Aggregate Demand and Aggregate Supply

PRINCIPLES OF
Economics

N. Gregory Mankiw

Lecture 10

In this chapter, look for the answers to these questions:

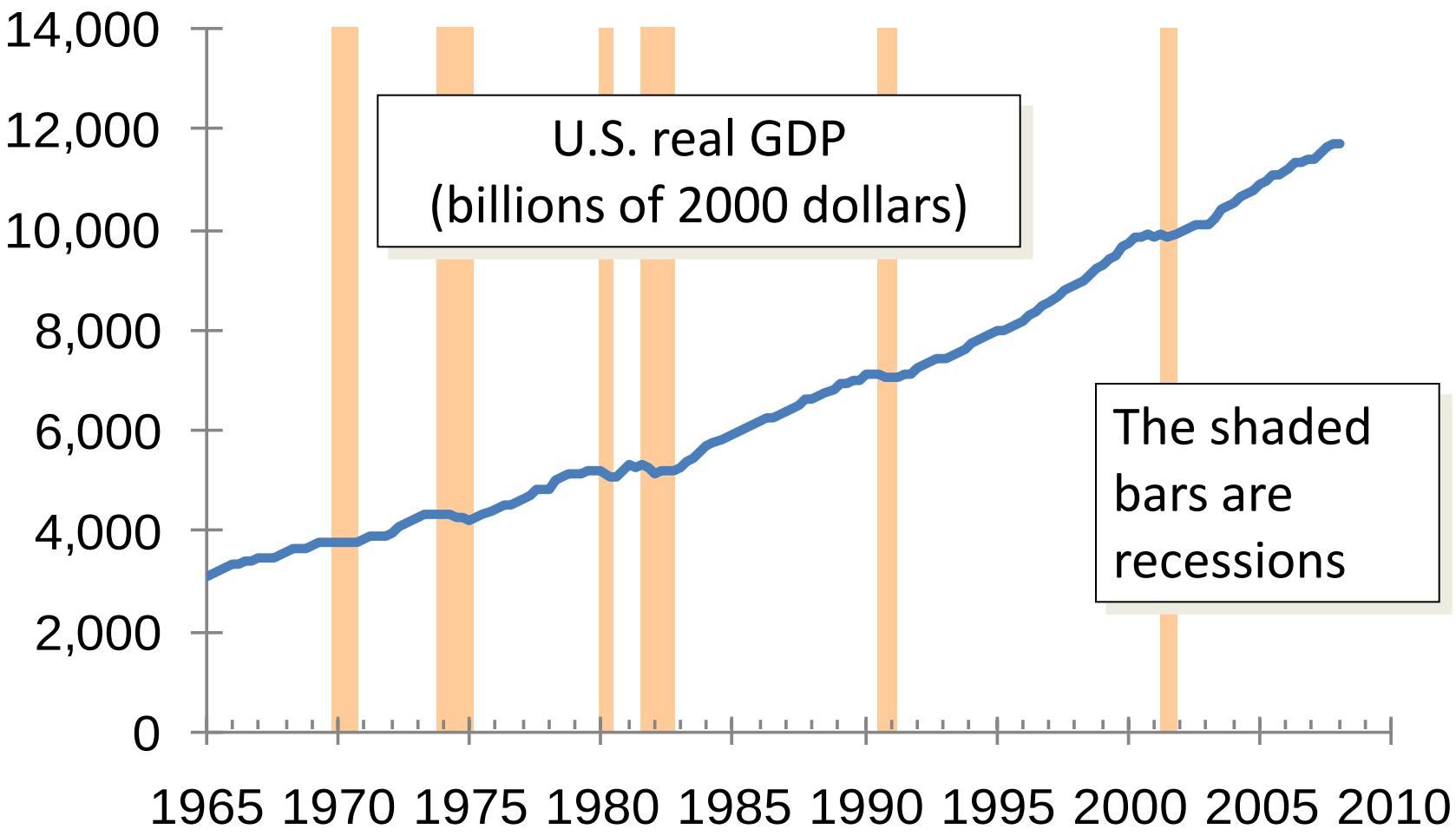
- What are economic fluctuations? What are their characteristics?
- How does the model of aggregate demand and aggregate supply explain economic fluctuations?
- Why does the Aggregate-Demand (AD) curve slope downward? What shifts the *AD* curve?
- What is the slope of the Aggregate-Supply (AS) curve in the short run? In the long run?
  What shifts the *AS* curve(s)?

Introduction

- Over the *long run*, real GDP in major industrial countries (such as USA) **grows** (about 3% per year on average).
- In the *short run*, GDP **fluctuates** around its trend.
  - **Recessions**: periods of falling real incomes and rising unemployment
  - **Depressions**: severe recessions (very rare)
- Short-run **economic fluctuations** are often called *business cycles*.

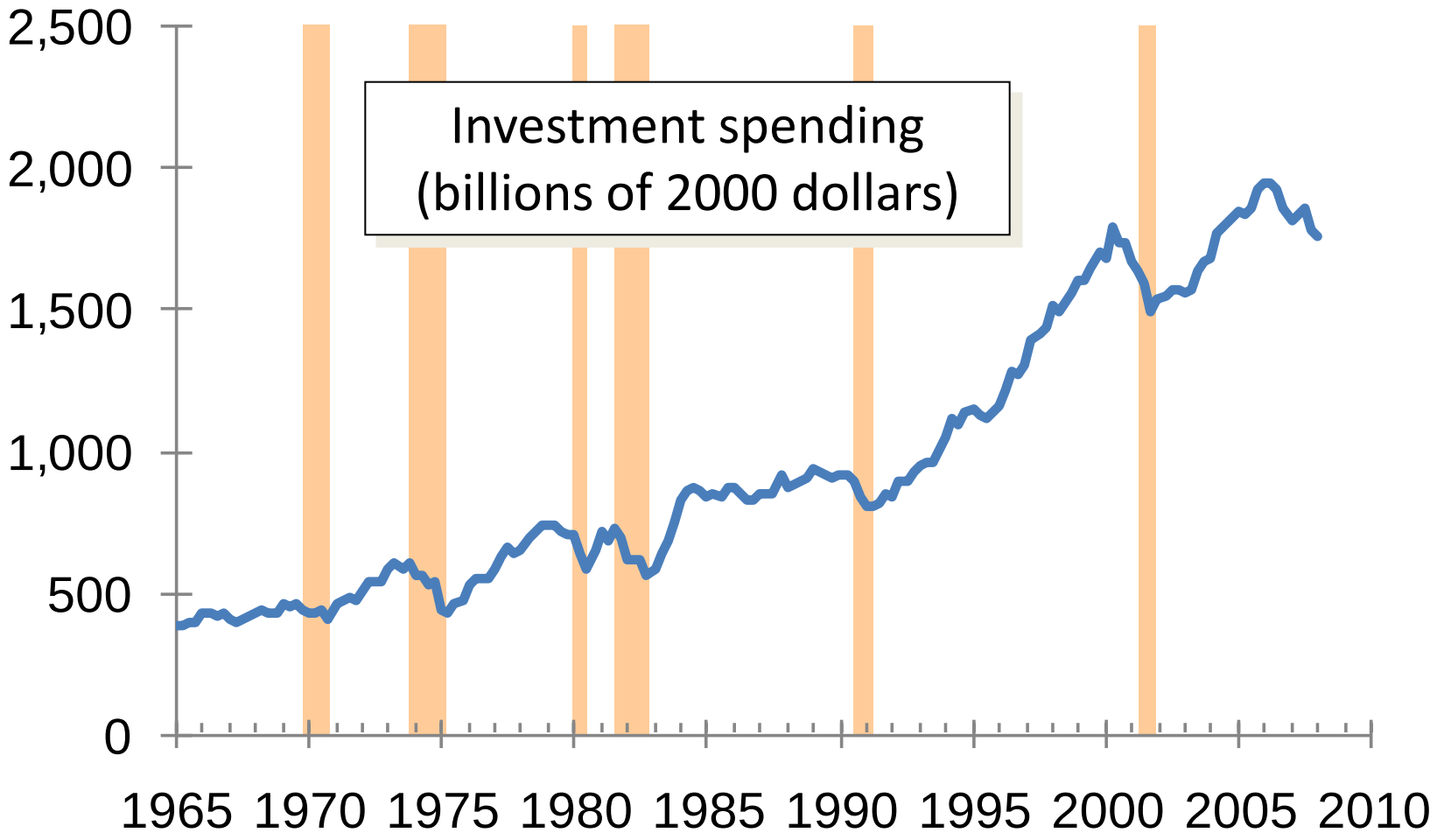
Three Facts About Economic Fluctuations

FACT 1: Economic fluctuations are **irregular** and **unpredictable**.



