ECON20001 Intermediate Macroeconomics

Tutorial 2 (Week 3)

Zheng Fan

Semester 2, 2022
The University of Melbourne

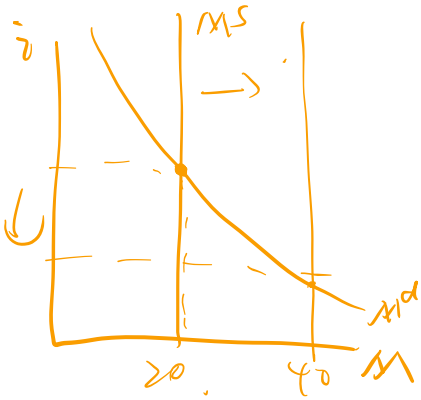
Introduction

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 me at: 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!

Last week lectures



	Money M	Bond B
Pay interest i	No	Yes
For transaction	Yes	No

Money demand

$$M^d = \$Y \times L(i) \qquad \text{with} \qquad \frac{dL}{di} < 0$$

Money supply $M^s = M$ given by Reserve Bank

Open Market Operations

- Expansionary: $M \ldots, i \ldots$

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- Contractionary: M decreases, i increases

Last week lectures

For one period bond, price

$$P_B = \frac{\$100}{1+i} \qquad \text{with face value of } \$100$$

Bank balance sheets

$$\text{Asset} = \text{Liabilities} + \text{Equity}$$

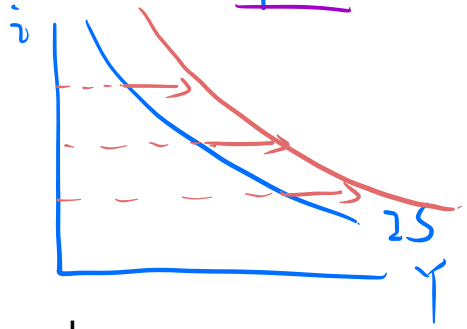
Leverage ratio

$$\text{Leverage} = \frac{Total\ Assets}{Equity}$$

Last week lectures

IS : downward sloping ? (move along)

$i \uparrow \rightarrow I \downarrow \rightarrow Y \downarrow$



Pre-tutorial Q4 & Q5:

IS curve: shift

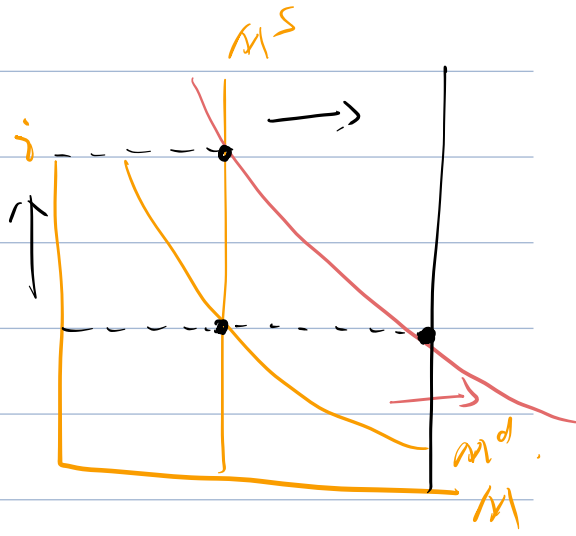
- Drawn for given fiscal policy G, T
- $G \uparrow, T \downarrow \rightarrow Y \uparrow \rightarrow$ IS curve shifts rightward
- $G \downarrow, T \uparrow \rightarrow Y \downarrow \rightarrow$ IS curve shifts leftward
- $c_0 \uparrow \rightarrow C \uparrow \rightarrow Z \uparrow \rightarrow Y \uparrow \rightarrow$ IS curve shifts rightward

LM curve: shift ?

LM : horizontal ? (move along)

- Drawn for given monetary policy
- $i \uparrow \rightarrow$ LM curve shifts upward (contractionary monetary policy)
- $i \downarrow \rightarrow$ LM curve shifts downward (expanisonary monetary policy)

LM: horizontal ? (move along)



Y ↑ → $Y (PY) ↑ → M^d ↑ → i ↑ → Y

↳ LM upward sloping (traditional)

RB does not react

Y ↑ → $Y (PY) ↑ → M^d ↑ → R.B → M^S ↑

i constant

↳ LM horizontal

In-tutorial Sheet - Q2

2. Assume that money demand is given by:

$$M^d = \$Y(0.25 - i)$$

where nominal income is \$100. You may also suppose that the money supply is \$20. Assume that the financial markets are in equilibrium.

