



# BUSINESS CYCLES AND AGGREGATE DEMAND I

# Overview of Lecture 6

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## Business cycles:

- Why do we need other than classical model?
  - ▣ Puzzle of Great Depression
- Prices in the short vs. long run
- Intro to AD and AS curves
- Effect of shocks in AD-AS model
- Stabilization policy – tools and goals

# Motivation

Failure of classical economy in the case of Great Depression

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## Great Depression:

- Before – period of rapid growth (GDP, stocks)
- October 24, 1929 – Black Thursday
  - ▣ Crash of stock market → sell-off
- Fall of wealth, savings => depression of real sector
- Output, consumption, investment falling
- Unemployment: 1929 – 3%, 30' – 9%, 33' – 25%, 39' – 17%

# Motivation

Failure of classical economy in the case of Great Depression

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## Classical economy

- Assumption of **self-regulating** economy
- Prices are **flexible**
- Unemployment and excess supply will disappear as soon as **prices will adjust**

## Reality

- Deflation (30' = -10%)
- Still, great unemployment

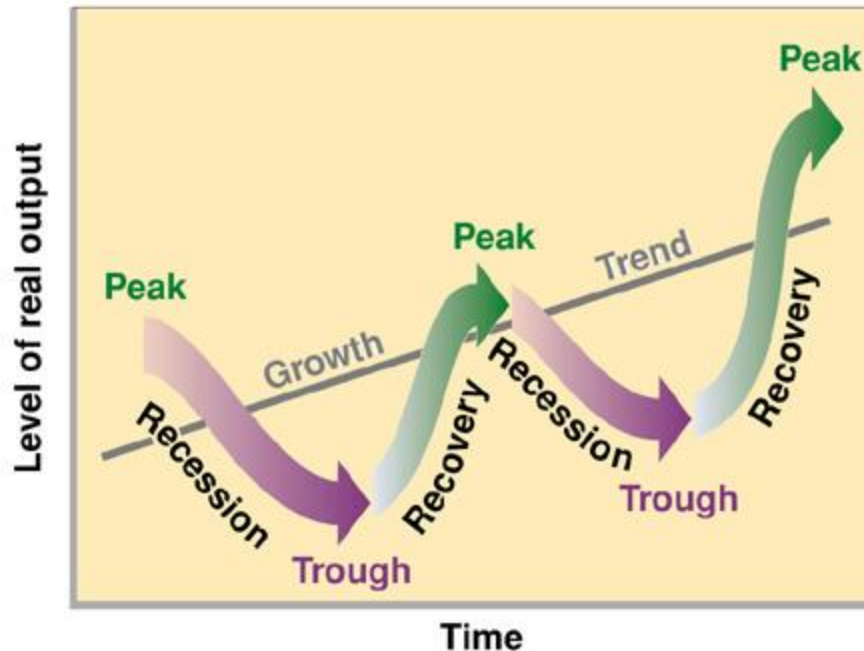
### Keynes:

- Economy is **inherently unstable**
- Need for government intervention
- Debate lasts until now

# Business cycles

Terminology – What do we mean by inherently unstable?

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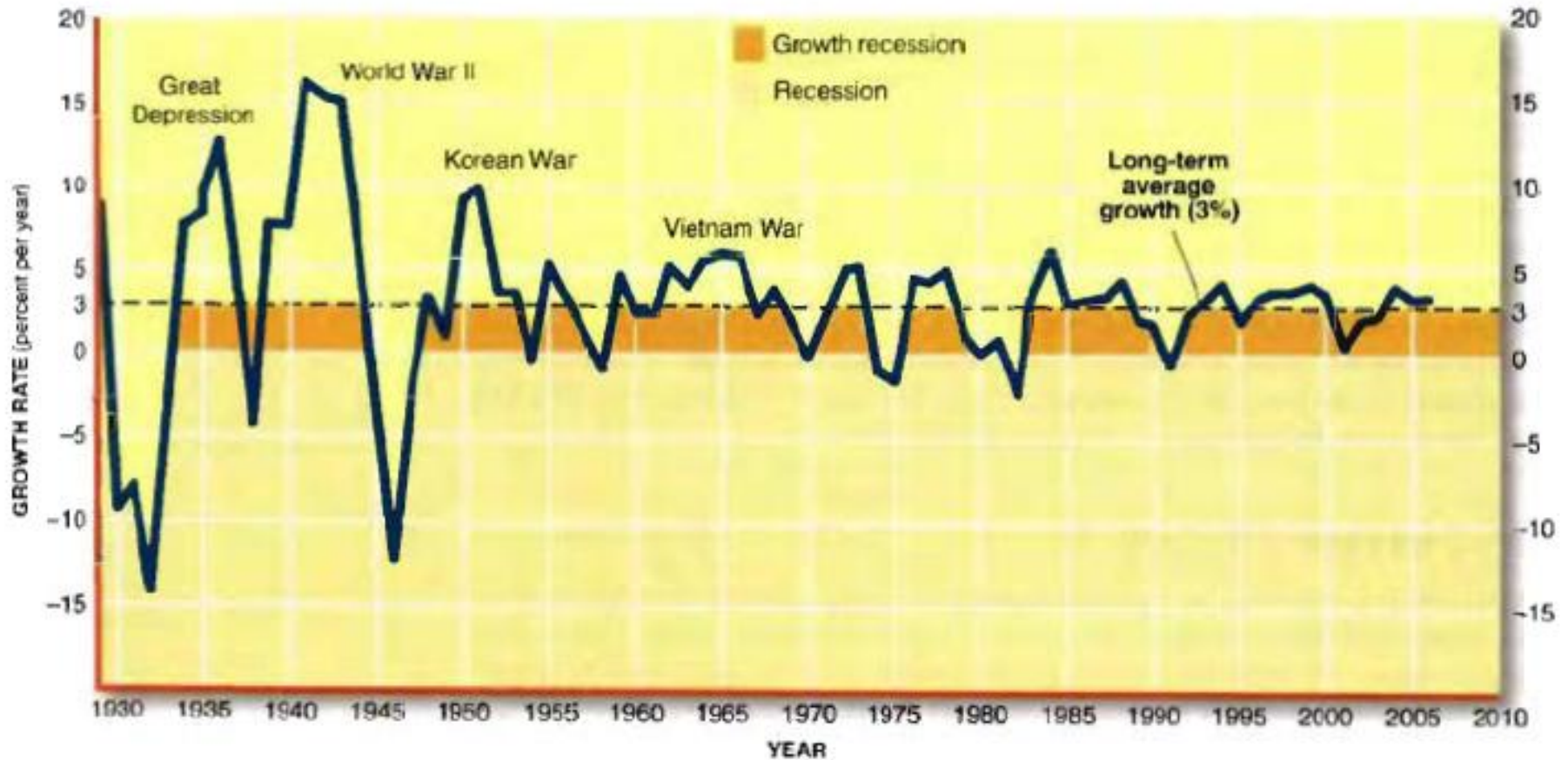
**Recession:** typically defined as a decline in real GDP for two or more consecutive quarters, accompanied with high unemployment

