

# Aggregate Demand Aggregate Supply

15.012 Applied Macro and International Economics

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# Class Outline

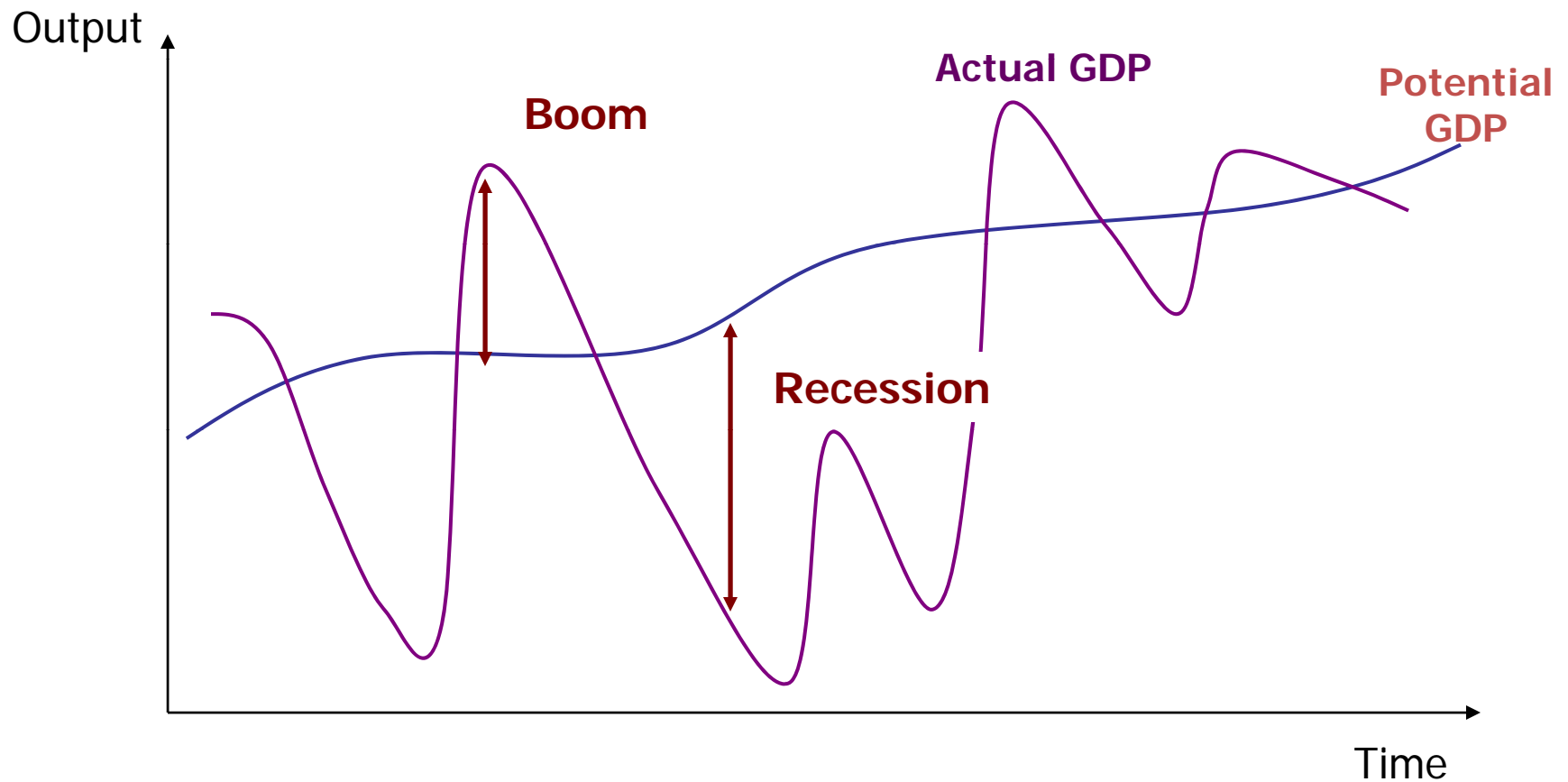
- The Business-Cycle: Potential and Actual GDP
- Aggregate Demand (AD)
  - The interest-rate effect and slope
- Aggregate Supply (AS)
  - Long-run → potential output, vertical AS
  - Short-run → sticky prices, positive slope AS
- Effects of Policies in AS-AD

# Potential and Actual GDP

$$Y = C + G + I + NX$$

- Potential GDP → estimate of GDP when all factors of production (capital, labor, and technology) are used at “normal” rates
  - Long-run → Growth theory  $Y = Af(K,L)$  → not in 15.012
- Actual GDP → can be different because of booms and recessions
  - These are short-run fluctuations, also called the “business cycle”
  - We will use the AS-AD model to analyze it

# Potential and Actual GDP



# IS-LM and AS-AD

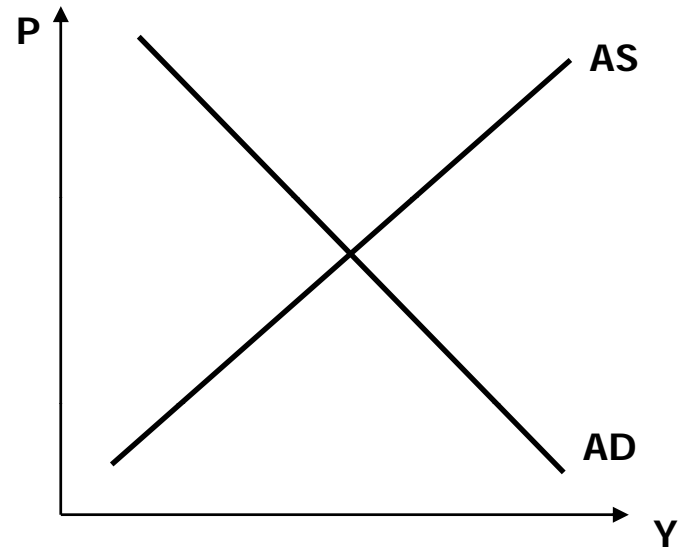
IS Curve  
Goods market  
 $Y - C - G = I(i, bc)$

LM Curve  
Money Market  
 $M_s = M_d(PY, i)$

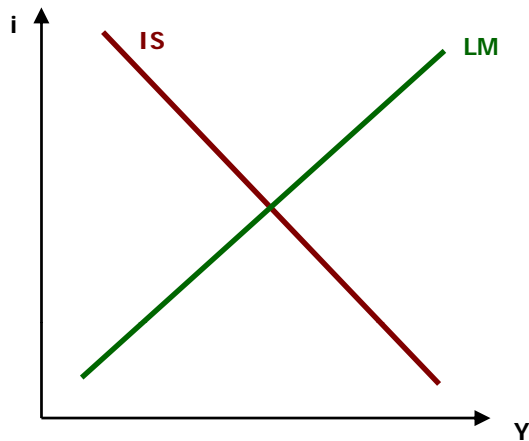


Aggregate  
Demand

Aggregate  
Supply  
(sticky prices)