(a) What is the equilibrium interest rate? 5%

In-tutorial Sheet - Q2

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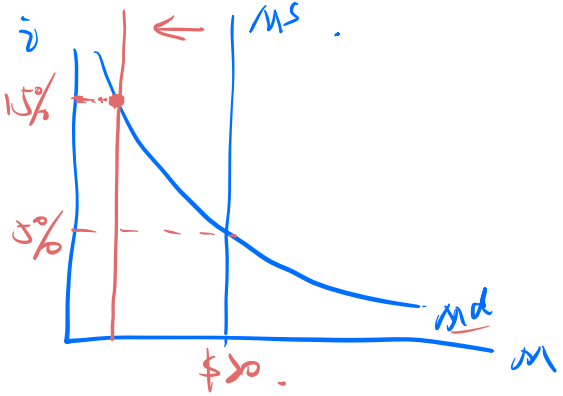
(a) What is the equilibrium interest rate? $M^s = M^d = 20$

$$i = 0.25 - \frac{M^d}{\$Y} = 0.25 - \frac{20}{100} = 0.05$$

In-tutorial Sheet - Q2



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(b) If the Reserve Bank wanted to increase i by 10 percentage points (that is the equilibrium interest rate you find in (a) plus 10%), at what level should it set the supply of money? \$10

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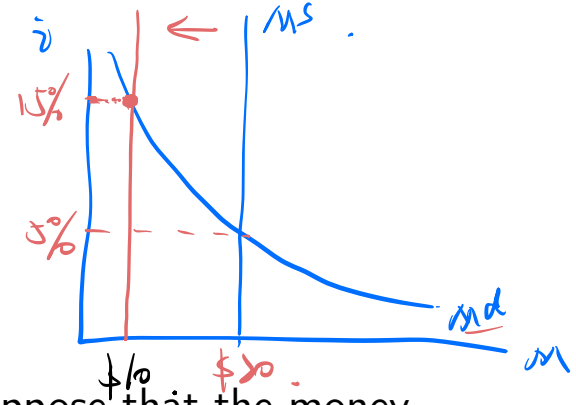

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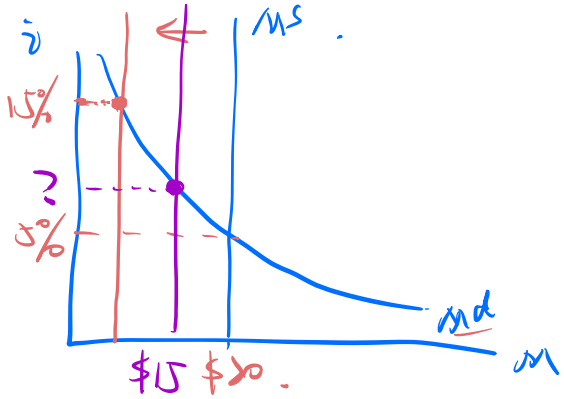
(b) If the Reserve Bank wanted to increase i by 10 percentage points (that is the equilibrium interest rate you find in (a) plus 10%), at what level should it set the supply of money?

$$M^d = \$Y(0.25 - i) = \$100(0.25 - 0.15) = \$10$$

In-tutorial Sheet - Q2



(c) If the money supply decreases to \$15, what wil be the impact on i?

In-tutorial Sheet - Q2

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Using $M = 15$, the equilibrium condition in the money market is

$$\$15 = \$100 \times (0.25 - i)$$

Solving for i gives $i = 0.1$ or 10%.

In-tutorial Sheet - Q3

3. Briefly explain how leverage can be used to amplify an investor's risk and return.

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An example bank:

Assets	−	Liabilities	=	Equity
\$1500 million		\$1400 million		\$100 million

So its leverage ratio is

$$\frac{\text{assets}}{\text{equity}} = \frac{1500}{100} \text{ or } 15:1$$

5% × 15.

① Good year : 5% ↑ ⟶ Equity ? ↑ 75%.

② Bad year : 5% ↓ ⟶ Equity ? ↓ 75%.

Asset		liability		equity.
1500	-	1400	=	100.

Good year:

leverage.

