

# IS-LM Model

## Part 3

# Quick Summary

## IS Curve

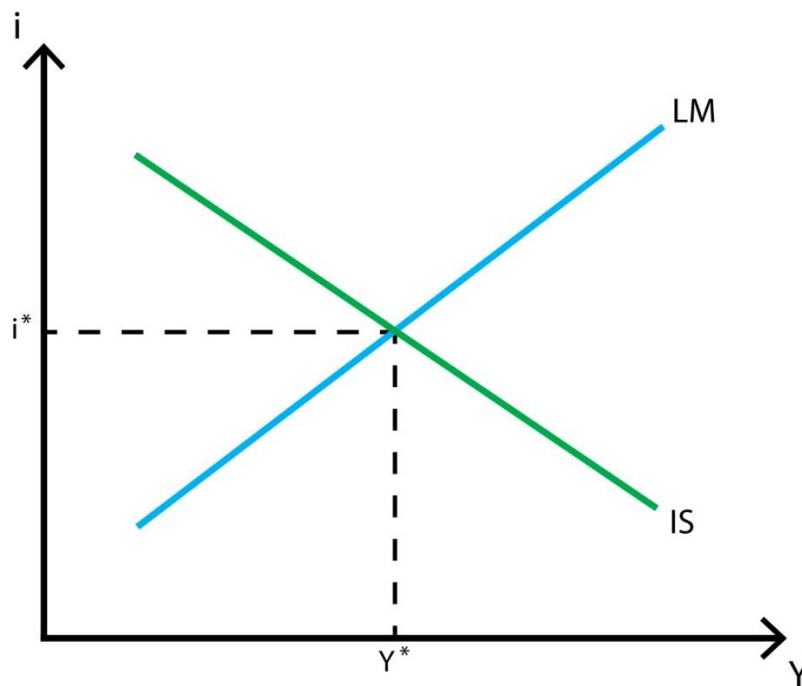
- Each point is an equilibrium in the goods market.
- **It shows all combinations of  $i$  and  $Y$  such that  $Y = AE$ .**
- The curve shows negative relationship between  $i$  and  $Y$ .
- Higher  $i$  reduces  $Y$  (because it discourages investment).

## LM Curve

- Each point is an equilibrium in the money market.
- **It shows all combinations of  $i$  and  $Y$  such that  $M_d = M_s$ .**
- The curve shows positive relationship between  $i$  and  $Y$ .
- Higher  $i$  raises  $Y$  (so that  $M_d = M_s$ ).

# Equilibrium – IS-LM Model

- The equilibrium is at the intersection between IS and LM.
- Any point that is not on the IS or LM or both curves will adjust until it is on both curves.
- Adjustment will take place in one or both markets.



# Equilibrium – IS Curve

- **At points to the right** of the IS curve, there is **excess supply for goods** ( $Y > AE$ ). When  $Y > AE$ , inventories accumulate. Producers will produce less, and hence  $Y$  falls back to the equilibrium.
- **At points to the left** of the IS curve, there is **excess demand for goods** ( $Y < AE$ ). When  $Y < AE$ , inventories dissipate. Producers will produce more, and hence  $Y$  rises back to the equilibrium.

# Equilibrium – LM Curve

- At **points to the right** of the LM curve, the **interest rate is below the equilibrium rate** ( $i < i^*$ ). There will be excess money demand. People will sell bond. The demand for bond will be low. Bond issuers will respond by raising the interest rate. The market returns to equilibrium.
- At **points to the left** of the LM curve, the **interest rate is above the equilibrium rate** ( $i > i^*$ ). There will be excess money supply. People will buy bond. The demand for bond will be high. Bond issuers will respond by reducing the interest rate. The market returns to equilibrium.