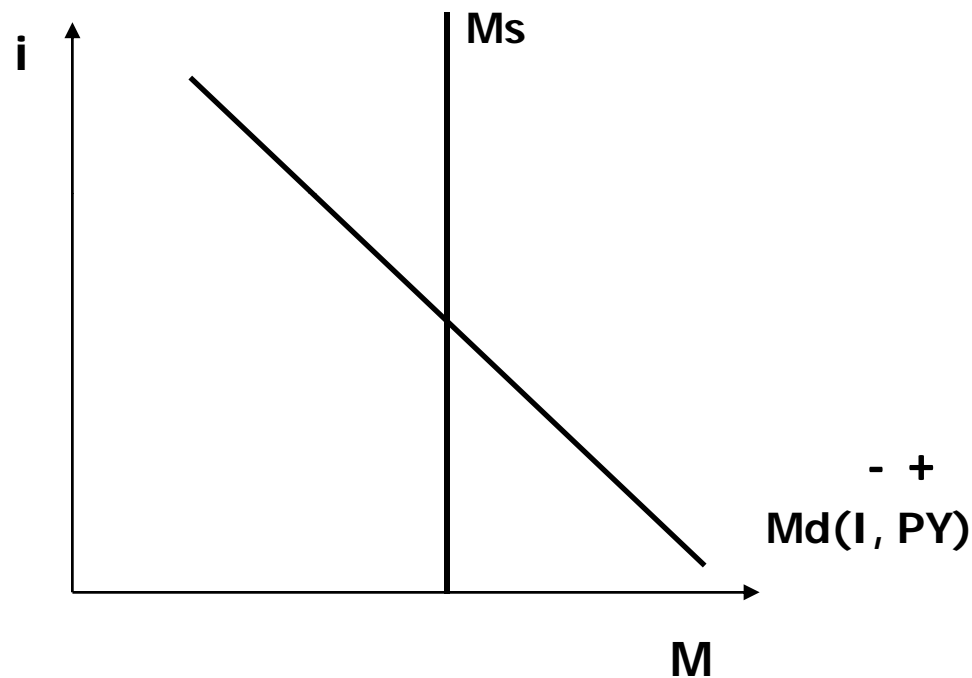
Prices and Output



# IS-LM and AS-AD

- AS-AD → prices can change
- In the money market...  $M_s = M_d(i, PY)$

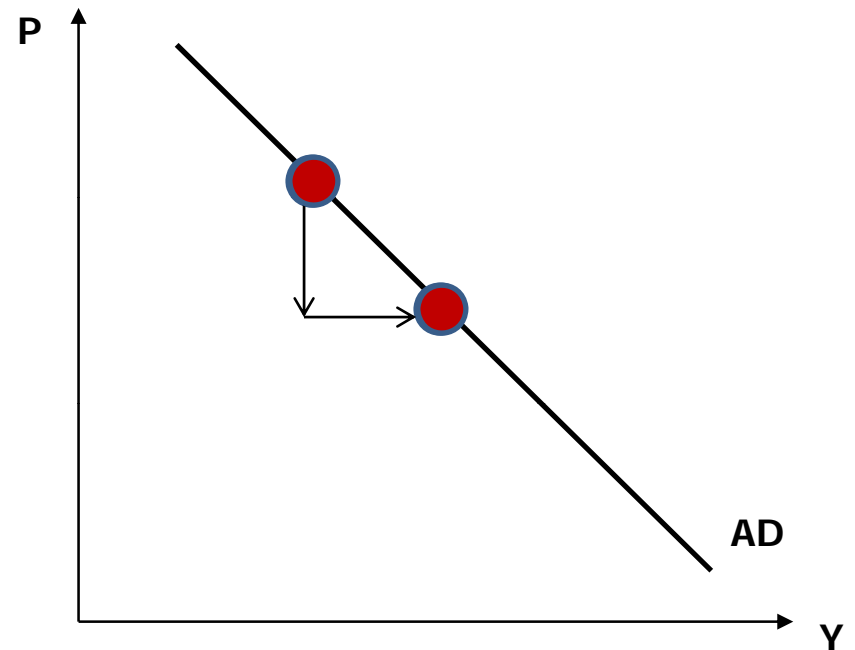
Money Market



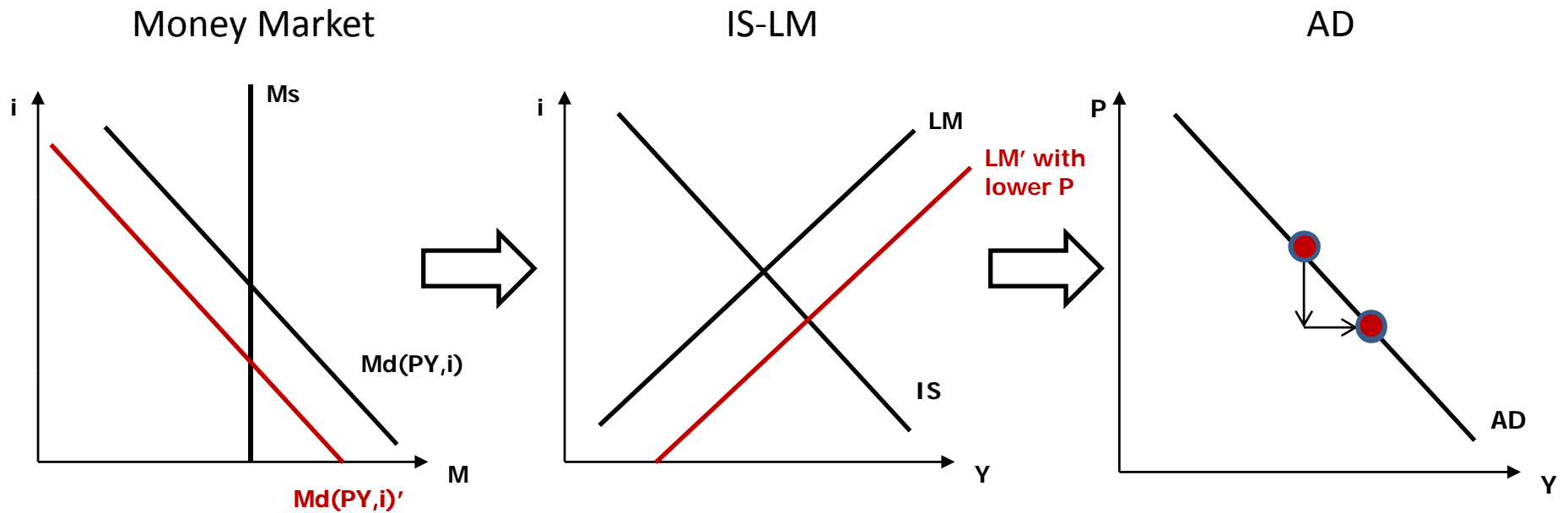
# Aggregate Demand

Why is the AD curve downward sloping? (not micro...)