**Depression:** any economic downturn where real GDP declines by more than 10 percent, longer and more severe than recession

# Business cycles (fluctuations)

Real world – example of USA

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# Business cycles (fluctuations)

Real world – Summary of example of USA

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Real GDP growth in US:

- ▣ long-run growth of 3.5%
- ▣ not steady – fluctuations around trend:
  - Great Depression
  - WWII – growth by 19%, all people employed
  - 46'-48' – postwar depression (military production)
  - 80's oil crisis

# Business cycles (fluctuations)

## Stylized facts

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- No simple regular or cyclical pattern
- Distributed unevenly over the components of output
  - ▣ stable: consumption of non-durables and services, net export
  - ▣ Unstable: consumption of durables, housing, inventories
- Asymmetries between rises and falls in output
  - ▣ Long time slightly above and short time far below the mean value



# Business fluctuations

## Role of macro theory

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- Macro theory tries to explain why we observe alternating periods of growth and contraction in short run; together with long-term trends
- Main difference
  - ▣ Long-run: **prices are flexible**, respond to changes in supply or demand
  - ▣ Short run: many prices are “sticky”

***The economy behaves much differently when prices are sticky.***

# Business fluctuations

Comparison of long-term and short-term determinants

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## Long-term (classical economy)

- Price flexibility
- Output determined by supply side (  $F(K,L)$  )
- Change in demand only affects prices, not quantities
- Say's law: supply creates demand

## Short term (business cycles)

- Price stickiness
- Output determined also by demand – affected by exogenous changes
- Ex: firm – how much we are able to sell at given price

# Model of AD and AS

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- the paradigm that most mainstream economists & policymakers use to think about economic fluctuations and policies to stabilize the economy
- shows how the price level and aggregate output are determined **simultaneously**
- shows how the economy's behavior is different in the **short run** and **long run**

# Aggregate demand

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- The aggregate demand curve shows the relationship between **the price level** and the **quantity of output** demanded.
- For this chapter's intro to the AD/AS model, we use a **very simple** theory of aggregate demand based on the Quantity Theory of Money.
- In this and next lecture we develop the theory of aggregate demand in more detail.

# Aggregate demand

## Quantity theory of money

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- From Lecture 3, recall the quantity equation

$$M V = P Y$$

and the money demand function it implies:

$$(M/P)^d = k Y$$

where  $V = 1/k =$  velocity.

- For given values of  $M$  and  $V$ , these equations imply an inverse relationship between  $P$  and  $Y$ :

$$P = (M V) / Y$$

# Aggregate demand

Downward-sloping curve

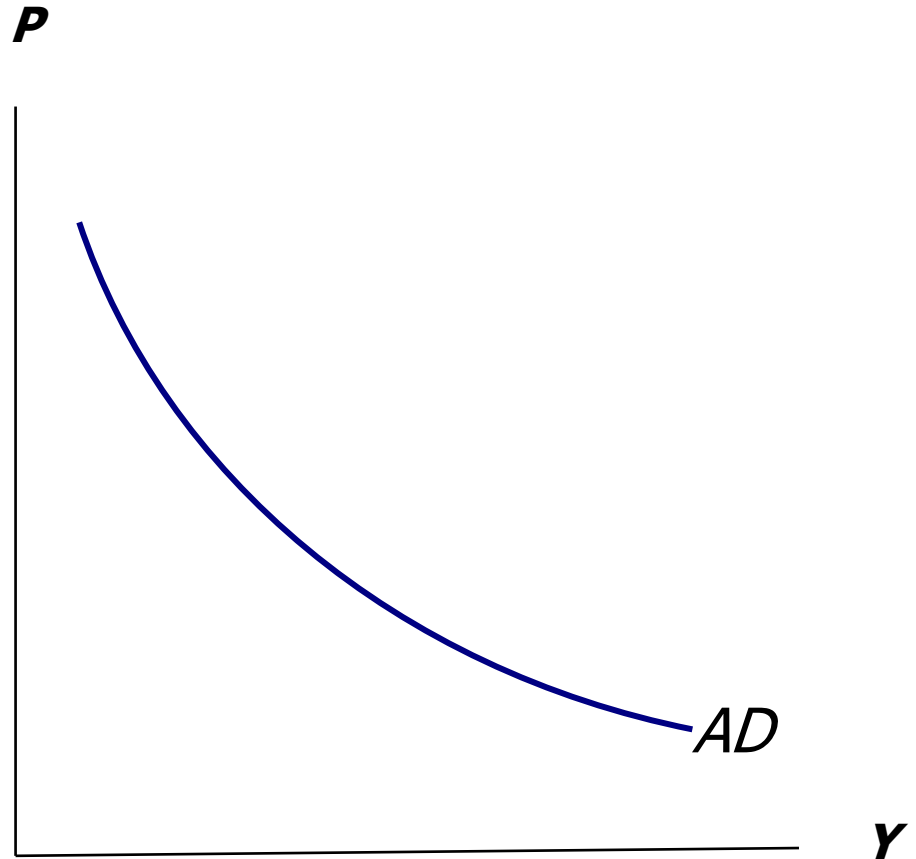
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## Real balances effect:

- Increase in price level causes fall in real money balances => decrease in demand

Alternative explanations:

- Foreign trade effect
- Interest rate effect



# Aggregate demand

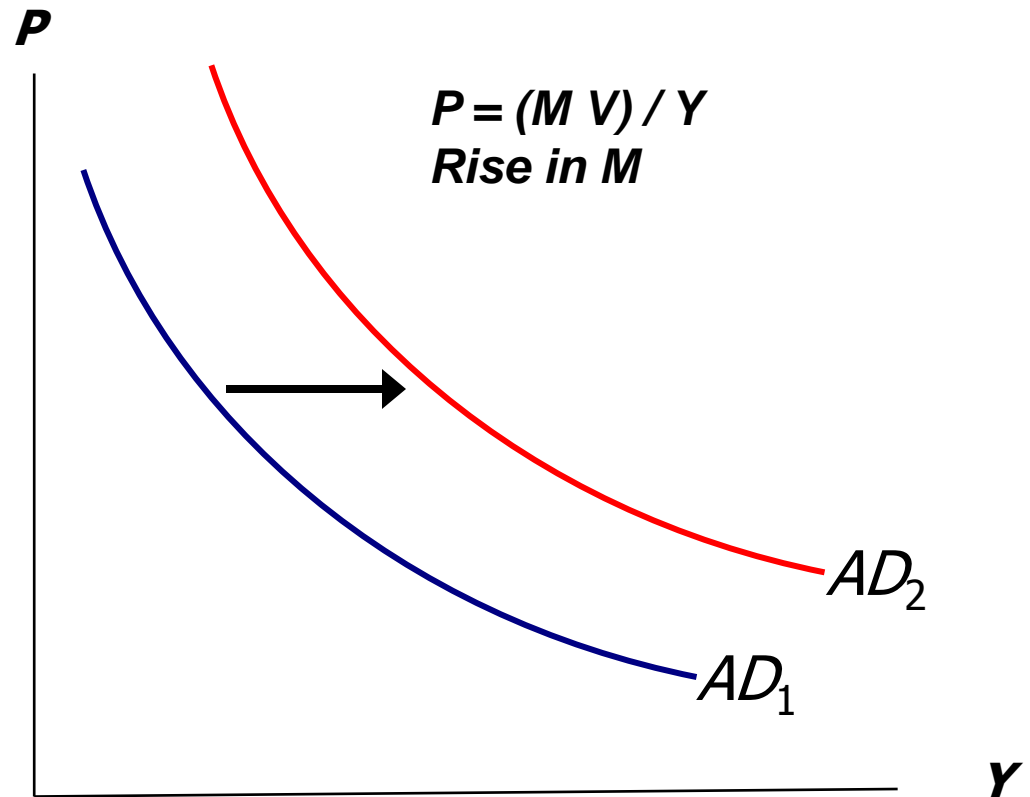
Shift of AD curve – Ex.: increase in the money supply

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Increase in money supply => shift of AD curve to the right

Explanation:

- Can buy more at the same price



# Aggregate supply

## Long run AS curve

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In the long run, output is determined by factor supplies and technology

$$\bar{Y} = F(\bar{K}, \bar{L})$$

- **full-employment** or **natural** level of output, the level of output at unemployment equals its natural rate (no inflationary pressures).
- does not depend on the price level, so the long run aggregate supply (LRAS) curve is vertical:

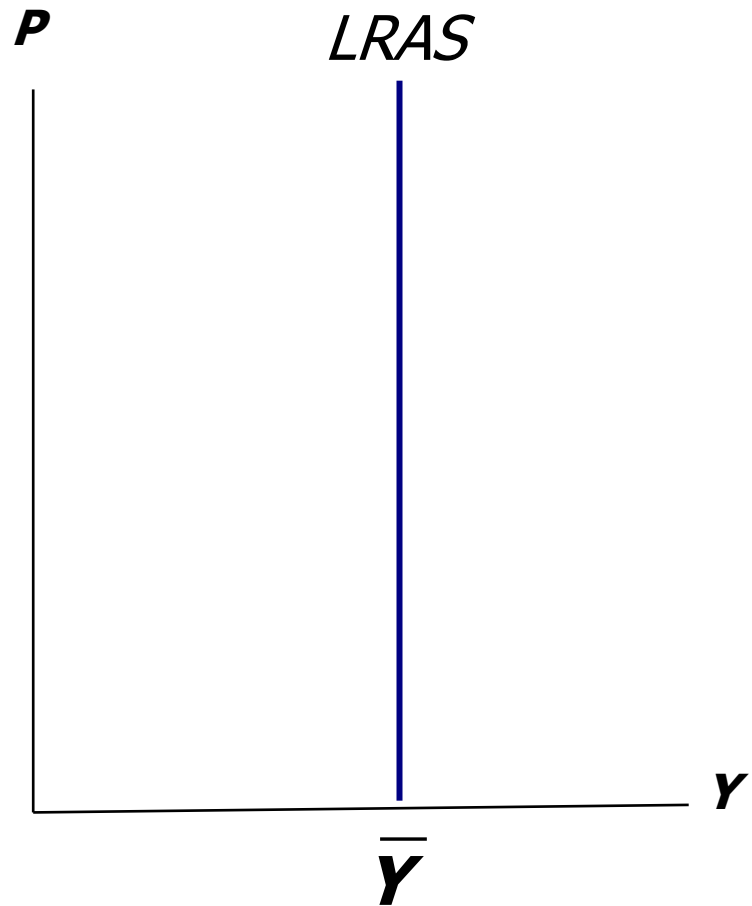


# Aggregate supply

Long run - graph

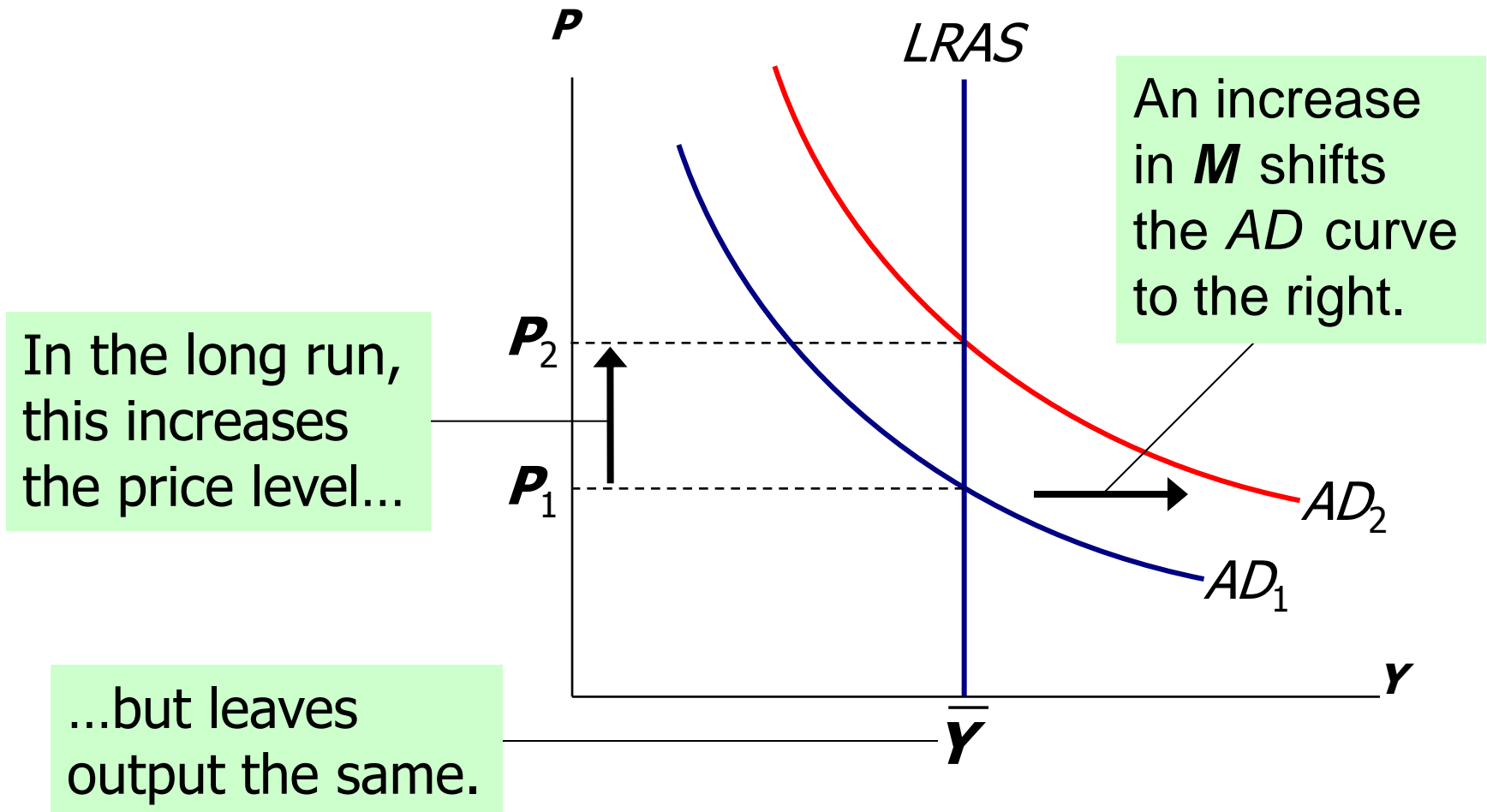
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- Long run AS curve is vertical at optimal  $Y$
- Classical assumption