# Fiscal & Monetary Policies

## Fiscal Policy

- Expansionary
  - $G \uparrow$
  - $T \downarrow$
  - $G \uparrow$  and  $T \uparrow$  equally
- Contractionary
  - $G \downarrow$
  - $T \uparrow$
  - $G \downarrow$  and  $T \downarrow$  equally

## Monetary Policy

- Expansionary
  - $M \uparrow$
- Contractionary
  - $M \downarrow$

# Policies in the IS-LM Model

- IS Equation:  $Y = C(Y-T) + I(i) + G$
- IS Curve shifts when  $G$  or  $T$  changes.
- Thus, Fiscal Policy shifts the IS curve ONLY.
  
- LM Equation:  $M/P = L(i, Y)$
- LM Curve shifts when  $M$  or  $P$  changes.
- Thus, Monetary Policy shifts the LM curve ONLY.

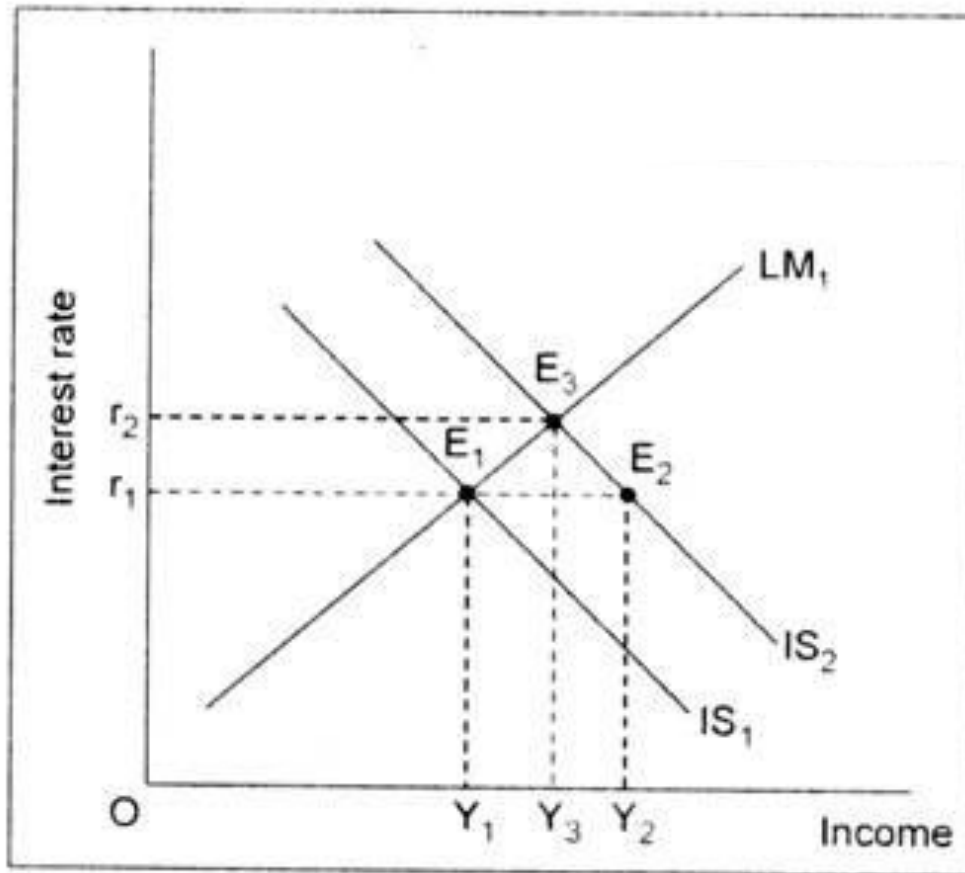
# Fiscal Policy and IS Curve

Let GM denotes goods market and MM denotes money market.

