Lecture 5

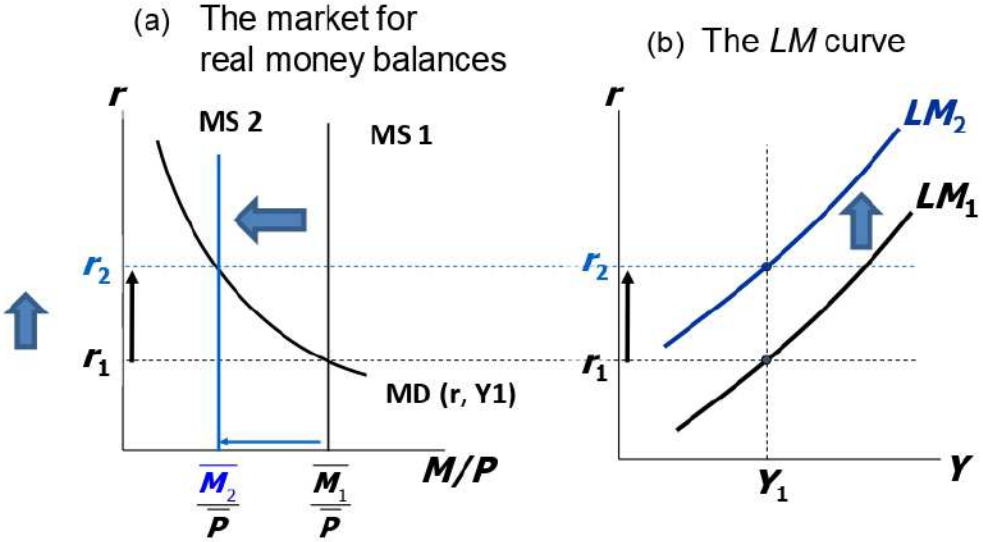
The IS LM Model

- ⇨ Shifts of the LM Curve
- ⇨ The IS LM Equilibrium graphically
- ⇨ The effect of fiscal & monetary policy on IS LM MODEL
- ⇨ The IS LM Equilibrium example

Shifts of the LM Curve

A decrease in money supply (contractionary monetary policy) leads the *LM* curve to shift upward.

When the central bank reduces M, the vertical distance of the shift tells us what happens to the equilibrium interest rate associated with a given value of income.



The effect of fiscal & monetary policy on IS LM MODEL

	Shift of *IS*	Shift of *LM*	Movement in Output	Movement in Interest Rate
Increase in taxes	left	none	down	down
Decrease in taxes	right	none	up	up
Increase in spending	right	none	up	up
Decrease in spending	left	none	down	down
Increase in money	none	down	up	down
Decrease in money	none	up	down	up

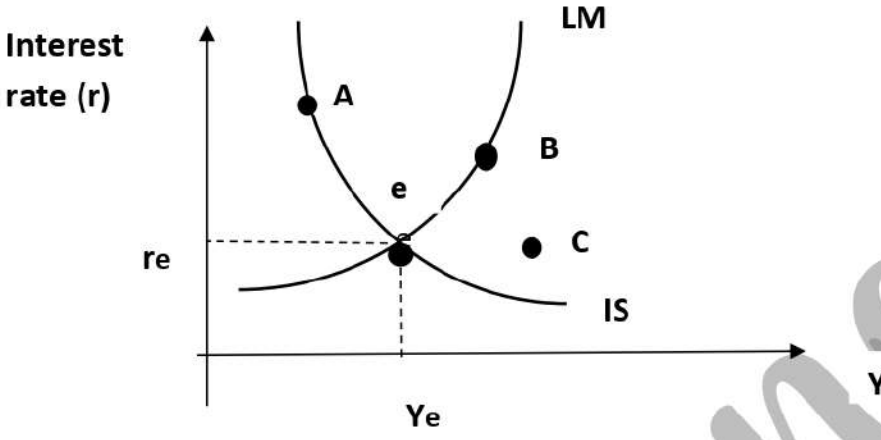
Example:

C = 100 + 0.8 Yd I = 50 - 25r G =T=50

Real Money Supply= (M/P) = MS = 200 MD = Y – 25 r

a- Calculate IS equation **b- Calculate LM equation** **c- Calculate the equilibrium level of output and interest**
d- Show graphically the effect of increasing real MS by 100
e- Show graphically the effect of increasing lumpsum tax by 100 (note: keep the MS at 200)

Notice the Points on the graph



Point (e) : shows equilibrium in both money market & goods market

Point (A) : shows equilibrium in goods market only

Point (B) : shows equilibrium in money market only

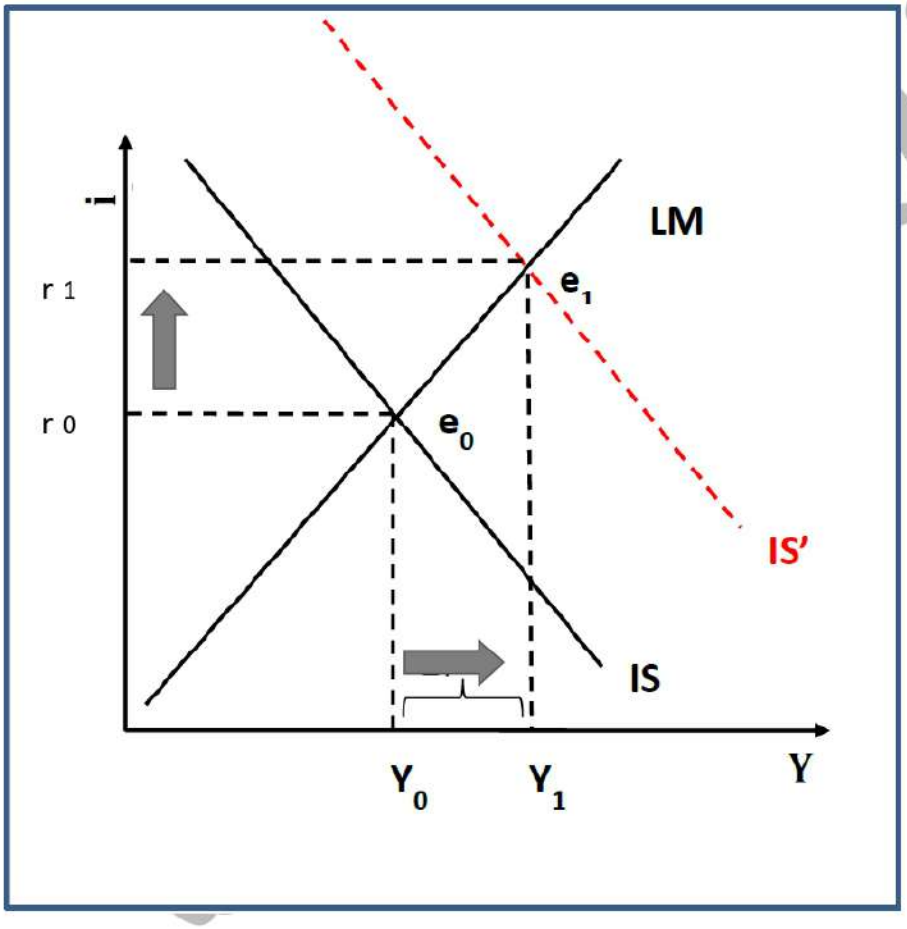
Point (C) : Not equilibrium either in money market or in goods market

The effect of fiscal & monetary policy on IS LM MODEL

1- The effect of Fiscal Policy

➔ Expansionary fiscal policy

An expansionary fiscal policy shifts the *IS* curve to the right and leads to an increase in the equilibrium level of output and the equilibrium interest rate.
Y↑ r ↑



Note:

Contractionary fiscal policy

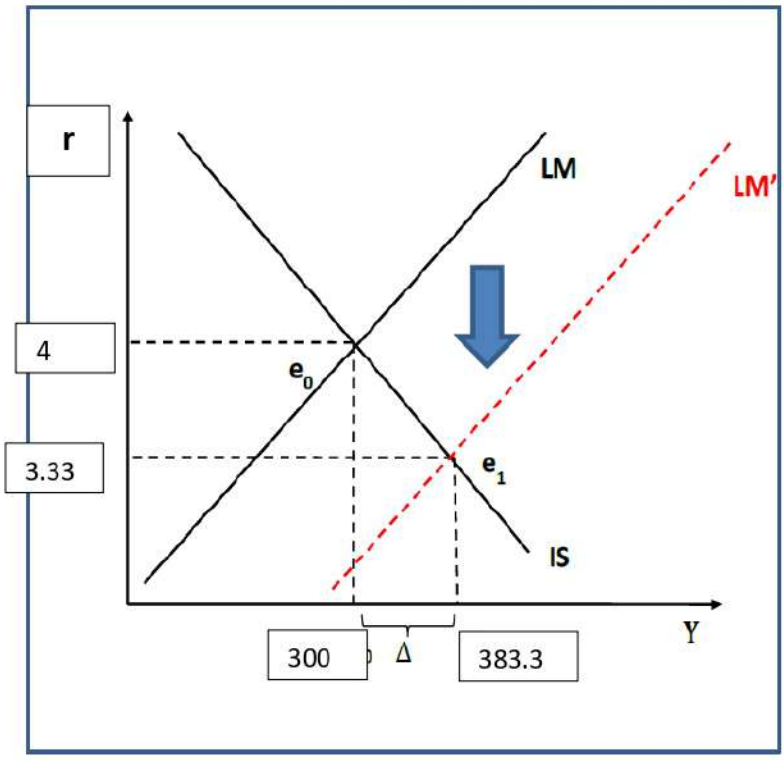
An increase in taxes shifts the *IS* curve to the left, and leads to a decrease in the equilibrium level of output and the equilibrium interest rate. **Y** ↓ **r** ↓

d- MD = MS

$$Y - 25r = 300$$

$$\boxed{Y = 300 + 25r} \rightarrow \text{New LM equation}$$

$$800 - 125r = 300 + 25r$$
$$500 = 150r$$
$$r = 3.333$$
$$Y = 383.3$$



Money supply increase

Expansionary monetary policy

LM shift down

Equilibrium interest decrease

Equilibrium output increase

e-

$$Y = C + I + G$$

$$Y = 100 + 0.8\,(Y-150) + 50 - 25r + 50$$
$$Y = 200 + 0.8\,Y - 120 - 25r$$
$$Y = 80 + 0.8\,Y - 25r$$
$$0.2\,Y = 80 - 25r$$

