ECON20001 Intermediate Macroeconomics

Tutorial 1 (Week 2)

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The University of Melbourne

Introduction

Zheng Fan

- Ph.D student in Economics at Unimelb
- Consultation & Ed discussion board (your first priority)
- Email: fan.z@unimelb.edu.au (last resort!)

Please attend consultations or post on Ed discussion board before sending me an email!

- Before ask any questions, make sure you have went thorough the subject guide and Q&A on Canvas!
- All administrative things goes to Dr David Moreton
- Special consideration goes to Stop 1
- In-tute and pre-tute solutions will be available at the end of each week

Last week lectures

Total demand for goods Z

$$Z = C + I + G + X - IM$$

In a closed economy, $X = IM = 0$,

$$Z = C + I + G$$

Consumption:

$$C = c_0 + c_1 Y_D = c_0 + c_1(Y - T)$$

Endogenous investment (something different from Intro Macro):

$$I = I(Y, i) = b_0 + b_1 Y - b_2 i$$

So in equilibrium $Z = Y$

$$Y = \frac{1}{1 - c_1 - b_1}(c_0 - c_1 T + b_0 - b_2 i + G)$$

In-tutorial Sheet - Q1

1. Make sure that you understand the problems set in the blue sheet (pre-tutorial work) for this week's tutorial. Ask others in your group if you are still unsure about any of the blue sheet problems.

- 5 mins talk to introduce yourself and know each other.

In-tutorial Sheet - Q2

2. For both political and macroeconomic reasons, governments are often reluctant to run budget deficits. Here we examine whether policy changes in G and T that maintain a balanced budget are macro-economically neutral. Put another way, we examine whether it is possible to affect output through changes in G and T that keep the budget balanced. You should begin with the equilibrium condition:

$$Y = c_0 + c_1(Y - T) + I + G$$

(a) By how much does Y increase when G increases by one unit?

$$(1 - c_1)Y = c_0 - c_1 T + I + G$$

$$\frac{\partial Y}{\partial G} = \frac{1}{1 - c_1}$$

$$\Delta Y = \frac{\partial Y}{\partial G} \cdot \Delta G = \frac{1}{1 - c_1}$$

$$Y^* = \frac{1}{1 - c_1}(c_0 - c_1 T + I + G)$$

In-tutorial Sheet - Q2

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$$Y = c_0 + c_1(Y - T) + I + G$$

(a) By how much does Y increase when G increases by one unit? Due to the multiplier effect, Y increases by

$$\frac{1}{1 - c_1}$$

In-tutorial Sheet - Q2

$c_1 T$. c_1

(b) By how much does Y decrease when T increases by one unit?

$$Y^* = \frac{1}{1-c_1}\left(c_0 - c_1 T + I + G\right)$$

$$\frac{dY}{dT} = \frac{\partial Y}{\partial T} = \frac{1}{1-c_1} \cdot (-c_1)$$

$$= \frac{-c_1}{1-c_1}$$

$$\Delta Y = \frac{\partial Y}{\partial T} \cdot \Delta T = -\frac{c_1}{1-c_1} < 0.$$

$T \uparrow \longrightarrow Y \downarrow$ by $\frac{c_1}{1-c}$,

$Y \uparrow$ by $\frac{-c_1}{1-c_1}$

In-tutorial Sheet - Q2

$$\frac{\partial Y}{\partial T} = -\frac{c_1}{1-c_1} < 0.$$

(b) By how much does Y decrease when T increases by one unit?

Due to the multiplier effect plus the slope coefficient (MPC) attached to T, equilibrium Y decreases by $\frac{c_1}{1-c_1}$

In-tutorial Sheet - Q2

(b) By how much does Y decrease when T increases by one unit?

Due to the multiplier effect plus the slope coefficient (MPC) attached to T, equilibrium Y decreases

$$\frac{c_1}{1 - c_1}$$

(c) Why are your answers to (a) and (b) different?

In-tutorial Sheet - Q2

(b) By how much does Y decrease when T increases by one unit?

Due to the multiplier effect plus the slope coefficient (MPC) attached to T, equilibrium Y decreases

$$\frac{c_1}{1 - c_1}$$

(c) Why are your answers to (a) and (b) different?

Because government spending affects demand directly while taxes affect demand indirectly through consumption and the MPC is less than one ($0 < c_1 < 1$).

$$Y = c_0 + c_1(Y - T) + I + G.$$

$c_1 < 1$

In-tutorial Sheet - Q2

Suppose that the economy starts with a balanced budget: $T = G$. If the increase in G is equal to the increase in T, then the budget remains in balance. You are going to calculate the balanced budget multiplier.