# AD-AS model

Long-run effects of AD shift (increase in  $M$ )



# AD-AS model

## Long-run - Implications

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In the long run – change in the money supply does not have any effect on real variable, only on the price level

- Deviation only as long as price adjusts

## Not what we observe in reality!

- Consider a long term outcome
  - ▣ Self-adjusting deviations
  - ▣ Economic growth based on the growth of real variables: capital, labor, technology
  - ▣ Analyze departures

# Aggregate supply

## Short run

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- In the real world, many prices are **sticky** in the short run.
- From now on we assume that all prices are stuck at a predetermined level in the short run...
- ...and that firms are willing to sell as much as their customers are willing to buy at that price level.
- Therefore, the short-run aggregate supply (SRAS) curve is horizontal:
  - (simplification – usually upward sloping)

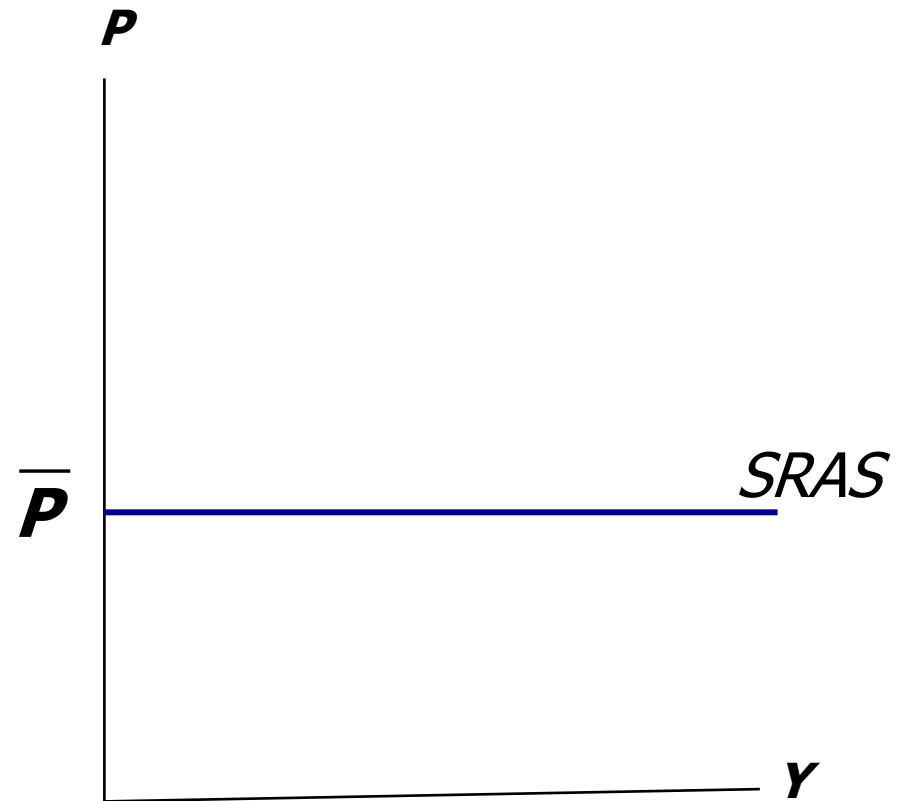
# Aggregate supply

## Short run AS curve

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SRAS is horizontal:

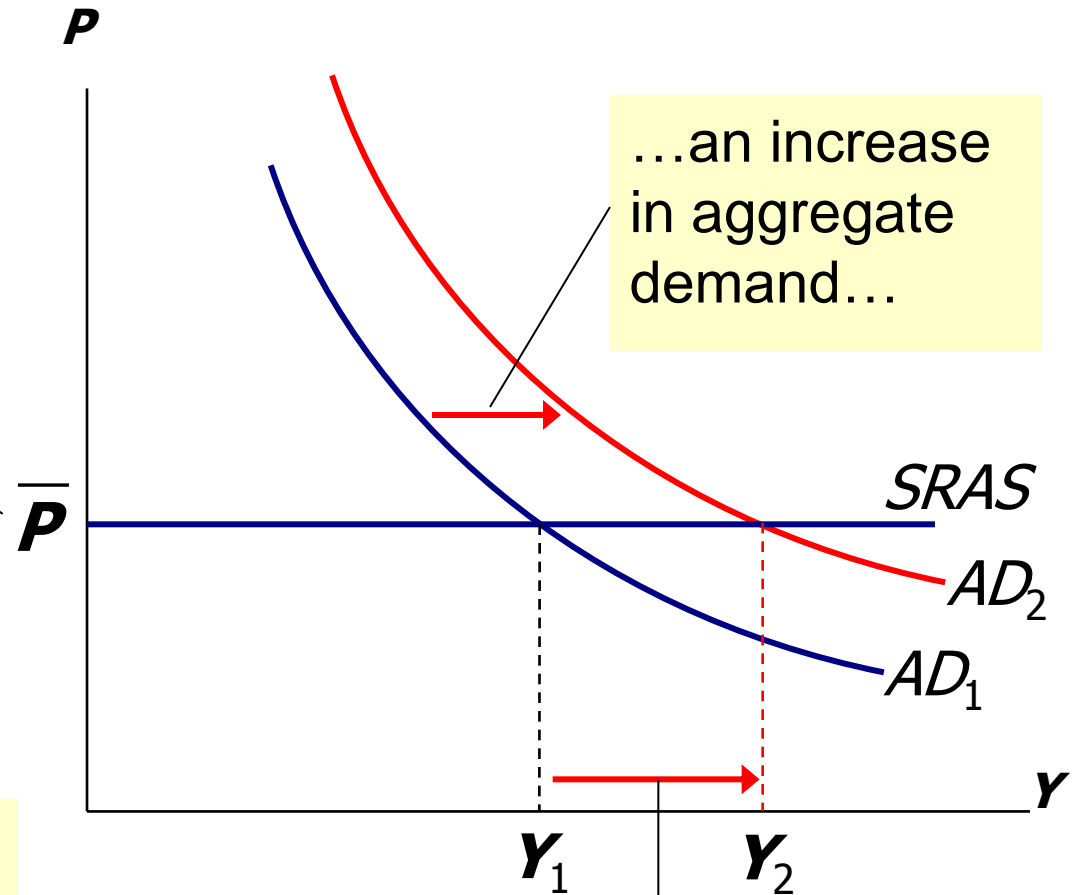
- Price level fixed at a predetermined level
- Firms sell as much as buyers demand



