ECON20001 Intermediate Macroeconomics

Tutorial 3 (Week 4)

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Semester 2, 2022
The University of Melbourne

Introduction

Monday   OLT 1.
Lecture 1 - 6.

before Tues 2 pm.

Zheng Fan

- Ph.D student in Economics at Unimelb

- Consultation & Ed discussion board (your first priority)

- Email Dr David Moreton for all administrative issues

- Consult Stop 1 for special consideration

- Email: fan.z@unimelb.edu.au (last resort!)

Before asking any questions, make sure you have gone through the Ed discussion board, subject guide and Q&A on Canvas!

Slides: github.com/zhengf1/InterMa2022

IS-LM

→ download

IS curve:

- $Y = C(Y, T) + I(Y, i) + G$ $\bar{i}$: $Y \downarrow$

- Fiscal contraction: G decreases and/or T increases, IS curve shifts in

- Fiscal expansion: G increases and/or T decreases, IS curve shifts out

- Movement along LM curve $\bar{i}$: $Y \uparrow$

IS-LM

IS curve:

- $Y = C(Y, T) + I(Y, i) + G$

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- Movement along LM curve

LM curve:

- $\frac{M}{P} = YL(i)$

- Monetary contraction , M decreases, LM curve shifts up $i \uparrow$

- Monetary expansion , M increases, LM curve shifts down $i \downarrow$
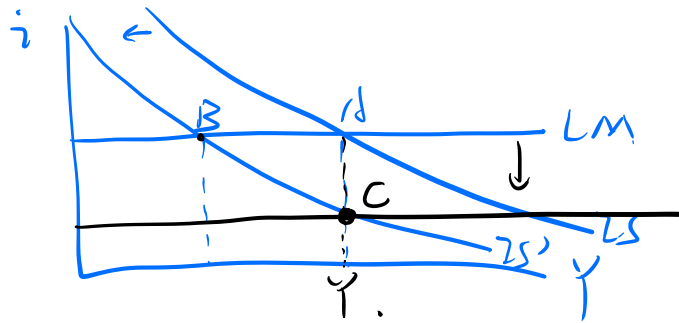
- Movement along IS curve

Policy mixture

Policy mix
to reduce

$G - T$ ↓

- Large deficit: Fiscal Contraction, Monetary Expansion

Effectiveness of monetary and fiscal policy

Liquidity traps

Policy mixture

Policy mix

- Large deficit: Fiscal Contraction, Monetary Expansion
- Global boom: Fiscal Contraction, Monetary Contraction

IS left *LM up*

Effectiveness of monetary and fiscal policy

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Policy mixture

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    G-7 ↑ IS →   LM ↓ .
- Global financial crisis: Fiscal Expansion, Monetary Expansion

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Policy mixture

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- Global boom: Fiscal Contraction, Monetary Contraction

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Effectiveness of monetary and fiscal policy

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- Large deficit: Fiscal Contraction, Monetary Expansion

- Global boom: Fiscal Contraction, Monetary Contraction

- Global financial crisis: Fiscal Expansion, Monetary Expansion

Effectiveness of monetary and fiscal policy

- Comparative effects of monetary or fiscal policy depend on . . . of IS
  and LM curves