- Wealth effect  
 $\downarrow P \rightarrow \text{wealthier} \rightarrow \uparrow C \rightarrow \uparrow Y$
- Interest rate effect (LM)  
 $\downarrow P \rightarrow \text{less money needed to buy}$   
 $\rightarrow \downarrow M_d \rightarrow \text{put money in bank}$   
 $\rightarrow \downarrow i \rightarrow \uparrow I \rightarrow \uparrow Y$
- Exchange rate effect  
 $\downarrow P \rightarrow \downarrow i \rightarrow \uparrow \text{Capital Outflows}$   
 $\rightarrow \text{Sell dollars} \rightarrow \text{Dollar Depreciates}$   
 $\rightarrow \uparrow \text{net exports } X \rightarrow \uparrow Y$



# The interest rate effect

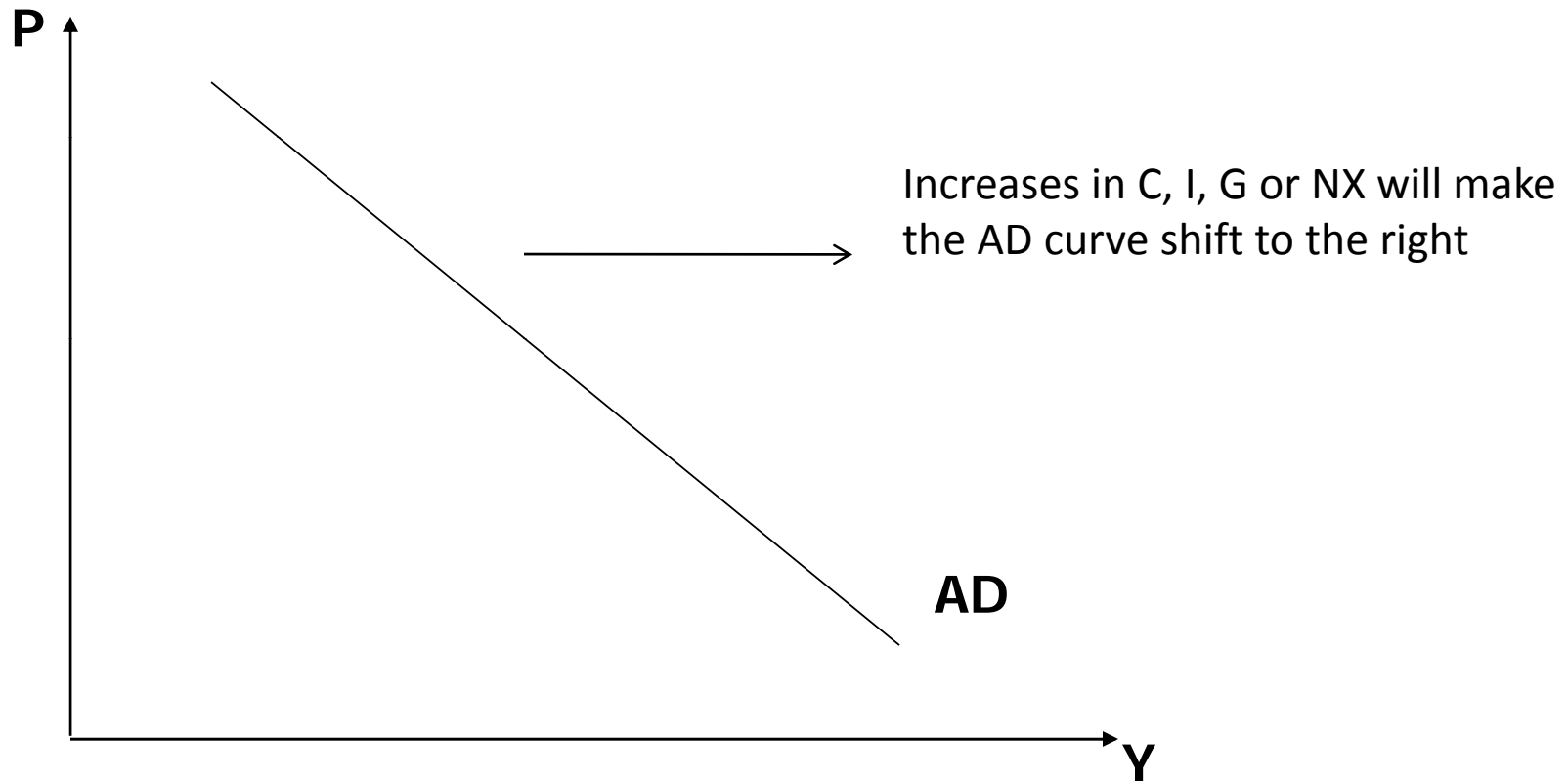


$\downarrow P \rightarrow$  less cash needed to buy things  $\rightarrow \downarrow M_d \rightarrow \downarrow i \rightarrow \uparrow I \rightarrow \uparrow Y$



