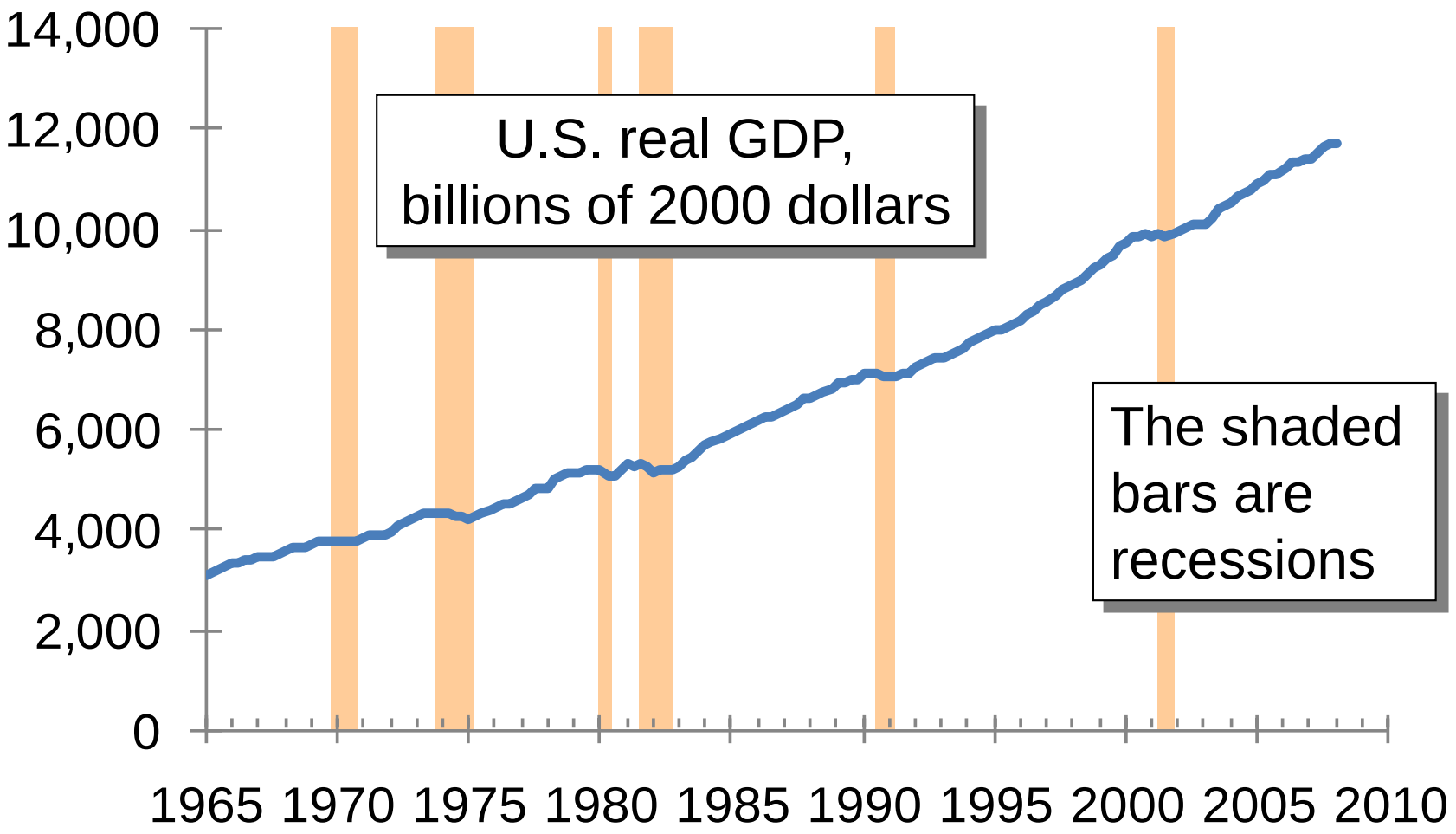
Introduction

- Over the long run, real GDP 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**.

