The Mundell-Flemming Model and the Exchange Rate Regime

Chapter 13

1 The Mundell-Fleming Model

1.1 Assumptions:

- Small Open Economy with perfect capital mobility
  - Small Open Economy: the country's actions have a __________________________ effect on the world economy
  - Perfect Capital Mobility: the residents of the country have full access to world ___________________ markets
  - SOE and Perfect Capital Mobility mean that the country's real _____________ rate (r) is equal to the _____________ interest rate (_____________ set):
- We are in the short-run.
  - Both domestic prices (______) and world prices (______) are _____________.

1.2 The Goods Market Equilibrium and the IS* Curve

- In equilibrium, we require that the supply of output (_____________) be equal to demand for output (_____________).
  - This condition (___________________) should be recognizable as the equation for _____________.
- Demand for Output:
  - Consumption: _______________________________________
    - We assume that consumption is _____________ related to disposable income (_____________).
  - Investment: __________________________
    - Notice that since the country's interest rate is _____________ to the world interest rate, the level of investment in this country is fixed at _____________.
    - We assume that investment is _____________ related to the real interest rate (r).
  - Government Purchases: _____________
    - Government purchases (_____________) and taxes (_____________) are _____________ set.
  - Net Exports: __________________________
    - Note that net exports depends on the _____________ (e) not _____________ exchange rate (ϵ). Why?

- Because prices are ____________ (short-run) the nominal exchange rate is ____________ to the real exchange rate:

- We will use the nominal exchange rate because ____________ exchange rates are quoted in nominal terms.

- We assume that net exports is ____________ related to the exchange rate.

- Now we can put the pieces together and write down the ____________ in the goods market:

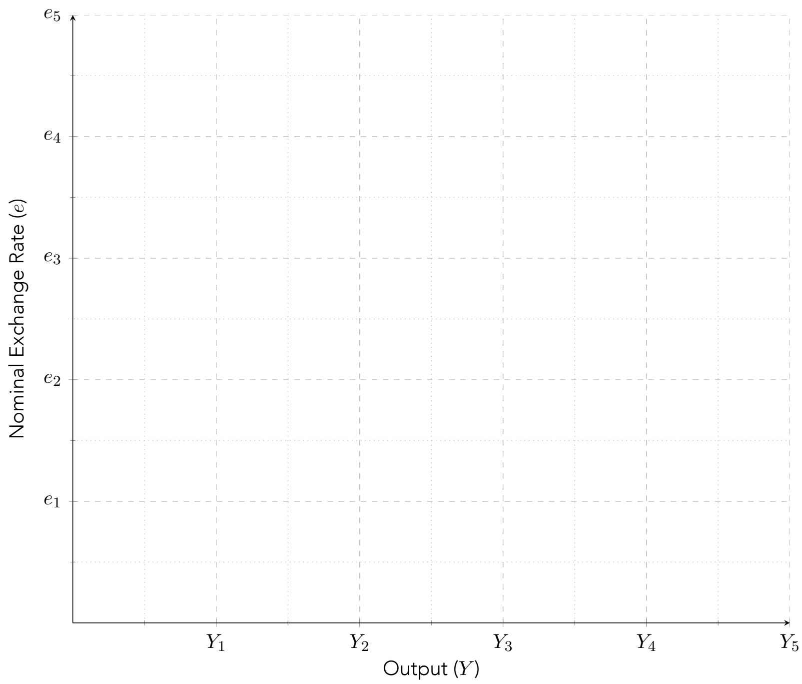
  - Three exogenous variables: ____________
  - Two endogenous variables: ____________
    - We need to determine the ____________ between these two variables.

- The relationship between e and Y in the goods market.
  - First note that if we substitute our functional form in for $\hat{C}$ we can write the equilibrium condition as:

  - Important take-aways:
    - Output (Y) and the nominal exchange rate (e) are ____________ correlated.
      - ____________________________________
    - The the absolute value of the change in output (ΔY) is ____________ than the absolute value of the change in net exports (ΔNX).
      - ____________________________________
      - ____________________________________
      - ____________________________________

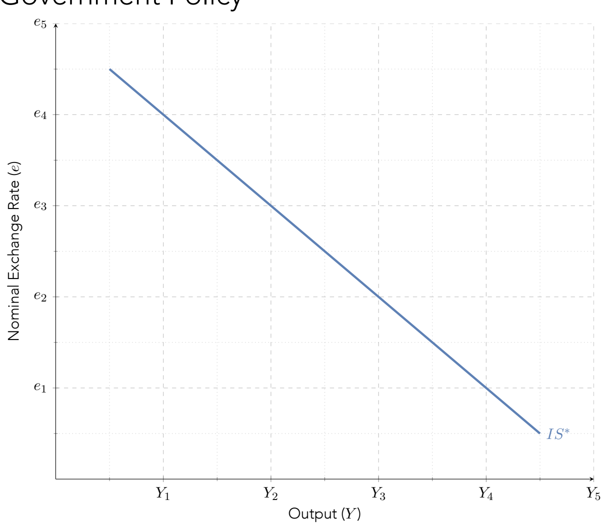
- For a given nominal exchange rate (e):
  - ______________________________
  - ______________________________
  - ______________________________
  - ______________________________

- Now we can graph the IS^* curve:

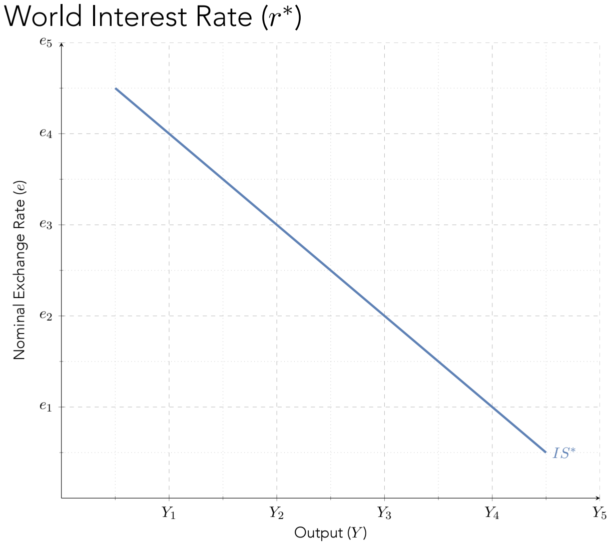


- We can consider the following shifts of the IS^* curve:

Government Policy



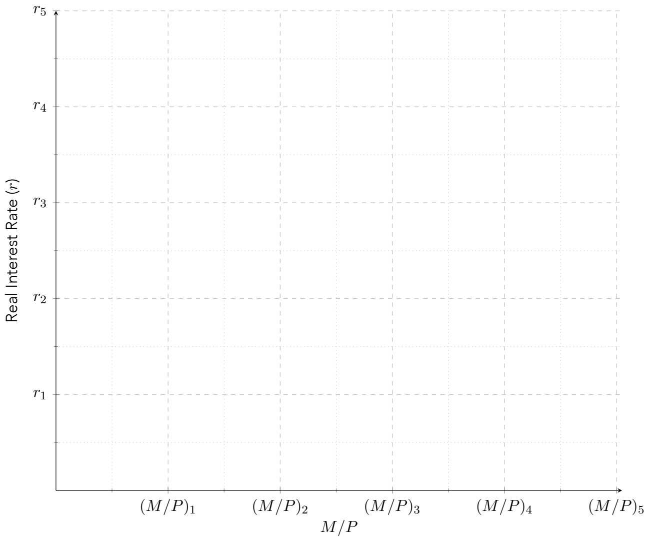
World Interest Rate (r^*)



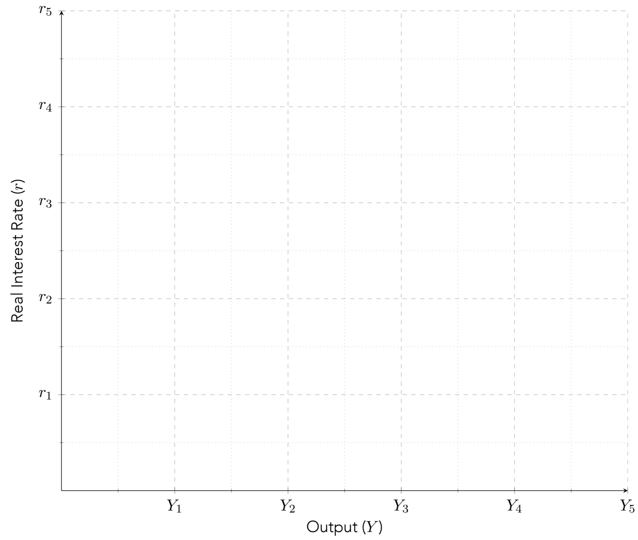
1.3 The Money Market Equilibrium and the LM^* Curve

- In equilibrium, we require the ____________ of real money balances (____________) to be equal to the ____________ for real money balances (____________).
  - Supply of real money balances.
    - M: Money ____________ (exogenously set)
    - P: ____________ level (constant in the short-run)
  - Demand for real money balances:
    - r: ____________ interest rate.
      - Normally the demand for real money balances depends on the ____________ interest rate (i) to capture the cost of ____________ investing (r) and the loss of value due to ____________ (π).
      - Since we are in the short-run and prices are fixed, ____________, so we can use the real interest rate in this case.
      - Real money demand depends ____________ on the real interest rate.
    - Y: ____________
      - Real money demand depends ____________ on income.
- Just like with the IS^* curve and the goods market, the LM^* curve represents the equilibrium in the money market.
  - We can derive the LM^* curve graphically using the money market.

Money Market

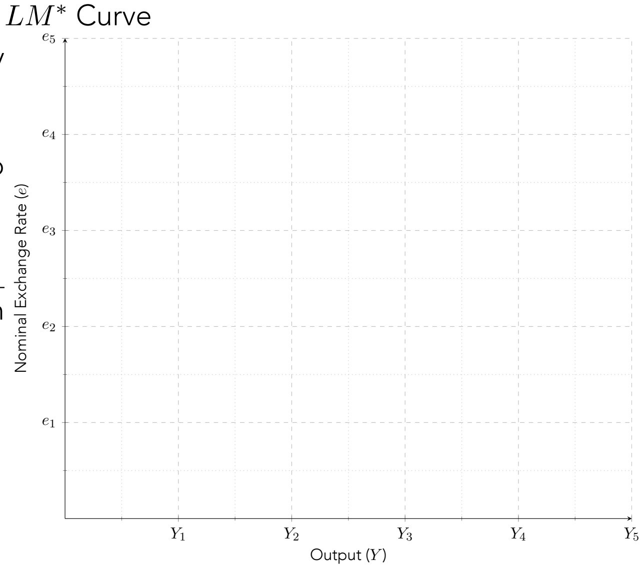


LM Curve



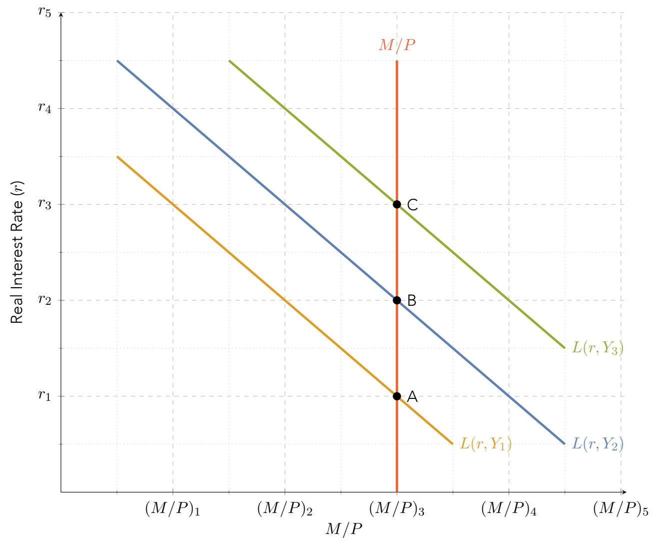
- The LM curve represents equilibrium in the money market:
  - LM: ______________
- In the Mundell-Fleming model, ______________, so equilibrium in the money market is:
  - ______________
  - This means that there is only ______________ income level (______________) that will result in equilibrium in the money market.