# Aggregate Demand

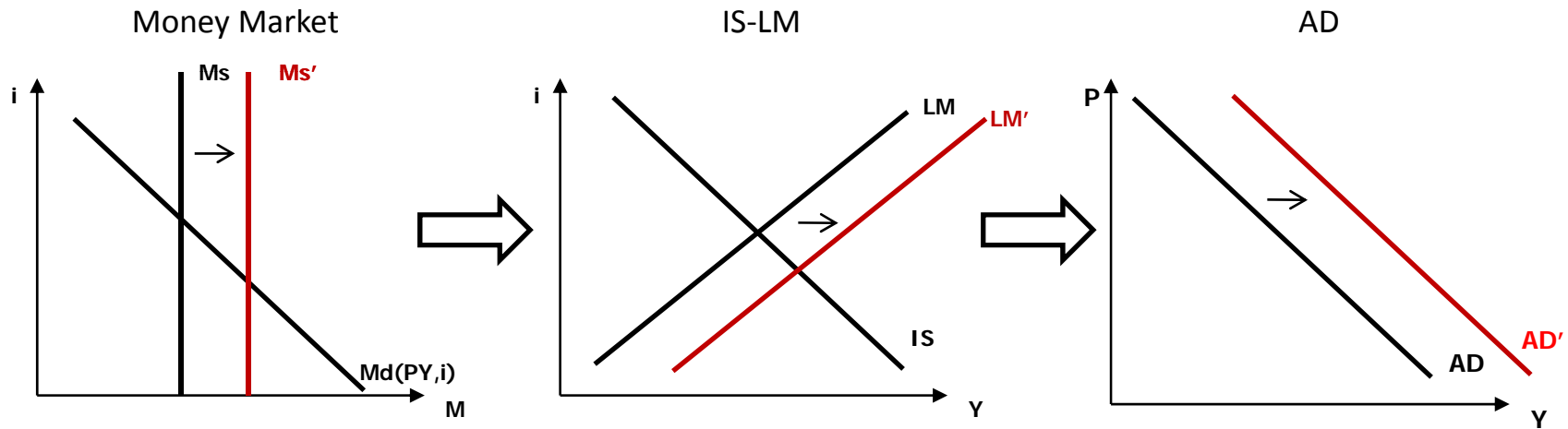
$$Y = C + I + G + NX$$



# Monetary Policy and A

- Expansionary monetary policy

↑ money supply → ↓ interest rates → ↑ investment → ↑ Y and AD

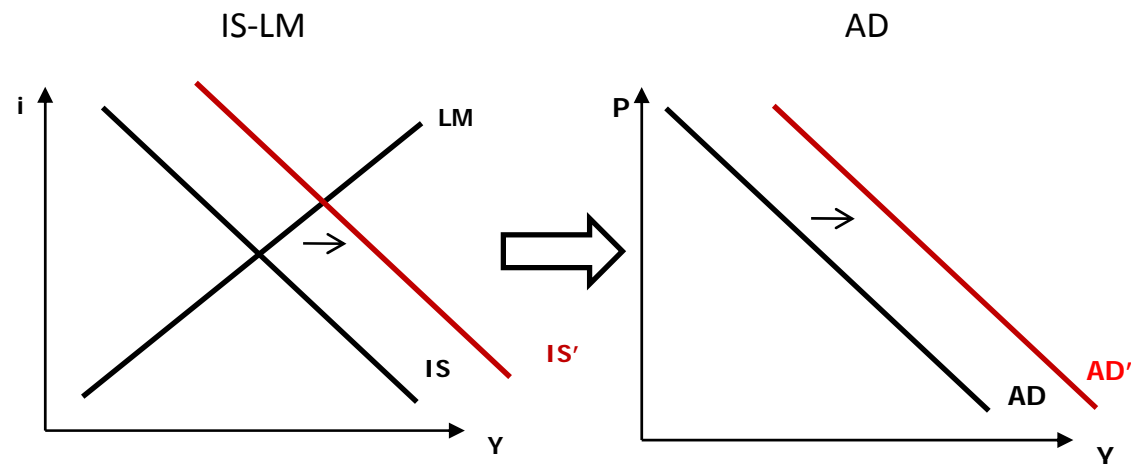


# Fiscal Policy and AD

- Expansionary fiscal policy

$\uparrow G \rightarrow \uparrow AD$

Or  $\downarrow T \rightarrow \uparrow C \rightarrow \uparrow AD$

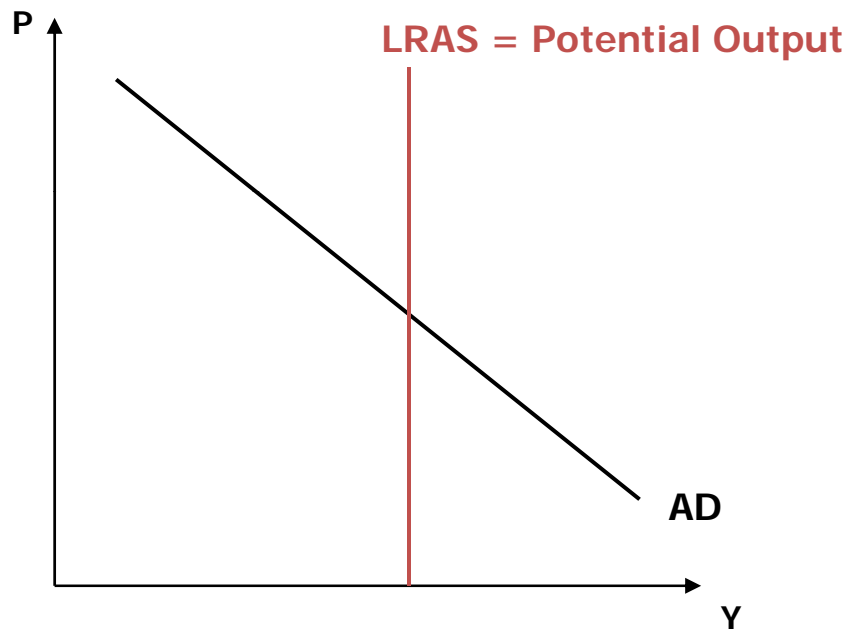


# Demand and Supply

- Monetary and fiscal policies move aggregate demand (AD)
- But final impact on  $Y$  and  $P$  depends on....
- Aggregate Supply (AS)
  - Long run
  - Short run

# AS curve in Long Run

- Long-run (LRAS) → capacity to produce by an economy given by  $Y=Af(K,L)$



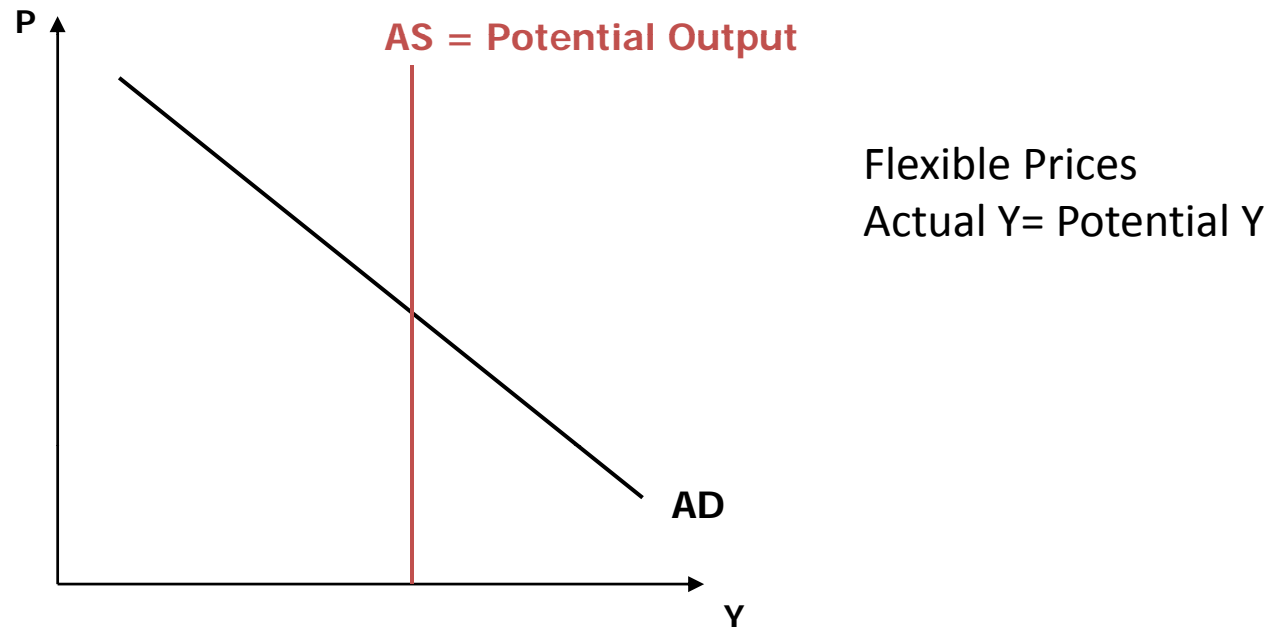
K is the capital stock, which depends on savings and investments

L is the labor force, affected by workers and average number of hours worked

A is the technology, skills, quality of management.

