

# Ch 9. Introduction to Economic Fluctuations

Macroeconomics, 7<sup>th</sup> ed.

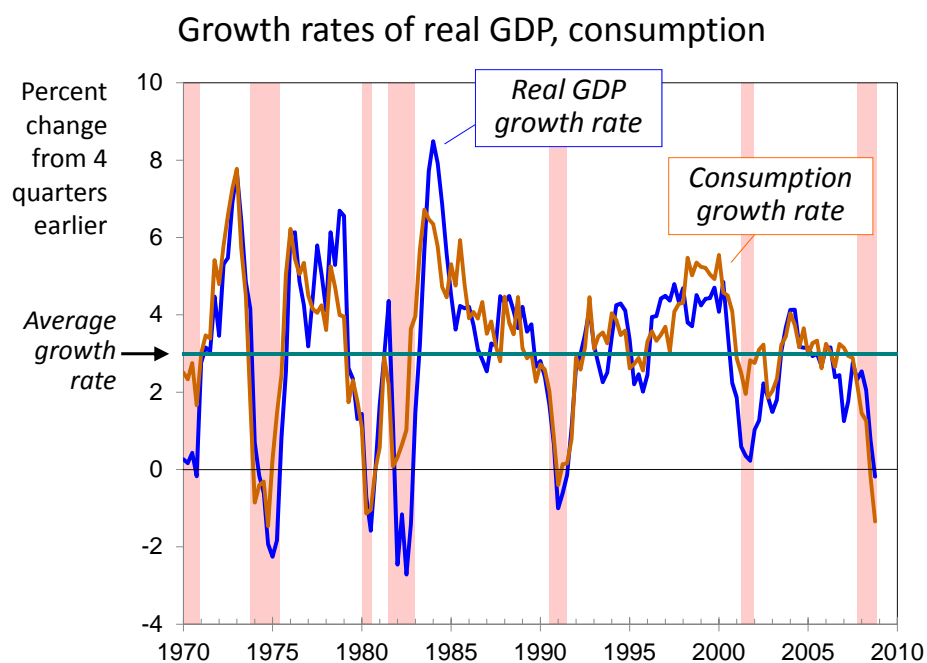
N. Gregory Mankiw

## Key Words

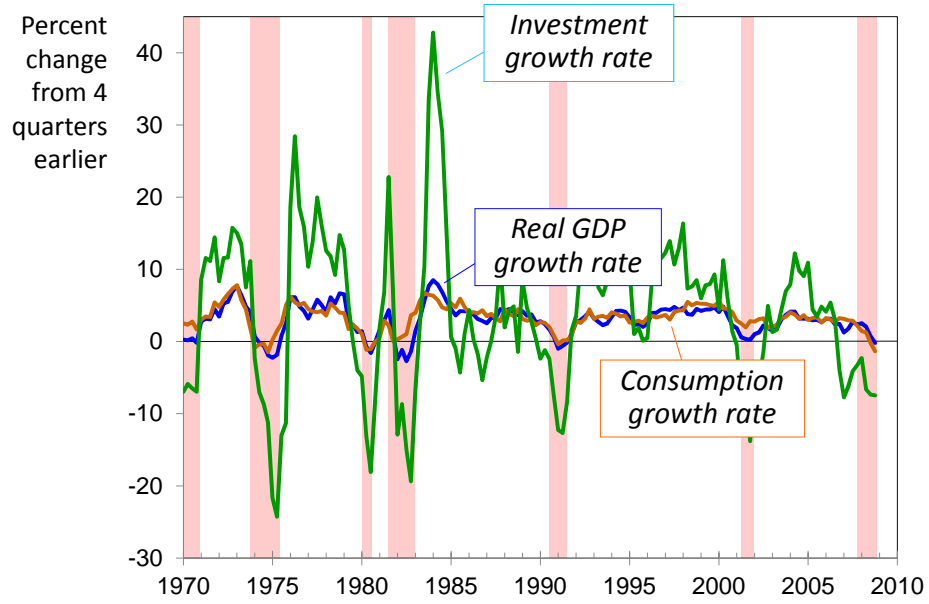
- the business cycle facts
- the short run vs. the long run
- aggregate demand
- aggregate supply in the short run and long run
- The model of aggregate demand and aggregate supply can be used to analyze the short-run and long-run effects of “shocks.”