Liquidity traps
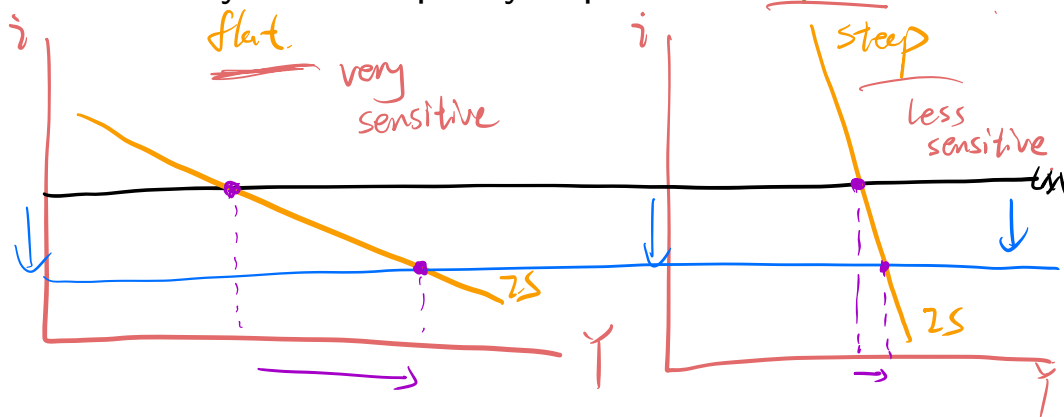
Policy mixture

$$I = b_0 + b_1 Y - b_2 i.$$

$i\uparrow$ $\xrightarrow{b_2 \text{ large}}$ $I \searrow$

$r\uparrow\uparrow$ $\xrightarrow{b_2 = 0}$ I no change $\rightarrow IS?$

Policy mix

- Large deficit: Fiscal Contraction, Monetary Expansion

- Global boom: Fiscal Contraction, Monetary Contraction

- Global financial crisis: Fiscal Expansion, Monetary Expansion

Effectiveness of monetary and fiscal policy

- Comparative effects of monetary or fiscal policy depend on slopes of IS and LM curves

Liquidity traps

flat very sensitive

steep less sensitive

i IS LM Y

i IS LM Y

Policy mixture

Policy mix

- Large deficit: Fiscal Contraction, Monetary Expansion

- Global boom: Fiscal Contraction, Monetary Contraction

- Global financial crisis: Fiscal Expansion, Monetary Expansion

Effectiveness of monetary and fiscal policy

- Comparative effects of monetary or fiscal policy depend on slopes of IS and LM curves

Liquidity traps

- Nominal interest rates i cannot fall below zero

Policy mixture

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- Large deficit: Fiscal Contraction, Monetary Expansion

- Global boom: Fiscal Contraction, Monetary Contraction

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Effectiveness of monetary and fiscal policy

- Comparative effects of monetary or fiscal policy depend on slopes of IS and LM curves

Liquidity traps

- Nominal interest rates i cannot fall below zero

- ... policy becomes ineffective while ... policy is still effective

Policy mixture

Policy mix

- Large deficit: Fiscal Contraction, Monetary Expansion

- Global boom: Fiscal Contraction, Monetary Contraction

- Global financial crisis: Fiscal Expansion, Monetary Expansion

Effectiveness of monetary and fiscal policy

- Comparative effects of monetary or fiscal policy depend on slopes of IS and LM curves

Liquidity traps

- Nominal interest rates i cannot fall below zero

- Monetary policy becomes ineffective while Fiscal policy is still effective

  conventional

In-tutorial Sheet - Q2

2. Consider the following numerical example of the IS-LM model:

$$C = 100 + 0.3Y_D$$

$$I = 150 + 0.2Y - 1000i$$

$$T = 100$$

$$G = 200$$

$$\bar{i} = 0.01$$

$$(M/P)^d = 2Y - 4000i$$

(a) Find the equation for aggregate demand. $Z = C + I + G$

(b) Derive the IS relation. (goods market clear)

(c) Derive the LM relation if the central bank sets an interest rate of 1%.

(d) $\longrightarrow$ Y ?

2. Consider the following numerical example of the IS-LM model:

$Y_D = Y - T.$

$$C = 100 + 0.3Y_D$$

$$I = 150 + 0.2Y - 1000i$$

$$T = 100$$

$$G = 200$$

$$\bar{i} = 0.01$$

$$(M/P)^d = 2Y - 4000i$$

$\dfrac{\partial Y}{\partial b_0}$

(a) Find the equation for aggregate demand.

Aggregate demand

Y_D

$Z = C + I + G = 100 + 0.3(Y - 100) + 150 + 0.2Y - 1000i + G = 200$

$= Y$

C

I

In-tutorial Sheet - Q2

(b) Derive the IS relation.

$(1 - 0.3 - 0.2) Y = \cdots \cdots$

$Y = \left(\dfrac{1}{0.5}\right)\left(\cdots \cdots + G\right)$

(b) Derive the IS relation.

multiplier ? $= 2$. $\quad \dfrac{\partial Y}{\partial G} = 2.$

The IS relation is derived from goods market equilibrium condition, which

requires

$\dfrac{\partial Y}{\partial C_0}$
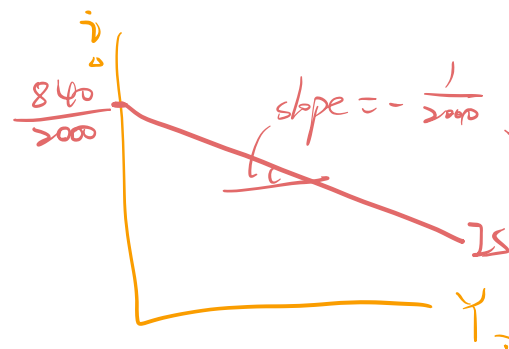
$Y = Z = 100 + 0.3(Y - 100) + 150 + 0.2Y - 1000i + G$