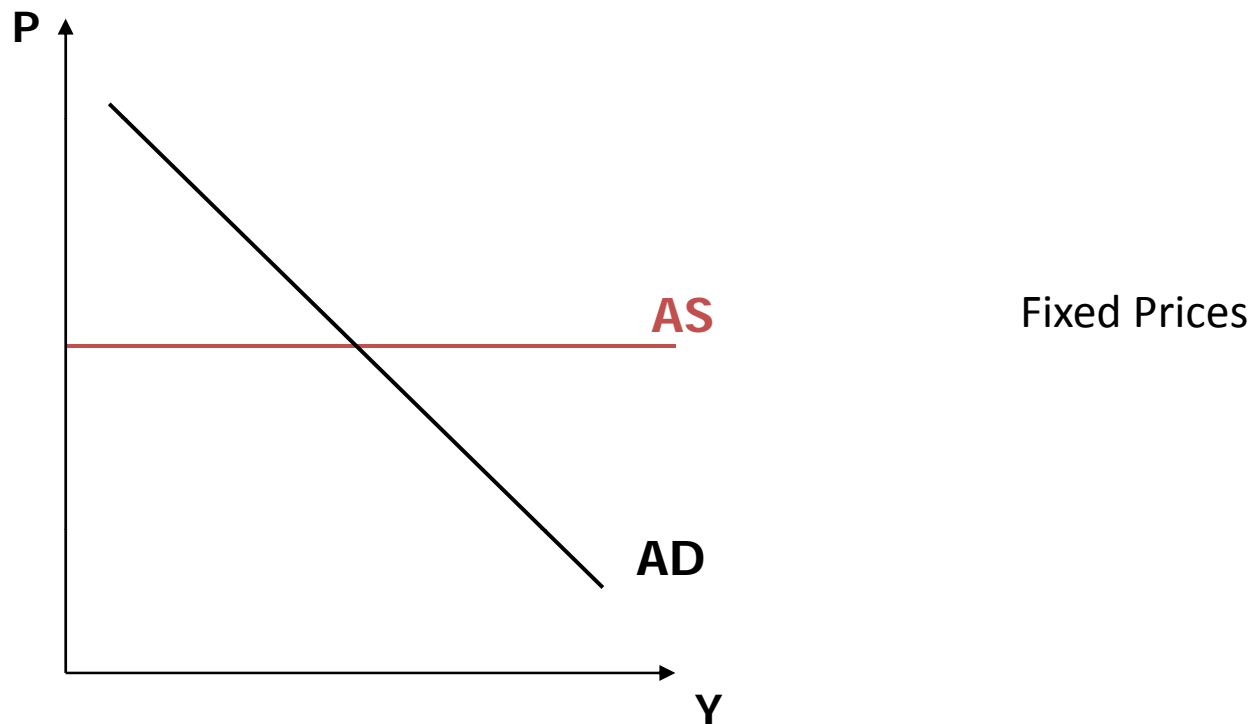
# AS Curve in Short Run

- Completely Flexible prices (classical view)
  - Output is given by potential output
  - Increase in AD lead only to increases in price
    - AS curve is a vertical line
    - Monetary and fiscal policy have no effect on output



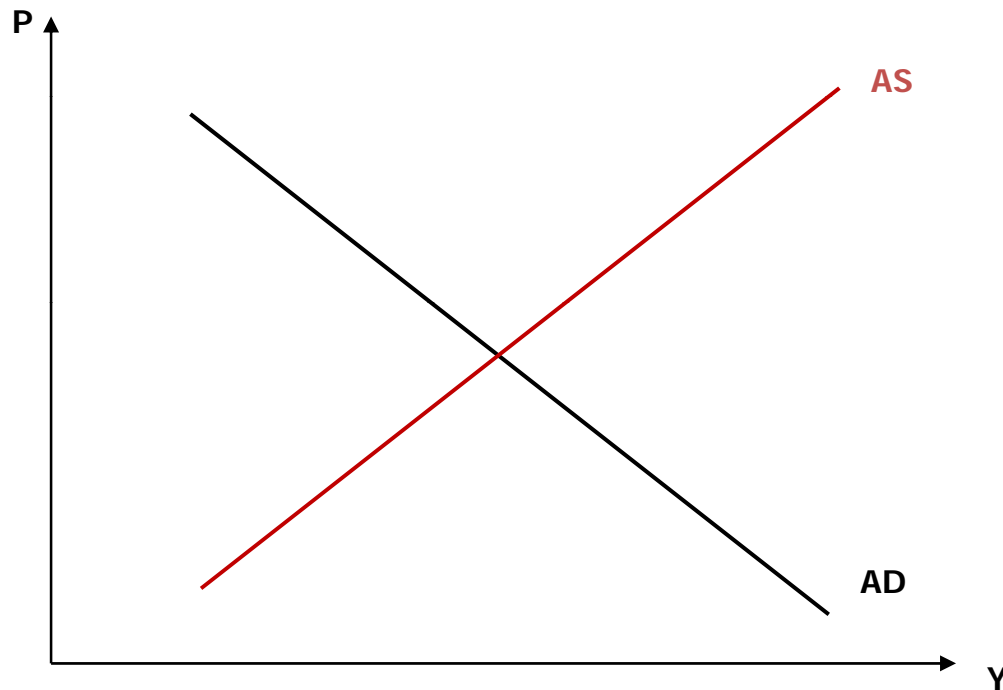
# AS Curve in Short Run

- Completely fixed prices (Keynesian view)
  - Increases in AD can be met by increases in output
    - AS curve is a horizontal line
    - Monetary and fiscal policy can affect output