$$\boxed{Y = 400 - 125r} \rightarrow \text{new IS equation}$$

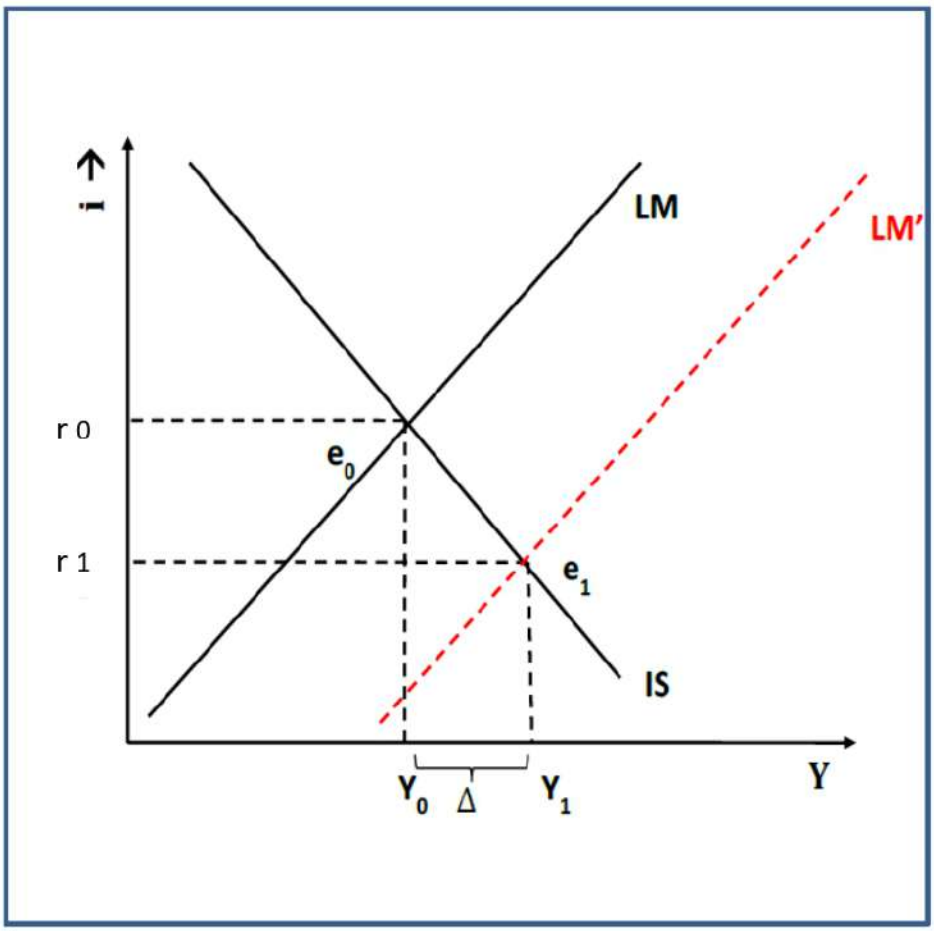
2- The effect of Monetary Policy

➔ Expansionary monetary Policy

An increase in the money supply is called **monetary expansion**.

Monetary policy does not affect the *IS* curve, only the *LM* curve. For example, an increase in the money supply shifts the *LM* curve down.

This leads to an increase in the equilibrium level of output and a decrease in the equilibrium interest rate. Y↑ r ↓



Note:

Contractionary monetary policy

A decrease in MS shifts the LM curve upward, and leads to a decrease in the equilibrium level of output and increase in the equilibrium interest rate. **Y** ↓ **r** ↑

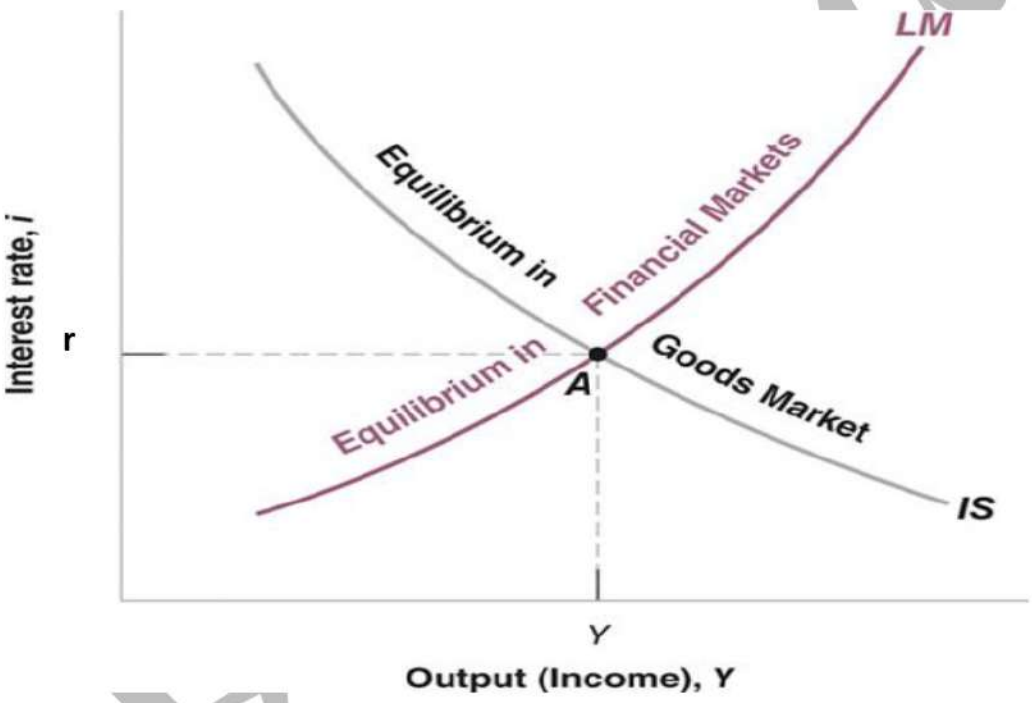
NOTE:

An increase in the money supply (expansionary monetary policy) causes the LM curve to shift down.

What happens if the nominal money supply increases?

- Real money supply increase (rightward shift in money supply curve)
- to maintain equilibrium: the interest rate must decrease
- downward shift of the LM curve.

The IS LM model



IS relation: Shows Equilibrium in goods market when Y = AE

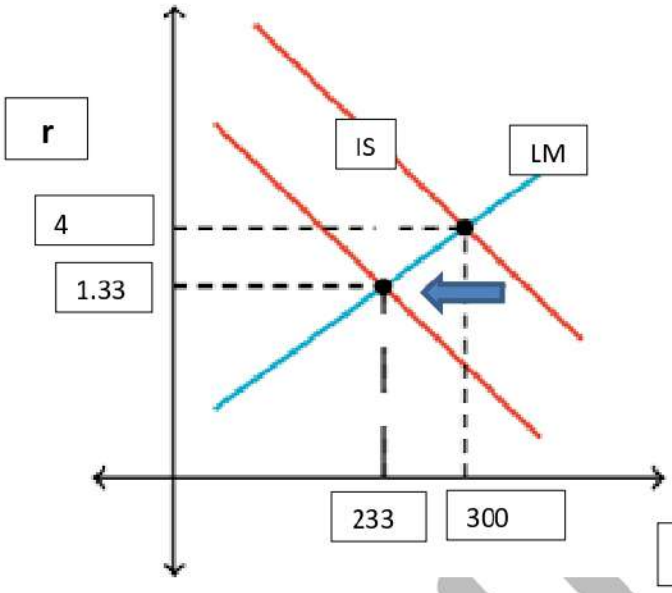
LM relation: Shows equilibrium in money market when the supply of money must be equal to the demand for money (MS = MD)

➔ **The intersection of the IS and LM curves shows the equilibrium point of interest rate (r) and output (Y or GDP) when the money market and the goods market are in equilibrium.**

400 – 125 r = 200 + 25 r

200 =150r r = 1.333

Y = 233.33



Lumpsum tax increase

Contractionary fiscal policy

IS shift leftward

Equilibrium interest decrease

Equilibrium output decrease

"Success is no accident. It is hard work, learning, studying, sacrifice, and most of all, love of what you are doing or learning to do.".

Best Wishes Dr. Hanan Abdelkhalik

Solution

a) Y = C + I + G

Y = 100 + 0.8 (Y-50) + 50 - 25r + 50
Y = 200 + 0.8 Y – 40 – 25r
Y = 160+ 0.8 Y – 25r
0.2 Y = 160 - 25 r **(divided by 0.2)**

Y = (160/0.2) – (25/0.2) r

Y = 800 – 125 r → **IS equation**

b) MD = MS

Y – 25 r = 200

Y = 200 + 25 r → **LM equation**

c) At equilibrium IS = LM

800 – 125 r = 200 + 25 r

800-200 = 25 r + 125 r

600 = 150 r **r = 600/150 = 4** **equilibrium interest =4%**

Substituting in IS or LM equation :

Y = 200 + 25 r = 200 + (25 * 4) = 300