LM^* Curve

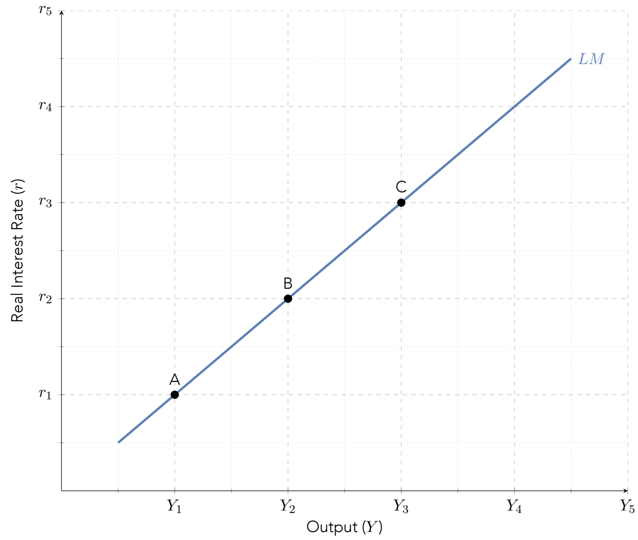


- What happens when the money supply increases ($M \uparrow$)?

Money Market

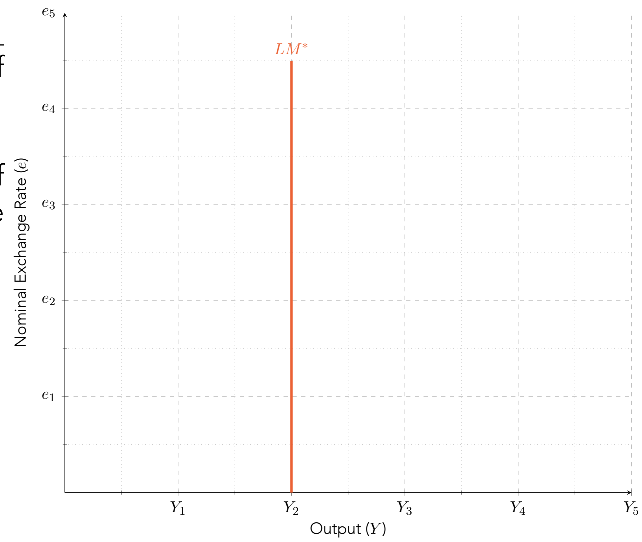


LM Curve

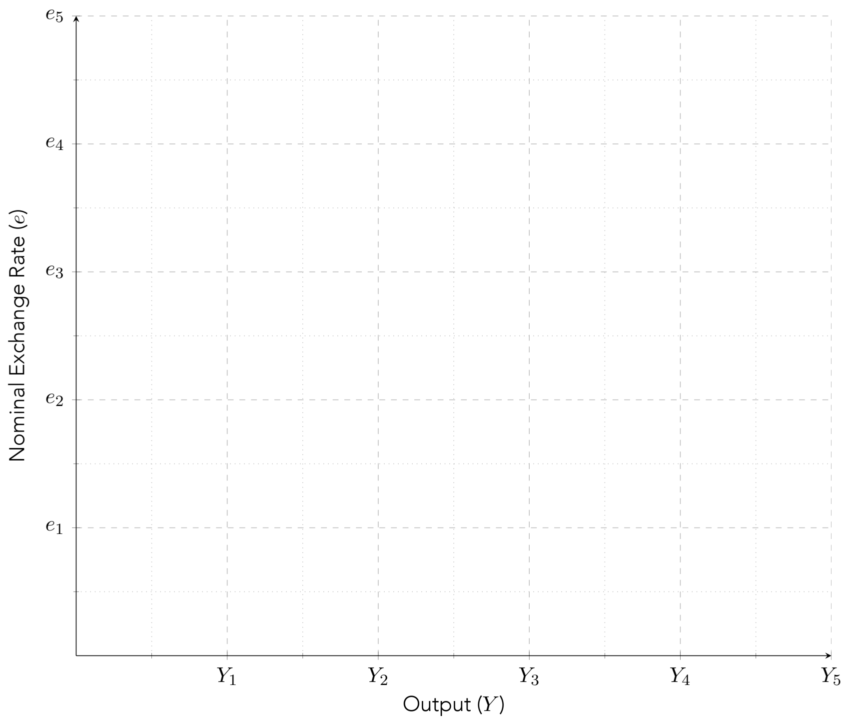


- The money supply increases which ____________ the equilibrium interest rate for every level of ____________.
- This causes the LM curve to shift ____________.
- At the world interest rate, the level of ____________ the creates equilibrium in the money market is now ____________.

LM^* Curve



1.4 Putting the Pieces Together



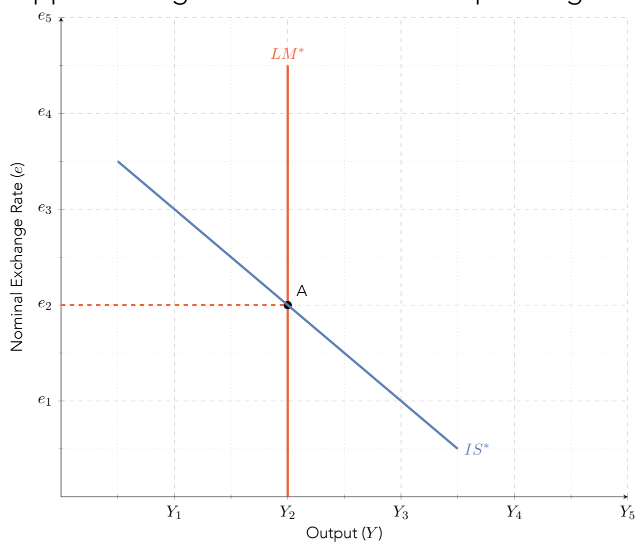
2 The SOE under Floating Exchange Rates

__________ **Exchange Rate**: Under a system of floating exchange rates, the exchange rate is set by market forces and is allowed to fluctuate in response to changing economic conditions.

