THE MUNDELL-FLEMING MODEL

EC4006
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TODAY

- the Mundell-Fleming model
  (*IS-LM* for the small open economy)

- causes and effects of interest rate differentials

- arguments for fixed vs. floating exchange rates

THE MUNDELL-FLEMING MODEL

- *Key assumption:*
  Small open economy with perfect capital mobility.

$$r = r^*$$
$$Y = C(Y - T) + I(r^*) + G + NX(e)$$

- Goods market equilibrium – the *IS** curve:
  where

  e = nominal exchange rate
  = foreign currency per unit domestic currency
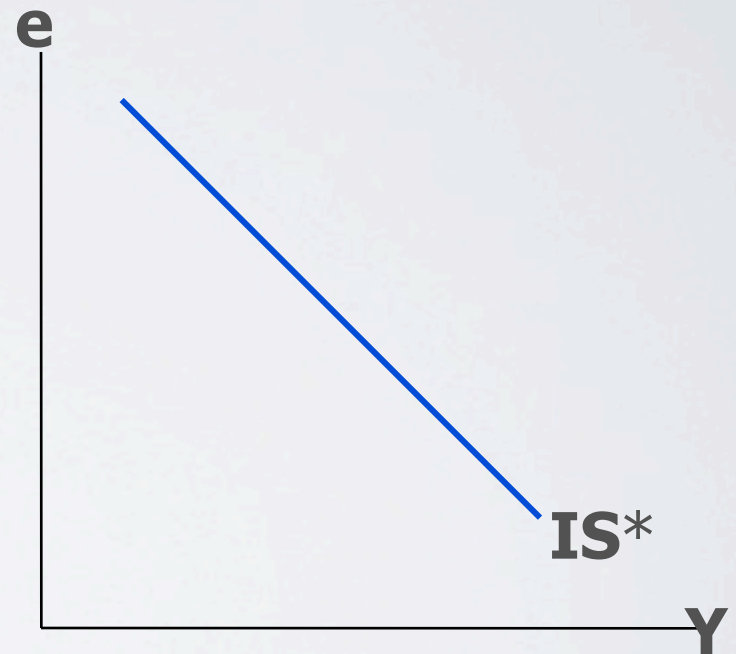
THE **IS*** CURVE: GOODS MARKET EQ'M

$$Y = C(Y-T) + I(r^*) + G + NX(e)$$

The *IS** curve is drawn for a given value of *r*.*

$$\downarrow e \;\Rightarrow\; \uparrow NX \;\Rightarrow\; \uparrow Y$$

Intuition for the slope:
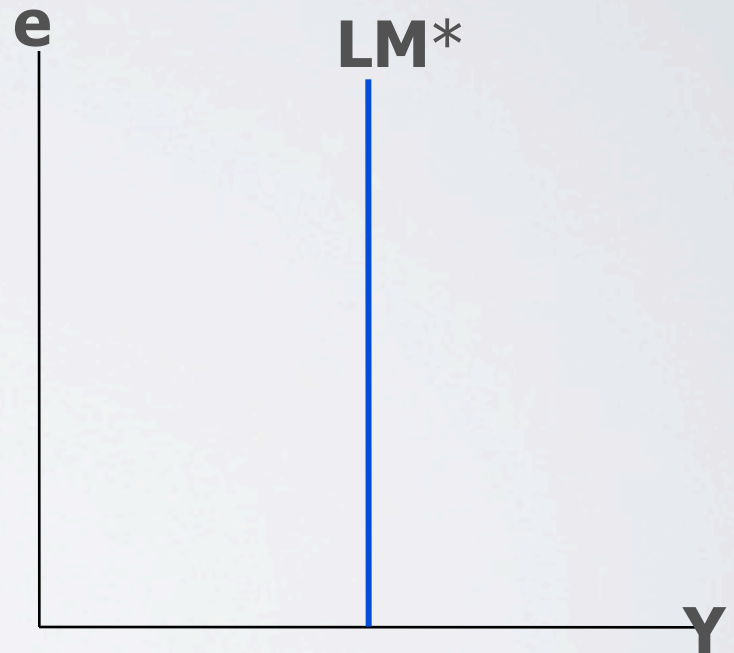
Remember, the IS curve incorporates the multiplier effect.