↑5%	×	15.	=	↑75%.
1575	−	1400	=	175.

Bad year:

↓5%	×	15	=	↓75%.
1425	−	1400	=	25.

In-tutorial Sheet - Q3

In a good year

- The value of the bank's assets might rise by 5%: to \$1575
- The new equity held by the bank's shareholders is \$100m+\$75m
- The percentage return to equity holders is 75%, 15 times of 5%

In a bad year

- The value of the bank's assets might fall by 5%: to \$1425
- The new equity held by the bank's shareholders is \$100m−\$75m
- The percentage return to equity holders is −75%, 15 times of 5%
- At a new equity level of \$25m, the bank is much closer to being insolvent

↳ 0.

In-tutorial Sheet - Q4

4. Suppose that nominal income in an economy is \$5000 and the demand for money is given by

$$M^d = \$Y(0.08 - 0.4i)$$

(a) If the money demand is equal to \$100, what is the interest rate?

In-tutorial Sheet - Q4

4. Suppose that nominal income in an economy is \$5000 and the demand for money is given by

$$M^d = \$Y(0.08 - 0.4i)$$

(a) If the money demand is equal to \$100, what is the interest rate?

From the money demand function, we have

$$\$100 = \$5000 \times (0.08 - 0.4i)$$

Solving for i gives $i = 0.15$ $\longrightarrow$ 15%.

In-tutorial Sheet - Q4

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Solving for i gives $i = 0.15$

(b) What should the central bank do to interest rates if it wants to increase the money supply to \$300?

$\rightarrow M^d = 300$,

$300 = 5000\,(0.08 - 0.4i)$

$\hookrightarrow i$

In-tutorial Sheet - Q4

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From the money demand function, we have

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Solving for i gives $i = 0.15$

(b) What should the central bank do to interest rates if it wants to increase the money supply to \$300?

The equilibrium condition in the money market implies

$$M^s = \$300 = M^d = \$5000 \times (0.08 - 0.4i)$$

Then, $i = 0.05$

In-tutorial Sheet - Q4

$M^d = \$Y(0.08 - 0.4i)$ (5000, 0)

(c) What is the demand for money when the central bank sets the interest rate at zero?

$M^d = 400$

In-tutorial Sheet - Q4

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The money demand function implies

$$M^d = \$5000 \times (0.08 - 0) = \$400$$

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(d) How would people choose between bonds and money when the interest rate is zero?

When the interest rate is zero, the opportunity cost of holding money is zero.

In-tutorial Sheet - Q4

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(d) How would people choose between bonds and money when the interest rate is zero?

When the interest rate is zero, the opportunity cost of holding money is zero.

Once people have enough money for transaction purposes, they are indifferent between holding money and holding bonds.