Expansionary Fiscal Policy: when  $G \uparrow$ , or  $T \downarrow$ , or both  $G \& T \uparrow$

- Consider the case when  $G \uparrow$
- First: in GM,  $G \uparrow \gg AE \uparrow \gg Y \uparrow$
- Now, GM is at E2, but MM is still at E1.
- Second: in MM,  $Y \uparrow \gg M_d \uparrow \gg i \uparrow$
- Now, MM is at E3, but GM is still at E2.
- Third: in GM,  $i \uparrow \gg I \downarrow \gg Y \downarrow$
- Now, GM and MM are in equilibrium at E3.
- New Equilibrium from  $G \uparrow$ : **Higher Y and Higher i**

# Expansionary Fiscal Policy



# Full Explanation

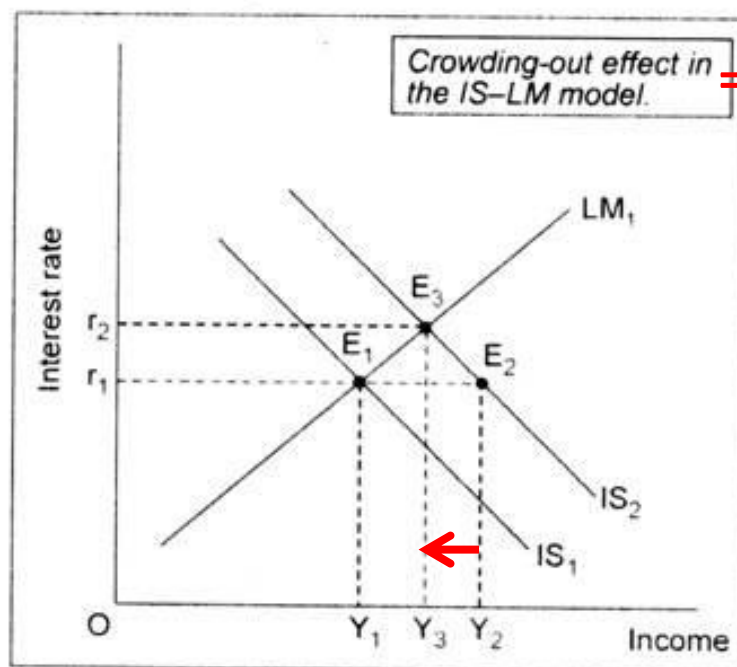
- When the government increases its spending ( $G$ ), this raises demand in the economy ( $AE$ ). Firms produce more to supply at the higher demand (so that  $Y = AE$ ). This **raises output and hence income ( $Y$ )** in the economy.
- When people have more income ( $Y$ ), they want to buy more goods. This raises the money demand ( $Md$ ). The rise in money demand ( $Md$ ) **raises the interest rate ( $i$ )**.
- However, higher interest rate ( $i$ ) discourages investment ( $I$ ). With lower investment, output falls ( $Y$ ).
- As a result, the new equilibrium has higher output and higher interest rate.

# Crowding-Out Effect

- Crowding-out Effect: public sector spending ( $G$ ) reduces or eliminates private sector spending ( $I$ ).
- The most common form of crowding-out effect is when a government increases its borrowing.
- The large borrowing (or large demand for money from the government) can lead to substantial rises in the interest rate, which discourages businesses from making investments.

# Crowding-Out Effect

- When  $G$  increases,  $Y_1$  increases to  $Y_2$  (at  $E_2$ ).
- However, **because of higher  $i$  (at  $E_3$ )**, investment falls.
- As a result,  $Y_2$  decreases to  $Y_3$ .