## Facts about the business cycle

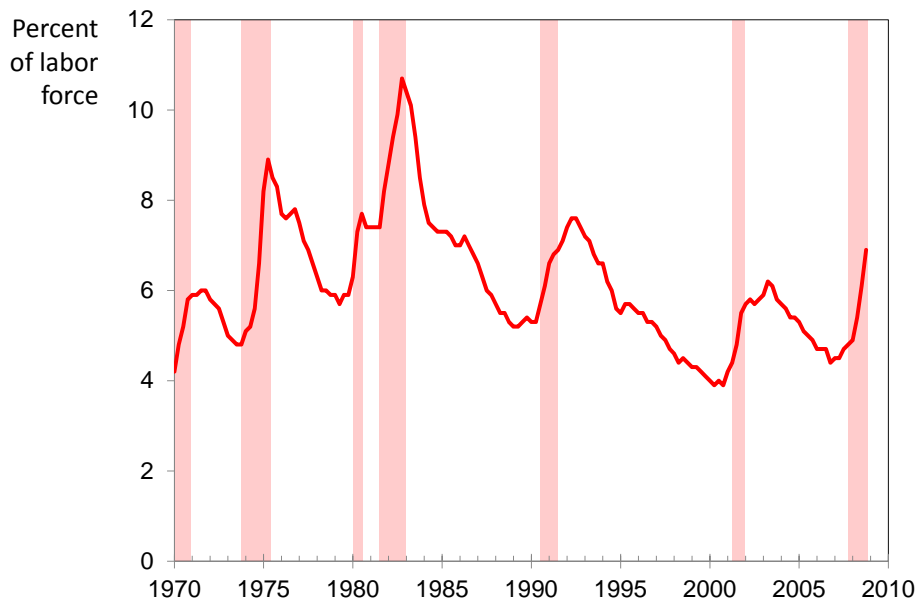
- GDP growth averages 3–3.5 percent per year over the long run with large fluctuations in the short run.
- Consumption and investment fluctuate with GDP, but consumption tends to be less volatile and investment more volatile than GDP.
- Unemployment rises during recessions and falls during expansions.
- **Okun's Law**: the negative relationship between GDP and unemployment.



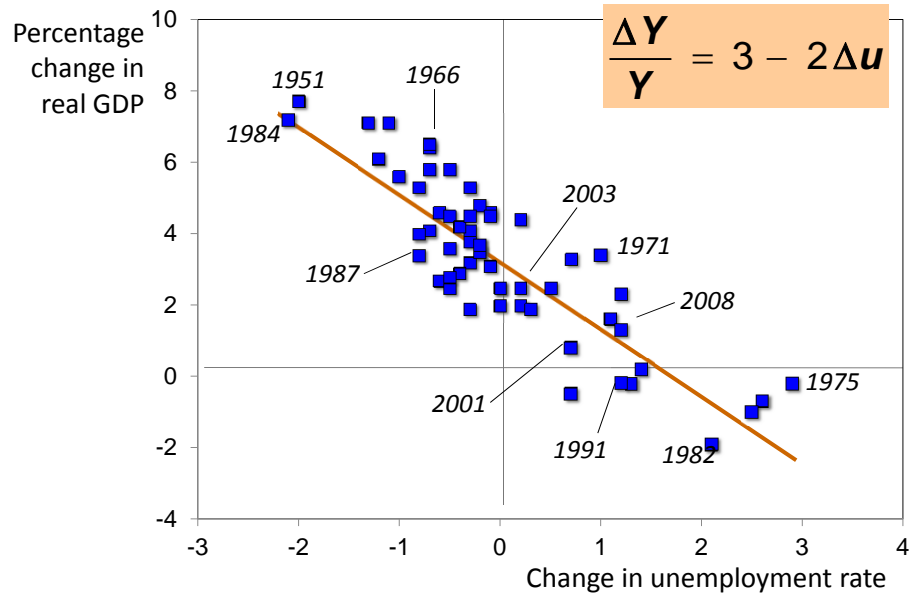
Growth rates of real GDP, consumption, investment



