

# ECON20001 Intermediate Macroeconomics

Tutorial 11 (Week 12)

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# 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: 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](https://github.com/zhengf1/InterMa2022)

# Last week lectures



$$NX = X(Y^*, E) - \underbrace{IM(Y, E)}_{\downarrow}$$

Mundell-Fleming model (an open economy IS-LM model):



- IS curve:  $Y = C(Y, T) + I(Y, i) + G + \underline{NX(Y, Y^*, E)}$
- LM curve:  $i = \bar{i}$
- Interest parity condition:  $(1 + i) = (1 + i^*) \frac{E}{\bar{E}^e} \Leftrightarrow \underline{E} = \frac{1 + \underline{i}}{1 + i^*} \bar{E}^e$
- Monetary contraction:  $i \uparrow \rightarrow$  LM shifts upward  $\rightarrow$  an exchange rate appreciation, what about NX?   
 $i \uparrow \rightarrow C, I \downarrow \rightarrow Y \downarrow \rightarrow \underline{NX \uparrow}$   
 $i \uparrow \rightarrow E \uparrow \rightarrow \underline{NX \downarrow}$
- Fiscal expansion:  $G \uparrow$  and RBA keeps  $i$ : IS shifts rightwards, more output ( $Y' > Y$ ), no change in  $E$ , what about NX?   
 $G \uparrow (T \downarrow) \rightarrow Y \uparrow \rightarrow \underline{NX \downarrow}$

# Last week lectures

Exchange rate regimes:

- Flexible (floating): market conditions determine exchange rate
- Fixed (pegged): collapse if run out of reserve (speculative attack) 
- Crawling peg: allows the national currency exchange rate to fluctuate in a specific range 

Trilemma:

-  Perfect international capital mobility
- Independent domestic monetary policy
- Fixed exchange rate 

# Last week lectures

U2P:  $1+i = (1+i^*) \cdot \frac{P}{P^*E}$   
 $\hookrightarrow i = i^*$

Under fixed exchange rates, the adjustment takes place through the price level rather than through the nominal exchange rate

- Fixed nominal exchange rate:  $E = \bar{E}, i = i^*$
- In the short run, fixed nominal exchange rate also implies fixed real exchange rate
- In the long run, real exchange rate can adjust

- If  $Y < \bar{Y}$ ,  $P < P^e$  and keeps decreasing  $\left( AS : P = \frac{P^e F(Y)}{F(\bar{Y})} \right)$   
contractionary  $P \downarrow \rightarrow \varepsilon \downarrow \left( \varepsilon = \frac{P}{P^*/E} \right) \rightarrow NX \uparrow$   
 $\hookrightarrow Y \uparrow$
- $Y > \bar{Y} \rightarrow P \uparrow \rightarrow \varepsilon \uparrow \rightarrow NX \downarrow \rightarrow Y \downarrow$

# Last week lectures

Exchange rate crises under fixed exchange rates:

- If foreign exchange markets expect devaluation:  $E_{t+1}^e < \bar{E}$
- Interest parity:  $i \approx i^* - \frac{E_{t+1}^e - \bar{E}}{\bar{E}} > i^*$
- Government
  - Give in and devalue
  - Maintain fixed rate, probably at the cost of very high interest rates and a potential recession

Flexible exchange rate:

- Interest parity:  $\bar{E}_t = \frac{1 + i_t}{1 + i_t^*} E_{t+1}^e$
- depends on path of future domestic and foreign interest rates and expectations of exchange rates far into the future

# Last week lectures

Choosing between exchange rate regimes:

- Fixed:
  - May severely constrain domestic monetary policy
  - Can be difficult to maintain credibility of a given fixed rate
  - Fiscal policy may be more powerful
- Flexible
  - May be excessively volatile, difficult to control via monetary policy
  - Volatility in nominal exchange rate implies short run volatility in real exchange rate, fluctuations in trade balance and real output

Consensus opinion amongst economists is that flexible exchange rates are generally preferable