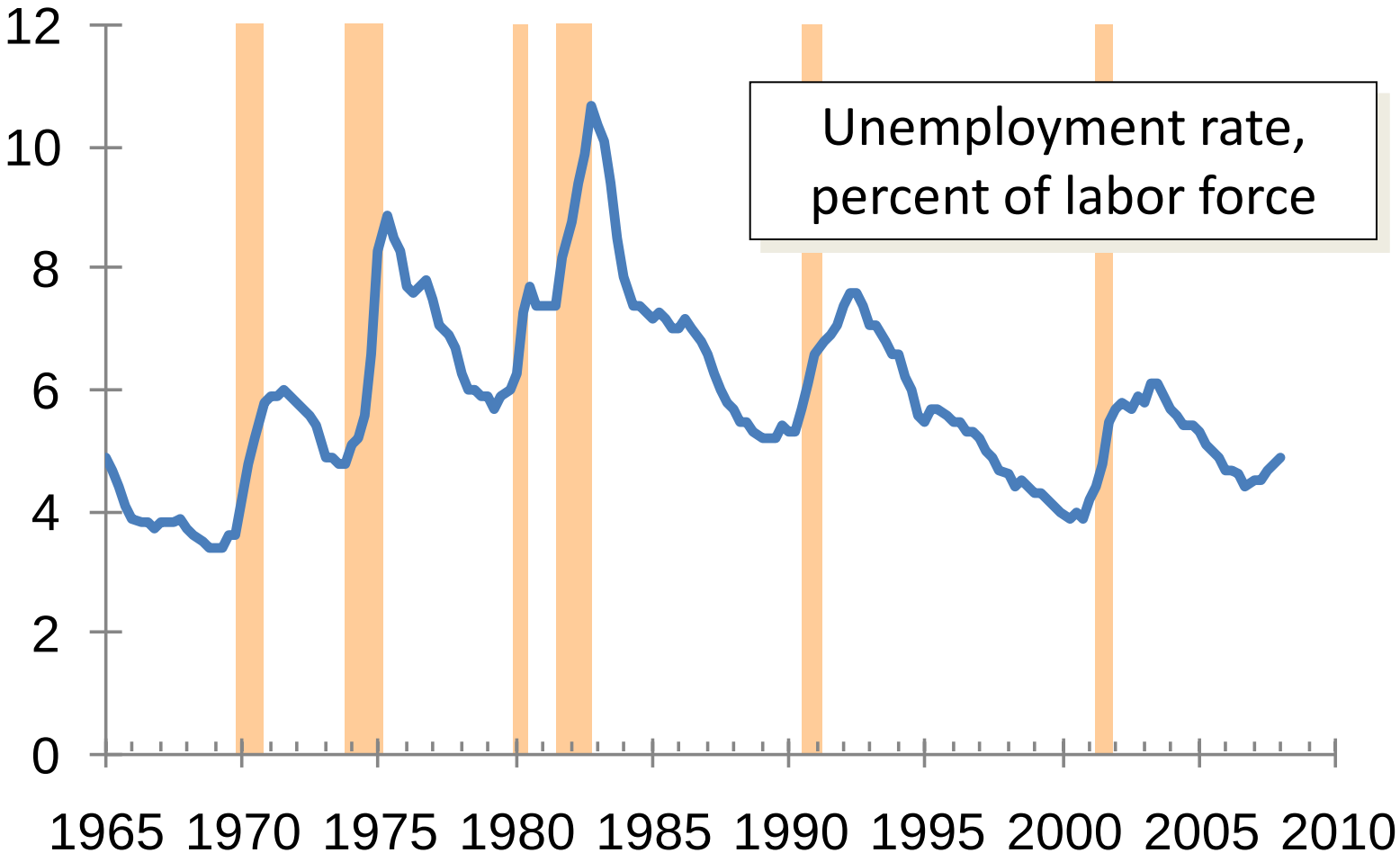
Three Facts About Economic Fluctuations

FACT 2: Most macroeconomic quantities fluctuate together.



Three Facts About Economic Fluctuations

FACT 3: As output falls, unemployment rises.



(2) Explaining Short-Run Economic Fluctuations

(A) Classical Economics—A Recap

- The previous chapters are based on the ideas of classical economics, especially:
- The **Classical Dichotomy**, the separation of variables into two groups:
  - Real – quantities, relative prices
  - Nominal – measured in terms of money
- The **neutrality of money**:
  Changes in the money supply affect nominal but not real variables.

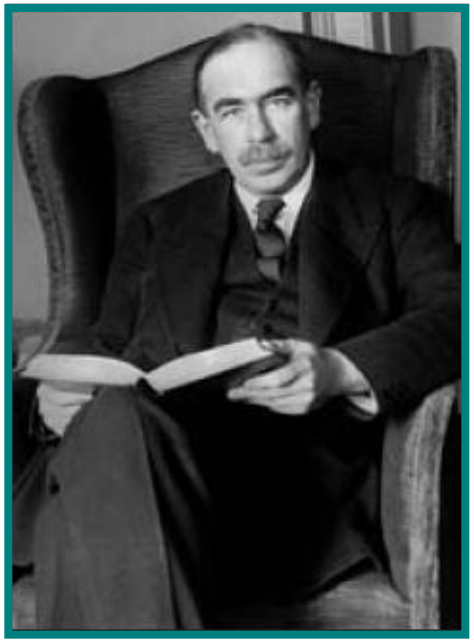
Classical Economics—A Recap

- Most economists believe classical theory describes the world in the long run, but not the short run.
- In the short run, changes in nominal variables (like the money supply or ***P***) can affect real variables (like ***Y*** or the u-rate).
- To study the short run, we use a new model (the AD and AS model).

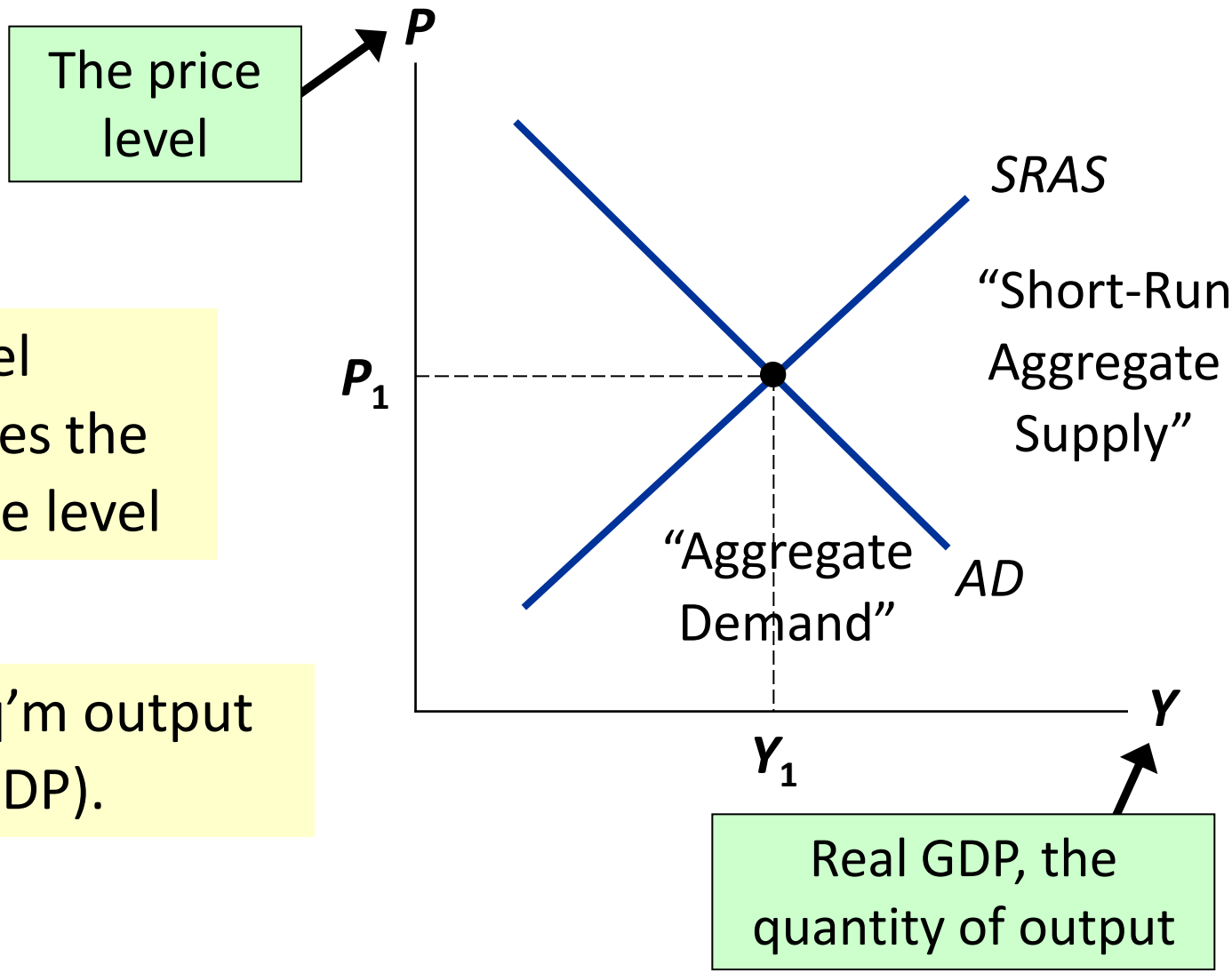
FYI: John Maynard Keynes, 1883-1946

- *The General Theory of Employment, Interest, and Money*, 1936
- Argued recessions and depressions can result from inadequate demand; policymakers should shift *AD*.
- Famous critique of classical theory:

  The long run is a misleading guide to current affairs. In the long run, we are all dead.