In-tutorial Sheet - Q4

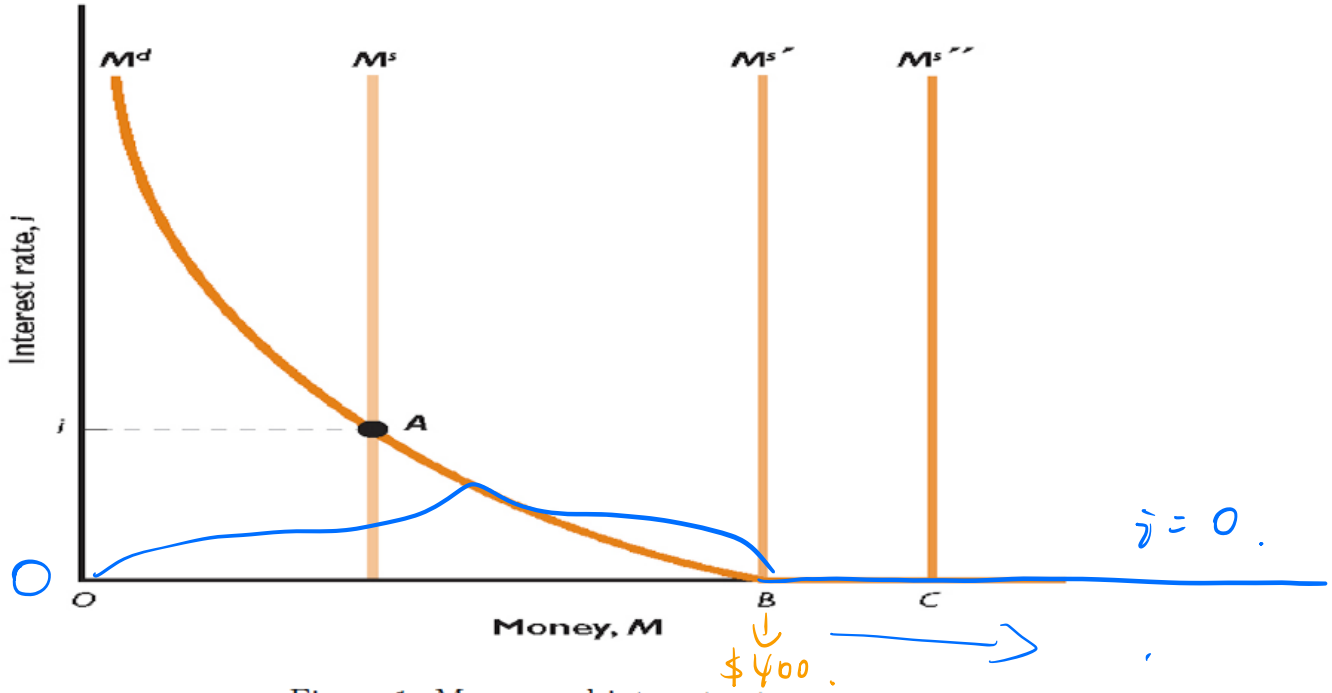

Figure 1: Money and interest rates

The distance OB shows the demand for money for transaction purposes. Beyond point B, the demand for money becomes horizontal.

In-tutorial Sheet - Q4

(e) Explain why there is a zero lower bound of the interest rate when the economy is in a liquidity trap.

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Generally, more money supply decreases the interest rate.

Once the equilibrium interest rate reaches zero, further increases in the money supply have no effect on the equilibrium interest rate, which remains equal to zero.

The interest rate cannot go below zero, a constraint known as the zero lower bound.

At the zero lower bound, monetary policy cannot decrease the interest rate further.

In this case, the economy is said to be in a liquidity trap.

Pre-tutorial Sheet - Q2

2. Suppose that a person has financial wealth of \$50,000 and an annual income of \$60,000. Suppose their demand for money is given by:

$$M^d = \$Y(0.35 - i)$$

(the notation $\$Y$ is to remind you that this is nominal income, the same thing as PY).

(a) What is their demand for money and bonds when the interest rate is 5% (that is, $i = 0.05$). What about when the interest rate is 10%?

$M^d = 18{,}000 \quad (i = 5\%)$

$M^d = 60{,}000 \times (0.35 - 0.05) = 18{,}000$

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(a) What is their demand for money and bonds when the interest rate is 5% (that is, $i = 0.05$). What about when the interest rate is 10%?

Wealth is either money or bonds, so $B^d = \$50,000 - M^d$.

At $i = 0.05$:

$$M^d = \$60,000 \times (0.35 - 0.05) = \$18,000 \qquad B^d = \$32,000$$

At $i = 0.10$:

$$M^d = \$15,000 \qquad B^d = \$35,000$$

Pre-tutorial sheet - Q2

$M^d = \$Y \cdot L(i)$

(d) Outline the effect of changes in income on money demand. How does this effect depend on the interest rate i?

$\$Y \uparrow$ 1% $\longrightarrow$ $M^d \uparrow$ 1%

$\$Y \uparrow$ \$1 $\longrightarrow$ $M^d \uparrow$ $\$1 \cdot L(i)$

Pre-tutorial sheet - Q2

(d) Outline the effect of changes in income on money demand. How does this effect depend on the interest rate i?

A 1% increase (decrease) in income leads to a 1% increase (decrease) in money demand
$\rightarrow$ independent of the interest rate.

But the absolute change in money demand does depend on the interest rate.

For example: $M^d = \$Y \times L(i)$ and $M^{d'} = \$Y' \times L(i)$

The percentage change is

$$\frac{M^{d'} - M^d}{M^d} = \frac{[\$Y' \times L(i)] - [\$Y \times L(i)]}{\$Y \times L(i)} = \frac{\$Y' - \$Y}{\$Y}$$

The absolute change is $M^{d'} - M^d = (\$Y' - \$Y)L(i)$

The end

Thanks for attending! 😄

Feel free to leave or see you next week!