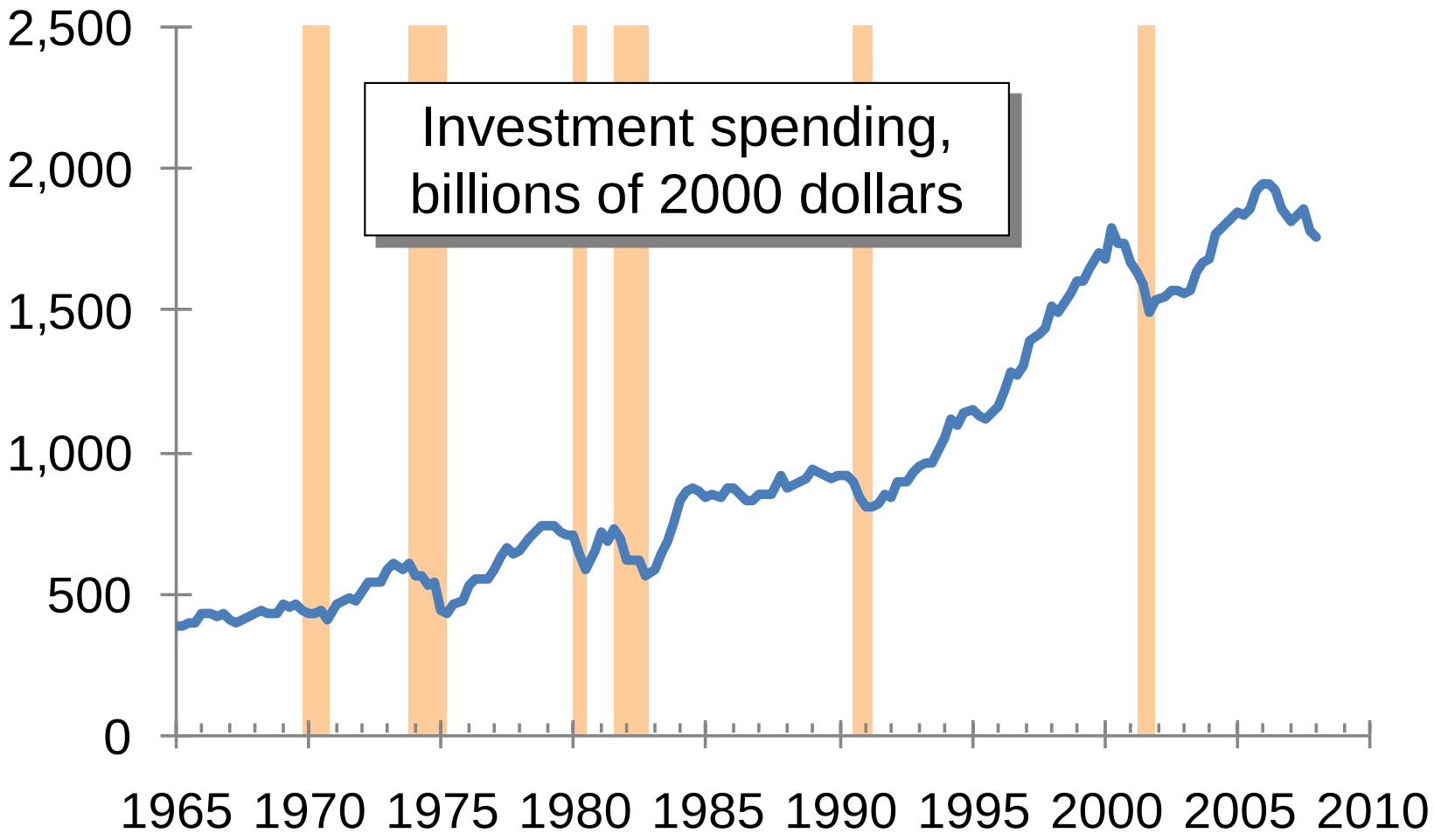
Three Facts About Economic Fluctuations

FACT 1: Economic fluctuations are irregular and unpredictable.