# In-tutorial Sheet - Q2

V2P:  $E = \frac{1+i}{1+i^*} \cdot \bar{E}^e$

$\hookrightarrow \hat{i} = \frac{1+i^*}{\bar{E}^e} (\hat{E} - 1)$

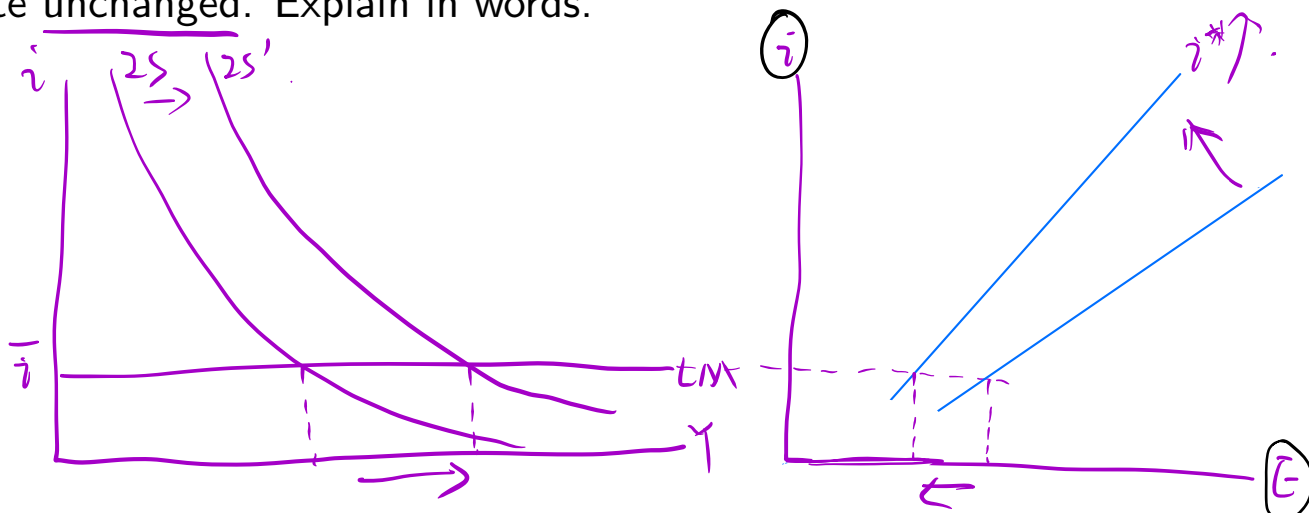
slope intercept

Flexible exchange rates and the response to changes in foreign macroeconomic policy. Suppose that both output  $Y^*$  and interest rate  $i^*$  increase in foreign country.

$Y^* \uparrow \rightarrow X \uparrow \rightarrow NX \uparrow \rightarrow Y \uparrow \rightarrow IS \text{ right}$

$i^* \uparrow \rightarrow E \downarrow \rightarrow NX \uparrow \rightarrow Y \uparrow \rightarrow IS \text{ right}$

(i) In an IS-LM-UIP diagram, show the effect of the increase in foreign output  $Y^*$  and the increase in the foreign interest rate,  $i^*$ , on domestic output  $Y$  and the exchange rate  $E$ , when the domestic central bank leaves the policy interest rate unchanged. Explain in words.





# In-tutorial Sheet - Q2

*Flexible exchange rates and the response to changes in foreign macroeconomic policy.* Suppose that both output  $Y^*$  and interest rate  $i^*$  increase in foreign country.

(i) In an IS-LM-UIP diagram, show the effect of the increase in foreign output  $Y^*$  and the increase in the foreign interest rate,  $i^*$ , on domestic output  $Y$  and the exchange rate  $E$ , when the domestic central bank leaves the policy interest rate unchanged. Explain in words.

The increase in both  $Y^*$  and  $i^*$  shift the IS curve to the right. Notice that the higher  $Y^*$  increases net exports and shifts the IS curve to the right.

The higher  $i^*$  also rotates up (and to the left) the interest parity condition, which implies that the domestic currency depreciates. Therefore, the higher  $i^*$  increases net exports and also shifts the IS curve to the right.