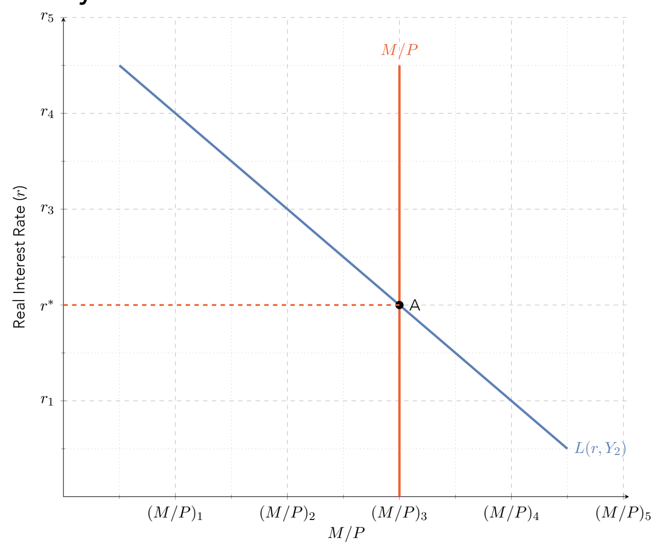
- In this case, the exchange rate (e) __________ to achieve __________ equilibrium in the goods market and the money market.

2.1 Fiscal Policy

Suppose the government increases spending.



Money Market



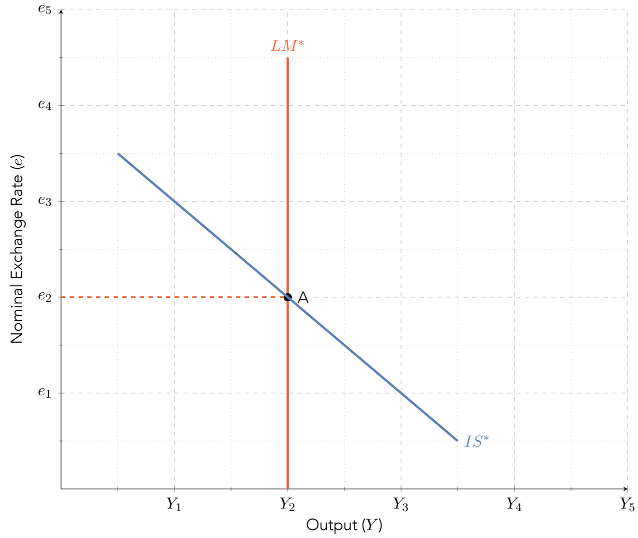
Notice that the equilibrium level of output does not change. Why?

1. From the equation for the IS^* curve, we know that the increase in government spending will result in an initial increase in __________ at a given __________ exchange rate (e).
2. This increase in income (from Y_2 to Y_3), will cause money demand to __________ (shift __________).
3. The increase in money demand $(M/P)^d$ will cause the interest rate to __________ above the world interest rate (__________).
4. This will __________ investors because this country is paying a __________ rate of return that other SOE's (__________).
   (a) This __________ investment will result in a __________ of the net capital outflow.
   (b) Foreign investors will demand __________ amounts of this country's currency.
5. Increased demand for the currency will cause the nominal exchange rate to __________ (__________).
6. An __________ nominal exchange rate will cause net exports to __________ which will cause output (Y) to __________.
   (a) The falling output will cause a __________ in money demand $(M/P)^d$ which will __________ the interest rate.
7. Output will continue to fall until it is back to its __________ level (__________). Why?
   (a) In order for the economy to be in equilibrium, the money __________ must be in equilibrium.
   (b) This requires __________ and we have seen that the only output level that makes this true is __________.

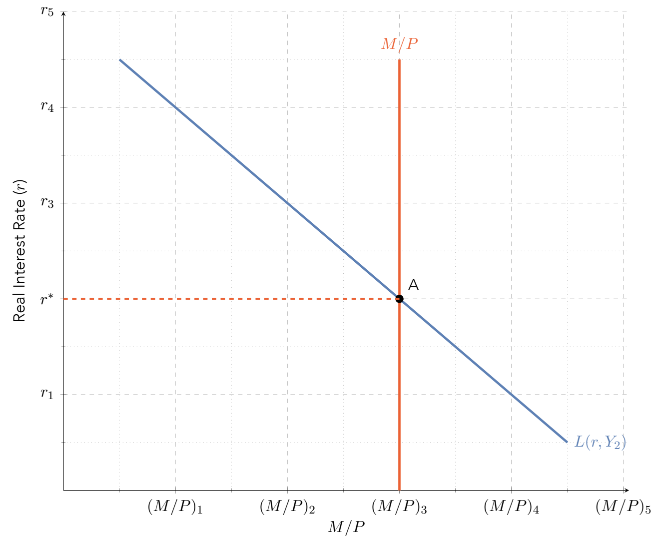
Equilibrium Outcomes:

2.2 Monetary Policy

Suppose the central bank increases the money supply.



Money Market

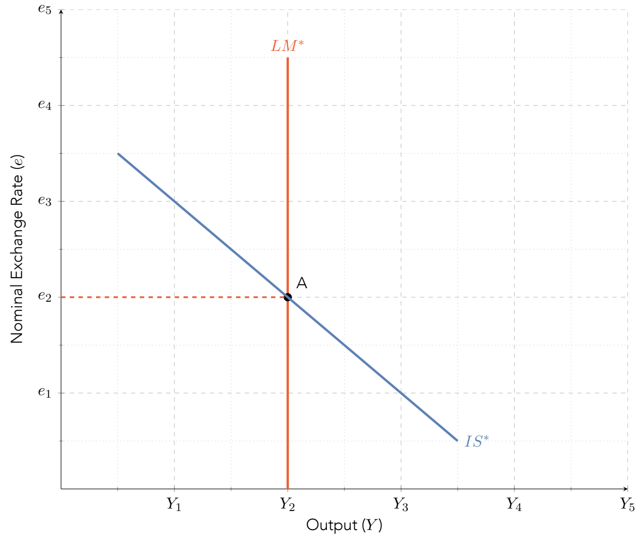


1. The increase in the money supply will cause the supply of real money balances to shift to the ____________.
2. The increase in the supply of real money balances will cause the interest rate to ____________ below the world interest rate (____________).
3. This will result in a ____________ of investors because this country is paying a ____________ rate of return that other SOE's (____________).
   (a) This ____________ investment will result in an ____________ in the net capital outflow.
   (b) Foreign investors will demand ____________ amounts of this country's currency.
4. ____________ demand for the currency will cause the nominal exchange rate to ____________ (____________).
5. An decreased nominal exchange rate will cause net exports to ____________ which will cause output (Y) to ____________.
   (a) The rising output will cause an ____________ in money demand $(M/P)^d$ which will ____________ the interest rate.
6. The exchange rate will ____________ and output and money demand will continue to ____________ until the interest rate is back to its ____________ level.