= RED ARROW

Crowding-out Effect

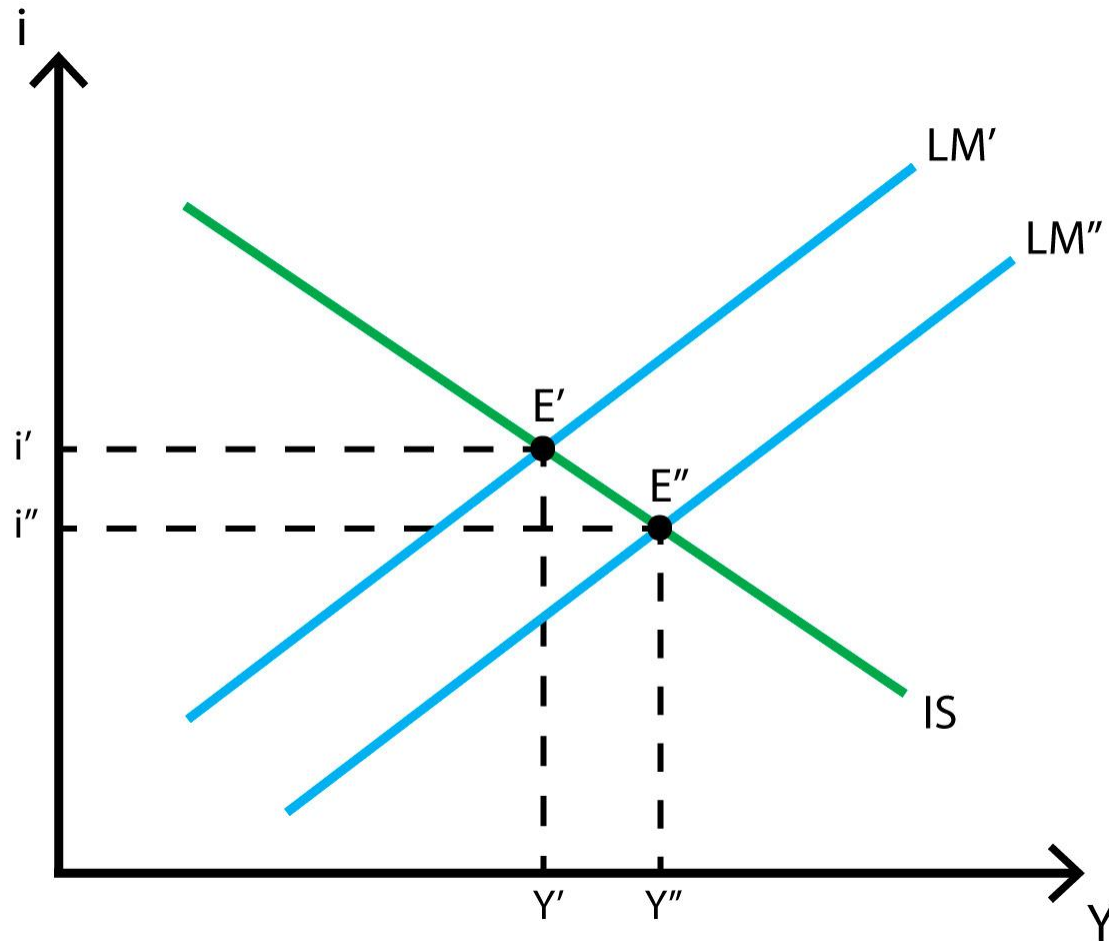
# Monetary Policy and LM Curve

Let GM denotes goods market and MM denotes money market.

Expansionary Monetary Policy: when  $M \uparrow$

- First: in MM,  $M \uparrow \gg i \downarrow$
- Second: in GM,  $i \downarrow \gg I \uparrow \gg AE \uparrow \gg Y \uparrow$
- New Equilibrium from  $M \uparrow$ : **Higher Y and Lower i**

# Expansionary Monetary Policy



# Full Explanation

- When the central bank increases money supply ( $M$ ), bond issuers lower the interest rate ( $i$ ).
- At the lower interest rate ( $i$ ), investment becomes attractive. Firms increase investment ( $I$ ). This raises demand in the economy ( $AE$ ). Firms produce more to supply at the higher demand (so that  $Y = AE$ ).
- As a result, the new equilibrium has higher output but lower interest rate.

# Policy Effectiveness

- Economic Policies are aimed to “change”  $Y$ .
- “Change” means that it can increase or decrease  $Y$ .
- A policy is “Effective” when it can greatly change  $Y$ .
- Policy effectiveness depends on **the Slopes** of the IS-LM.