(B) The Model of Aggregate Demand and Aggregate Supply



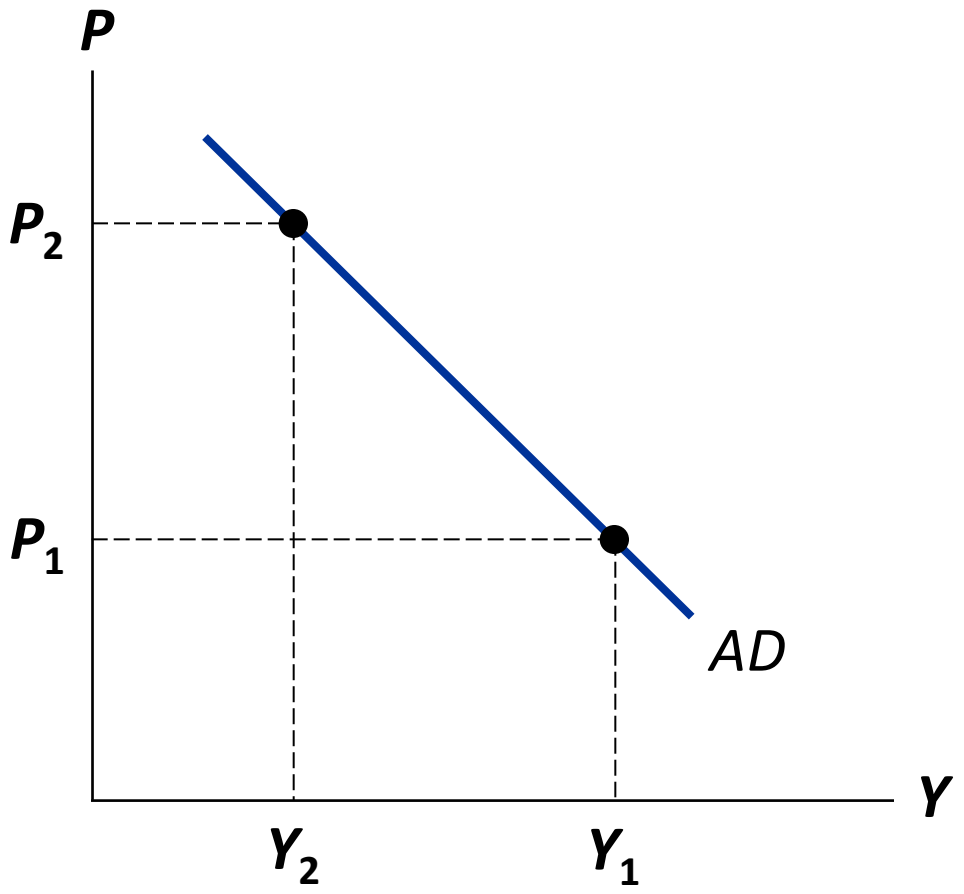
The model determines the eq'm price level

and eq'm output (real GDP).

(3) The Aggregate-Demand Curve

The Aggregate-Demand (*AD*) Curve

The ***AD* curve** shows the quantity of all g&s demanded in the economy at any given price level.

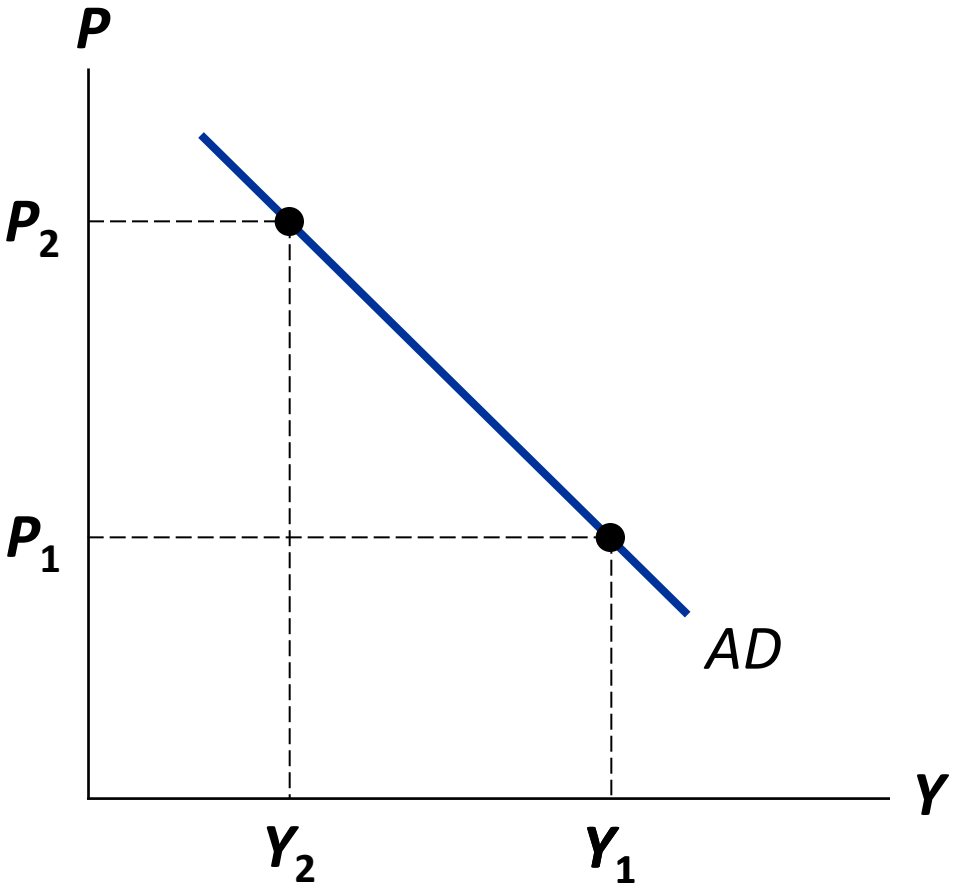


(A) Why the *AD* Curve Slopes Downward

AD = Y = C + I + G + NX

Assume ***G*** fixed by government policy.

To understand the slope of *AD*, must determine how a change in ***P*** affects ***C***, ***I***, and ***NX***.



The Wealth Effect (*P* and *C*)

Suppose ***P*** rises.

- The money (with fixed nominal value) people hold buy fewer g&s,
  so real wealth is lower.
- People feel poorer.

Result: ***C*** falls.

The Interest-Rate Effect (*P* and *I*)

Suppose ***P*** rises.

- Buying g&s requires more money.
- To get these money, people sell bonds or other assets.
- This drives down bond prices and drives up interest rates.

Result: ***I*** falls.
(Recall, ***I*** depends negatively on interest rates.)

The Exchange-Rate Effect (*P* and *NX*)

Suppose ***P*** rises.

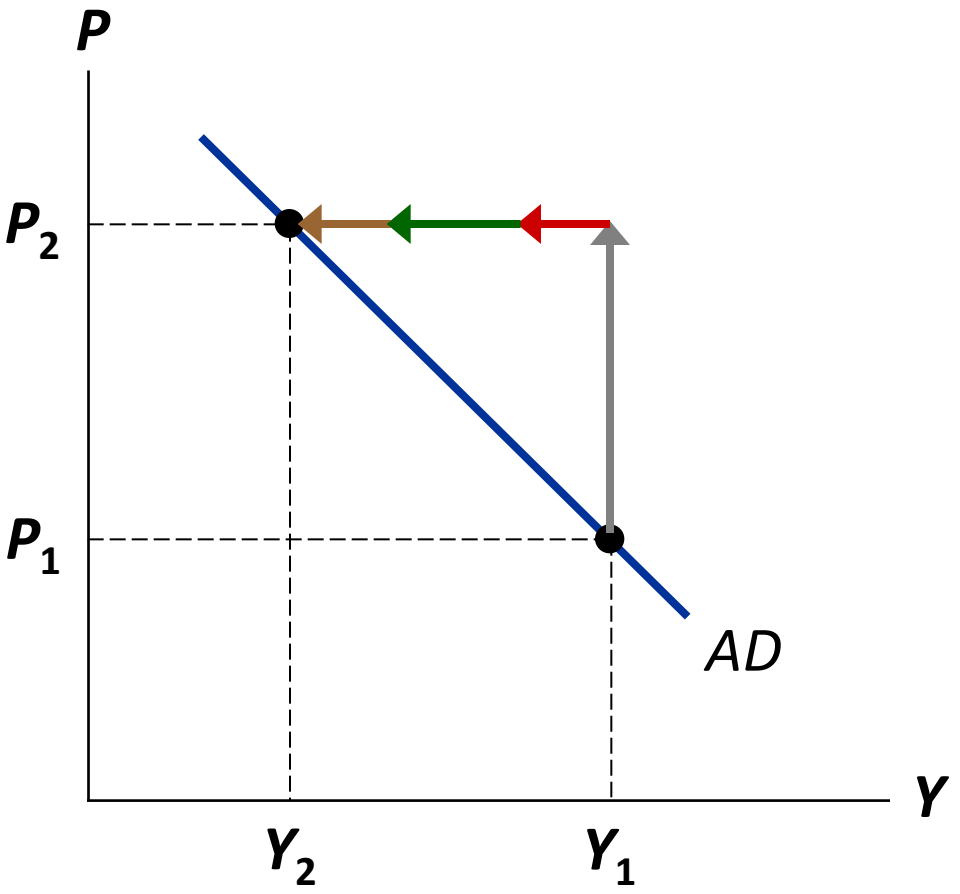
- D.E. interest rates rise (the interest-rate effect).
- Foreign investors desire more D.E. bonds.
- Higher demand for domestic currency in foreign exchange market.
- D.E. exchange rate appreciates.
- Domestic exports more expensive to people abroad, imports cheaper to domestic residents.

Result: ***NX*** falls.