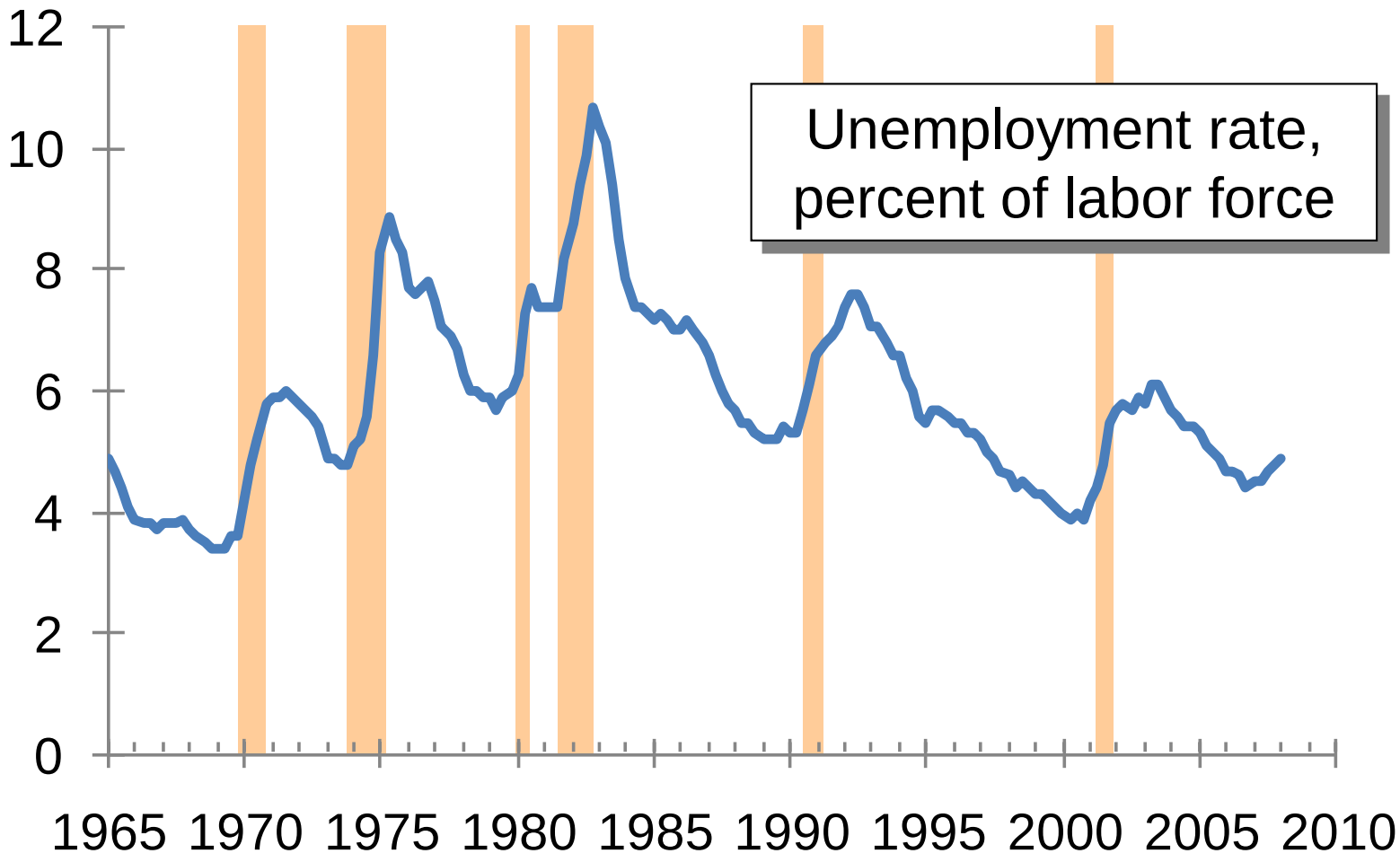
Three Facts About Economic Fluctuations

FACT 2: Most macroeconomic quantities fluctuate together.