Unemployment



## Okun's Law

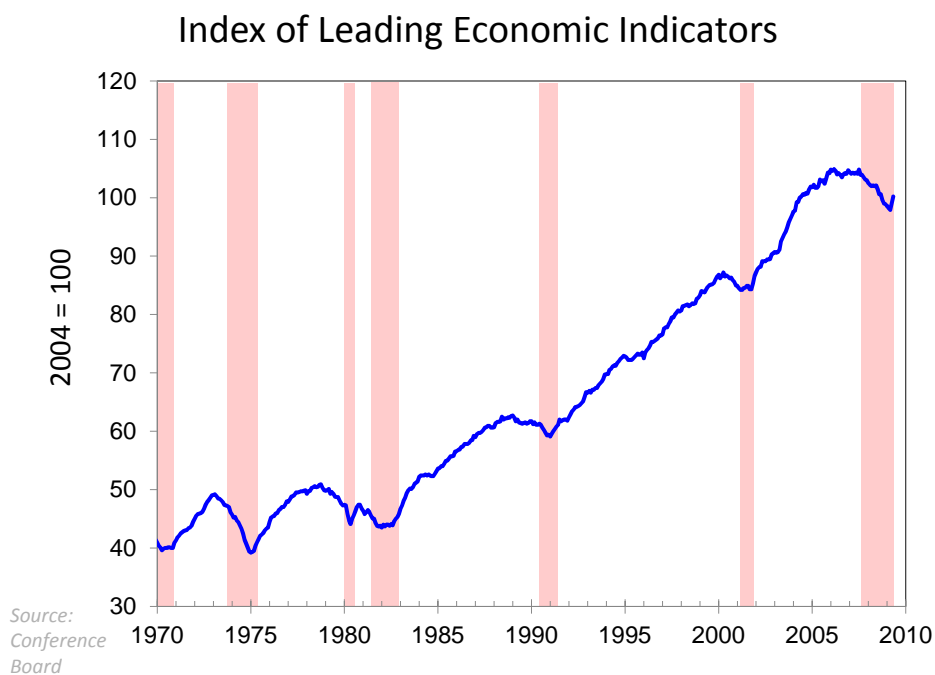


## Index of Leading Economic Indicators

- Published monthly by the Conference Board.
- Aims to forecast changes in economic activity 6-9 months into the future.
- Used in planning by businesses and govt, despite not being a perfect predictor.

## Components of the LEI index

- Average workweek in manufacturing
- Initial weekly claims for unemployment insurance
- New orders for consumer goods and materials
- New orders, nondefense capital goods
- Vendor performance
- New building permits issued
- Index of stock prices
- M2
- Yield spread (10-year minus 3-month) on Treasuries
- Index of consumer expectations



## Time horizons in macroeconomics

- Long run  
Prices are flexible, respond to changes in supply or demand.
- Short run  
Many prices are “sticky” at a predetermined level.

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

## Recap of classical macro theory

(Chaps. 3-8)

- Output is determined by the supply side:
  - supplies of capital, labor
  - technology
- Changes in demand for goods & services (**C**, **I**, **G**) only affect prices, not quantities.
- Assumes complete price flexibility.
- Applies to the long run.

## When prices are sticky...

...output and employment also depend on demand,  
which is affected by

- fiscal policy ( $G$  and  $T$ )
- monetary policy ( $M$ )
- other factors, like exogenous changes in  $C$  or  $I$ .

## The model of aggregate demand and supply

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

## Aggregate demand

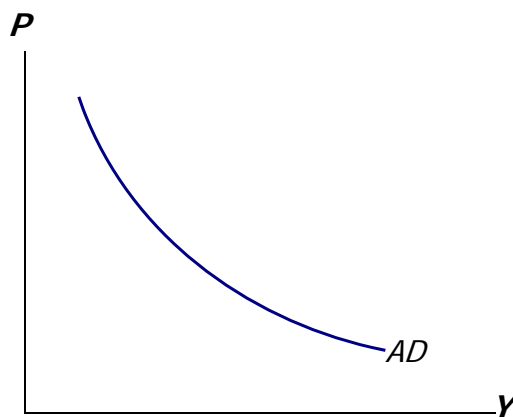
- The aggregate demand curve shows the relationship between the price level and the quantity of output demanded.
- For this chapter's intro to the *AD/AS* model, we use a simple theory of aggregate demand based on the quantity theory of money.
- Chapters 10-12 develop the theory of aggregate demand in more detail.