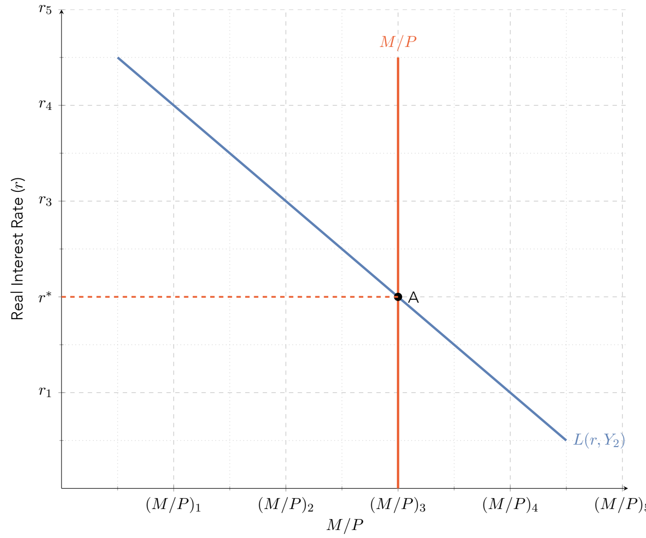
Equilibrium Outcomes:

2.3 Trade Policy

Suppose a protectionist trade policy



Money Market



Notice that the equilibrium level of output does not change. Why?

1. A protectionist below ____________ imports which will result in ____________ net exports at every nominal exchange rate.
2. From the equation for the IS^* curve, we know that the ____________ in net exports will result in an initial ____________ in output (Y).
3. This ____________ in income (from Y_2 to Y_3), will cause money ____________ to increase (shift ____________).
4. The increase in money demand $(M/P)^d$ will cause the interest rate to ____________ above the world interest rate (____________).
5. This will ____________ investors because this country is paying a ____________ rate of return that other SOE's (____________).
   (a) This increase investment will result in a ____________ of the net capital outflow.
   (b) Foreign investors will demand ____________ amounts of this country's currency.
6. ____________ demand for the currency will cause the nominal exchange rate to ____________ (____________).
7. An ____________ nominal exchange rate will cause net exports to ____________ which will cause output (Y) to ____________.
   (a) The falling output will cause a ____________ in money demand $(M/P)^d$ which will ____________ the interest rate.
8. Output will continue to ____________ until it is back to its original level (____________). Why?
   (a) In order for the economy to be in equilibrium, the ____________ market must be in equilibrium.
   (b) This requires ____________ and we have seen that the only output level that makes this true is ____________.

Equilibrium Outcomes:

3 The SOE under Fixed Exchange Rates

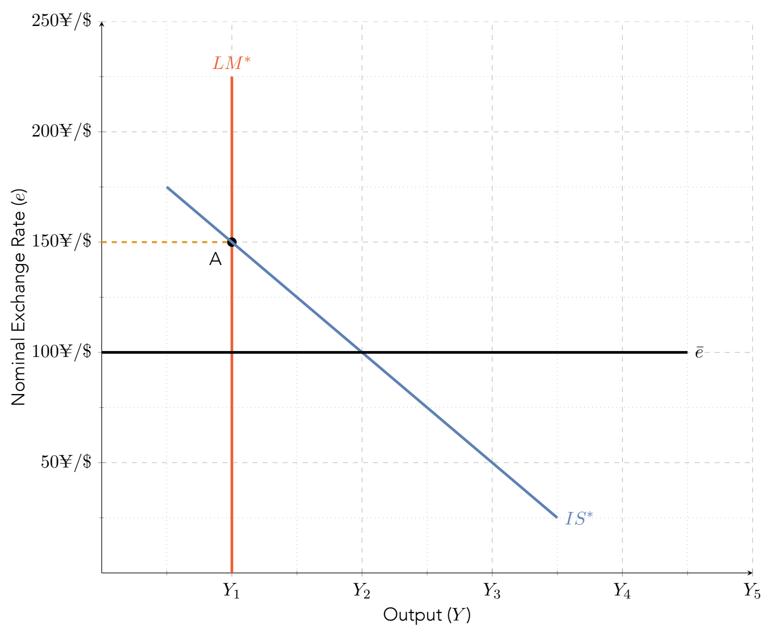
____________ **Exchange Rates**: Under a fixed exchange rate, the central bank announces the value for the exchange rate and stands ready to buy and sell the domestic currency to keep the exchange rate at its announced level.

3.1 How a Fixed-Exchange-Rate System Works

- Under a system of fixed exchange rates, a central bank stands ready to ____________ or ____________ the domestic currency for foreign currencies at a ____________ price.
- To carry out this policy, the central bank must have a stock of ____________ currency (which it can print) and ____________ currency (which it has to buy).
  - This policy means that the central bank has yielded control of its ____________ policy to the market in an attempt to keep the exchange rate ____________.