THE **LM*** CURVE: MONEY MARKET EQ'M

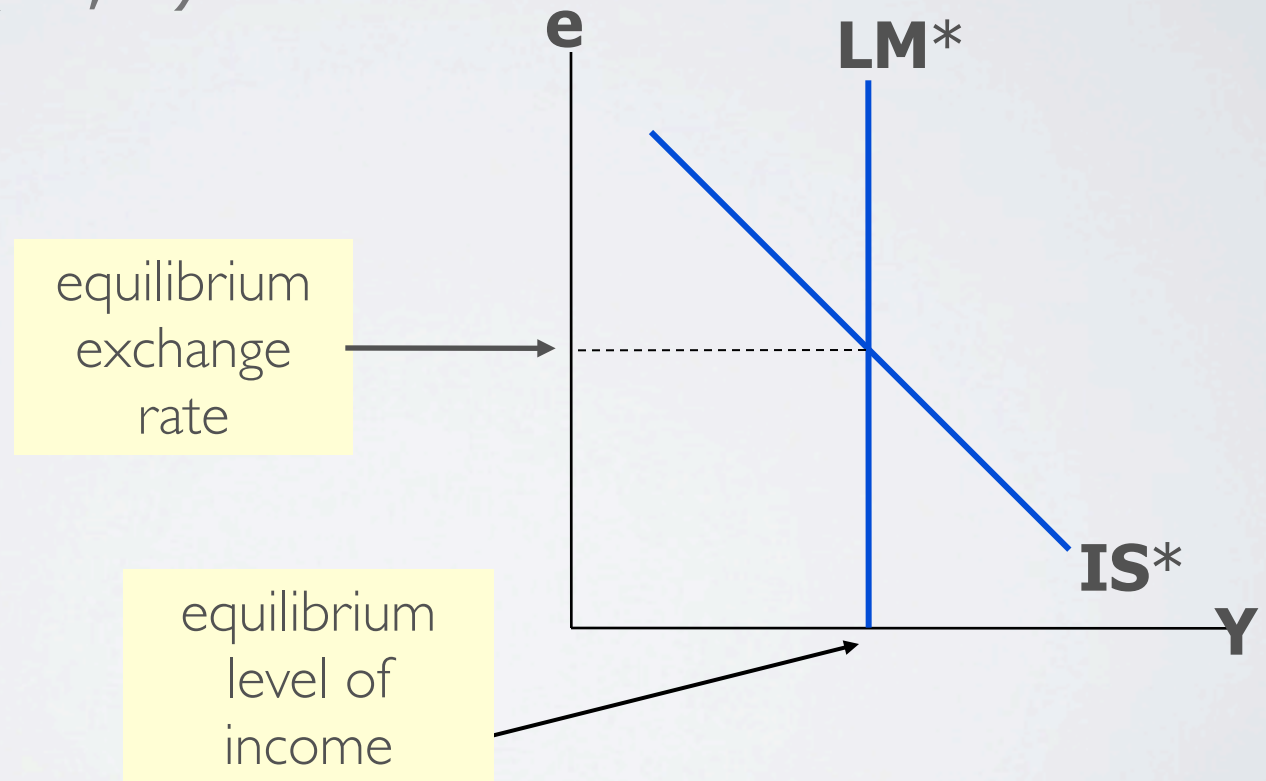$$\mathbf{M}/\mathbf{P} = \mathbf{L}(\mathbf{r}*,\mathbf{Y})$$

The *LM** curve

- is drawn for a given value of *r*.*

- is vertical because: given *r**, there is only one value of **Y** that equates money demand with supply, regardless of **e**.

EQUILIBRIUM IN THE MUNDELL-FLEMING MODEL

$$Y = C(Y - T) + I(r*) + G + NX(e)$$

$$M/P = L(r*, Y)$$

equilibrium exchange rate

equilibrium level of income

FLOATING & FIXED EXCHANGE RATES

- In a system of **floating exchange rates**,
  e is allowed to fluctuate in response to changing economic conditions.