The Slope of the *AD* Curve: Summary

An increase in ***P*** reduces the quantity of g&s demanded because:

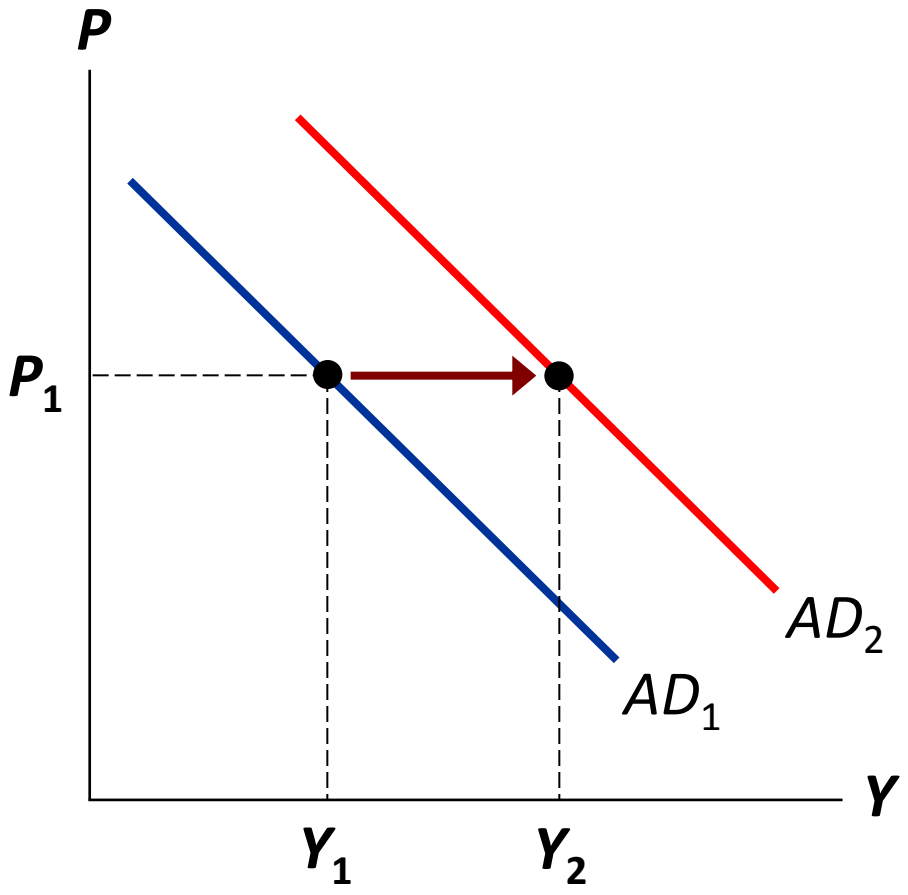
- the wealth effect (***C*** falls)
- the interest-rate effect (***I*** falls)
- the exchange-rate effect (***NX*** falls)



(B) Why the *AD* Curve Might Shift

Any event that changes ***C***,
I, ***G***, or ***NX***
– except a change in ***P*** –
will shift the *AD* curve.

Example:
A stock market boom
makes households feel
wealthier, ***C*** rises,
the *AD* curve shifts right.



Why the *AD* Curve Might Shift

- Changes in ***C***
  - Stock market boom/crash
  - Preferences regarding consumption/saving tradeoff
  - Tax hikes/cuts
- Changes in ***I***
  - Firms buy new computers, equipment, factories
  - Expectations, optimism/pessimism
  - Interest rates, monetary policy
  - Investment Tax Credit or other tax incentives

Why the *AD* Curve Might Shift

- Changes in ***G***
  - Federal (Central) government spending, *e.g.,* defense
  - State & local spending, *e.g.,* roads, schools
- Changes in ***NX***
  - Booms/recessions in countries that buy our exports.
  - Appreciation/depreciation resulting from international speculation in foreign exchange market

ACTIVE LEARNING *1*
The Aggregate-Demand curve

What happens to the *AD* curve in each of the following scenarios?

A. A ten-year-old investment tax credit expires.

B. The D.E. exchange rate falls.

C. A fall in prices increases the real value of consumers' wealth.

ACTIVE LEARNING *1*
Answers

A. A ten-year-old investment tax credit expires.

I falls, *AD* curve shifts left.

B. The D.E. exchange rate falls.

NX rises, *AD* curve shifts right.

C. A fall in prices increases the real value of consumers' wealth.

Move down along *AD* curve (wealth-effect).

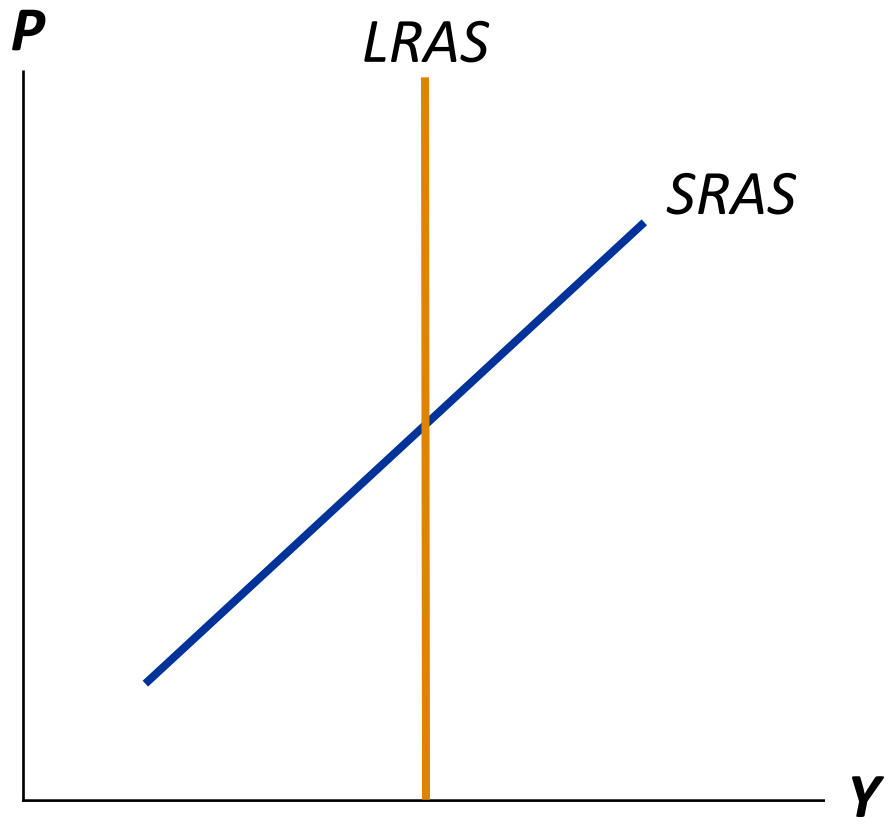
(4) The Aggregate-Supply Curve

The Aggregate-Supply (*AS*) Curves

The ***AS* curve** shows the total quantity of g&s firms produce and sell at any given price level.

AS is:

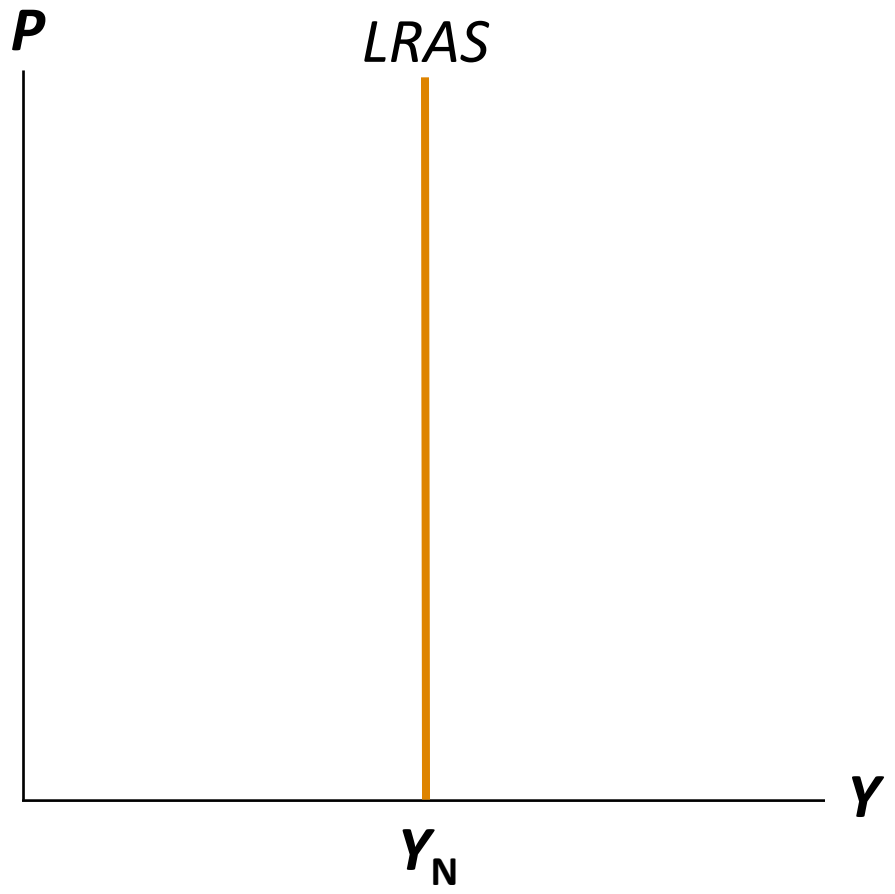
- upward-sloping in short run
- vertical in long run



(A) The Long-Run Aggregate-Supply Curve (*LRAS*)

The **natural rate of output** (Y_N) is the amount of output the economy produces when unemployment is at its natural rate.

Y_N is also called **potential output** or **full-employment output**.