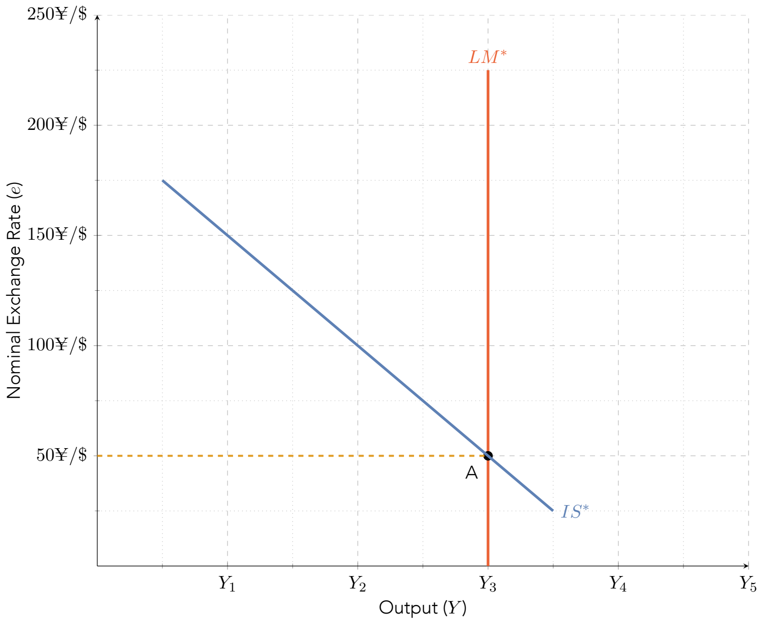
Example:

- The Fed fixes the exchange rate at ____________ per dollar.
  - Now suppose the market exchange rate is ____________ per dollar.
    - An arbitrageur could ____________ for ____________ in the market and sell those ____________ to the Fed for ____________.
    - Then they could go back to the market and buy ____________ for ____________ and sell those yen to the Fed for ____________.
    - As this occurs the money supply ____________, shifting the LM^* curve to the ____________ until the fixed exchange rate is the ____________ exchange rate.



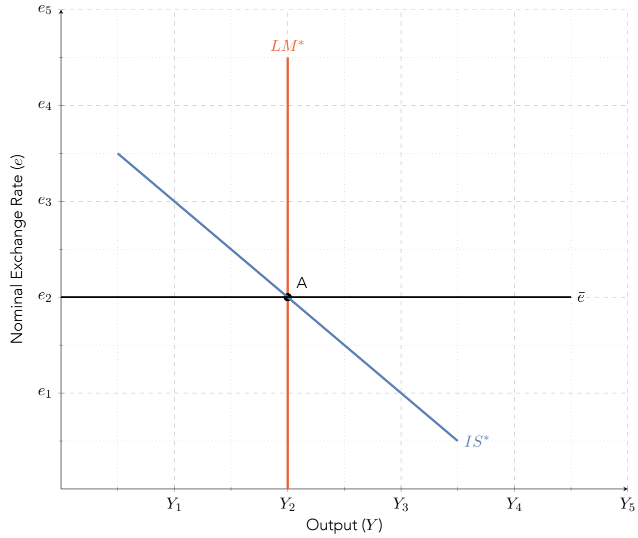
– Now suppose the market exchange rate is ____________ per dollar.

- In this case, the arbitrageur could make a profit by buying ____________ for a ____________ at the Fed and selling them in the market for ____________.
- Then they could buy ____________ for ____________ and sell them on the market for ____________.
- This ____________ the money supply, shifting the LM^* to the ____________ until the fixed exchange rate is the ____________ exchange rate.

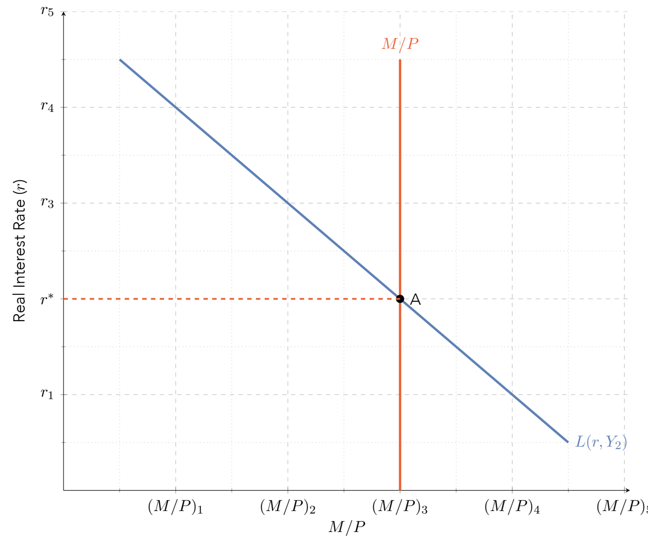


3.2 Fiscal Policy

Suppose the government increases spending.



Money Market

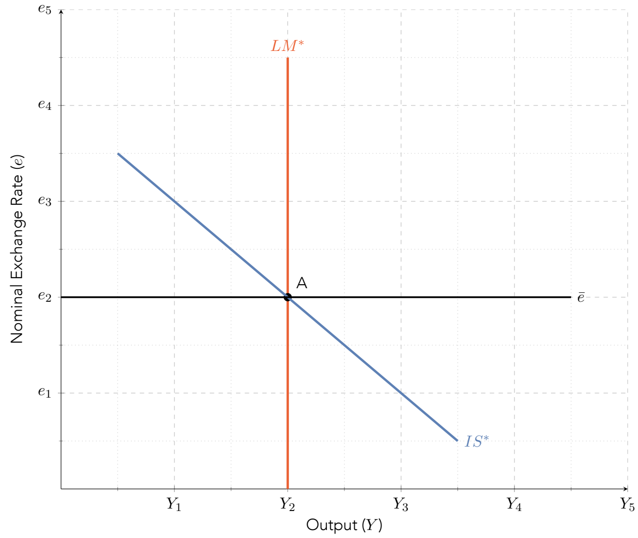


1. From the equation for the IS^* curve, we know that the ____________ in government spending will result in an initial ____________ in output (Y).
2. This increase in income (from Y_2 to Y_3), will cause money demand to ____________ (shift ____________).
3. The increase in money demand $(M/P)^d$ will cause the interest rate to ____________ above the world interest rate (____________).
4. This will ____________ investors because this country is paying a higher rate of return that other SOE's (____________).
   (a) This ____________ investment will result in a ____________ of the net capital outflow.
   (b) Foreign investors will demand ____________ amounts of this country's currency.
5. ____________ demand for the currency will cause the market nominal exchange rate to ____________ (____________).
6. Arbitragers will respond to the appreciation in the market nominal exchange rate by taking ____________ currency to the central bank and exchanging it for ____________ currency.
   (a) This will result in an ____________ in the money supply (____________ currency).
7. This increase in the money supply will cause the supply of real money balances to shift to the ____________, which causes the market interest rate to ____________ back to the world interest rate (____________).
   (a) The falling interest rate will reduce the ____________ for investment and thus reduce the demand for the ____________ currency.
8. The ____________ supply of the domestic currency (step 6) and ____________ demand for the domestic currency (step 8) will cause the ____________ of this currency (____________ exchange rate) to ____________.
   (a) The nominal exchange rate falls back to its ____________ value.
   (b) ____________ change in net exports (____________)