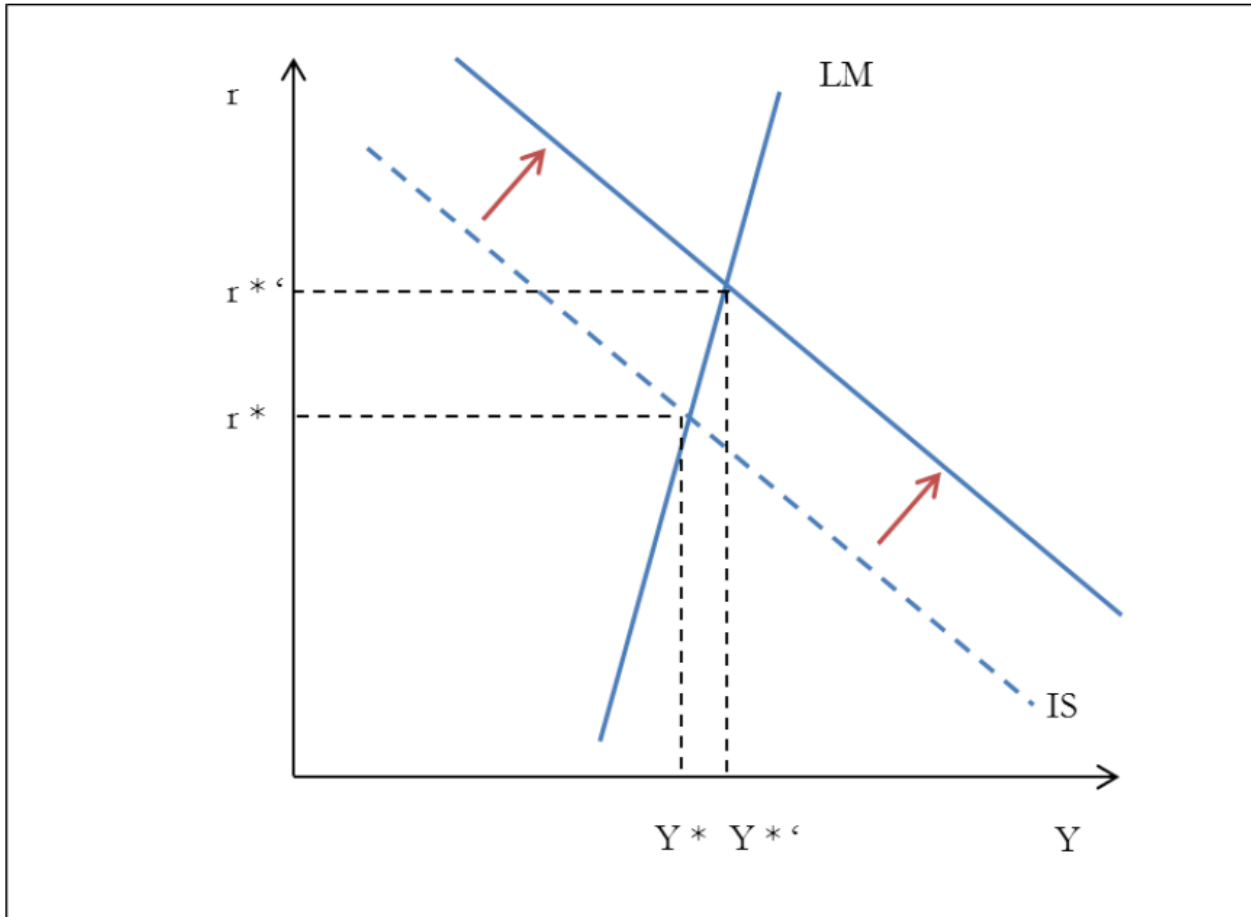
# Policy Effectiveness

- When the LM curve is steep, shifting the IS curve (by using fiscal policy) does not change the output much.
- Thus, in this case, monetary policy (shifting the LM curve) is more effective.
  
- When the IS curve is steep, shifting the LM curve (by using monetary policy) does not change the output much.
- Thus, in this case, fiscal policy (shifting the IS curve) is more effective.

LM Steep

→ Fiscal Policy NOT effective

→ Use Monetary Policy



## IS Steep

→ Monetary Policy NOT effective

→ Use Fiscal Policy