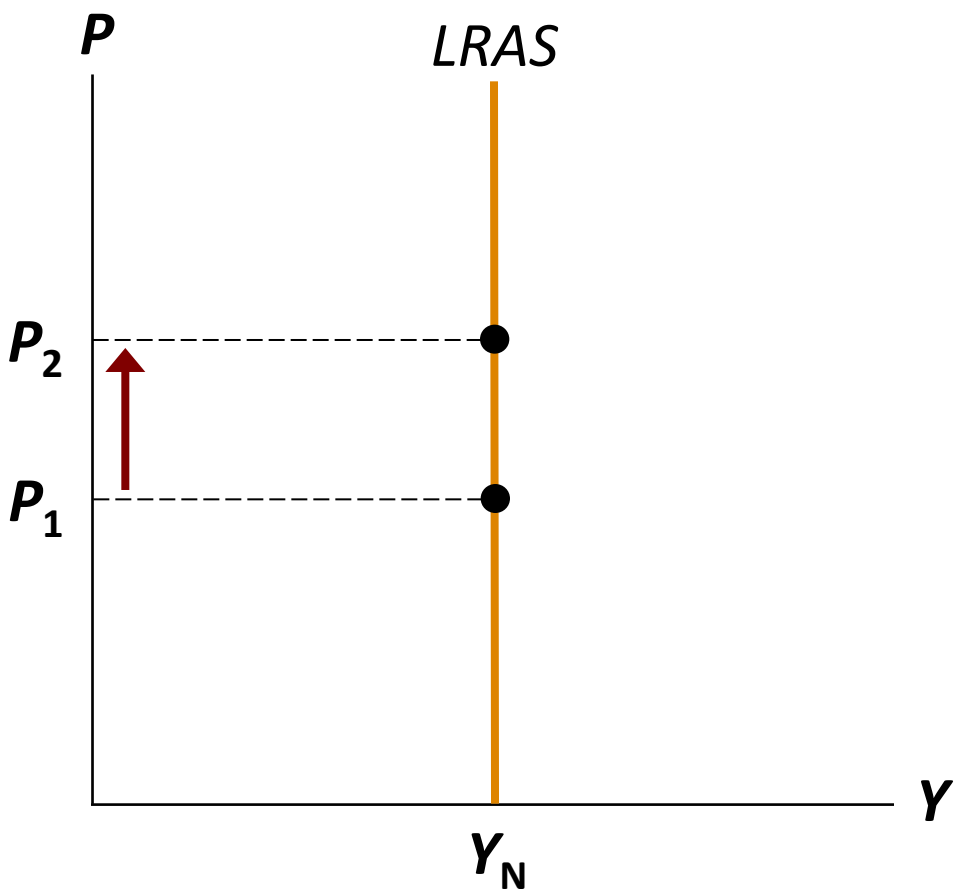
(B) Why *LRAS* Is Vertical

Y_N determined by the economy's stocks of labor, capital, and natural resources, and on the level of technology.

An increase in ***P***

does not affect any of these, so it does not affect Y_N.

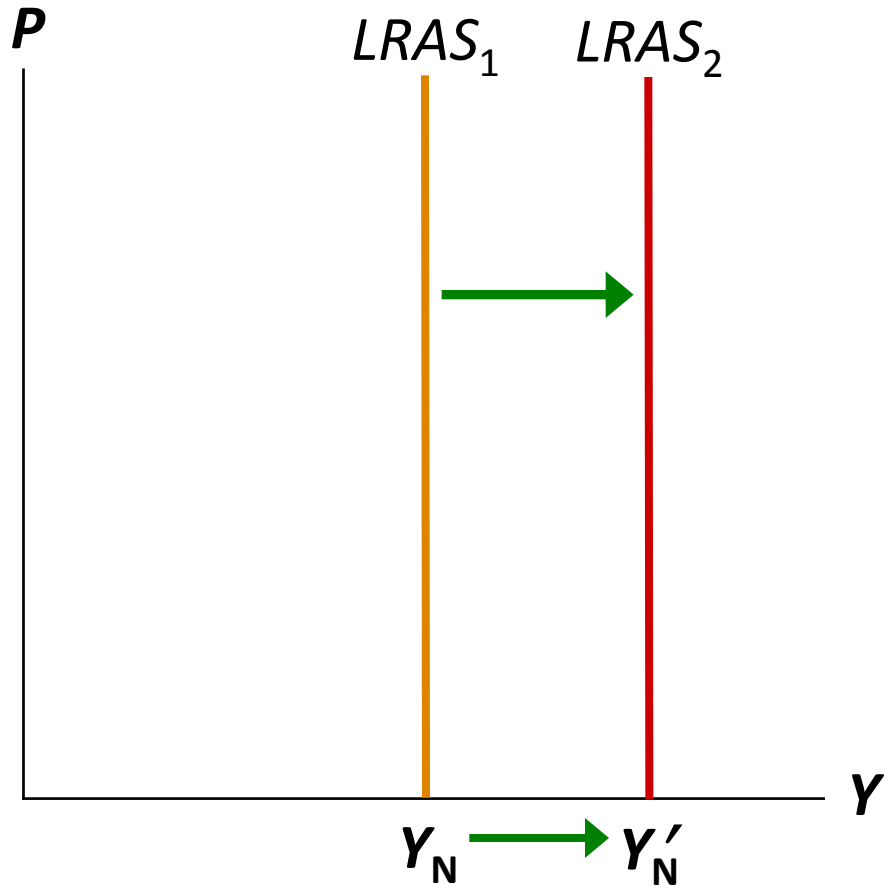
(Classical dichotomy)



(C) Why the *LRAS* Curve Might Shift

Any event that changes any of the determinants of Y_N will shift *LRAS*.

Example: Immigration increases ***L***, causing Y_N to rise.



Why the *LRAS* Curve Might Shift

- Changes in ***L*** or natural rate of unemployment
  - Immigration
  - Retirement Age
  - Government policies reduce natural rate of unemployment
- Changes in ***K*** or ***H***
  - Investment in factories, equipment
  - More people get college degrees
  - Factories destroyed by an earthquake

Why the *LRAS* Curve Might Shift

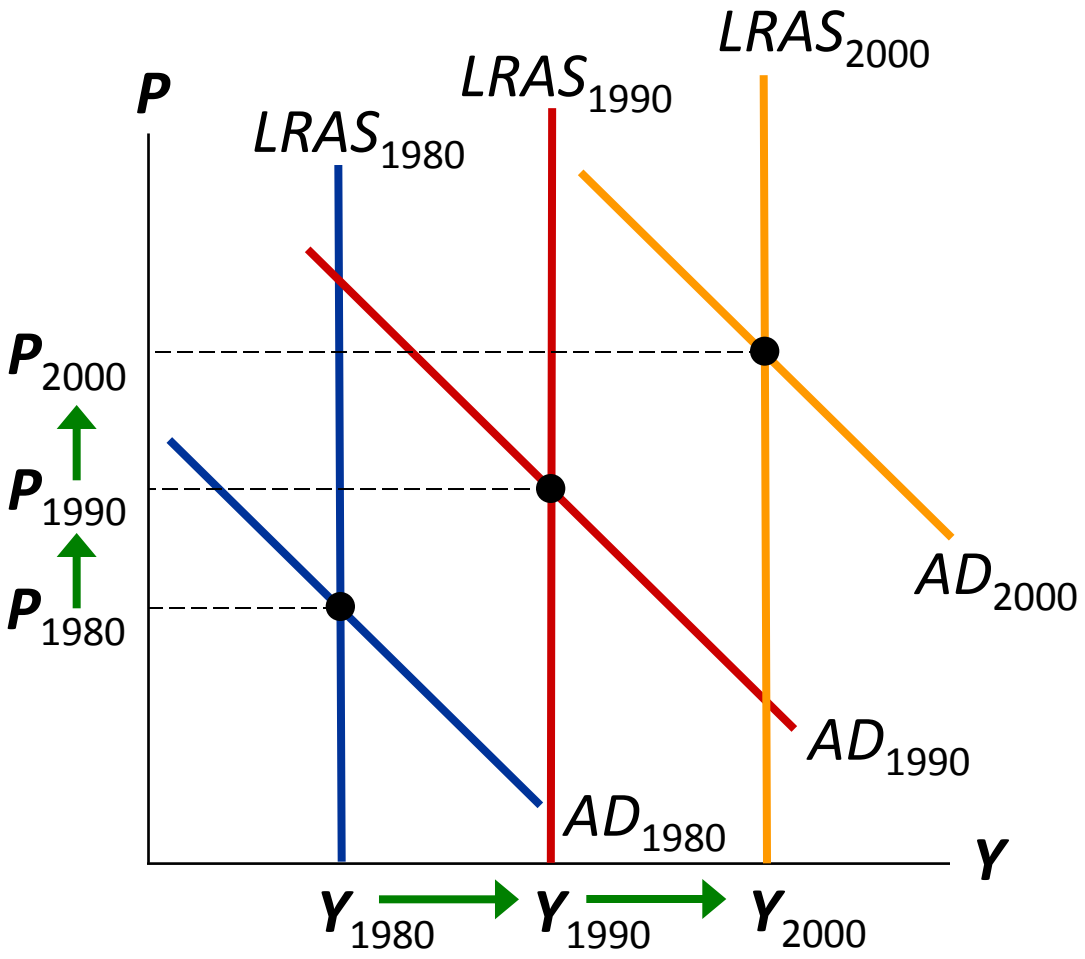
- Changes in natural resources
  - Discovery of new mineral deposits
  - Reduction in supply of imported oil
  - Changing weather patterns that affect agricultural production
- Changes in technology
  - Productivity improvements from technological progress

(D) Using *AD* & *AS* to Depict *LR* Growth and Inflation

Over the long run, tech. progress shifts *LRAS* to the right

and growth in the money supply shifts *AD* to the right.