$C_0 \qquad T \qquad b_0 \qquad b_1$

It follows

$$Y = 840 - 2000i$$

840

2000

slope $= -\dfrac{1}{2000}$

The IS relation is therefore

$$i = (840 - Y)/2000$$

$$= \underbrace{\frac{840}{2000}}_{\text{intercept}} - \underbrace{\frac{1}{2000}}_{\text{slope}} Y$$

In-tutorial Sheet - Q2

$$(1 - 0.3 - 0.2)Y = 100 - 0.3 \cdot T + 150$$
$$-1000 \, i + G$$

(b) Derive the IS relation.

$$T \uparrow \, 1 \quad \rightarrow \quad -\frac{0.3}{0.5} \cdot 1 = \Delta Y$$

The IS relation is derived from goods market equilibrium condition, which requires

$$Y = Z = \underbrace{100}_{c_0} + \underbrace{0.3}_{t_1}(Y - \underbrace{100}_{T}) + \underbrace{150}_{b_0} + 0.2Y - 1000i + \underbrace{G}$$

It follows

$$Y = 840 - 2000i$$

The IS relation is therefore

$$i = (840 - Y)/2000$$

(c) Derive the LM relation if the central bank sets an interest rate of 1%.

In-tutorial Sheet - Q2

(b) Derive the IS relation.

The IS relation is derived from goods market equilibrium condition, which requires

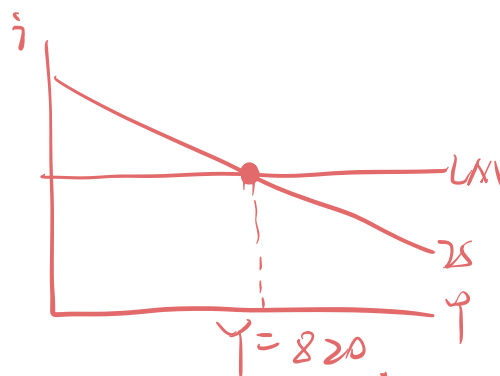$$Y = Z = \underbrace{100 + 0.3(Y - 100)}_{C} + \underbrace{150 + 0.2Y - 1000i}_{1} + G$$

It follows

$$Y = 840 - 2000i$$

The IS relation is therefore

$$i = (840 - Y)/2000$$

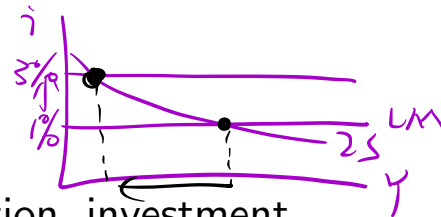(c) Derive the LM relation if the central bank sets an interest rate of 1%.

Since the central bank sets the interest rate, the LM relation is
$i = \bar{i} = 0.01.$

Y C I

(d) Solve for the equilibrium values of output, consumption, investment and real money supply.

In-tutorial Sheet - Q2

(d) Solve for the equilibrium values of output, consumption, investment and real money supply.

Using $\bar{i} = 0.01,$ we can find   *LM*

$G \uparrow$ from 200 to 300.

$G \uparrow 100$

$IS:\ Y = 840 - 2000i = 820$

new $IS \Rightarrow Y = 1040 - 2000i$

$Y \uparrow\ 100 \times multiplier$

Using the consumption function and investment function, we have

$$C = 100 + 0.3Y_D = 100 + 0.3(820 - 100) = 316$$

and

$$I = 150 + 0.2Y - 1000i = 150 + 0.2 \times 820 - 1000 \times 0.01 = 304$$

Use money market clearing condition to solve for real money supply

$$\frac{M^s}{P} = \frac{M^d}{P} = 2Y - 4000i = 2 \times 820 - 4000 \times 0.01 = 1600$$

In-tutorial Sheet - Q2

(e) Contractionary monetary policy:

Suppose that the central bank increases the interest rate to 0.03. What is the impact of this contractionary monetary policy on the IS and LM curves? Find the new equilibrium values of output, consumption, investment and real money supply.

In-tutorial Sheet - Q2

(e) Contractionary monetary policy:

Suppose that the central bank increases the interest rate to 0.03. What is the impact of this contractionary monetary policy on the IS and LM curves? Find the new equilibrium values of output, consumption, investment and real money supply.