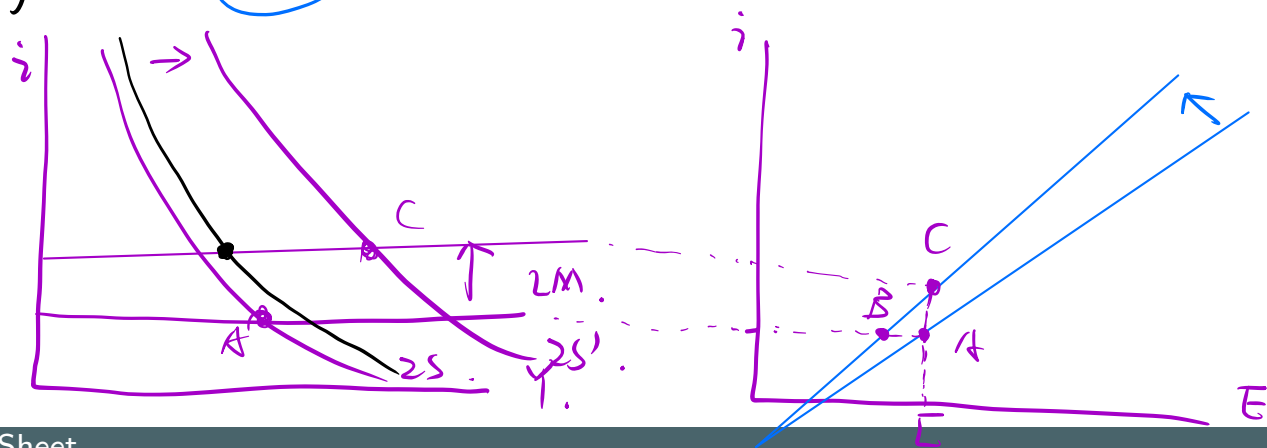
# In-tutorial Sheet - Q2

(ii) In an IS-LM-UIP diagram, show the effect of the increase in foreign output  $Y^*$  and the increase in the foreign interest rate,  $i^*$ , on domestic output  $Y$  and the exchange rate  $E$ , when the domestic central bank matches the increase in the foreign interest rate with an equal increase in the domestic interest rate. Explain in words.

$Y^* \uparrow \rightarrow X \uparrow \rightarrow NX \uparrow \rightarrow Y \uparrow \rightarrow IS \text{ right}$

$i^* \uparrow \rightarrow \bar{E} \rightarrow (i \uparrow)$

$i \uparrow \rightarrow Y \downarrow$



# In-tutorial Sheet - Q2

(ii) In an IS-LM-UIP diagram, show the effect of the increase in foreign output  $Y^*$  and the increase in the foreign interest rate,  $i^*$ , on domestic output  $Y$  and the exchange rate  $E$ , when the domestic central bank matches the increase in the foreign interest rate with an equal increase in the domestic interest rate. Explain in words.

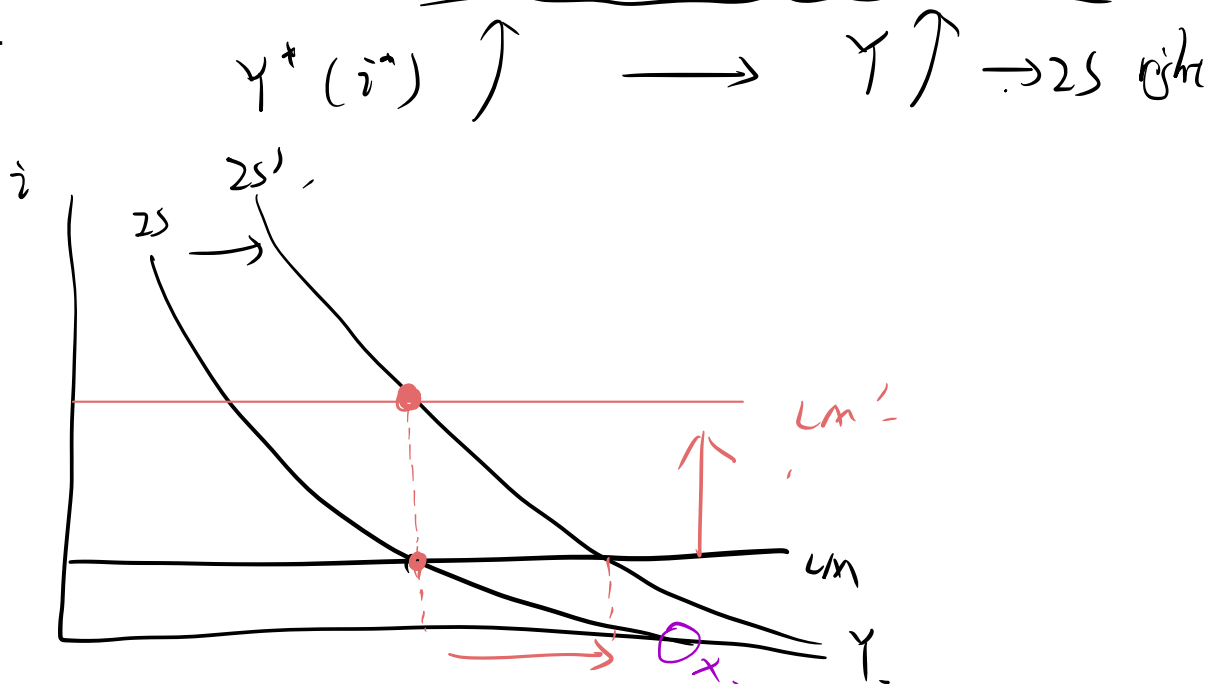
If the domestic central bank matches the increase in foreign interest rate, then although the interest parity condition rotates up (and to the left), the central bank increases the domestic interest rate so that the exchange rate can remain unchanged.