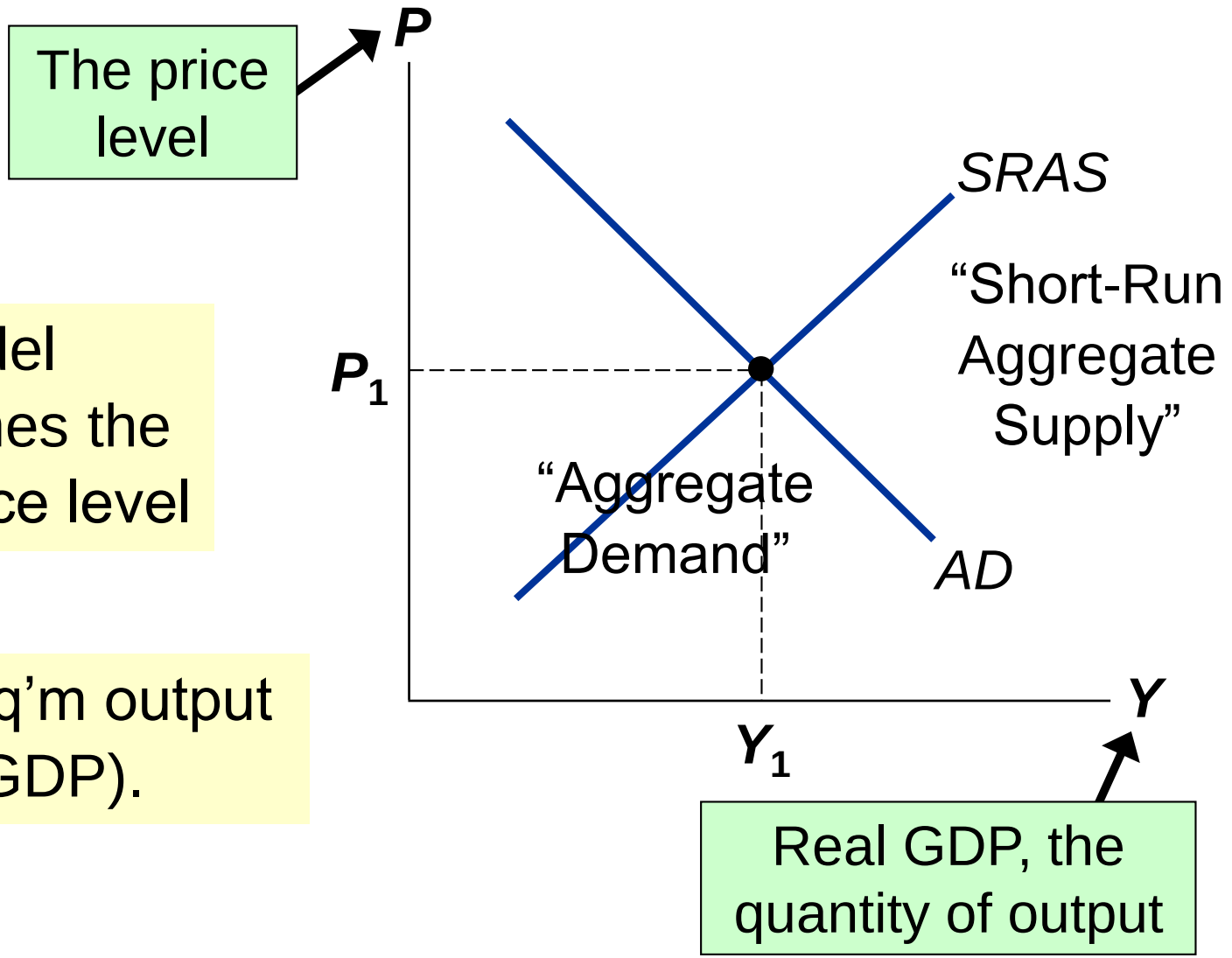


Three Facts About Economic Fluctuations

FACT 3: As output falls, unemployment rises.