# AS Curve in Short Run

- New “consensus” view:
  - Upward-sloping AS curve due to “sticky” prices



Sticky Prices → firms adjust prices slowly

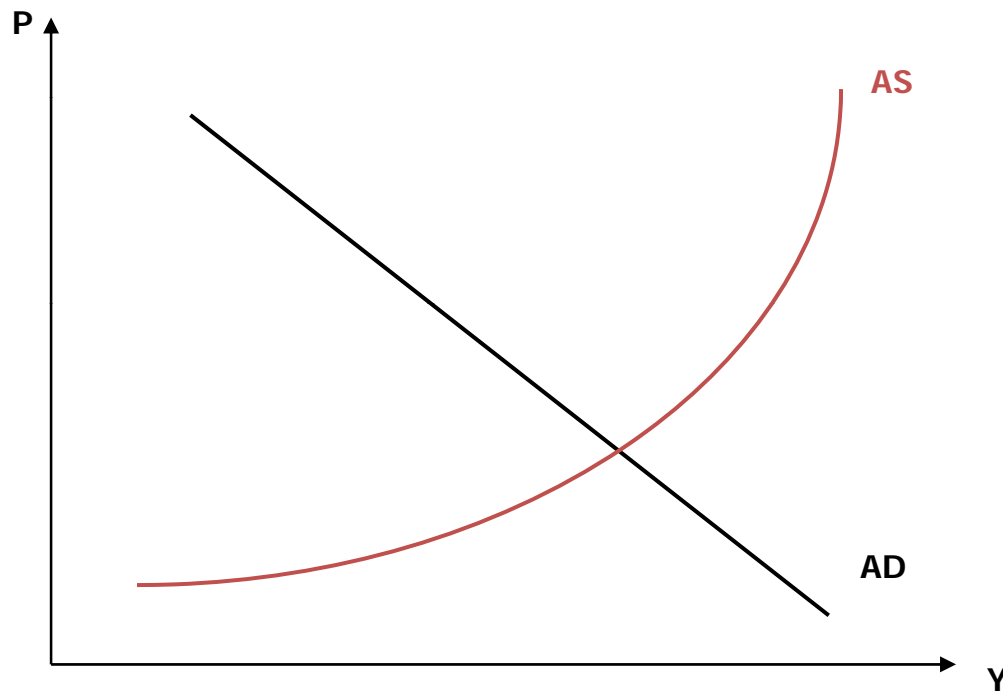
Why?

- Menu Costs
- Contracts
- Staggered price setting
- Coordination failure
- Customer relations



# AS Curve in Short Run

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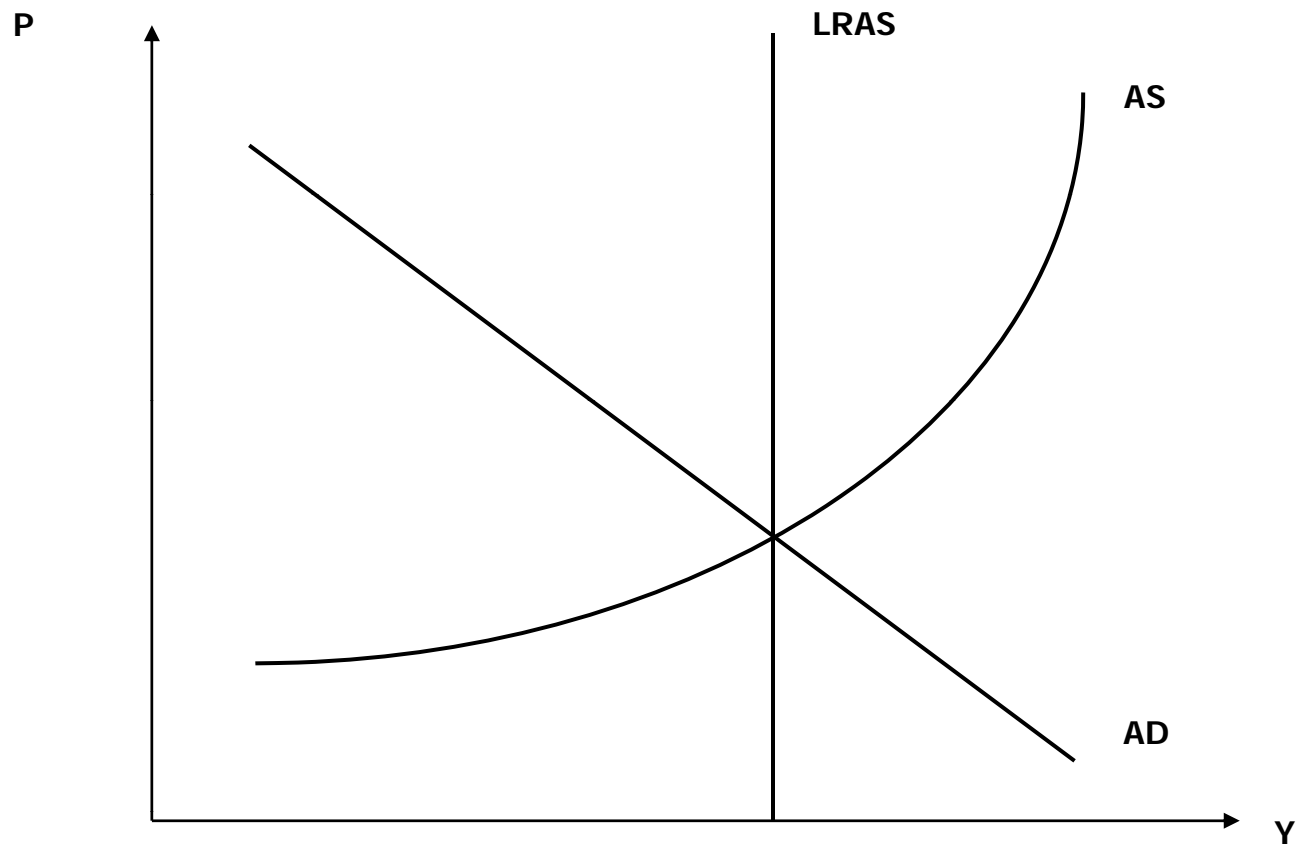
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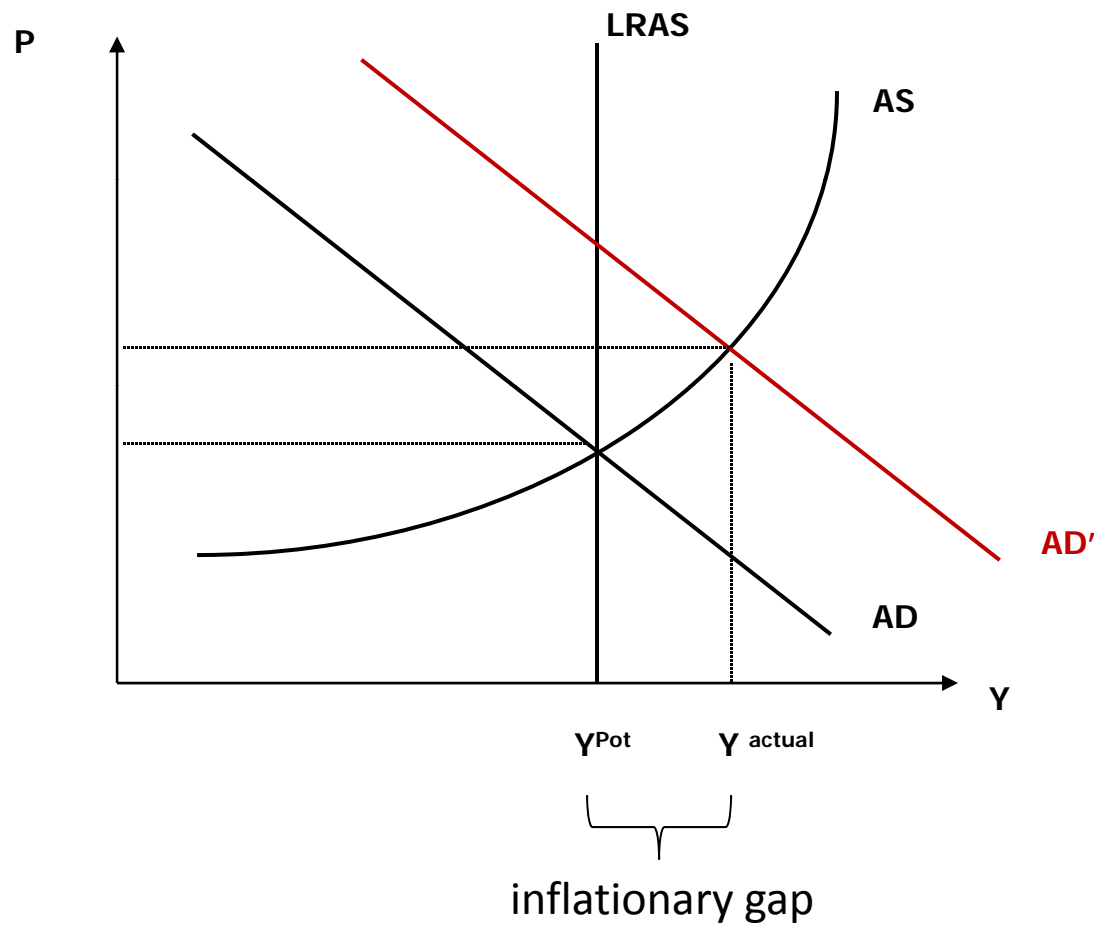
Curved → depends on the degree of slack in the economy (more Keynesian to the left, classical to the right)