However, the effect of  $Y^*$  on net exports remains effective. So the IS curve shifts to the right.

It is not clear whether domestic output will rise or fall. It will tend to rise as the IS curve shifts to the right, but tend to fall as the domestic interest rate rises.

# In-tutorial Sheet - Q2

(iii) Discuss the required domestic monetary policy following the increase in foreign output,  $Y^*$ , and the increase in foreign interest rate,  $i^*$ , if the goal of the domestic monetary policy is to leave domestic output  $Y$  unchanged. Explain in words.



# In-tutorial Sheet - Q2

(iii) Discuss the required domestic monetary policy following the increase in foreign output,  $Y^*$ , and the increase in foreign interest rate,  $i^*$ , if the goal of the domestic monetary policy is to leave domestic output  $Y$  unchanged. Explain in words.

If the domestic central bank does not change the domestic interest rate, IS curve shifts to the right and domestic output will rise as explained in part (i).

If the goal of domestic monetary policy is to leave domestic output unchanged, the domestic central bank should pursue a contractionary monetary policy to raise the domestic interest rate.

In this way, output can remain unchanged.

# In-tutorial Sheet - Q3

$$E = \frac{1+i}{1+i^*} \cdot \bar{E}^e$$

## 3. Devaluation and interest rates.

Consider an open economy with a fixed exchange rate,  $\bar{E}$ . Throughout the problem, assume that the foreign interest rate,  $i^*$ , remains constant.

(i) Suppose that financial market participants believe that the government is committed to a fixed exchange rate. What is the expected exchange rate? According to the interest parity condition, what is the domestic interest rate?

$$E = \bar{E}$$

$$\bar{E}^e = \bar{E}$$

~~$$E = \frac{1+i}{1+i^*} \cdot \bar{E}^e$$~~

$$\hookrightarrow i = i^*$$

# In-tutorial Sheet - Q3

## 3. Devaluation and interest rates.

Consider an open economy with a fixed exchange rate,  $\bar{E}$ . Throughout the problem, assume that the foreign interest rate,  $i^*$ , remains constant.

(i) Suppose that financial market participants believe that the government is committed to a fixed exchange rate. What is the expected exchange rate? According to the interest parity condition, what is the domestic interest rate?

With a fixed exchange rate, the expected exchange rate is  $\bar{E}$ . From the interest rate parity condition, the domestic interest rate is  $i^*$ .