With the contractionary monetary policy, the new interest rate is 0.03.

Following the same steps as before by substituting $\bar{i} = 0.03$ into the IS relation, we can find $Y = 780$.

Using the consumption function and investment function, $C = 304$ and $I = 276$.

The money market clearing condition gives $M/P = 1440$.

The contractionary monetary policy lowers output, consumption and investment. It requires a fall in real money supply.

(f) Expansionary fiscal policy.

Suppose that the government increases its spending $\underset{\text{from}}{} \overset{200}{} $ G to 300 (keeping $\bar{i} = 0.01$). What is the impact of this expansionary fiscal policy on the IS and LM curves? Find the new equilibrium values of output, consumption, investment and real money supply.

$$1\rfloor = \underline{b_0} + b_1 \overset{\curvearrowright}{Y} - b_y \overset{\curvearrowright}{i}$$

$$\underset{\uparrow 100}{} \qquad \underset{Y \uparrow \; 200.}{}$$

(f) Expansionary fiscal policy.

Suppose that the government increases its spending G to 300 (keeping $\bar{i} = 0.01$). What is the impact of this expansionary fiscal policy on the IS and LM curves? Find the new equilibrium values of output, consumption, investment and real money supply.

With the expansionary fiscal policy, G increases to 300. The goods market equilibrium condition :

$$Y = 1040 - 2000i$$

Since $\bar{i} = 0.01$, we can solve for $Y = 1020$, $C = 376$ and $I = 344$. The money market clearing condition gives $M/P = 2000$.

Notice that the expansionary fiscal policy raises output, consumption and investment. To keep the interest rate at $\bar{i} = 0.01$, real money supply increases to accommodate the rise in money demand.

In-tutorial Sheet - Q3

3. Policy mix.

What policy mix of monetary and fiscal policy is needed to meet the objectives given here?

(a) Increase Y while keeping $\bar{i}$ constant. Would investment (I) change?

LM

In-tutorial Sheet - Q3

3. Policy mix.

What policy mix of monetary and fiscal policy is needed to meet the objectives given here?

(a) Increase Y while keeping $\bar{i}$ constant. Would investment (I) change?

The interest rate constant
→ the LM curve remains unchanged   .

To increase output, the government can use an expansionary fiscal policy
by either increasing G or decreasing T
→ the IS curve shifts to the right.

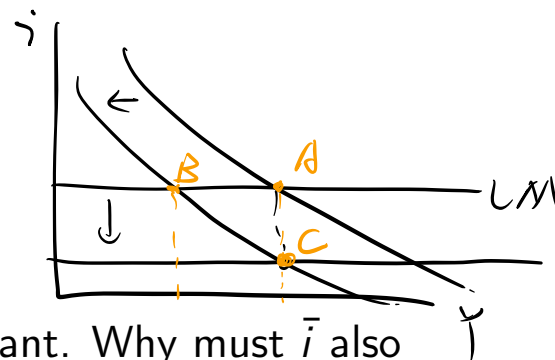Investment will increase because output rises and the interest rate is constant.

$$I = b_0 + b_1 Y - b_2 i$$

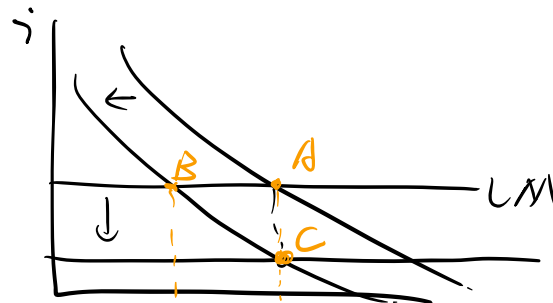$\downarrow G$ $\uparrow T$ $\downarrow \bar{i}$

(b) Decrease a fiscal deficit while keeping Y constant. Why must $\bar{i}$ also change?

(b) Decrease a fiscal deficit while keeping Y constant. Why must $\bar{i}$ also change?

The government should pursue a contractionary fiscal policy by either increasing T or decreasing G to reduce the fiscal deficit.
→ The IS curve shifts to the left.

To keep output constant, monetary policy has to be expansionary
→ The central bank should cut the interest rate to level output unchanged.
→ The LM curve shifts down

The economy has a lower interest rate, but output is constant.

The end

Thanks for your attention! 😄