# AS-AD in equilibrium



# Policy example: Expansionary MP

Short - Run



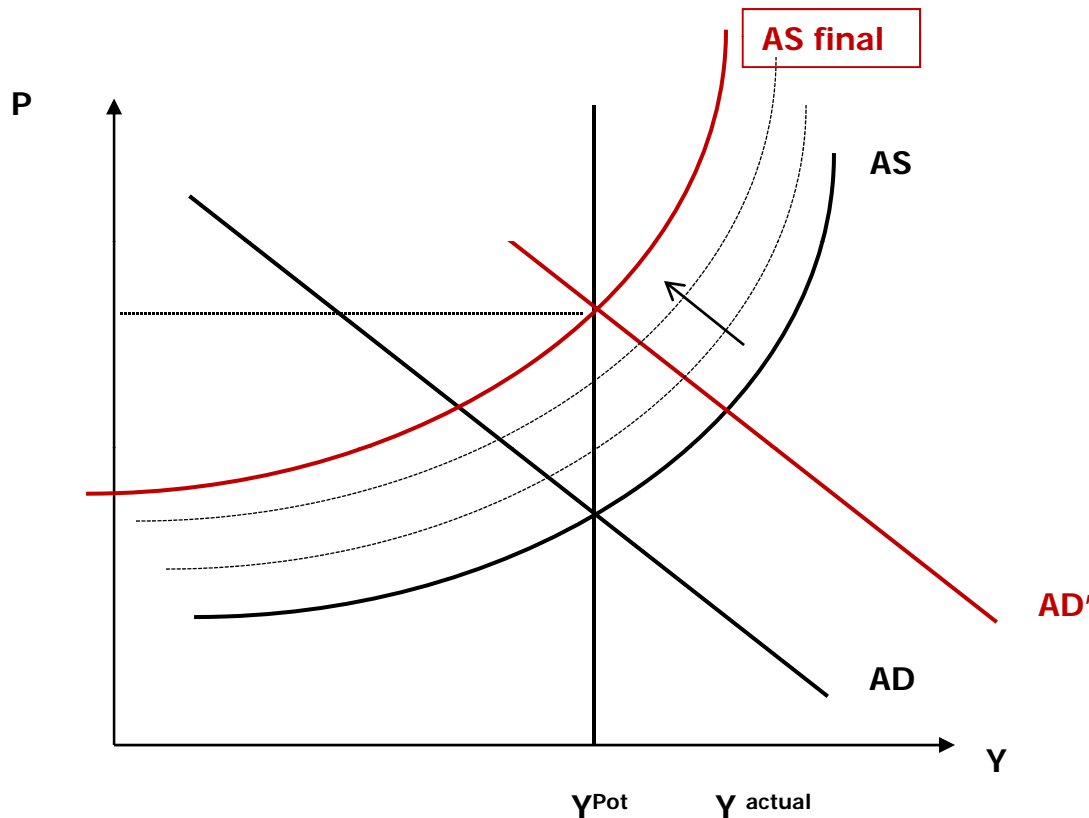
Short-run effects:

$\uparrow P$  and  $\uparrow Y$

$Y^{actual} > Y^{Pot} \rightarrow$  boom or over-employment

# Example: Expansionary MP

Transition to Long - Run



With time, AS moves up as more and more firms adjust their prices

In the LR,  $Y^{actual} = Y^{Pot}$

**Long-run effects:**

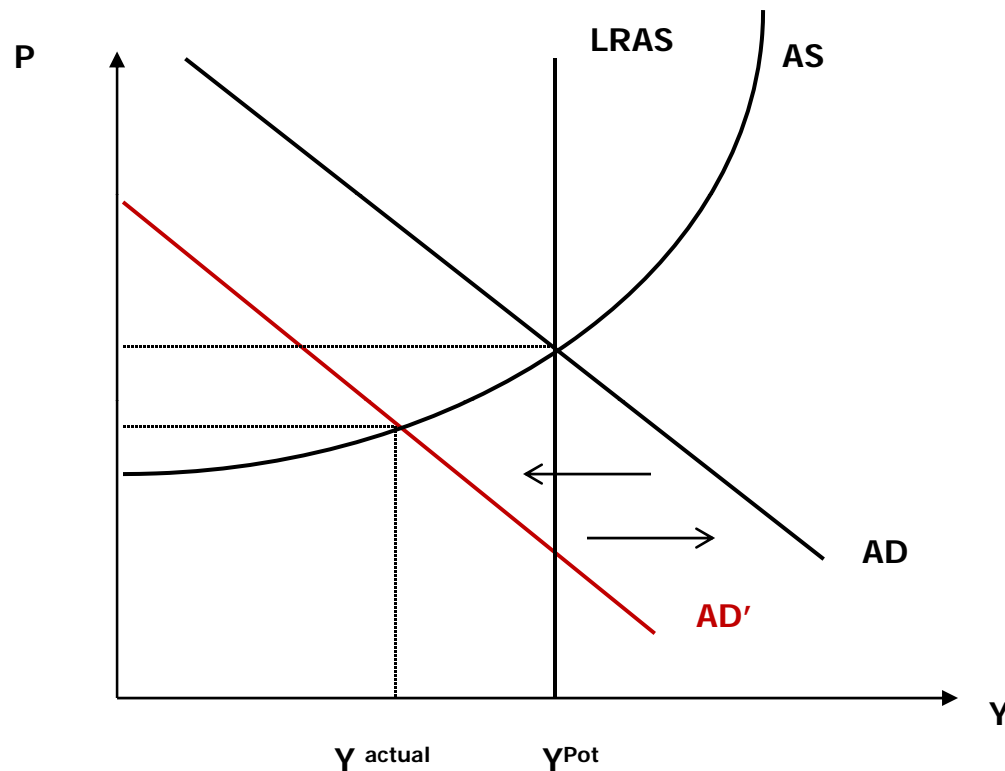
**↑ P**

**no change in Y**

# AS-AD and policy analysis

- What is your starting position?
  - Equilibrium
  - Boom
  - Recession
- What is the main shock?
  - Demand or supply?
- Different policies can achieve different things
  - Monetary and Fiscal Policy → target the AD
  - Supply-side policies → target the AS