Result:
ongoing inflation and growth in output.

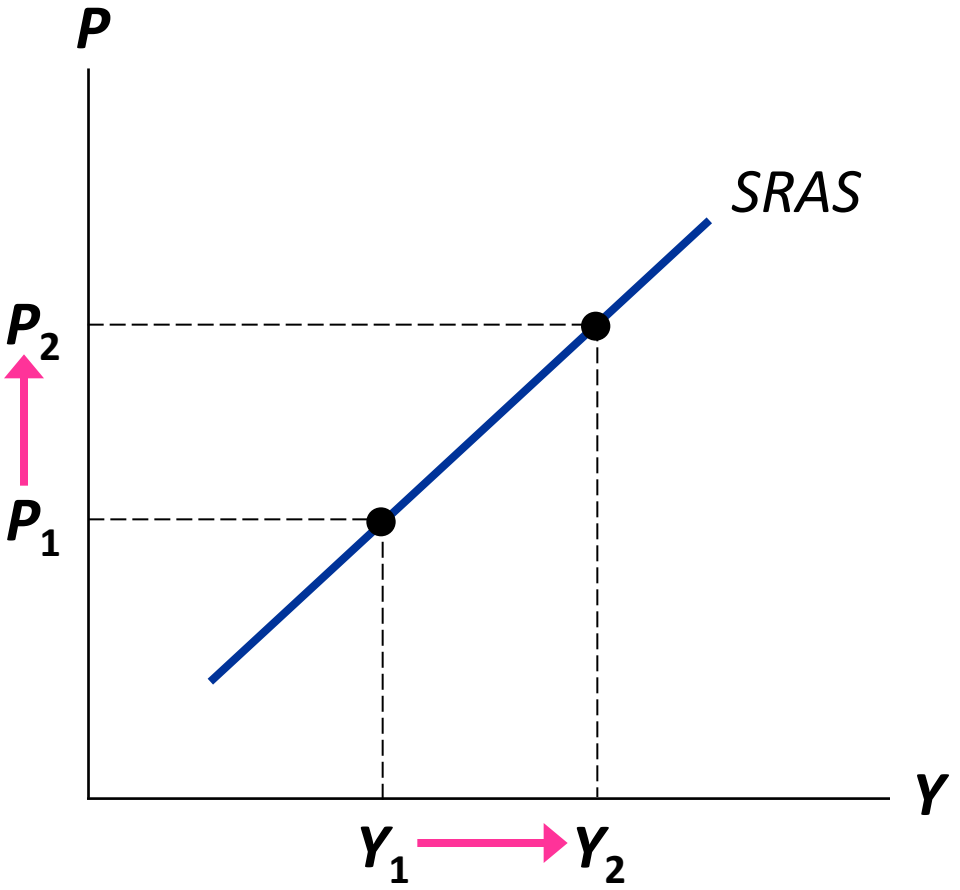


(E) Short Run Aggregate Supply (*SRAS*)

The *SRAS* curve is upward sloping:

Over the period of 1-2 years, an increase in ***P***

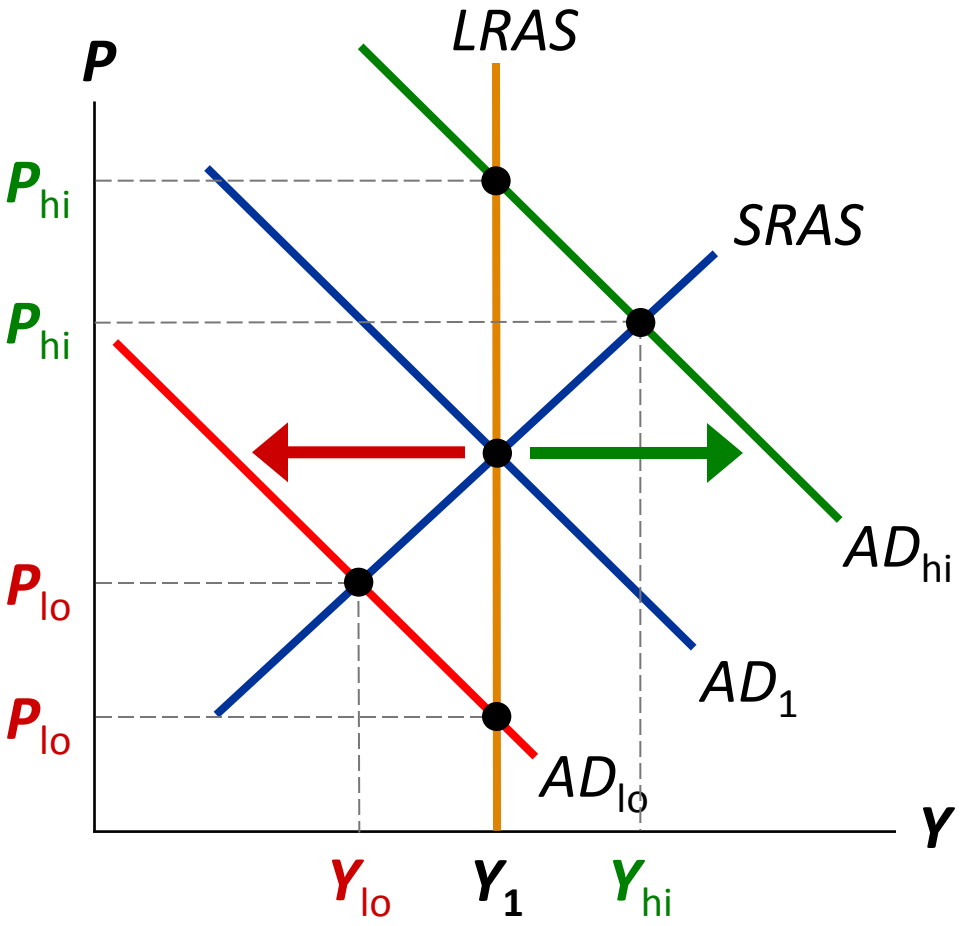
causes an increase in the quantity of g & s supplied.



(F) Why the Slope of *SRAS* Matters

If *AS* is vertical,
fluctuations in *AD*
do not cause
fluctuations in output or
employment.

If *AS* slopes up,
then shifts in *AD*
<u>do</u> affect output and
employment.



Three Theories of upward sloping *SRAS*

1. The Sticky-Price Theory
2. The Sticky-Price Theory
3. The Misperceptions Theory

In each,

– some type of **market imperfection**

– result:

Output deviates from its natural rate when the actual price level deviates from the price level people expected.

Two Causes of Economic Fluctuations

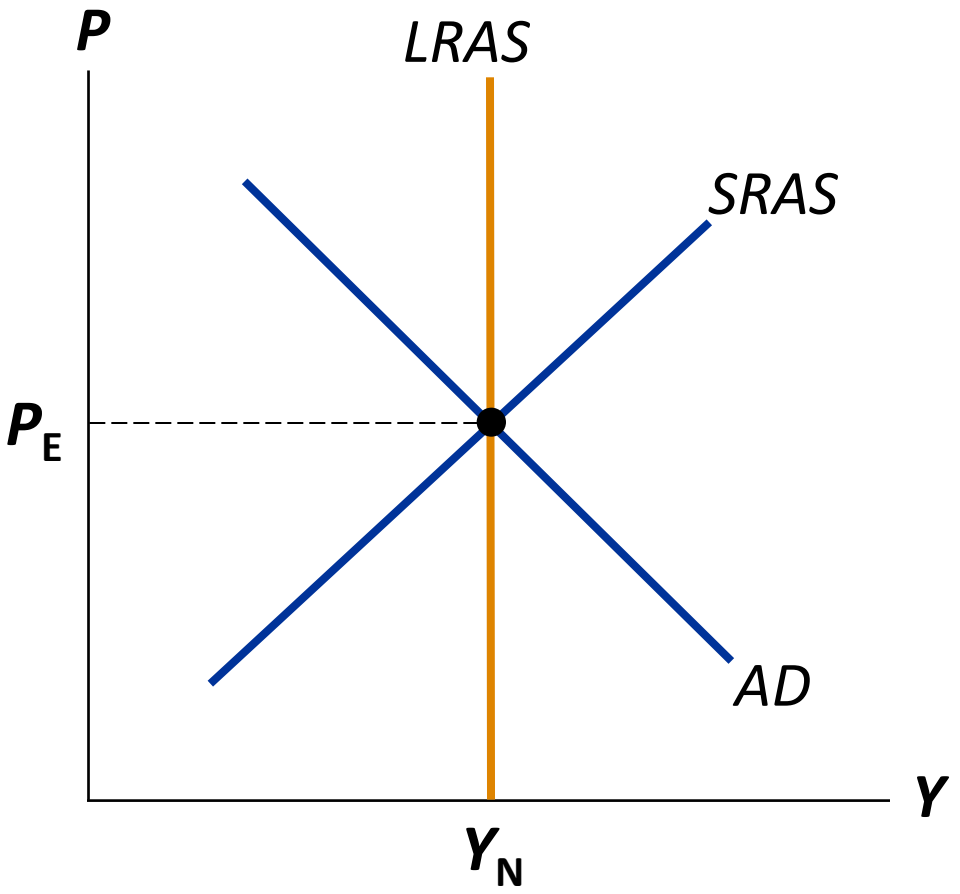
(A) The Long-Run Equilibrium

In the long-run equilibrium,

$P_E = P$,

$Y = Y_N$,

and unemployment is at its natural rate.