- In contrast, under **fixed exchange rates**,
  the central bank trades domestic for foreign currency at a predetermined price.

- Next, policy analysis –

  - first, in a floating exchange rate system

  - then, in a fixed exchange rate system

LESSONS ABOUT FISCAL POLICY

- In a small open economy with perfect capital mobility, fiscal policy cannot affect real GDP.

- "Crowding out"

  - *closed economy:*
    Fiscal policy crowds out investment by causing the interest rate to rise.

  - *small open economy:*
    Fiscal policy crowds out net exports by causing the exchange rate to appreciate.

MONETARY POLICY UNDER FLOATING EXCHANGE RATES

$$Y = C(Y - T) + I(r*) + G + NX(e)$$

$$M/P = L(r*, Y)$$

An increase in M shifts $LM*$ right because Y must rise to restore eq'm in the money market.
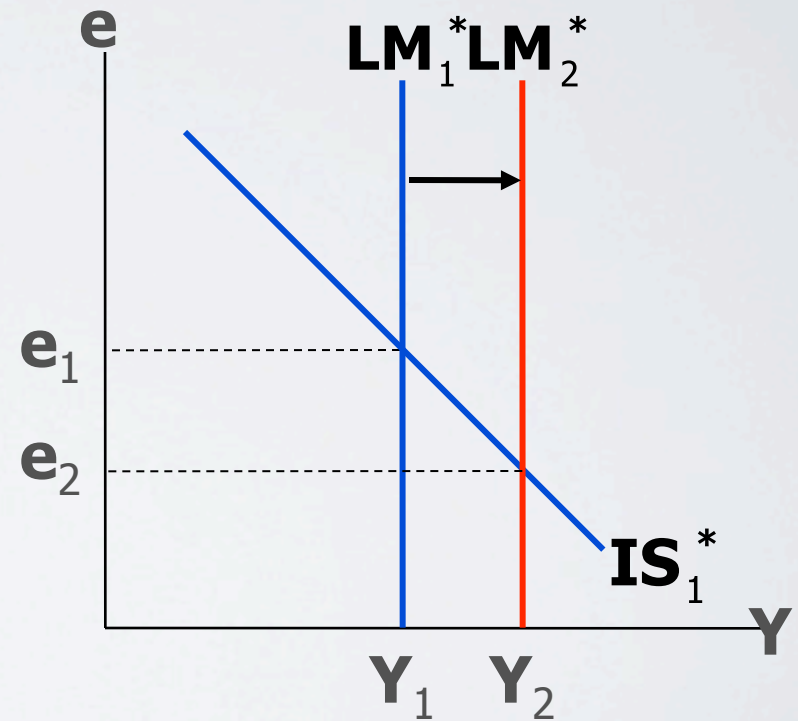
Results:

$$\Delta e < 0, \quad \Delta Y > 0$$

- Monetary policy affects output by affecting the components of aggregate demand:

$$\text{closed economy:} \quad \uparrow M \Rightarrow \downarrow r \Rightarrow \uparrow I \Rightarrow \uparrow Y$$

$$\text{small open economy:} \quad \uparrow M \Rightarrow \downarrow e \Rightarrow \uparrow NX \Rightarrow \uparrow Y$$

- Expansionary mon. policy does not raise world agg. demand, it merely shifts demand from foreign to domestic products.

  So, the increases in domestic income and employment are at the expense of losses abroad.