# Demand-shock Recession

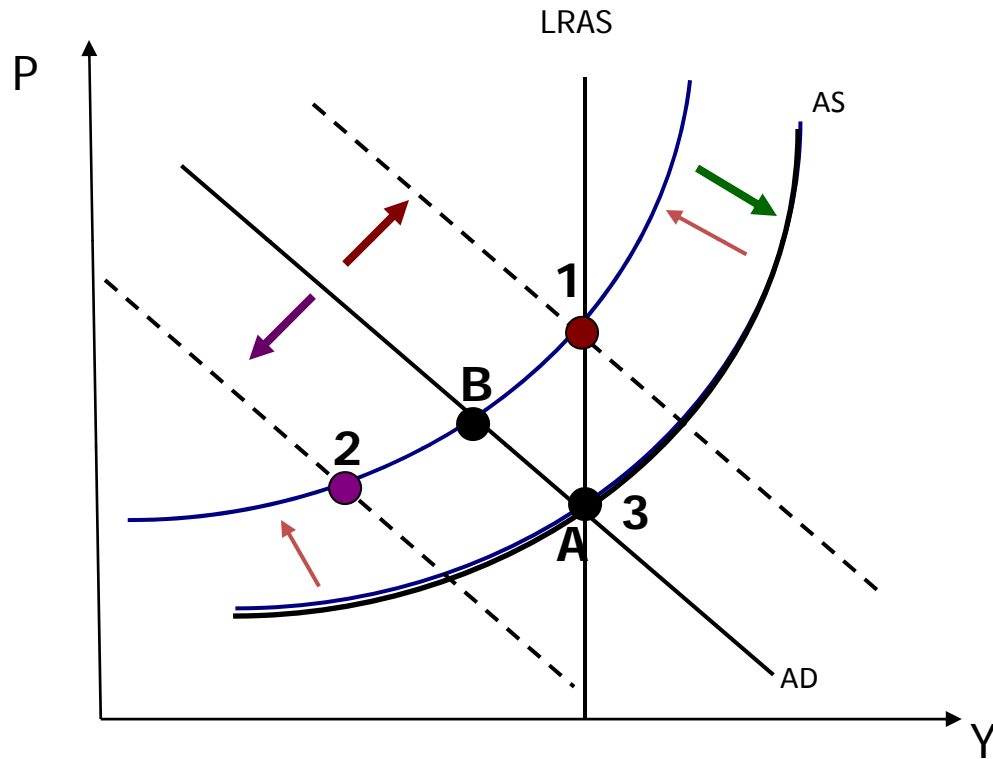


Fall in AD  $\rightarrow \downarrow Y, \downarrow P$

-Policy Response?

Expansionary Monetary and/or  
Fiscal Policy  $\rightarrow \uparrow Y, \uparrow P \rightarrow$   
restore the equilibrium

# Supply-shock Recession



If there is an oil price shock that shifts AS in  $\rightarrow \downarrow Y, \uparrow P$  (stagflation)

Policy options?

**Option 1:**  
**Shift AD out to stabilize Y**

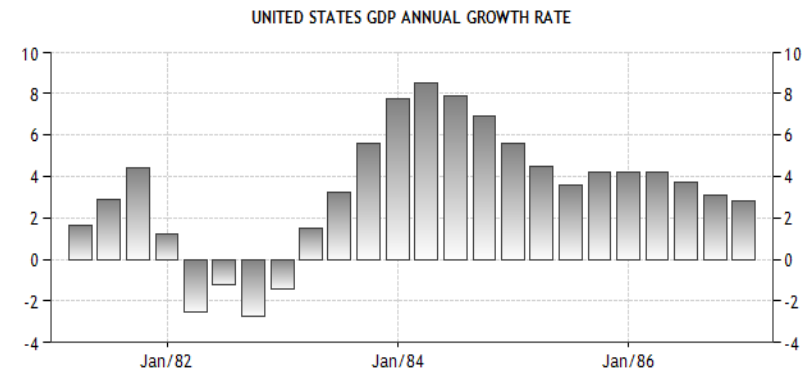
**Option 2:**  
**Shift AD In to stabilize P**

**Option 3:**  
**"Supply Side" Economics**  
 $\rightarrow$  production incentives to get closer to potential Y  
 $\rightarrow$  try to push LRAS as well

# US in the 80's: Reagan



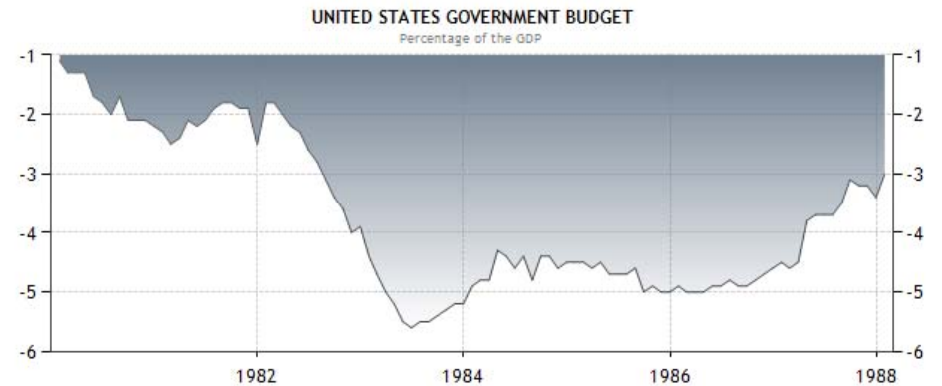
source: TradingEconomics.com; Bureau of Labor Statistics



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source: TradingEconomics.com; Federal Reserve



source: TradingEconomics.com; US Treasury

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# Remember

- The AS-AD model and transition back to potential output
- Monetary and fiscal policy in the AS-AD model
- Use it for shock and policy analysis:
  - Starting position?
  - Type of shock?
  - Effects of policies? Short-run vs Long-run

# Next Class

- So far we have talked about stabilization policies in an closed economy
- Next two classes we will talk more about how the Central Bank operates, introduce exchange rates and discuss financial crises

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