The Model of Aggregate Demand and Aggregate Supply

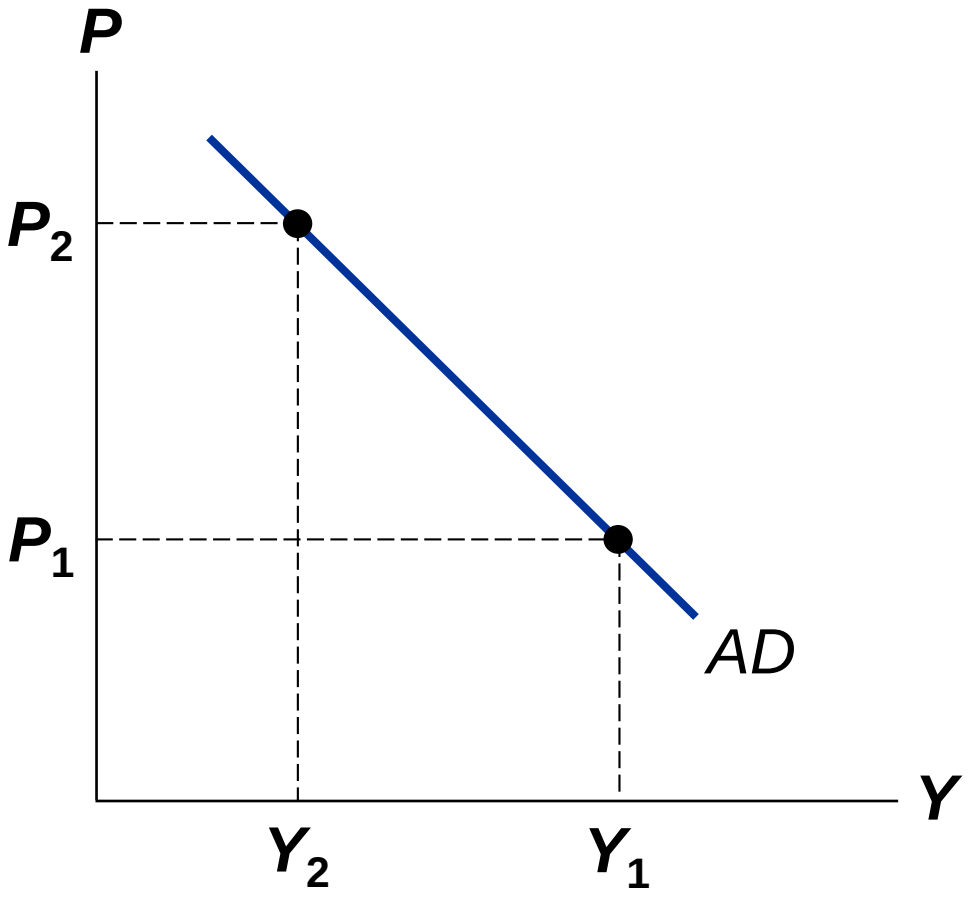


The model determines the eq'm price level

and eq'm output (real GDP).