# AD-AS model

Long-run effects of AD shift (increase in  $M$ )

In the short run  
when prices are  
sticky,...



...causes output  
to rise.

# AD-AS model

## Short-run - Implications

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In the long run – change in the AD (money supply) has full effect on real variable + no on price level

Equilibrium may be **undesirable** – higher or lower output (and corresponding prices) than in natural level

- Lower output – recessionary gap – high unemployment rate
- Higher output – inflationary gap – pressure to increase prices

# AS-AD model

From the short run to the long run

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Over time, prices gradually become “unstuck.”  
When they do, will they rise or fall?

In the short-run equilibrium, if	then over time, the price level will
$Y > \bar{Y}$	?
$Y < \bar{Y}$	?
$Y = \bar{Y}$	?



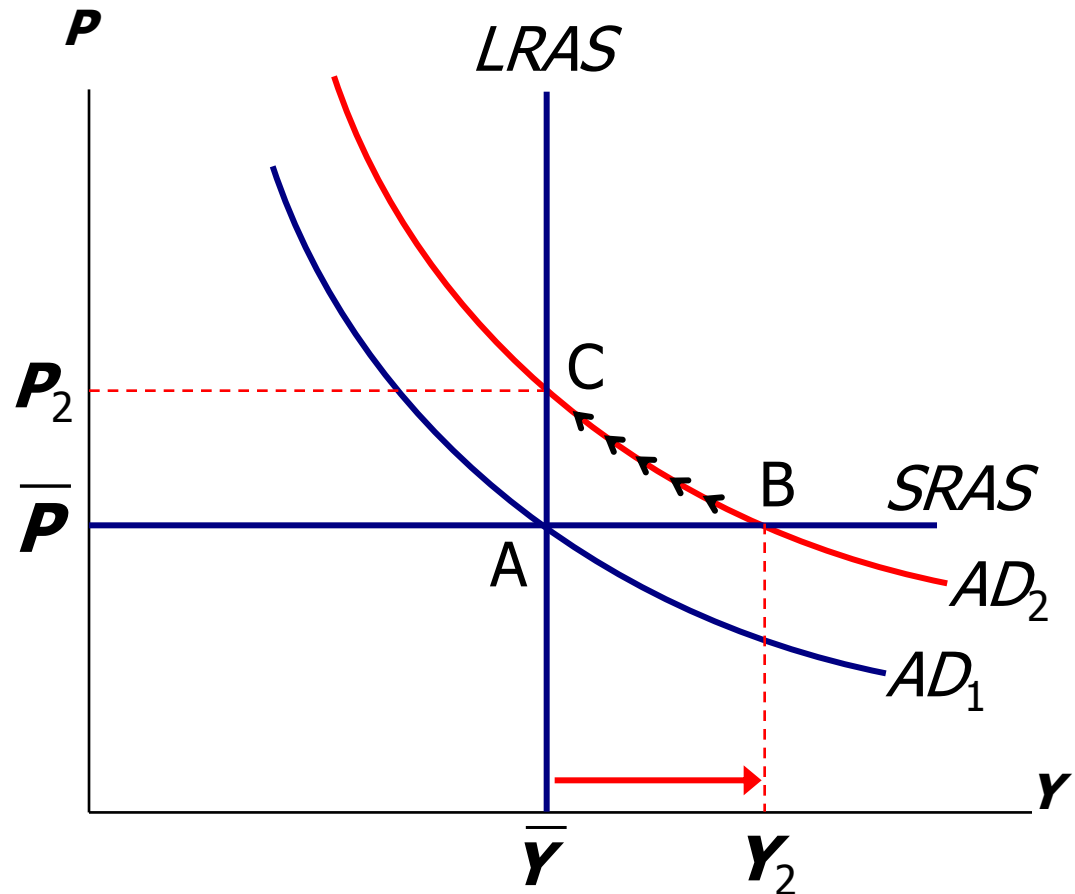
# AD-AS model

Short and Long-run effects of AD shift (increase in  $M$ )

A = initial equilibrium

B = new short-run equilibrium after increase  $M$

C = long-run equilibrium



# AD-AS model

## Summary of basic model

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- Bad news – recessions are inevitable
- Good news – hope for adjustment

**BUT!!!**      Reality strikes back

- Money supply changes are predictable (CB), however, other **shocks** may shift both curves – unpredictable and even simultaneous
- Adjustment takes a **long time** – do we need “nudge” from government?

# AD-AS model

## 1. Introduction of shocks

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Shocks:

- exogenous changes in aggregate supply or demand
- temporarily push the economy away from full-employment

### AD shocks

- Lower export demand
- Lower consumer confidence
- Taxation

### AS shocks

- Changing import prices
- Natural disasters
- changing input costs

## CASE STUDY:

# The 1970s oil shocks

- Early 1970s: OPEC coordinates a reduction in the supply of oil.
- Oil prices rose
  - 11% in 1973
  - 68% in 1974
  - 16% in 1975
- Such sharp oil price increases are **supply shocks** because they significantly impact production costs and prices.