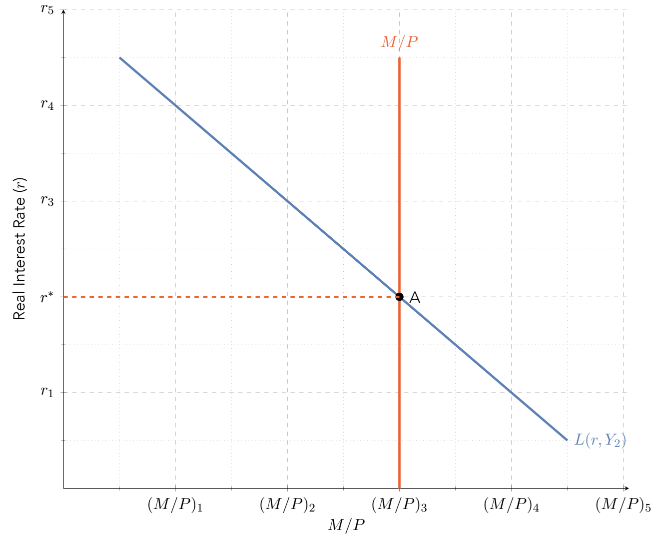
Equilibrium Outcomes:

3.3 Monetary Policy

Suppose the central bank increases the money supply.



Money Market



1. The increase in the money supply will cause the supply of real money balances to shift to the ____________.
2. The ____________ in the supply of real money balances will cause the interest rate to ____________ below the world interest rate (____________).
3. This will result in a ____________ of investors because this country is paying a ____________ rate of return that other SOE's (____________).
   (a) This ____________ investment will result in an ____________ in the net capital outflow.
   (b) Foreign investors will demand ____________ amounts of this country's currency.
4. ____________ supply of the currency and ____________ demand for the currency will cause the nominal exchange rate to ____________ (____________).
5. Arbitragers will respond to the ____________ in the market nominal exchange rate by taking ____________ currency to the central bank and exchanging it for ____________ currency.
   (a) This will result in a ____________ in the money supply (domestic currency).
6. This ____________ in the money supply will cause real money balances to ____________, which will result in an increase in the real interest rate ____________ back to the world interest rate (____________).
   (a) Capital will flow back ____________ the country, resulting in an increased ____________ for the currency
7. ____________ supply of the currency and ____________ demand for the currency will cause the nominal exchange rate to ____________ (____________).

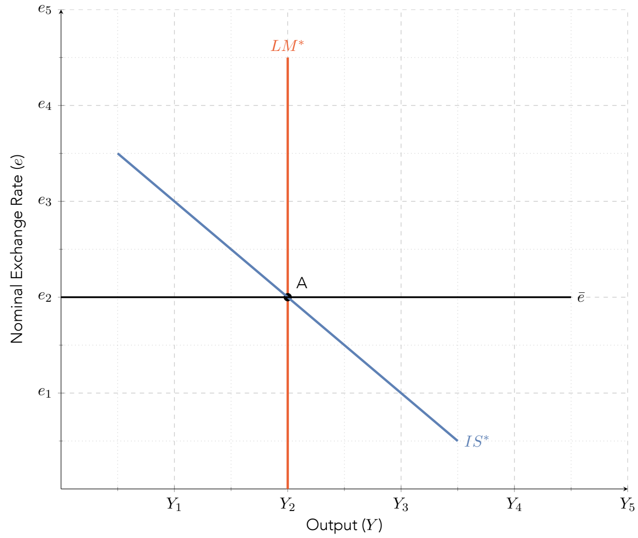
Equilibrium Outcomes:

Implication:

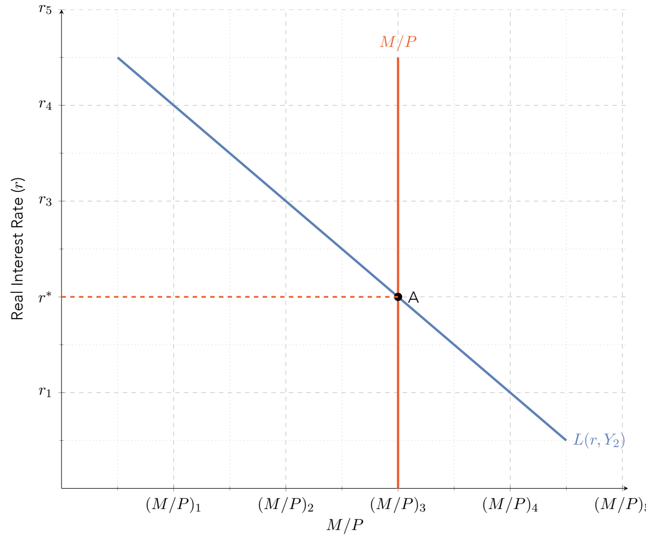
- If the central bank wished to manipulate output it could undertake a ____________, which acts as a change in the money supply.
  - In the situation above, if the central bank had lowered the fixed exchange rate to ____________, it would result in an ____________ in the money supply and increase output to ____________.

3.4 Trade Policy

Suppose a protectionist trade policy.



