

## Lecture 12

# Economic Fluctuations: the Goods and Money Markets

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## Economic Growth and Economic Fluctuations

### the Goods and Money Markets

- In Lecture 10, when we studied the money market in the **long run**, we saw that the demand for investment is a decreasing function of the real interest rate
- In Lecture 11, when we studied the goods market in the **short run**, we assumed that planned investment is fixed
- But it is **NOT** reasonable to assume that planned investment is fixed in the short run, so we'll relax that assumption in this lecture



- In Lecture 10, we saw that increases in output increase the demand for real money balances, which increases the nominal interest rate
- In Lecture 11, we saw that **expansionary fiscal policy** – increases in government spending and decreases in taxes – **increases aggregate output**
- But in Lecture 11, we did not mention how expansionary fiscal policy would affect interest rates



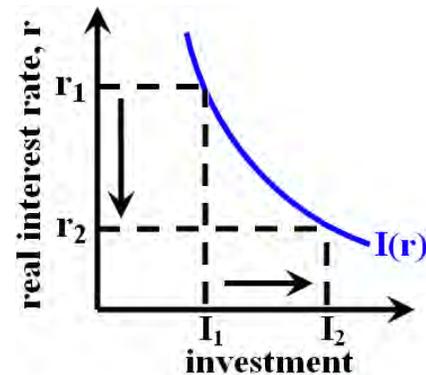
- The goods market and the money market do not operate independently, so we need to examine the links between the two

# Sticky Prices

- **This lecture assumes that prices are “sticky” in the short run.**
  - Unless the inflation rate is extremely high, firms do not immediately adjust their prices in response to changes in the money supply.
  - Moreover, it may take time for households and firms to change their expectations of future inflation rates in response to changes in the rate of money growth.
- **So expansionary monetary policy** – increases in the money supply, which lower the nominal interest rate – **also lowers the real interest rate in the short run if inflationary expectations do not change quickly**
- **Both the goods and money markets are simultaneously in equilibrium:**
  - at a certain level of aggregate output (income),  $Y$
  - at and a certain level of the interest rate,  $r$
- **As we'll see in this lecture, the requirement that both the goods and money markets be in equilibrium implies that expansionary monetary policy can increase aggregate output in the short run**
- **In this lecture, we'll also see that expansionary fiscal policy** – increases in government spending or a reduction in taxes – **increase aggregate output and increase the real interest rate in the short run**

## Real Interest Rate and Investment

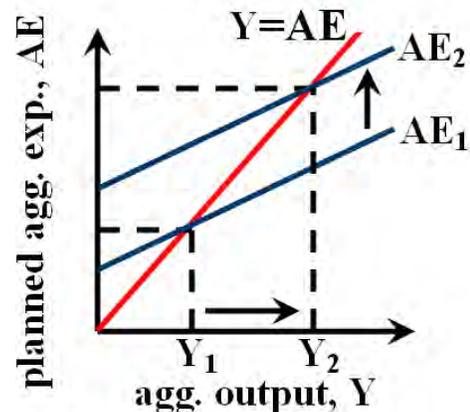
- Recall from Lecture 10 that planned investment in new capital is a decreasing function of the real interest rate
- So if the real interest rate were to fall planned investment in new capital would increase



- Next recall from Lecture 11 that planned aggregate expenditure depends in part on planned investment:

$$AE = C + I + G$$

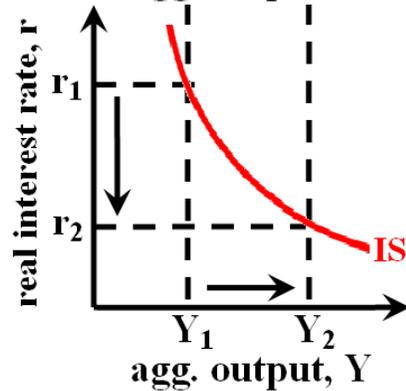
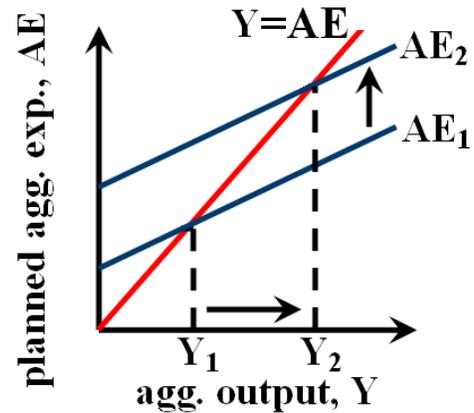
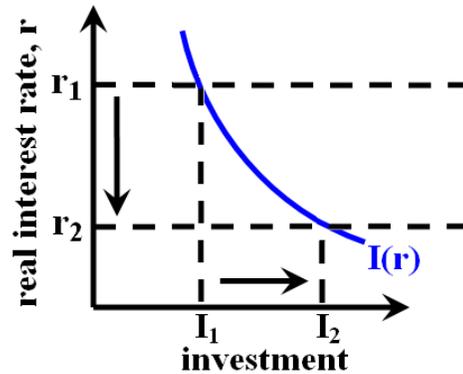
- So if the real interest rate were to fall, the increase in planned investment would increase equilibrium output



