Y^* ?

Balanced budget multiplier in Closed Economy

- let's assume $I = I_0$, $T = T_0$
- Autonomous Government Spending Multiplier : $\frac{\Delta Y}{\Delta G_0} =$,
- Autonomous Tax Multiplier : $\frac{\Delta Y}{\Delta T_0} =$
- Balanced Budget Multiplier : $\frac{\Delta Y}{\Delta B} =$

This means that

- The balanced budget multiplier in closed economy is one.
Why?

- Balanced budget multiplier in Opened Economy
- Autonomous Government Spending Multiplier : $\frac{\Delta Y}{\Delta G_0} =$,
- Autonomous Tax Multiplier : $\frac{\Delta Y}{\Delta T_0} =$
- Balanced Budget Multiplier : $\frac{\Delta Y}{\Delta B} =$

Example : Given the following specifications.

$$C = C_0 + b.Y^d$$

$$I = I_0 + d.Y$$

$$G = G_0$$

$$T = T_0 + t.Y$$

$$X = X_0$$

$$M = M_0 + m.Y$$

- Find the equilibrium national income.
- Find all multipliers in this economy.
- Find the balanced budget multiplier.

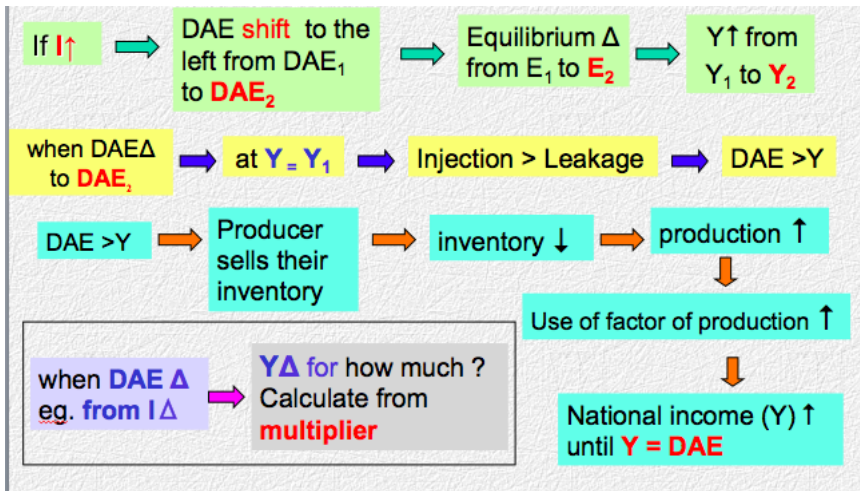
- 1 Given the following specifications.

$$S = 90 + 0.8Y^d, I = 80 + 0.1Y, G = 70, T = 50$$

$$X = 100, M = 50 + 0.2Y$$

- 1 Find equilibrium national income using injection = leakage approach.
- 2 Draw a graph showing the equilibrium national income based on the solution from question (a)
- 3 Find all multipliers in this economy.
- 4 Find the balanced budget multiplier.
- 5 Based on the solution from question (c), if the potential output is equal to 1,500 units, what type of economic problem this economy is facing?
- 6 Based on the solution from (e). Suppose the government want to solve the problem by changing autonomous tax, calculate the change in autonomous tax that the government has to impose.
- 7 Based on the solution from (e). Suppose the government want to solve the problem by changing its balanced budget, calculate the change in the balanced budget that the government has to impose.

- Changes in equilibrium and adjustment to new equilibrium (By Dr.Nessara Sukpanich)



5. Inflationary and deflationary gap

- Output gap is actual national income minus potential national income. Also called the GDP Gap. We have to define where Y^F is.
- Graphically Illustration.

- When $Y^* < Y^F$, at Y^F , DAE is 45 degree line. This means that DAE Y , at Y^F . We have gap.

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6. Paradox of Thrift (Paradox of Saving)

- “John Maynard Keynes”
- a fallacy of composition
- Saving (thrift) may be good for individual but it may not be good for the economy.
- If the population saves more money, MPS and MPC
- Given the other things (autonomous expenditures) being constant, multiplier and equilibrium national income

- Multiplier (revisit) : Find Multipliers

- Closed Economy : Case 1

$$C = C_0 + bY^d$$

$$I = I_0$$

$$G = G_0$$

$$T = T_0$$

- Closed economy : Case 2

$$C = C_0 + bY^d$$

$$I = I_0 + dY$$

$$G = G_0$$

$$T = T_0$$

- Closed Economy Case 1 :

$$C = C_0 + bY^d, \quad I = I_0, \quad G = G_0, \quad T = T_0$$

- Existing equilibrium : $S = S_1, I = I_0 = I_1, Y = Y_1$
- If people change their behaviour to save more, then (graphically illustration)

- Saving curve shift from to
- Y from to
- New equilibrium : $S = \dots\dots\dots$ and $I = \dots\dots\dots$ which is the
..... old equilibrium saving and old equilibrium investment

- Case 1 : Adjustment to the new equilibrium
- $Y = C + I$, at the old equilibrium (when Y stays the same),
 $S \uparrow \Rightarrow C \dots \Rightarrow DAE \dots \Rightarrow S \dots I \Rightarrow Y \dots DAE \Rightarrow$ goods sold
 $\dots$ goods produced
 $\Rightarrow$ inventory $\dots \Rightarrow$ production $\dots \Rightarrow$ use less factors of
production $\Rightarrow Y \dots$
- $S \downarrow \Rightarrow Y \downarrow$ because of the multiplier effect ; $\Delta Y \dots \Delta S$
- Multiplier effect : $S \downarrow \Rightarrow C \dots \Rightarrow DAE \dots \Rightarrow Y \dots \Rightarrow C \dots$ and
so on.
- In short run if we want to stimulate economy we should $\downarrow S$ and
 $\uparrow C$.
- However, in the long run, we should $\dots S$ so that we would have
more funds for future investment.
- Fallacy of composition : “arises when one infers that something is
true of the whole from the fact that it is true of some part of the
whole (or even of every proper part)”

- Closed Economy Case 2:

$$C = C_0 + bY^d, \quad I = I_0 + dY, \quad G = G_0, \quad T = T_0$$

- Existing equilibrium : $S = S_1, I = I_0 = I_1, Y = Y_1$

- If people change their behaviour to save more, then (graphically illustration)

- Saving curve shift from to
- Y from to
- New equilibrium : $S = \dots\dots\dots$ and $I = \dots\dots\dots$ which is the
..... old equilibrium saving and old equilibrium investment.
- Multiplier effect depends on both MPC and MPI.
- $S \uparrow \Rightarrow Y \downarrow$
- $$\begin{array}{ccccccc}
 S \uparrow & \Rightarrow & C \downarrow & \Rightarrow & Y \downarrow & \Rightarrow & C \dots \Rightarrow DAE \dots \Rightarrow Y \dots \Rightarrow \\
 & & DAE \downarrow & & & & I \dots
 \end{array}$$
- When $S \uparrow$, in the case of induced investment $\downarrow >$ the case of autonomous investment because there exists the effect from $\downarrow$ in I

- Break-even national income : $Y = \dots\dots\dots$
- Relationship between APC and MPC and between APS and MPS
- Equilibrium national income
- Change in equilibrium national income
- Multipliers
- Balanced budget multiplier
- Inflationary gap and deflationary gap
- Paradox of Thrift