The Aggregate-Demand (*AD*) Curve

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

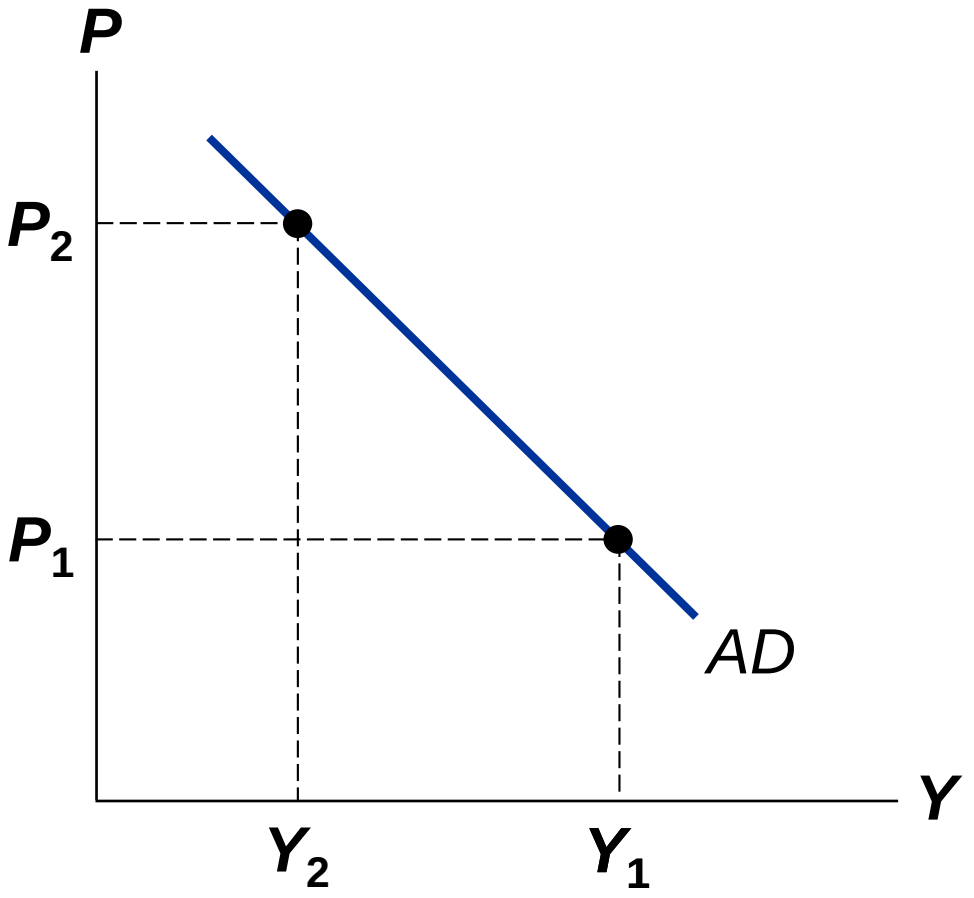


Why the *AD* Curve Slopes Downward

$Y = C + I + G + NX$

Assume ***G*** fixed by govt 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 dollars 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 dollars.
- To get these dollars, people sell bonds or other assets.
- This drives up interest rates.

Result: ***I*** falls.

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

The Exchange-Rate Effect (P and NX)

Suppose ***P*** rises.

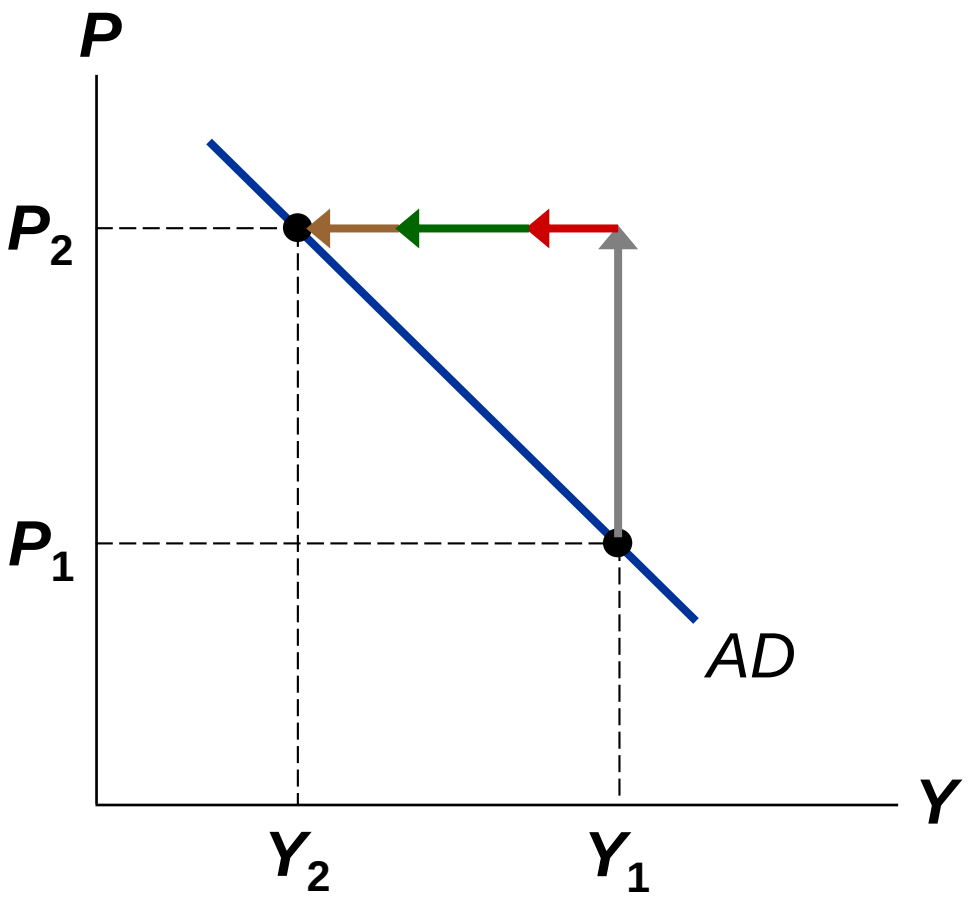
- U.S. interest rates rise (the interest-rate effect).
- Foreign investors desire more U.S. bonds.
- Higher demand for $ in foreign exchange market.
- U.S. exchange rate appreciates.
- U.S. exports more expensive to people abroad, imports cheaper to U.S. residents.

Result: ***NX*** falls.