# the IS curve

1. A decrease in the interest rate
2. raises planned investment which
3. increases planned aggregate expenditure
4. and raises equilibrium aggregate output
5. The IS curve summarizes these changes

The IS curve shows the combinations of aggregate output and real interest rate for which the goods market is in equilibrium.



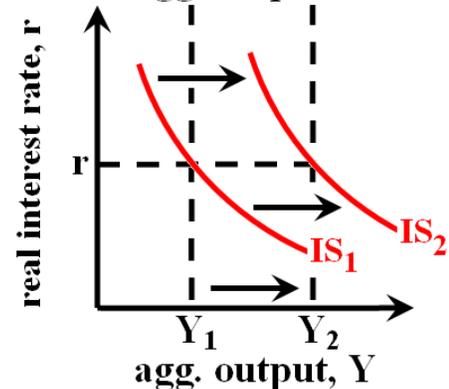
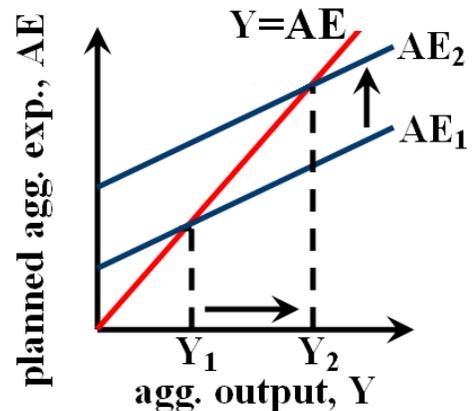
## Shifts of the IS curve

- The IS curve is drawn for a given fiscal policy, i.e. for a given level of government spending and taxation
- If the government were to pursue an **expansionary fiscal policy** – i.e. increase government spending or decrease taxes
  - **planned aggregate expenditure would increase**

$$AE = C + I + G$$

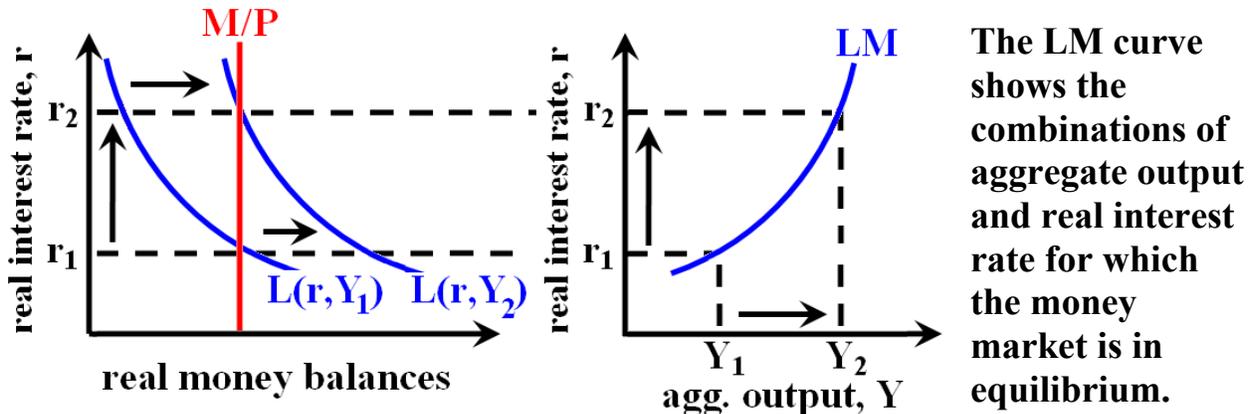
$$= a + b \cdot (Y - T) + I + G$$

- **raising equilibrium output**
- **and shifting the IS curve outward**
- Similarly, a **contractionary fiscal policy** – i.e. a decrease in government spending or an increase in taxes – would shift the IS curve inward