TRADE POLICY UNDER FLOATING EXCHANGE RATES

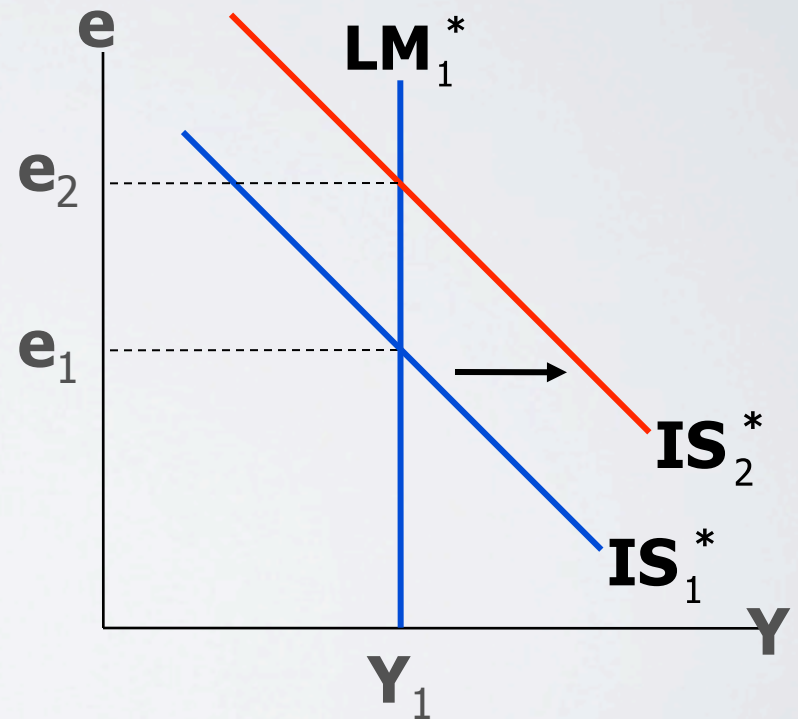$$Y = C(Y - T) + I(r*) + G + NX(e)$$

$$M/P = L(r*, Y)$$

At any given value of **e**,
a tariff or quota reduces
imports, increases **NX**,
and shifts **IS*** to the right.

NX does not change! Why?

Results:

$$\Delta e > 0, \quad \Delta Y = 0$$

LESSONS ABOUT TRADE POLICY

- Import restrictions cannot reduce a trade deficit.

- Even though **NX** is unchanged, there is less trade:

    - the trade restriction reduces imports.

    - the exchange rate appreciation reduces exports.

- Less trade means fewer "gains from trade."

FIXED EXCHANGE RATES

- Under fixed exchange rates, the central bank stands ready to buy or sell the domestic currency for foreign currency at a predetermined rate.

- In the Mundell-Fleming model, the central bank shifts the *LM** curve as required to keep *e* at its preannounced rate.

- This system fixes the nominal exchange rate.
  In the long run, when prices are flexible,
  the real exchange rate can move even if the nominal rate is fixed.

Under floating rates,
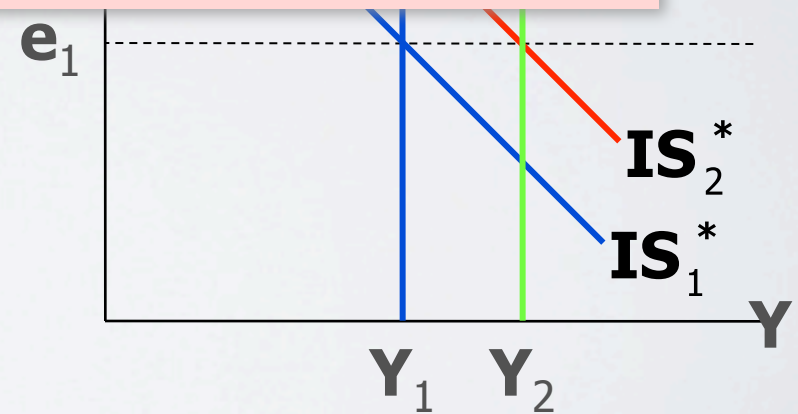a fiscal expansion
would raise **e**.

To keep **e** from rising,
the central bank must
sell domestic currency,
which increases **M**
and shifts *LM** right.

Results:

$$\Delta e = 0, \ \Delta Y > 0$$

Under floating rates,
<u>fiscal policy is ineffective</u>
at changing output.