(d) Suppose that G and T increase by one unit. Using your answers to parts (a) and (b), what is the change to equilibrium GDP? Are balanced budget changes to G and T macro-economically neutral?

$$\Delta Y = \frac{dY}{dT} \cdot \Delta T + \frac{dY}{dG} \cdot \Delta G$$

$$= -\frac{c_1}{1-c_1} \cdot 1 + \frac{1}{1-c_1} \cdot 1$$

$$= \frac{-c_1 + 1}{1-c_1} = \frac{1-c_1}{1-c_1} = 1$$

In-tutorial Sheet - Q2

Suppose that the economy starts with a balanced budget: $T = G$. If the increase in G is equal to the increase in T, then the budget remains in balance. You are going to calculate the balanced budget multiplier.

(d) Suppose that G and T increase by one unit. Using your answers to parts (a) and (b), what is the change to equilibrium GDP? Are balanced budget changes to G and T macro-economically neutral?

$Y_D = Y - T$

The net change in Y is given by

$$\frac{1}{1-c_1} - \frac{c_1}{1-c_1} = 1 \qquad \frac{1-c_1}{1-c_1} = 1.$$

Therefore the balanced budget changes in G and T are NOT macro-economically neutral.

In-tutorial Sheet - Q2

(e) How does the specific value of the marginal propensity to consume affect your answer to part (d)? Why does this happen?

In-tutorial Sheet - Q2

Y_D

$Y = C_0 + C_1(Y - T) + I + G$.

1 unit; 1 unit, 1 unit; 1 unit.

(e) How does the specific value of the marginal propensity to consume affect your answer to part (d)? Why does this happen?

The marginal propensity to consume has no effect because the balanced budget tax increase aborts the multiplier process initiated by the increase in government spending.

As Y and T both increase by one unit, disposable income, and hence consumption, does not change.

In-tutorial Sheet - Q3

Suppose the economy is characterized by the following behavioral equations:

$$C = c_0 + c_1 Y_D \qquad Y_D = Y - T \qquad I = b_0 + b_1 Y$$

Government spending and taxes are constant. Note that investment now increase with output. closed economy.

(a) Solve for equilibrium output.

$$Y = C + I + G.$$

$$= c_0 + c_1(Y - T) + b_0 + b_1 Y + G,$$

$$\Rightarrow (1 - c_1 - b_1) Y = c_0 - c_1 T + b_0 + G.$$

$$\Rightarrow Y = \frac{1}{1 - c_1 - b_1}(c_0 - c_1 T + b_0 + G).$$

In-tutorial Sheet - Q3

Suppose the economy is characterized by the following behavioral equations:

$$C = c_0 + c_1 Y_D \qquad Y_D = Y - T \qquad I = b_0 + b_1 Y$$

Government spending and taxes are constant. Note that investment now increase with output.

(a) Solve for equilibrium output.

$$\frac{\partial Y}{\partial G} = \frac{1}{1 - c_1 - b_1}$$

Goods market equilibrium requires

$$Y = C + I + G$$

Plug in for C, Y_D and I into the equilibrium condition

$$Y = c_0 + c_1(Y - T) + b_0 + b_1 Y + G$$

Solve for Y

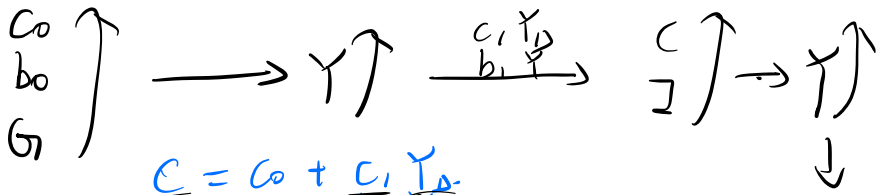
$$Y = \frac{1}{1 - c_1 - b_1}(c_0 - c_1 T + G + b_0)$$

In-tutorial Sheet - Q3

$$\frac{1}{1-b_1-c_1}.$$

(b) What is the value of the multiplier? How does the relation between investment and output affect the value of the multiplier? For the multiplier to be positive, what condition must $(b_1 + c_1)$ satisfy? Explain your answers.

In-tutorial Sheet - Q3



(b) What is the value of the multiplier? How does the relation between investment and output affect the value of the multiplier? For the multiplier to be positive, what condition must $(b_1 + c_1)$ satisfy? Explain your answers.

The multiplier is

$$\frac{1}{1 - c_1 - b_1}$$

In the investment equation, a higher b_1 would lead to a higher multiplier.