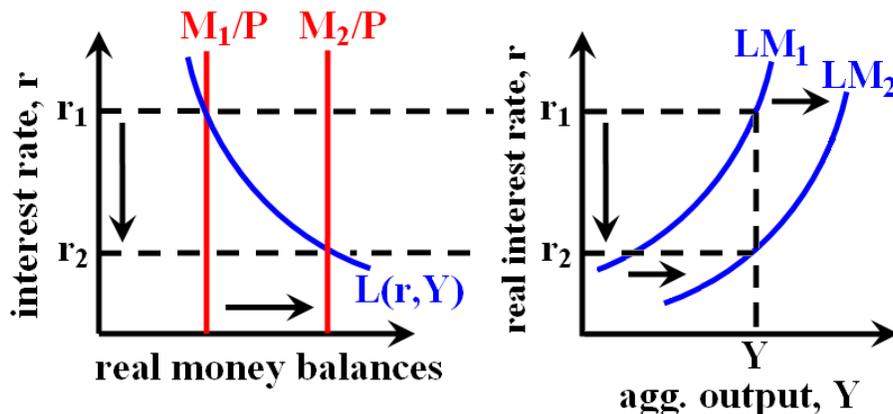
# Income and Money Demand

- Aggregate output (income),  $Y$ , is determined in the goods market, but in the short run, aggregate output can affect the money market
  - As we saw in Lecture 10, an increase in aggregate output (income) shifts out the money demand curve, which raises the nominal interest rate
  - If prices are sticky in the short run, a higher nominal interest rate leads to a higher real interest rate in the short run
1. An increase in income raises the demand for real money balances
  2. increasing the short-run real interest rate
  3. The LM curve summarizes these changes



## Shifts of the LM curve

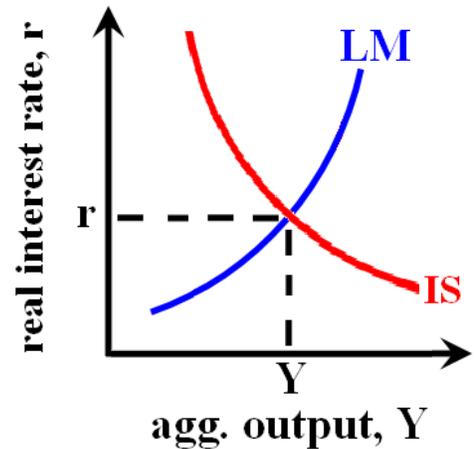
- The LM curve is drawn for a given supply of real money balances, i.e. the ratio of available money to the price level
- If the Fed were to pursue an expansionary monetary policy – i.e. increase the money supply and lower the nominal interest rate
  - the real interest rate would fall in the short run
  - since prices are sticky in the short run
  - and the LM curve would shift outward



- Similarly, a contractionary monetary policy – i.e. an increase in the money supply, which lowers the real interest rate – would shift the LM curve inward

# The IS-LM Diagram

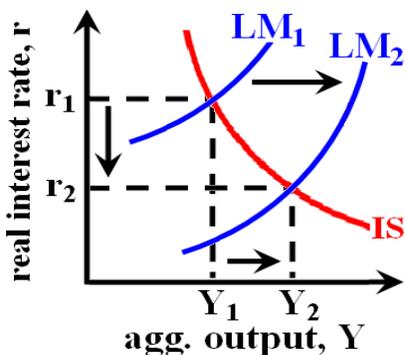
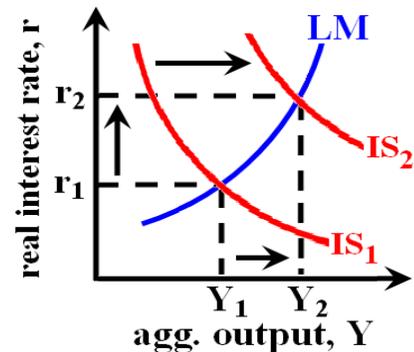
- The point at which the IS and LM curves intersect corresponds to the point at which the goods market and the money market are both simultaneously in equilibrium.
  - Each point on the IS curve represents equilibrium in the goods market.
  - Each point on the LM curve represents equilibrium in the money market.



## Policy Analysis using IS-LM

### expansionary fiscal policy

- increases aggregate output,  $Y$
- increases the real interest rate,  $r$
- the higher real interest rate decreases the effectiveness of fiscal stimulus because the higher real interest rate “crowds out” planned investment

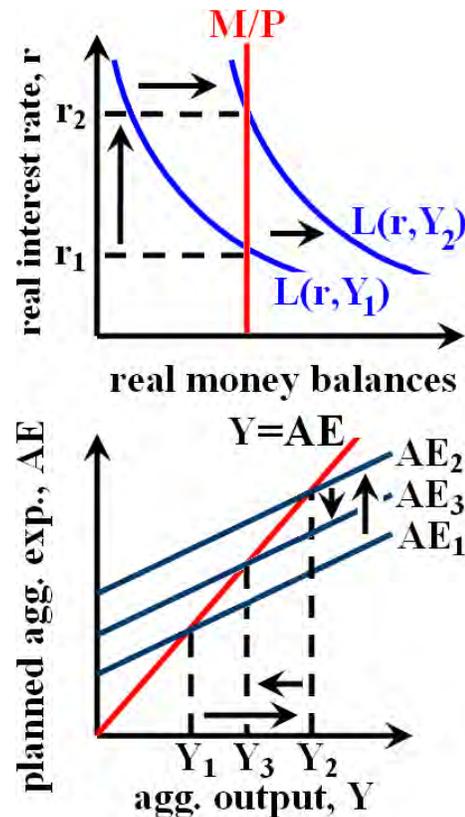


### expansionary monetary policy

- increases aggregate output,  $Y$
- decreases the real interest rate,  $r$
- the increase in aggregate output “crowds the interest rate” and reduces the ability of the Fed to lower the real interest rate in the short run