### The Quantity Equation as Aggregate Demand

- From Chapter 4, recall the quantity equation
$$MV = PY$$
- For given values of *M* and *V*, this equation implies an inverse relationship between *P* and *Y*:

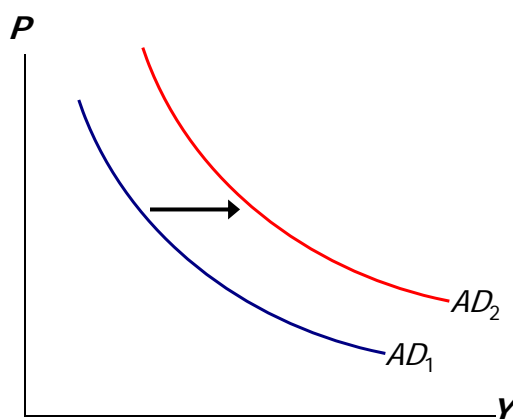
## The downward-sloping $AD$ curve

An increase in the price level causes a fall in real money balances ( $M/P$ ), causing a decrease in the demand for goods & services.



## Shifting the $AD$ curve

An increase in the money supply shifts the  $AD$  curve to the right.



## Aggregate supply in the long run

- Recall from Chapter 3:  
In the long run, output is determined by factor supplies and technology

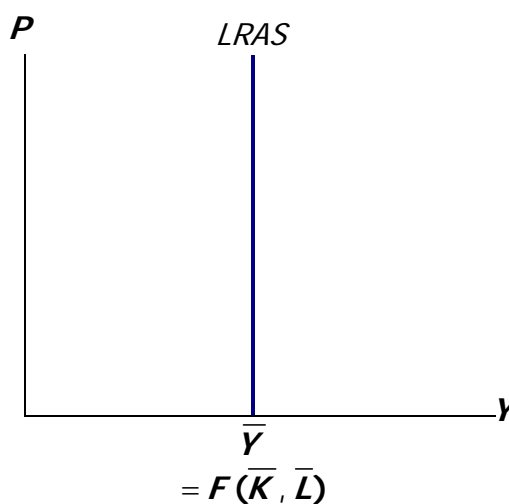
$$\bar{Y} = F(\bar{K}, \bar{L})$$

$\bar{Y}$  is the **full-employment** or **natural** level of output, at which the economy's resources are fully employed.

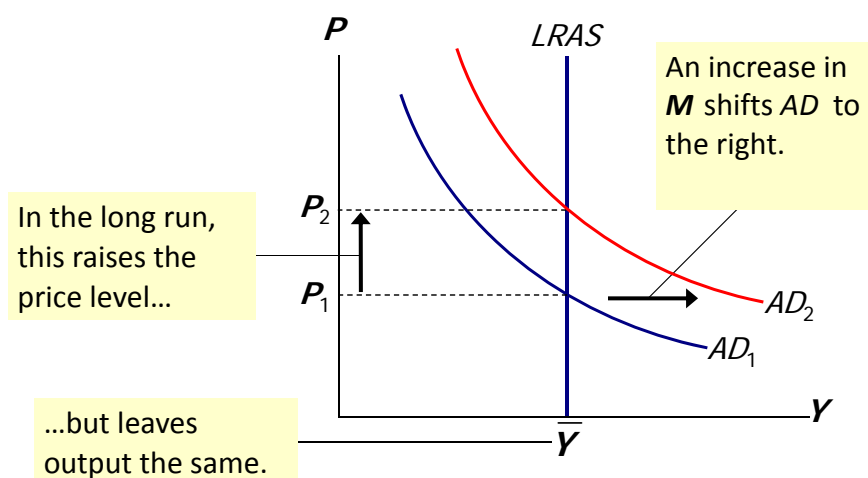
*“Full employment” means that unemployment equals its natural rate (not zero).*

## The long-run aggregate supply curve

$\bar{Y}$  does not depend on  $P$ , so  $LRAS$  is vertical.