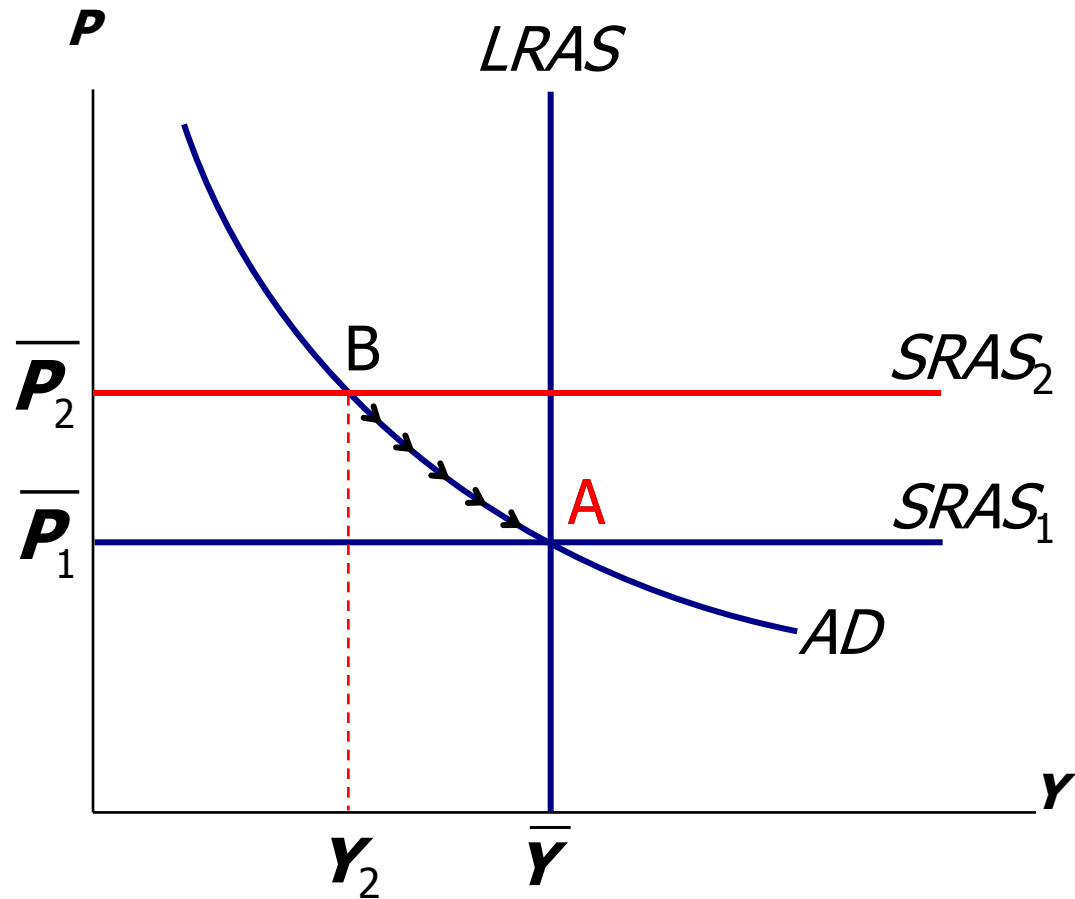
**Q1: How would this situations look depicted in AD-AS framework?**

## CASE STUDY:

# The 1970s oil shocks

The oil price shock shifts SRAS up, causing output and employment to fall.

In absence of further price shocks, prices will fall over time and economy moves back toward full employment.

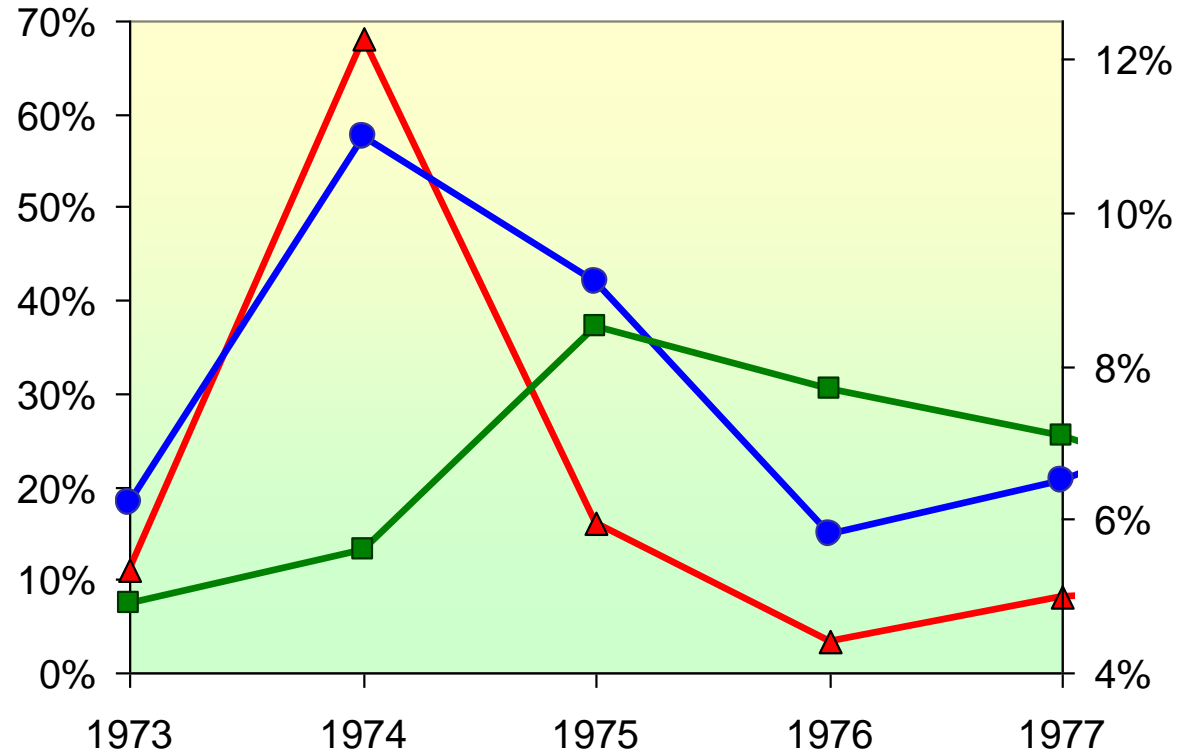


# CASE STUDY: The 1970s oil shocks

Predicted effects of  
the oil price shock:

- inflation  $\uparrow$
- output  $\downarrow$
- unemployment  $\uparrow$

...and then a  
gradual recovery.