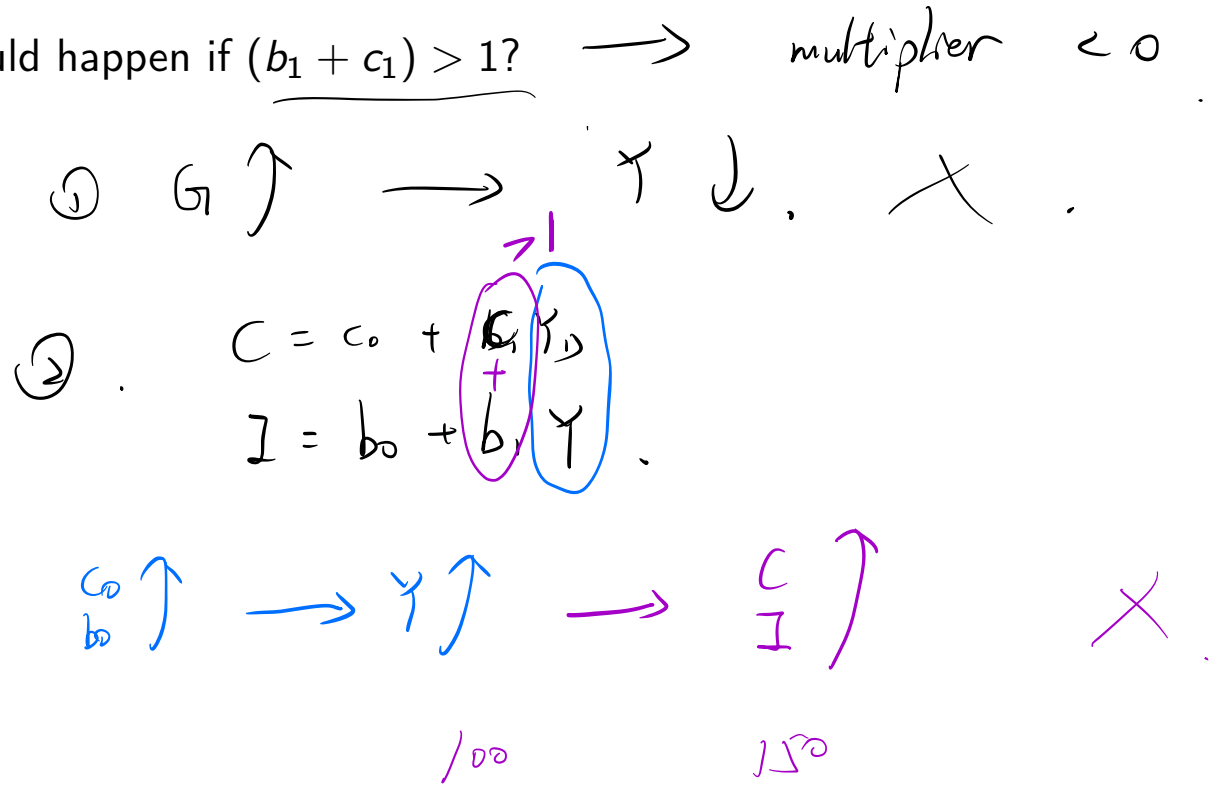
Two channels that autonomous spending can affect output

- A consumption channel through c_1
- An investment channel through b_1

For the multiplier to be positive, we require $b_1 + c_1 < 1$

In-tutorial Sheet - Q3

(c) What would happen if $(b_1 + c_1) > 1$? → multiplier < 0



In-tutorial Sheet - Q3

(c) What would happen if $(b_1 + c_1) > 1$?

If

$$b_1 + c_1 > 1,$$

the multiplier will be negative and there is no equilibrium level of output.

Intuitively, $b_1 + c_1 > 1$ implies that the increase in consumption and investment will be more than 1 when autonomous spending increases by 1, which does not make sense.

In-tutorial Sheet - Q3

(d). Suppose that the parameter b_0, sometimes called business confidence, increases. How will equilibrium output be affected? Will investment change by more or less than the change in b_0? Why? What will happen to national saving?

$b_0 \uparrow \rightarrow Y \uparrow$ $I = b_0 + b_1 Y$ $I \uparrow \rightarrow Y \uparrow$ ↓ ⋮

$$\frac{\partial Y}{\partial b_0} = \frac{1}{1 - b_1 - c_1}$$

In-tutorial Sheet - Q3

(c) Suppose that the parameter b_0, sometimes called business confidence, increases. How will equilibrium output be affected? Will investment change by more or less than the change in b_0? Why? What will happen to national saving?

$$Y = \frac{1}{1 - c_1 - b_1}(c_0 - c_1 T + G + b_0) \quad \Delta Y = \frac{\partial Y}{\partial b_0} \cdot \Delta b_0$$

When business confidence b_0 increases by 1, output increases by the size of the multiplier.

In-tutorial Sheet - Q3

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When business confidence b_0 increases by 1, output increases by the size of the multiplier.

$$I = b_0 + b_1 Y$$

Investment increases by the change in b_0 plus b_1 times the change in output. The change in business confidence leads to an increase in output, which induces an additional increase in investment.

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Since investment increases, and national saving equals investment, national saving must also increase.

The end

Thanks for your attention! 😄

See you next week!