## Long-run effects of an increase in $M$

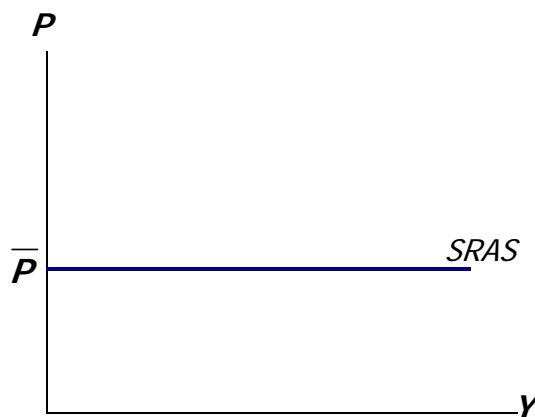


## Aggregate supply in the short run

- Many prices are sticky in the short run.
- For now (and through Chap. 12), we assume
  - all prices are stuck at a predetermined level in the short run.
  - firms are willing to sell as much at that price level as their customers are willing to buy.
- Therefore, the short-run aggregate supply ( $SRAS$ ) curve is horizontal:

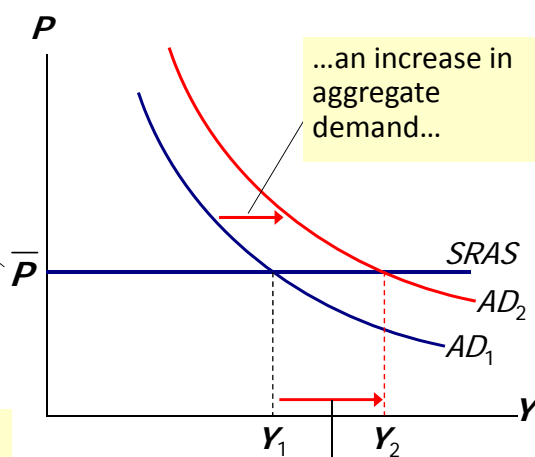
## The short-run aggregate supply curve

The *SRAS* curve is horizontal:  
The price level is fixed at a predetermined level, and firms sell as much as buyers demand.



## Short-run effects of an increase in $M$

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



...an increase in aggregate demand...

...causes output to rise.

## From the short run to the long run

Over time, prices gradually become “unstuck.”

When they do, will they rise or fall?

| In the short-run equilibrium, if | then over time, $P$ will... |
|----------------------------------|-----------------------------|
| $Y > \bar{Y}$                    | <i>rise</i>                 |
| $Y < \bar{Y}$                    | <i>fall</i>                 |
| $Y = \bar{Y}$                    | <i>remain constant</i>      |

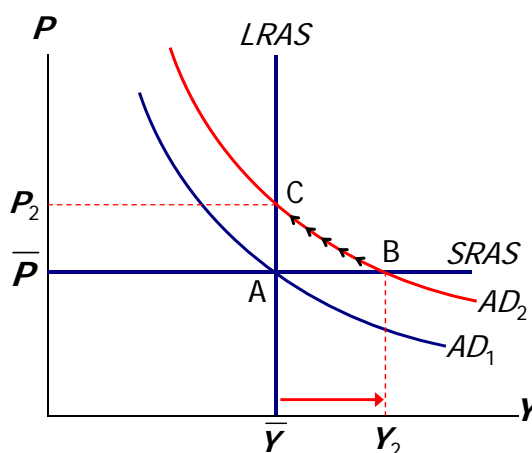
***The adjustment of prices is what moves the economy to its long-run equilibrium.***