—▲— Change in oil prices (left scale)

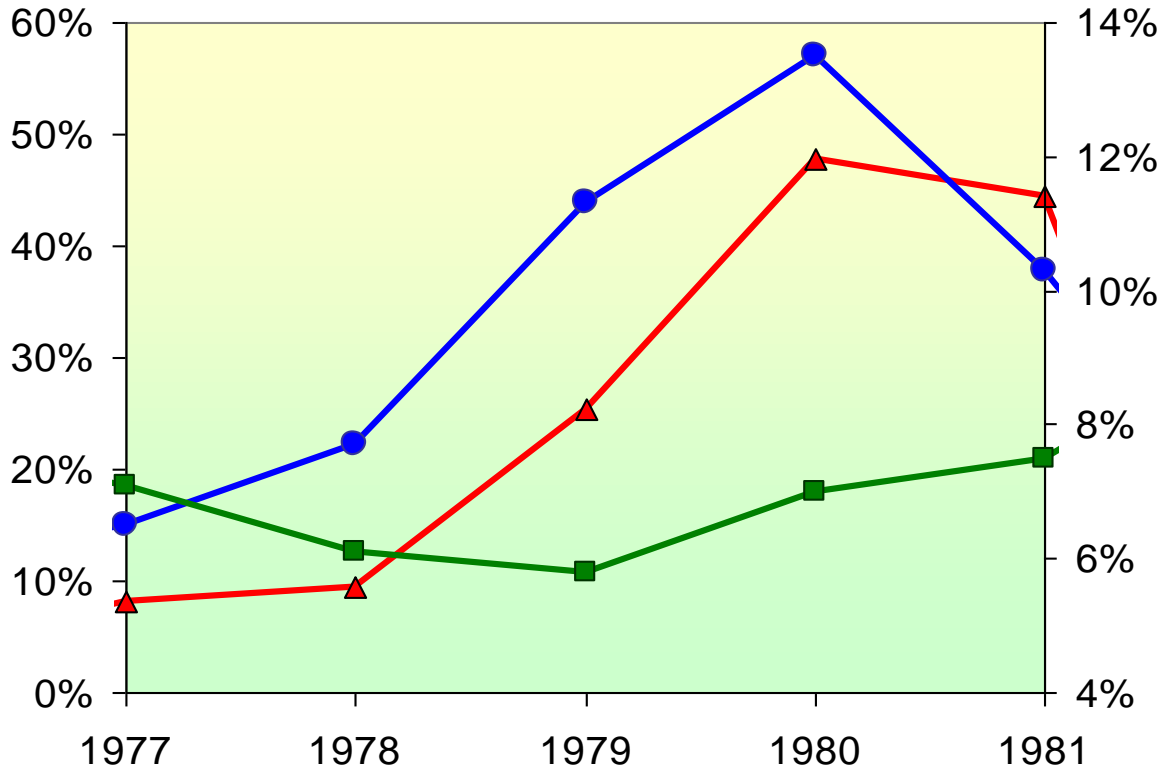
—●— Inflation rate-CPI (right scale)

—■— Unemployment rate (right scale)

# CASE STUDY: The 1970s oil shocks

Late 1970s:

As economy was recovering, oil prices shot up again, causing another huge supply shock!!!



- ▲— Change in oil prices (left scale)
- Inflation rate-CPI (right scale)
- Unemployment rate (right scale)

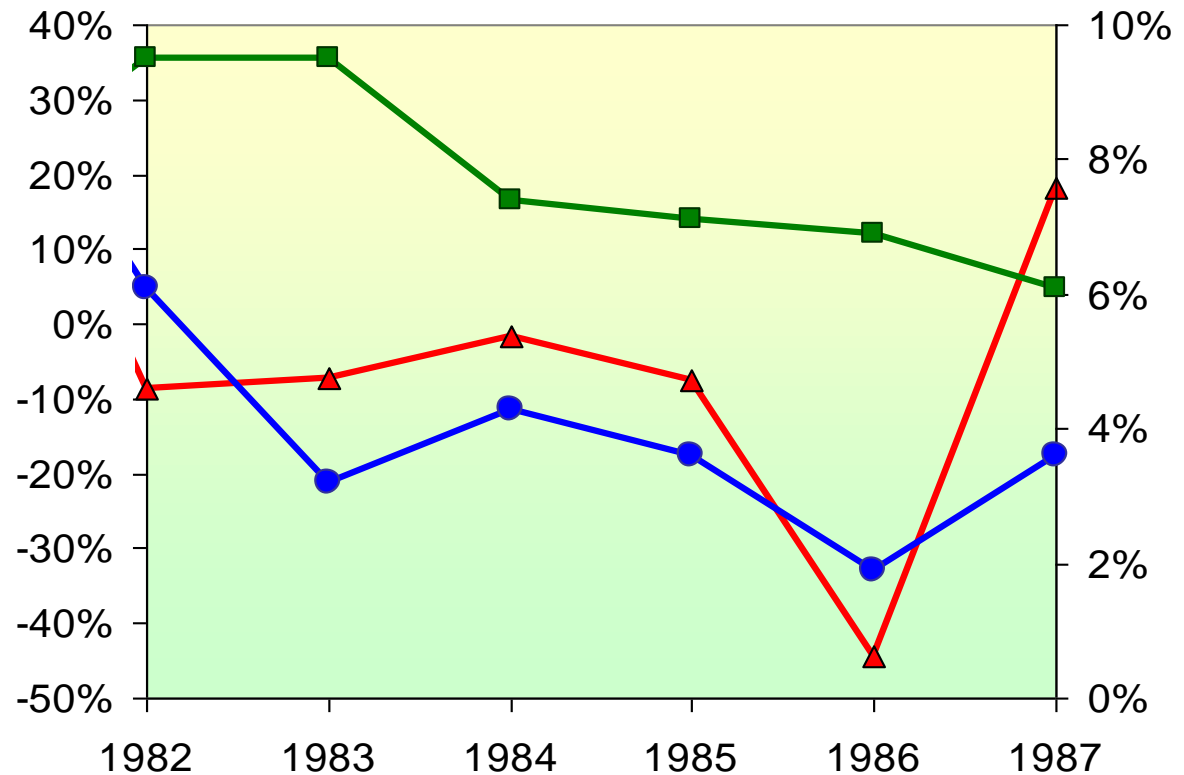
## CASE STUDY:

# The 1980s oil shocks

1980s:

A favorable supply shock-- a significant fall in oil prices.