The Slope of the *AD* Curve: Summary

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

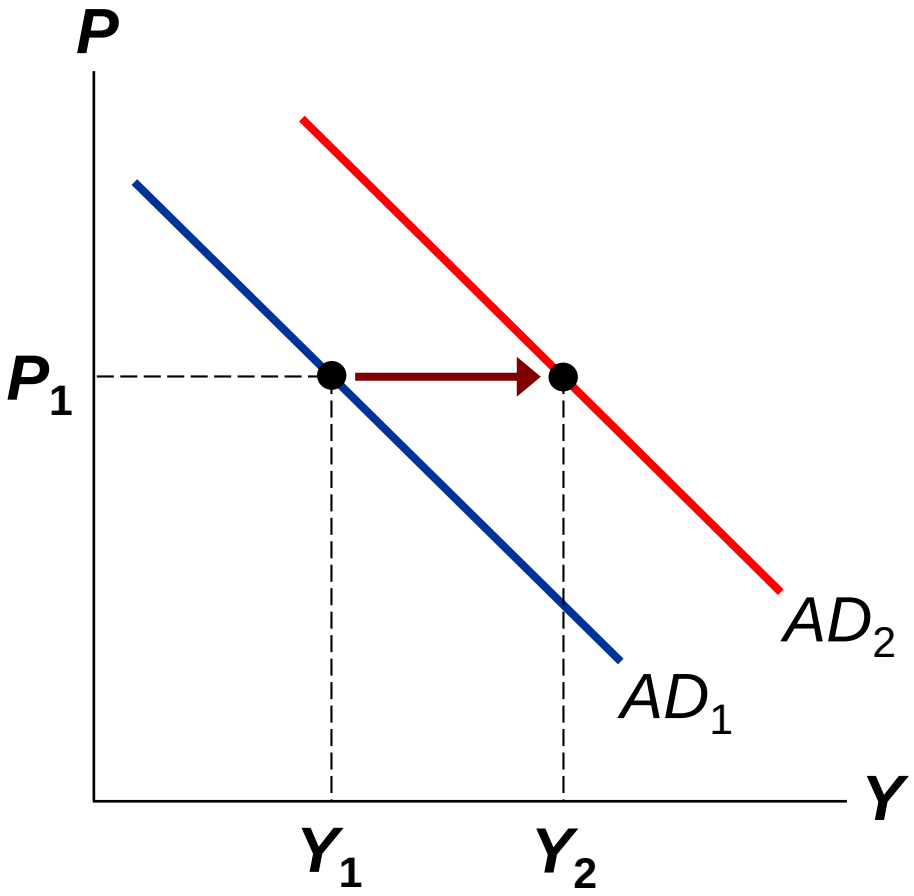
- the wealth effect (***C*** falls)
- the interest-rate effect (***I*** falls)
- the exchange-rate effect (***NX*** falls)



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 re: 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 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 U.S. exchange rate falls.

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

D. State governments replace their sales taxes with new taxes on interest, dividends, and capital gains.

ACTIVE LEARNING 1
Answers

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

I falls, *AD* curve shifts left.