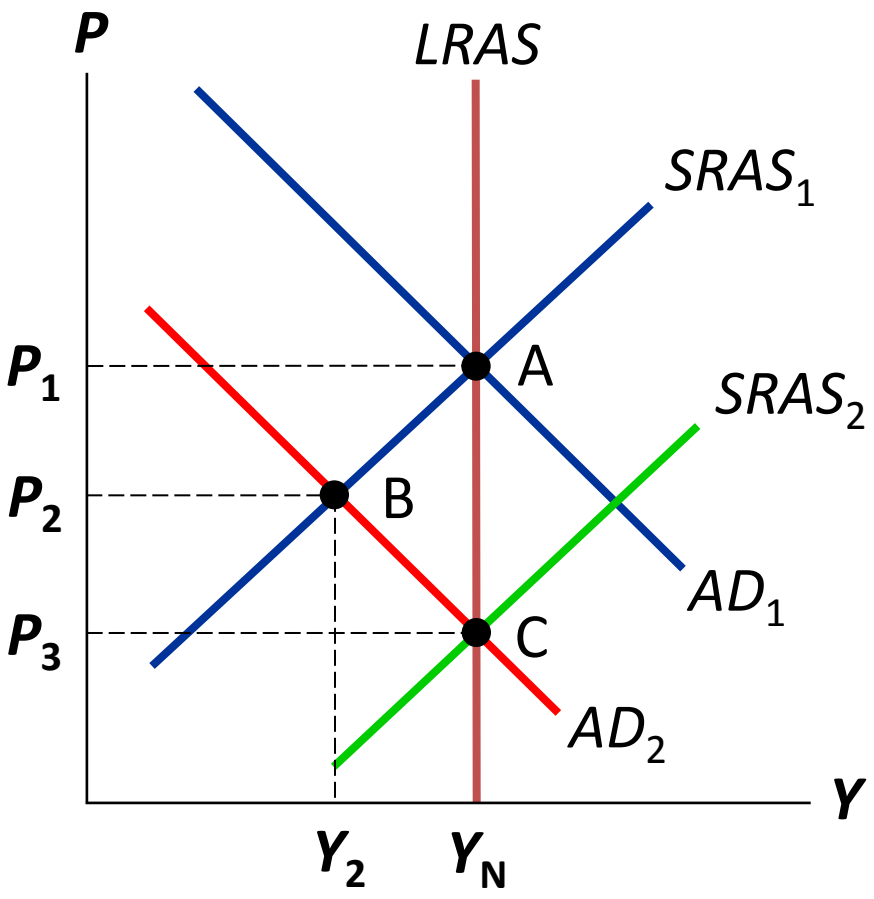
(B) Economic Fluctuations

- Caused by events that shift the *AD* and/or *AS* curves (from the long-run equilibrium position).
- Four steps to analyzing economic fluctuations:
  1. Determine whether the event shifts *AD* or *AS*.
  2. Determine whether curve shifts left or right.
  3. Use *AD-AS* diagram to see how the shift changes ***Y*** and ***P*** in the short run.
  4. Use *AD-AS* diagram to see how economy moves from new SR eq'm to new LR eq'm.

(C) The Effects of a Shift in *AD*

Event: Stock market crash

1. Affects consumption (***C***), *AD* curve
2. ***C*** falls, so *AD* shifts left
3. **SR eq'm** at B.
   P and ***Y*** lower, unemp higher
4. **Over time**, P_E falls (Why?),
   SRAS shifts right, until **LR eq'm** at C.
   Y and unemp back at initial levels.

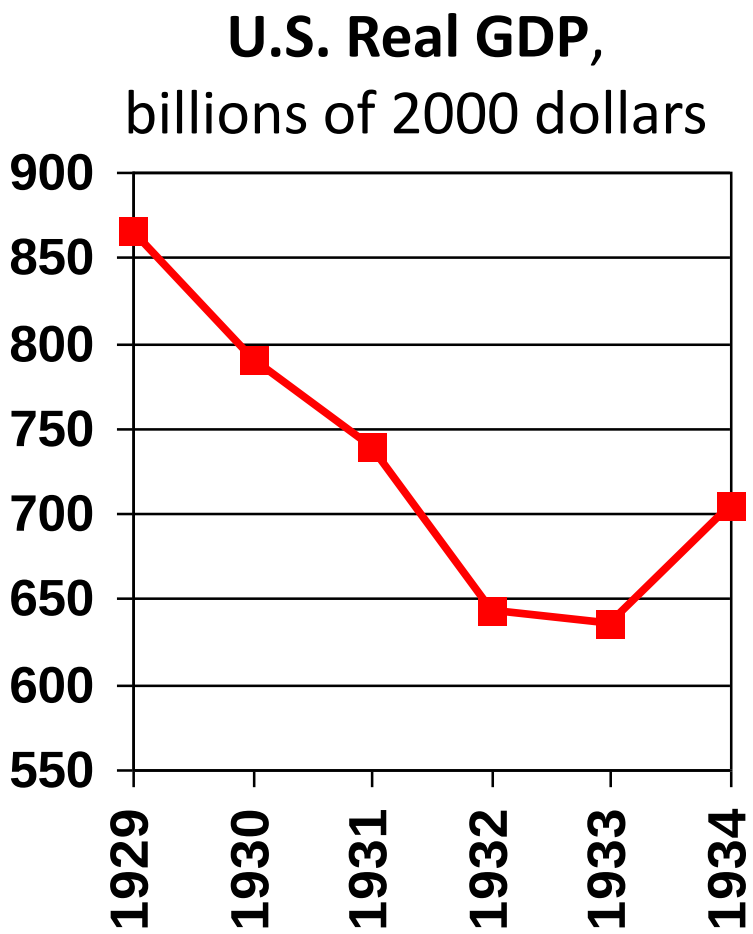


Two Big *AD* Shifts:

1. The Great Depression

From 1929-1933,

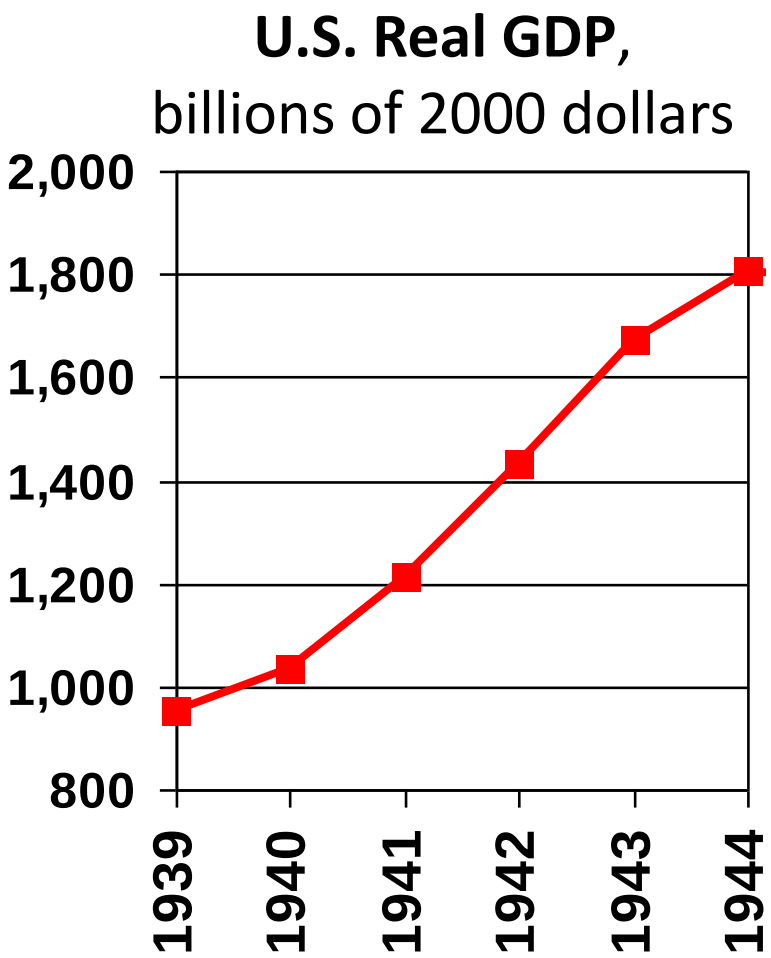
- money supply fell 28% due to problems in banking system
- stock prices fell 90%, reducing ***C*** and ***I***
- ***Y*** fell 27%
- ***P*** fell 22%
- u-rate rose from 3% to 25%



Two Big *AD* Shifts:
2. The World War II Boom

From 1939-1944,

- govt outlays rose from $9.1 billion to $91.3 billion
- ***Y*** rose 90%
- ***P*** rose 20%
- u-rate fell from 17% to 1%