As the model would predict, inflation and unemployment fell:



- ▲ Change in oil prices (left scale)
- Inflation rate-CPI (right scale)
- Unemployment rate (right scale)



# AS-AD model

## 2. Stabilization policy

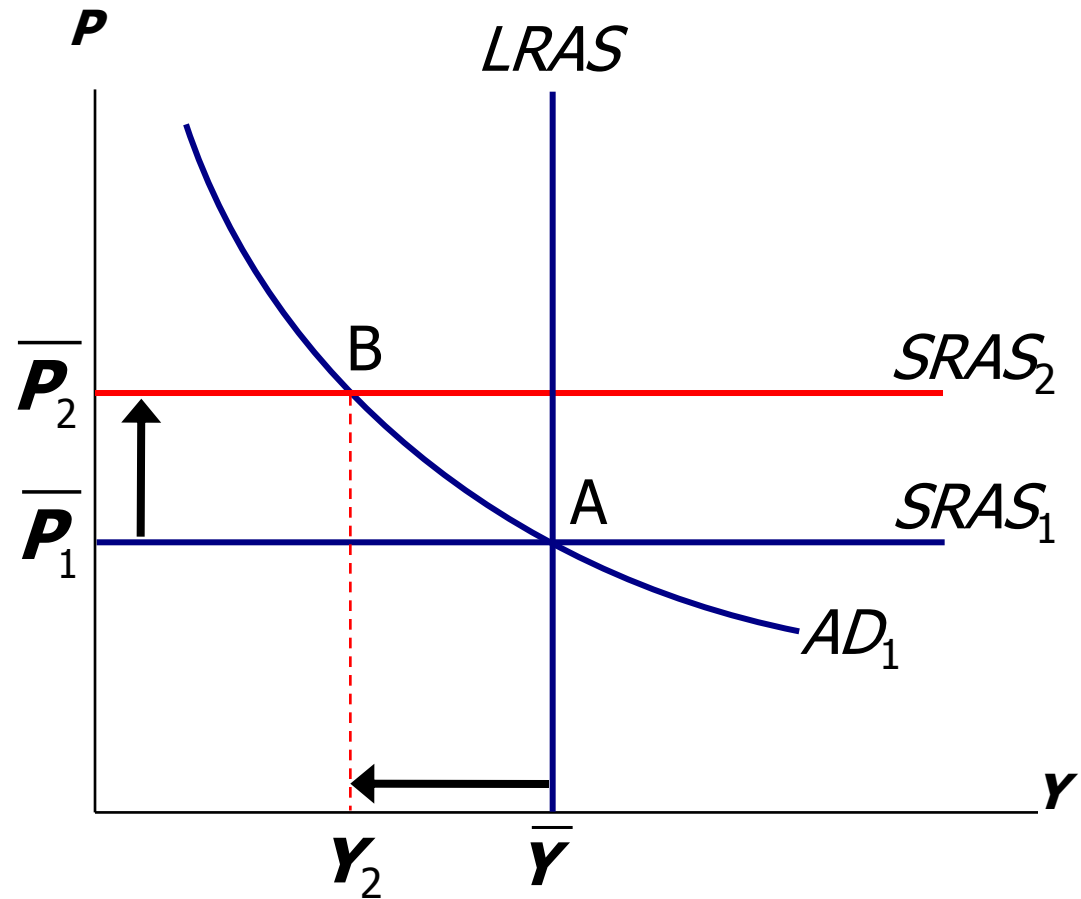
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- Definition: policy actions aimed at reducing the severity of short run economic fluctuations
- Types:
  - ▣ Laissez faire – no action, economy will self-adjust to optimal position
  - ▣ Fiscal policy: gvt expenditures, taxation (AD side)
    - Fiscal multiplier
  - ▣ Monetary policy: money supply and interest rates
    - Money multiplier
  - ▣ Supply side policy: incentives for work, saving, investment
  - ▣ Trade policy: e.g. reducing trade barriers

# AS-AD model

## 2. Stabilization policy – example of supply shock

The adverse supply shock moves the economy to point B.



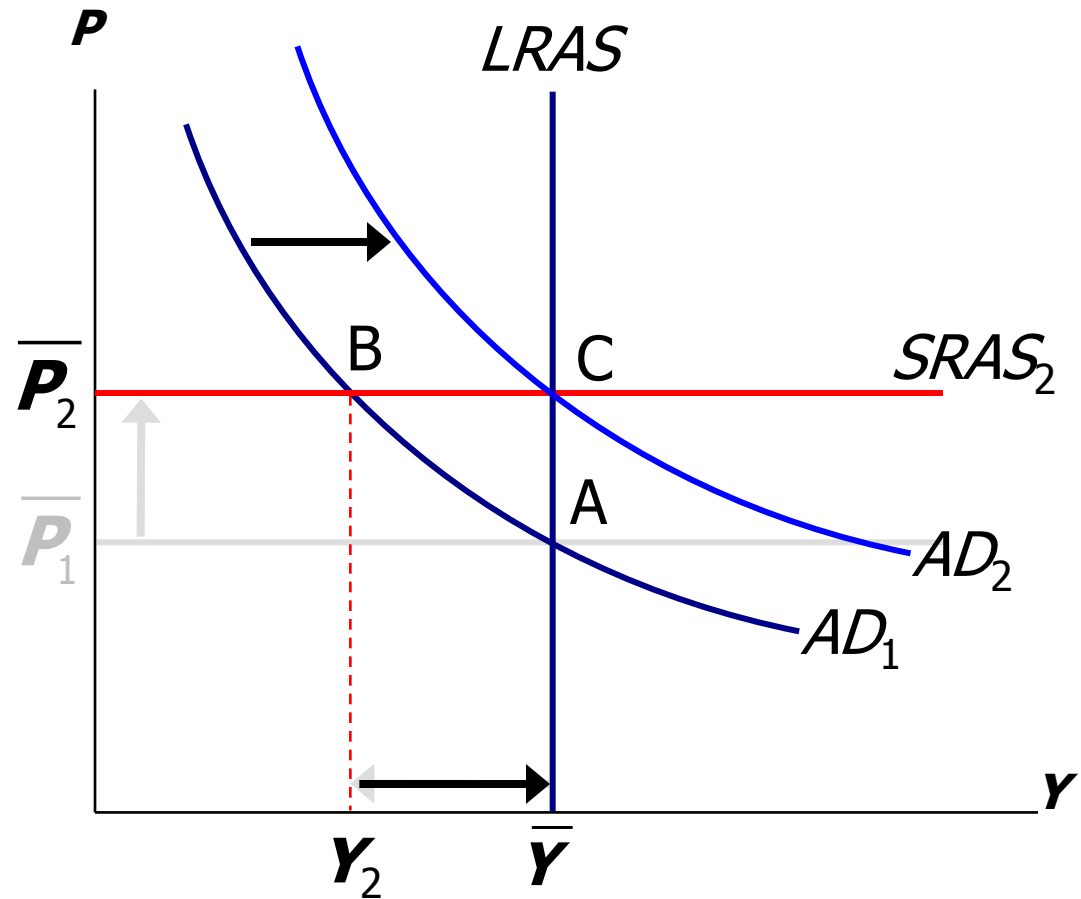
# AS-AD model

## 2. Stabilization policy – example of supply shock

But CB can accommodate the shock by raising agg. demand.

results:

$P$  is permanently higher, but  $Y$  remains at its full-employment level.



# AD-AS model

## Stabilization policy - concerns

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- Which type of policy tool is optimal?
- What would be the final result? Can we account for all the injections (multiplication) and leakages?
- How do we account for changing expectations?
- How do we trade between inflation and unemployment?