# In-tutorial Sheet - Q3

(ii) Suppose that financial market participants do not believe that the government is committed to a fixed exchange rate. Instead, they suspect that the government will either devalue or abandon the fixed exchange rate altogether and adopt a flexible exchange rate. If the government adopts a flexible exchange rate, financial market participants expect the exchange rate to depreciate from its current fixed value,  $\bar{E}$ . Under these circumstances, how does the expected exchange rate compare with  $\bar{E}$ ? How does the domestic interest rate compare with  $i^*$ ?

$$E = \bar{E}$$

$$\bar{E}^e < \bar{E} \Rightarrow \frac{\bar{E}}{\bar{E}^e} > 1$$

$$E = \frac{1+i}{1+i^*} \cdot \bar{E}^e$$

$$\hookrightarrow \frac{E}{\bar{E}^e} = \frac{\bar{E}}{\bar{E}^e} = \frac{1+i}{1+i^*} > 1$$
$$\Rightarrow i > i^*$$



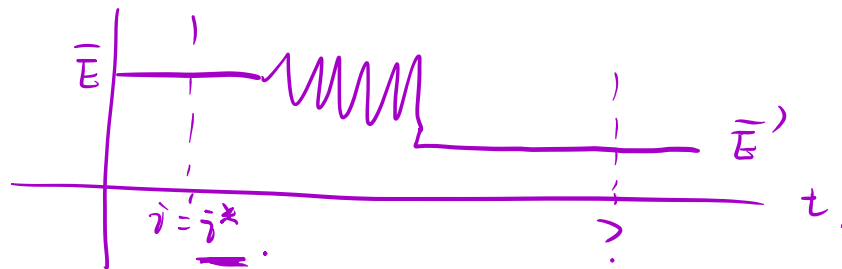
# In-tutorial Sheet - Q3

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Since financial market participants expect the exchange rate to depreciate, the expected exchange rate is less than  $\bar{E}$ .

In this case, the interest rate parity condition implies that the domestic central bank must raise the domestic interest rate to be higher than  $i^*$ .

# In-tutorial Sheet - Q3



(iii) Suppose that financial market participants feared a devaluation as in part (ii), and a devaluation actually occurs. The government announces that it will maintain a fixed exchange rate regime but changes the level of the fixed exchange rate to  $\bar{E}'$  where  $\bar{E}' < \bar{E}$ . Suppose that financial market participants believe that the government will remain committed to the new exchange rate,  $\bar{E}'$ , and that there will be no further devaluations. What happens to the domestic interest rate after the devaluation?

$$\bar{E} = \bar{E}'$$

$$\bar{E}^e = \bar{E}'$$

$$\frac{\bar{E}}{\bar{E}^e} = \frac{1+i}{1+i^*} \cdot \frac{\bar{E}^e}{\bar{E}^e}$$

$$\hookrightarrow i = \underline{i^*}$$

# In-tutorial Sheet - Q3

(iii) Suppose that financial market participants feared a devaluation, as in part (ii), and a devaluation actually occurs. The government announces that it will maintain a fixed exchange rate regime but changes the level of the fixed exchange rate to  $\bar{E}'$  where  $\bar{E}' < \bar{E}$ . Suppose that financial market participants believe that the government will remain committed to the new exchange rate,  $\bar{E}'$ , and that there will be no further devaluations. What happens to the domestic interest rate after the devaluation?

After the devaluation, the expected exchange rate will equal to the new fixed exchange rate  $\bar{E}'$ . There is no further expected depreciation. Therefore, the domestic interest rate will return to  $i^*$ .

# In-tutorial Sheet - Q3

(iv) Does a devaluation necessarily lead to higher domestic interest rates?  
Does fear of a devaluation necessarily lead to higher domestic interest rates?

# In-tutorial Sheet - Q3

$$\bar{E} = \frac{1+i}{1+i^*} \cdot \bar{E}^e$$

(iv) Does a devaluation necessarily lead to higher domestic interest rates? *NO*

Does fear of a devaluation necessarily lead to higher domestic interest rates? *YES*

$$\hookrightarrow \bar{E}^e < \bar{E} \rightarrow i \uparrow$$

From part (ii) and part (iii),

we find that devaluation per se does not lead to higher interest rates (as in part (iii)).

The fear of devaluation does lead to higher interest rates (as in part (ii)).

# Exam preparation

Get concepts right!

- ① Lecture materials and examples
  - ② Tutorial questions (in and pre): do it again
  - ③ Assignment questions: do it again
  - ④ Textbook example questions and extra readings
- PEs.

# Farewell

I wish you every success in all your future endeavours.

Good luck on your exam!