Under fixed rates,
<u>fiscal policy is very
effective</u> at changing
output.

e_1

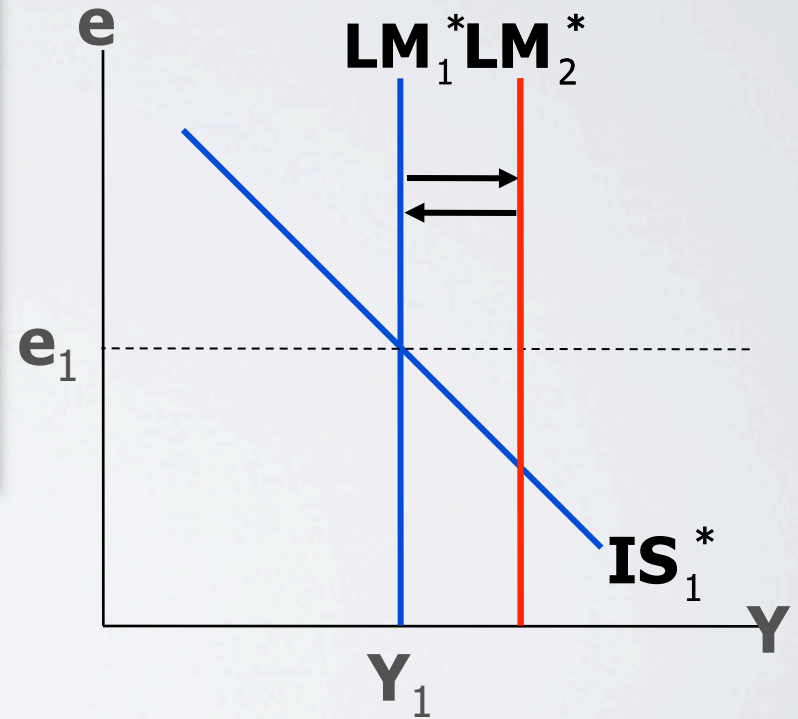IS_2^*

IS_1^*

Y

Y_1 Y_2

Under floating rates, monetary policy is <u>very effective</u> at changing output.

Under fixed rates, monetary policy <u>cannot be used to affect output</u>.

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reduces *M* and shifts *LM** back left.

Results:

$$\Delta e = 0, \quad \Delta Y = 0$$

e

$\mathbf{LM_1^*}\mathbf{LM_2^*}$

e_1

$\mathbf{IS_1^*}$

Y

Y_1

SUMMARY OF POLICY EFFECTS IN THE MUNDELL-FLEMING MODEL

Policy	type of exchange rate regime:					
	floating			fixed		
	impact on:					
	Y	e	NX	Y	e	NX
fiscal expansion	0	↑	↓	↑	0	0
mon. expansion	↑	↓	↑	0	0	0
import restriction	0	↑	0	↑	0	↑

FLOATING VS. FIXED EXCHANGE RATES

Argument for floating rates:

- allows monetary policy to be used to pursue other goals (stable growth, low inflation).

Arguments for fixed rates:

- avoids uncertainty and volatility, making international transactions easier.

- disciplines monetary policy to prevent excessive money growth & hyperinflation.

THE IMPOSSIBLE TRINITY

A nation cannot have free capital flows, independent monetary policy, and a fixed exchange rate simultaneously.

A nation must choose one side of this triangle and give up the opposite corner.

Free capital flows

Option 1 (U.S.)

Option 2 (Hong Kong)

Independent monetary policy

Option 3 (China)