## The SR & LR effects of $\Delta M > 0$

A = initial equilibrium

B = new short-run eq'm after Fed increases  $M$

C = long-run equilibrium



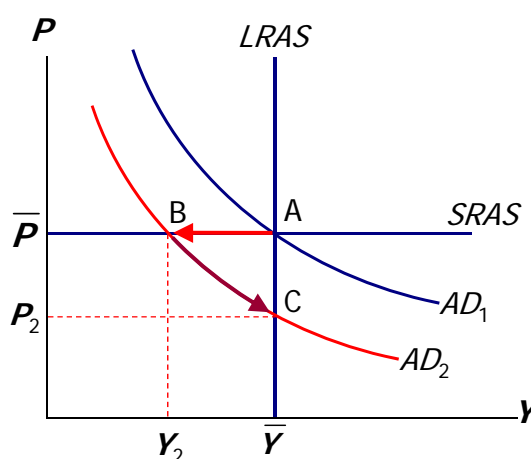
## How shocking!!!

- **Shocks:** exogenous changes in agg. supply or demand
- Shocks temporarily push the economy away from full employment.
- Example: exogenous decrease in velocity  
If the money supply is held constant, a decrease in  $V$  means people will be using their money in fewer transactions, causing a decrease in demand for goods and services.

### The effects of a negative demand shock

AD shifts left, depressing output and employment in the short run.

Over time, prices fall and the economy moves down its demand curve toward full-employment.



## Supply shocks

- A **supply shock** alters production costs, affects the prices that firms charge. (also called **price shocks**)
- Examples of adverse supply shocks:
  - Bad weather reduces crop yields, pushing up food prices.
  - Workers unionize, negotiate wage increases.
  - New environmental regulations require firms to reduce emissions. Firms charge higher prices to help cover the costs of compliance.
- Favorable supply shocks lower costs and prices.
  - Reduction in the price of oil

### CASE STUDY:

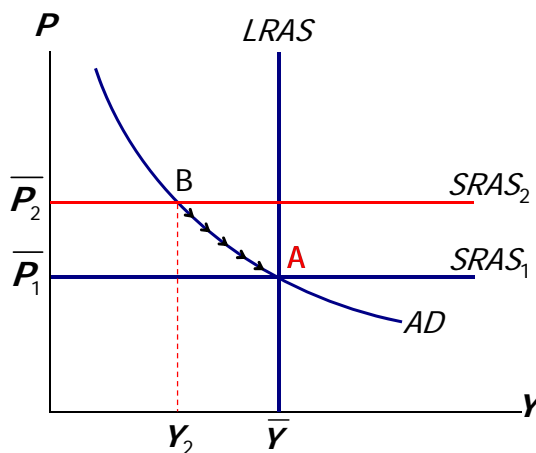
#### The 1970s oil shocks

- 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.

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.

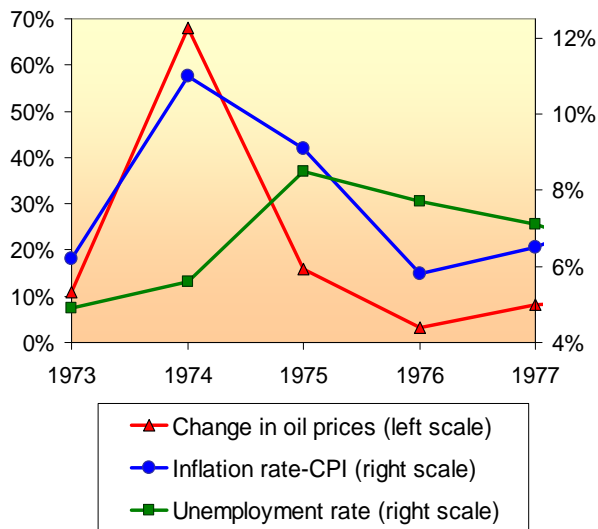


CASE STUDY:  
The 1970s oil shocks

Predicted effects of the oil shock:

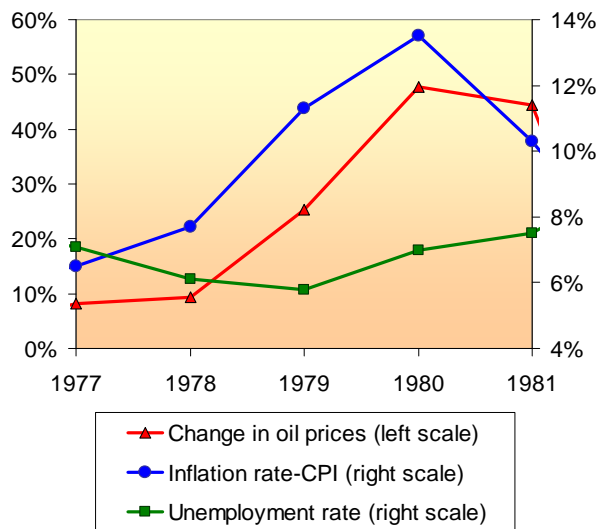
- inflation ↑
- output ↓
- unemployment ↑

...and then a gradual recovery.