Money Market



1. A protectionist below ____________ imports which will result in ____________ net exports at every nominal exchange rate.
2. From the equation for the IS^* curve, we know that the ____________ in net exports will result in an initial ____________ in output (Y).
3. This increase in income (from Y_2 to Y_3), will cause money demand to ____________ (shift ____________).
4. The ____________ in money demand $(M/P)^d$ will cause the interest rate to ____________ above the world interest rate (____________).
5. This will ____________ investors because this country is paying a ____________ rate of return that other SOE's (____________).
   (a) This ____________ investment will result in a ____________ of the net capital outflow.
   (b) Foreign investors will demand ____________ amounts of this country's currency.
6. ____________ demand for the currency will cause the market nominal exchange rate to ____________ (____________).
7. Arbitragers will respond to the ____________ in the market nominal exchange rate by taking ____________ currency to the central bank and exchanging it for ____________ currency.
   (a) This will result in an ____________ in the money supply (domestic currency).
8. This ____________ in the money supply will cause the supply of real money balances to shift to the ____________, which causes the market interest rate to ____________ back to the world interest rate (____________).
   (a) The ____________ interest rate will ____________ the demand for investment and thus ____________ the demand for the domestic currency.
9. The ____________ supply of the domestic currency (step 6) and falling ____________ for the domestic currency (step 8) will cause the price of this currency (nominal exchange rate) to ____________.
   (a) The nominal exchange rate falls ____________ to its fixed value.

Equilibrium Outcomes:

3.5 Policy in the Mundell-Fleming Model: A Summary

	Exchange Rate Regime					
	Floating			Fixed		
Policy	Y	e	NX	Y	e	NX
Fiscal Expansion						
Monetary Expansion						
Protectionism						

4 Interest Rate Differentials

4.1 Country Risk and Exchange-Rate Expectations

There could be reasons why a country's interest rate is different from the World Interest Rate.

- Country ______________
- ______________ Changes in the Exchange Rate.
  - Suppose that people thought the Mexican peso would ______________ in value in relation to the US dollar.
  - Lenders would get paid back in currency that is worth ______________, so they charge a ______________ interest rate.

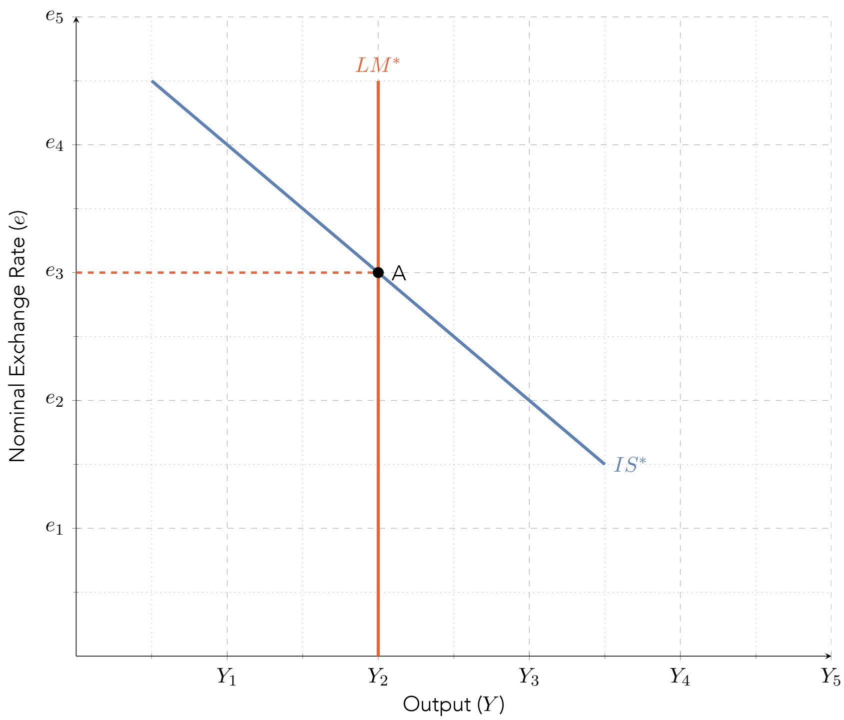
4.2 Differentials in the Mundell-Fleming Model

- Suppose we include the interest rate differential as:

  - Assume θ is ______________.
- This would imply that the $IS^* - LM^*$ model can be expressed as:

- If θ is ______________, monetary and fiscal policy work as they did in the ______________ section.
- Now suppose political turmoil causes the country's risk premium to ______________.
  - ____________________________
  - Investment ______________ because the country's interest rate ($r^* + \theta$) is now ______________, causing the IS^* curve to shift to the ______________.
  - What happens to the LM^* curve?
    - Before the increase in risk ($\theta_1 < \theta_2$), ____________________________
    - After the increase in risk, the interest rate ($r = r^* + \theta$) ______________ causing money demand to ______________, meaning that ____________________________

- In order for the money market to be back in equilibrium, money demand must ______________, which would occur when either:
  - The interest rate $(r^* + \theta)$ ______________. But it is ______________ so it won't ______________.
  - Therefore ______________ must ______________ in order to put the market back into equilibrium: ______________________________.
- This means the LM^* shifts to the ______________.



- Somewhat ______________. Expect a ______________ of currency, assign a ______________ risk premium, the currency ______________.
- Interestingly output ______________ when risk goes up. This probably ______________ the case, but the mechanism operates through the exchange rate and net exports.
- Three reasons why risk premium most likely will not result in higher incomes.
  - In an effort to avoid a massive ______________, the central bank ______________ the money supply.
  - The depreciation may result in higher ______________.
  - Citizens respond to the increase in risk by increasing their ______________ for money.

5 Should Exchange Rates be Floating or Fixed?

5.1 Pros and Cons of Different Exchange-Rate Systems

- The primary argument for a floating exchange rate is that it allows a nation to use its ______________ policy for other purposes.
  - Under floating exchange rates, monetary policy can be used to ______________ the economy.
- Proponents of the fixed exchange rates argue that exchange-rate ______________ makes international trade more ______________.
- The division between the two is not clear.
  - Most countries use a ______________ of both.

5.2 Speculative Attacks, Currency Boards, and Dollarization

Suppose you are a central banker of a SOE and you peg your currency to the US dollar. Now one, lets say, peso trades for one dollar. You have opened yourself up to some issues.

- _____________ Attack: a rumor starts that you are going to abandon your peg and everyone rushes to the central bank to exchange pesos for dollars before they lose their value. You run out of pesos, so you have to drop your peg.
- _____________ Board: an arrangement by which the central bank holds enough foreign currency to bank each unit of the domestic currency. So in our example, they would hold one dollar for every peso.
- _____________: abandon its own currency and use the dollar instead.

5.3 The Impossible Trinity