Fixed exchange rate
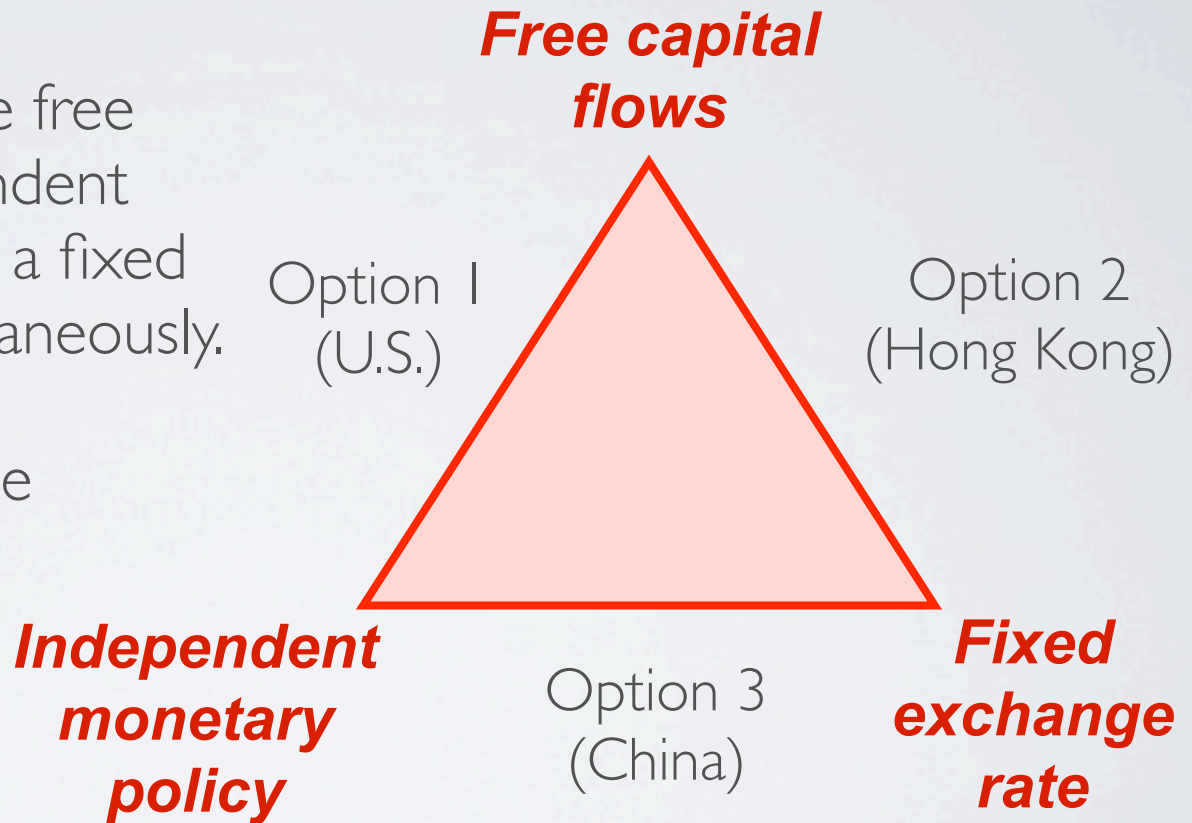
INTEREST-RATE DIFFERENTIALS

Two reasons why **r** may differ from **r***

- **country risk**: The risk that the country's borrowers will default on their loan repayments because of political or economic turmoil.

  Lenders require a higher interest rate to compensate them for this risk.

- **expected exchange rate changes**: If a country's exchange rate is expected to fall, then its borrowers must pay a higher interest rate to compensate lenders for the expected currency depreciation.

EXPECTED CHANGE IN EXCHANGE RATES

- When a foreigner buys a domestic bond, they really earn more than just *r*, the interest rate.

- They are holding a euro asset. Foreigners gain if the euro itself gains value relative to the foreign currency.

- The expected appreciation of the euro: $\dfrac{e_{+1} - e}{e}$

INTEREST PARITY

- The total expected return for a foreigner is

$$r + \frac{e^e_{+1} - e}{e}$$

- "Interest parity" says that the return on the home country's bonds equal the foreign interest rate:

$$r + \frac{e^e_{+1} - e}{e} = r^*$$

INTEREST RATES AND EXCHANGE RATES

- We can rewrite the interest parity equation to get a relationship that says the exchange rate is determined by home and foreign interest rates, and the expected future exchange rate:

$$e = \frac{e^e_{+1}}{1 + r^* - r}$$

- Home currency is stronger if:

  - Home interest rate, *r*, rises

  - Foreign interest rate, *r**, falls

  - Expected exchange rate increases

SUMMARY

- When we allow for expected changes in the value of the currency and use interest parity, the model is like the closed economy IS-LM.

- The IS curve is flatter because a drop in the interest rate also causes e to fall, which stimulates net exports.

- The expected exchange rate, e^e, and the foreign interest rate, r^*, can affect the IS curve.