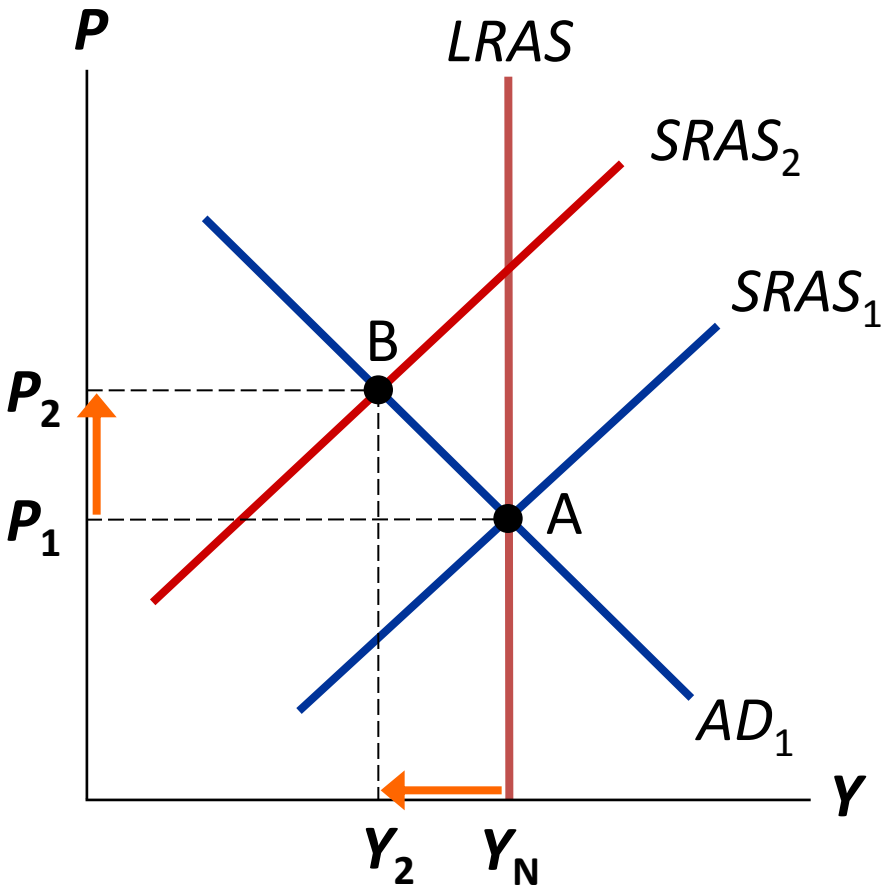


(D) The Effects of a Shift in *SRAS*

Event: Oil prices rise

1. Increases costs, shifts *SRAS* *(assume LRAS constant)*
2. *SRAS* shifts left
3. SR eq'm at point B. ***P*** higher, ***Y*** lower, unemp higher

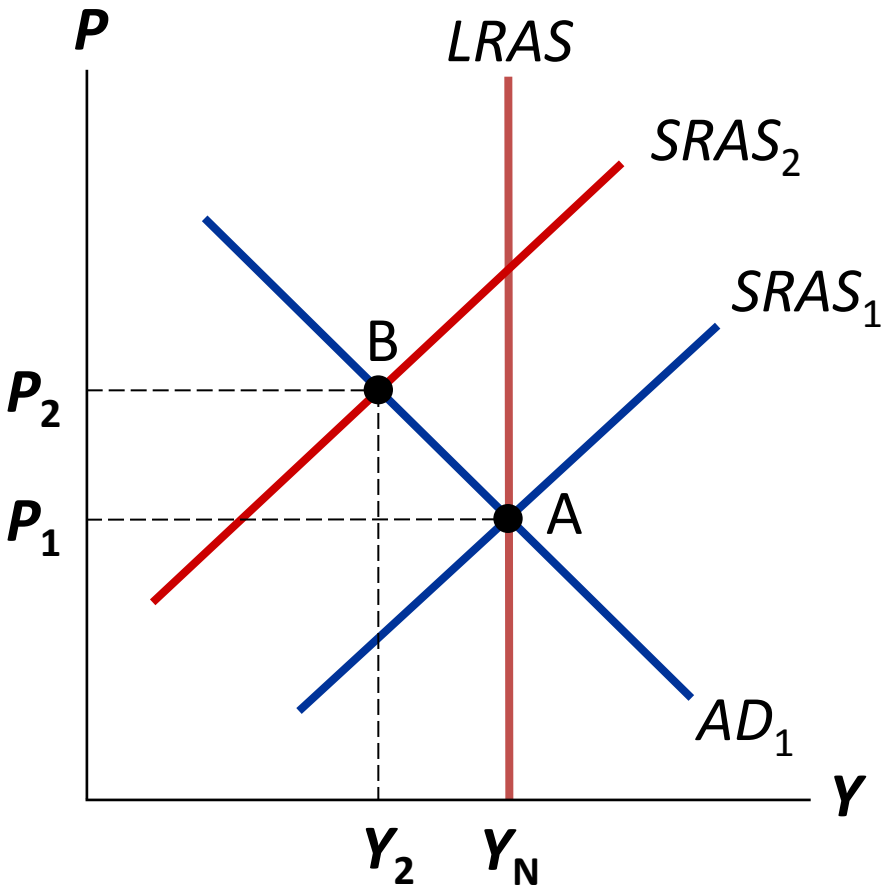
   From A to B, **stagflation**, a period of falling output and rising prices.



The Effects of a Shift in *SRAS*

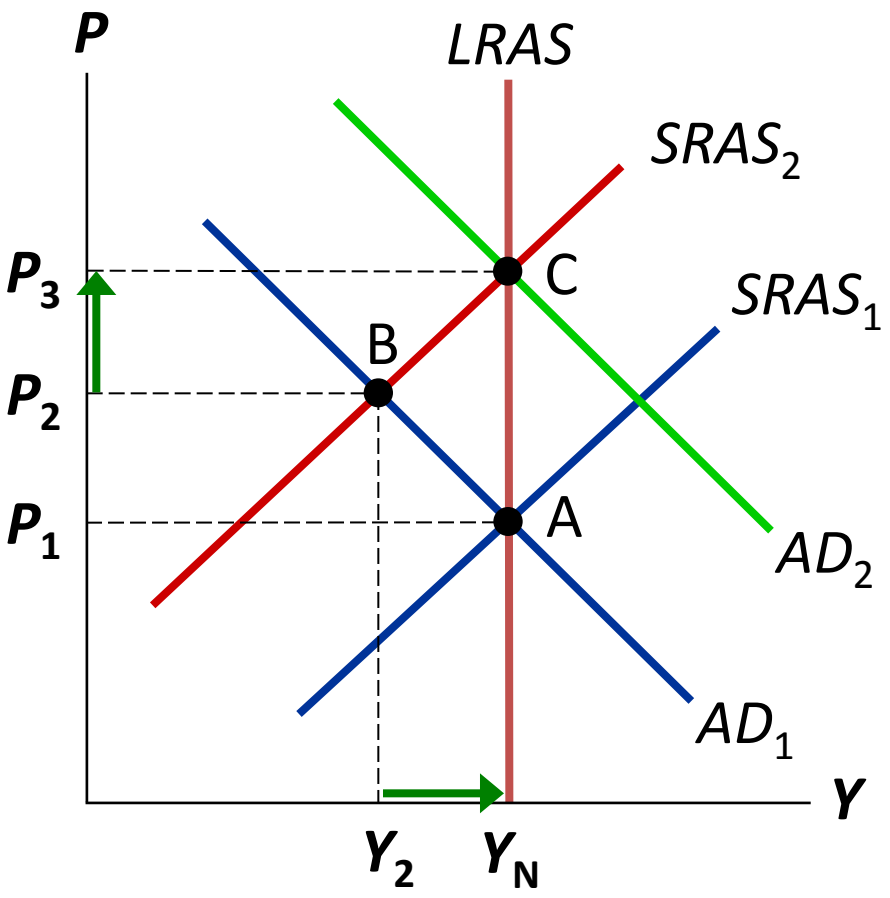
If policymakers do nothing,

4. Low employment causes wages to fall, *SRAS* shifts right, until LR eq'm at A.



Accommodating an Adverse Shift in *SRAS*

Or, policymakers could use fiscal or monetary policy to increase aggregate demand (shift of *AD* curve) and accommodate the *AS* shift:
Y back to $\boldsymbol{Y_N}$, but
P permanently higher.



CONCLUSION

- This chapter has introduced the model of aggregate demand and aggregate supply, which helps explain economic fluctuations.
- Keep in mind: these fluctuations are **deviations from the long-run trends**
- In the next chapter, we will learn how policymakers can affect aggregate demand with fiscal and monetary policy.

CHAPTER SUMMARY

- Short-run fluctuations in GDP and other macroeconomic quantities are **irregular** and **unpredictable**. Recessions are periods of falling real GDP and rising unemployment.
- Economists analyze fluctuations using the **model of aggregate demand and aggregate supply**.
- The aggregate demand curve **slopes downward** because a change in the price level has a wealth effect on consumption, an interest-rate effect on investment, and an exchange-rate effect on net exports.

CHAPTER SUMMARY

- Anything that changes ***C***, ***I***, ***G***, or ***NX*** – except a change in the price level – will shift the aggregate demand curve.
- The long-run aggregate supply curve is **vertical** because changes in the price level do not affect output in the long run.
- In the long run, output is determined by labor, capital, natural resources, and technology; changes in any of these will shift the long-run aggregate supply curve.

CHAPTER SUMMARY

- In the short run, output deviates from its natural rate when the price level is different than expected, leading to an **upward-sloping** short-run aggregate supply curve. The three theories proposed to explain this upward slope are the sticky wage theory, the sticky price theory, and the misperceptions theory.
- The short-run aggregate-supply curve shifts in response to changes in the expected price level and to anything that shifts the long-run aggregate supply curve.

CHAPTER SUMMARY

- Economic fluctuations are caused by shifts in aggregate demand and aggregate supply.
- When aggregate demand falls, output and the price level fall in the short run. Over time, a change in expectations causes wages, prices, and perceptions to adjust, and the short-run aggregate supply curve shifts rightward. In the long run, the economy returns to the natural rates of output and unemployment, but with a lower price level.

CHAPTER SUMMARY

- A fall in aggregate supply results in stagflation – falling output and rising prices.
  Wages, prices, and perceptions adjust over time, and the economy recovers.