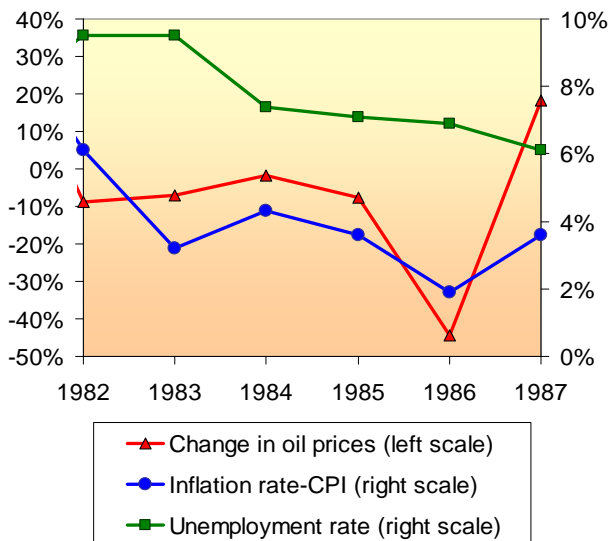
### CASE STUDY: The 1970s oil shocks

Late 1970s:  
As economy was recovering, oil prices shot up again, causing another huge supply shock!!!

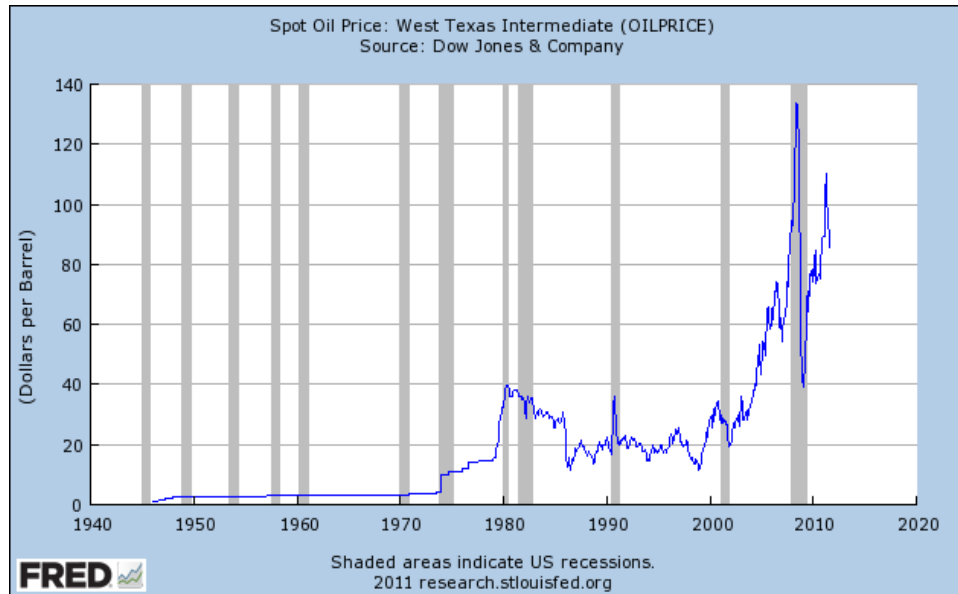


### CASE STUDY: The 1980s oil shocks

1980s:  
A favorable supply shock-- a significant fall in oil prices. As the model predicts, inflation and unemployment fell:



## The Oil Price

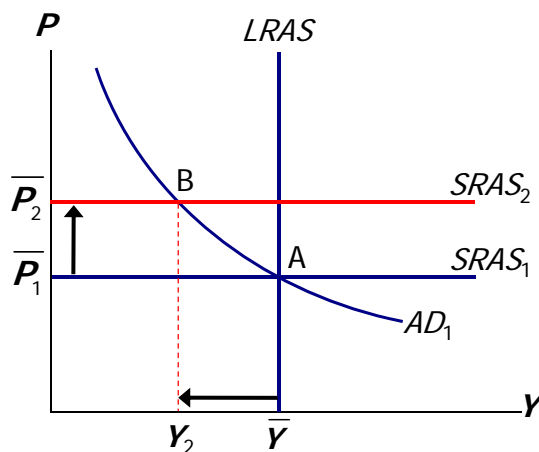


## Stabilization policy

- Def: policy actions aimed at reducing the severity of short-run economic fluctuations.
- Example: Using monetary policy to combat the effects of adverse supply shocks...

## Stabilizing output with monetary policy

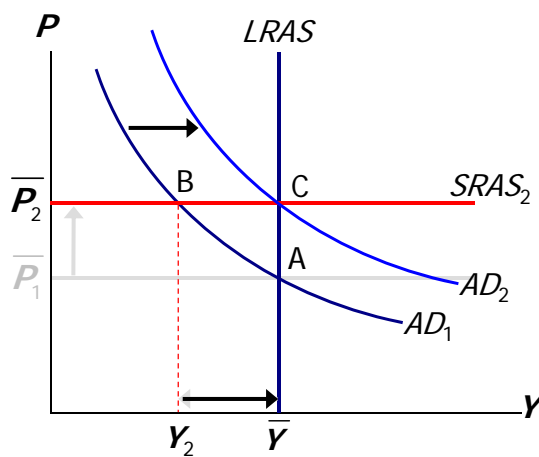
The adverse supply shock moves the economy to point B.



## Stabilizing output with monetary policy

But the Fed accommodates the shock by raising agg. demand.

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

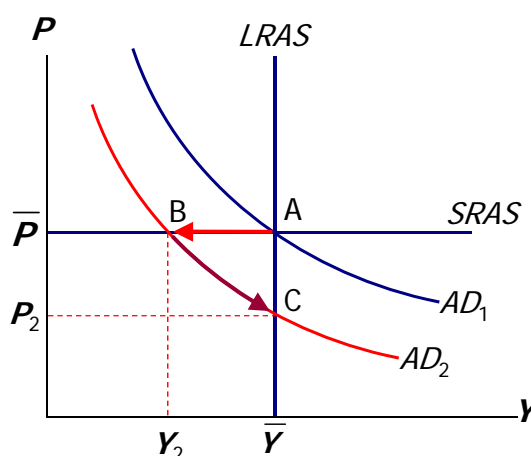


## Stabilization of a negative demand shock

AD shifts left due to a demand shock

Over time, prices fall and the economy moves down its demand curve toward full-employment.

What can the Fed do about this situation?



## Assignment

- (Problem 9.3)

Let's examine how the goals of the Fed influence its response to shocks. Suppose Fed A cares only about keeping the price level stable and Fed B cares only about keeping output and employment at their natural levels. Explain how each Fed would respond to the following.

- An exogenous decrease in the velocity of money
- An exogenous increase in the price of oil

## Numerical Problem

Assume that the long-run aggregate supply is vertical at  $Y = 3,000$  while the short-run aggregate supply curve is horizontal at  $P = 1.0$ . The aggregate demand curve is and  $M = 1,500$ .

- a. If the economy is initially in long-run equilibrium, what are the values of  $P$  and  $Y$ ?
- b. What is the velocity of money in this case?
- c. Suppose that, as banks start paying interest on checking accounts, the aggregate demand function shifts to . What are the short-run equilibrium values of  $P$  and  $Y$ ?
- d. What is the velocity of money in this case?
- e. With the new aggregate demand function, once the economy adjusts to long-run equilibrium, what are  $P$  and  $Y$ ?
- f. Draw an AD-AS diagram and mark the position of the economy (i) in the initial equilibrium, (ii) the short-run equilibrium, and (iii) the new long-run equilibrium by "A", "B", and "C", respectively.