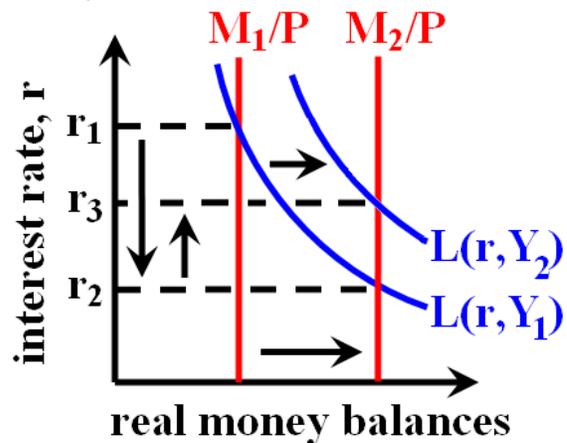
# The Crowding-Out Effect

- The **crowding-out effect** – refers to the tendency for expansionary fiscal policy to reduce private investment spending
- Expansionary fiscal policy increases aggregate output
- When aggregate output increases:
  - the demand for real money balances shifts outward,
  - causing the real interest rate to rise in the short run
- Because the real interest rate rises, planned investment decreases
- The higher real interest rate decreases the effectiveness of fiscal stimulus



## “Crowding the Interest Rate”

- The money market also experiences an effect similar to the crowding-out effect discussed above. (In reality, it’s not called “crowding the interest rate.” I just made up the term to convey the similarity).
- An increase in the money supply:
  - decreases the short run real interest rate
  - and increases investment and aggregate output.
- However, the higher level of aggregate output increases the demand for real money balances.
- The higher demand for real money balances prevents the short run real interest rate from falling as far as it would in the absence of an increase in aggregate output.



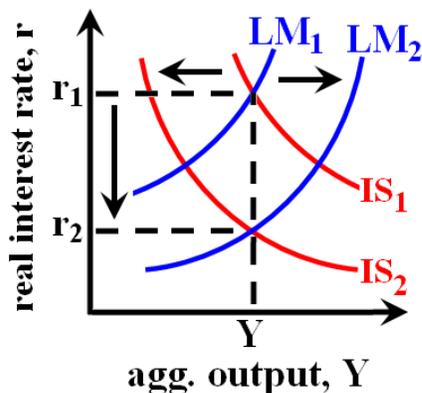
- the increase in aggregate output reduces the ability of the Fed to lower the real interest rate in the short run

# What should you do?

- Now, let's say you've just been elected President of the United States
  - you've inherited a massive government debt
  - some of your advisors fear that if you do not eliminate the budget deficit (and try to finance continued budget deficits by issuing more bonds):
    - the bond markets will respond by selling off old bonds en masse
    - causing interest rates to shoot sky high
    - and causing planned investment to collapse
    - which, in turn, will provoke a recession
  - these advisors urge you to focus on long run economic growth
  - they remind you that cutting government spending and raising taxes will increase government saving (as discussed in Lecture 7) and increase the steady state level of output per worker
- ◆ ◆ ◆
- other advisors fear the political consequences of the immediate recession provoked by the contractionary fiscal policy
  - they argue that if you balance the budget, you will lose political support and you will be unable to implement other policies designed to increase the steady state level of output per worker

## Policy Coordination

- Conflicted, you turn to Fed Chairman Ben Bernanke for help and say: “Ben, I want to balance the budget, but politically, I won't be able to keep the budget balanced for long if the country endures a harsh recession. Could you help me out?”
- Luckily, Bernanke is sympathetic to your plight. He says to you: “I'm always happy to help Prof. Doviak's students. So let's do this. You balance the budget and I'll increase the money supply. The contractionary effects of your fiscal policy will be offset by the expansionary effects of my monetary policy and the country will not have to endure a nasty recession.”



- Your contractionary fiscal policy shifts the IS curve inward.
- The Fed's expansionary monetary policy shifts the LM curve outward.
- The short-run real interest rate falls, stimulating planned investment
- and equilibrium aggregate output remains unchanged in the short run