B. The U.S. 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).

D. State governments replace sales taxes with new taxes on interest, dividends, and capital gains.

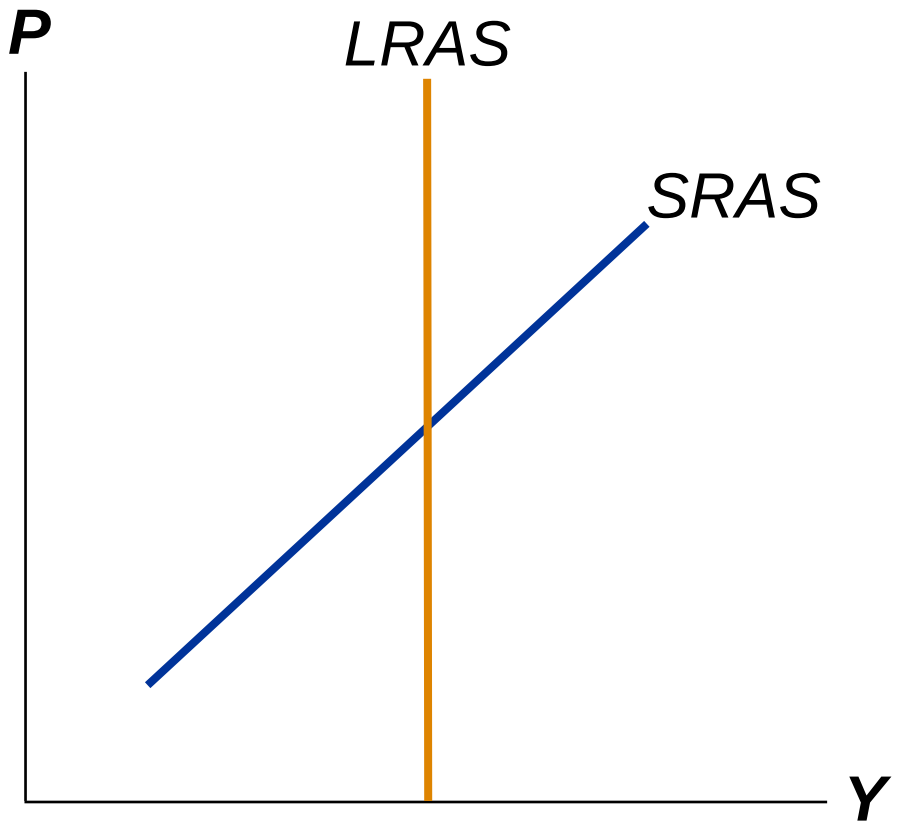
C rises, *AD* shifts right.

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:

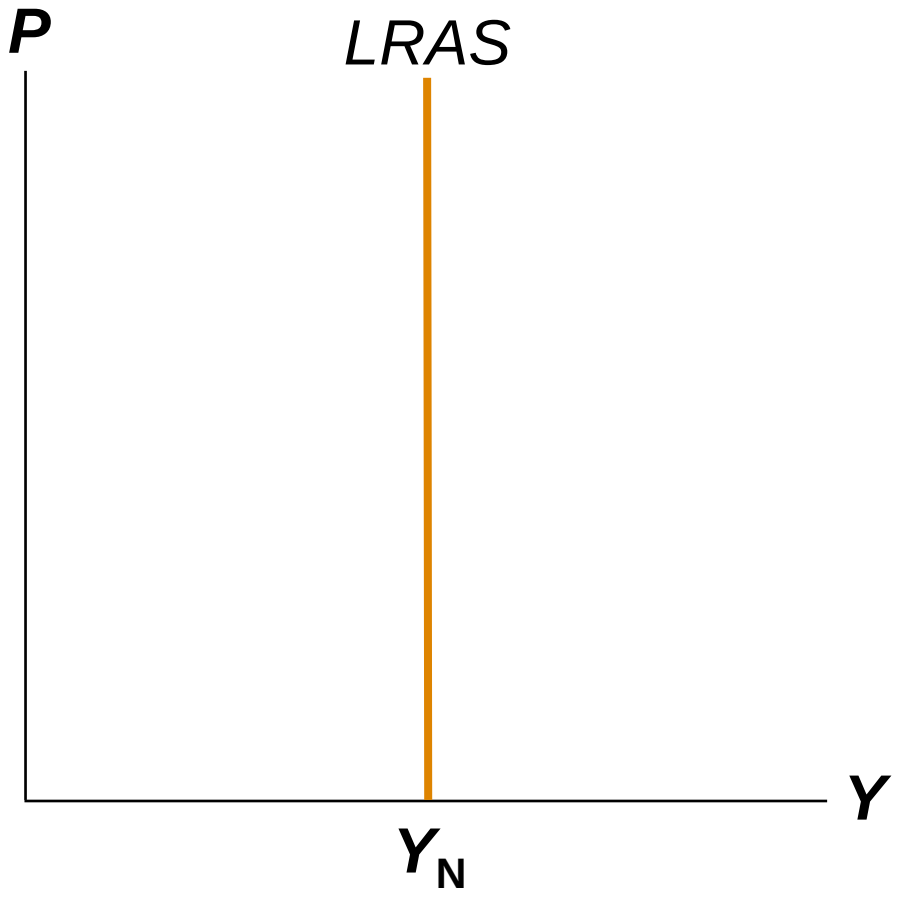
- upward-sloping in short run
- vertical in long run



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**.

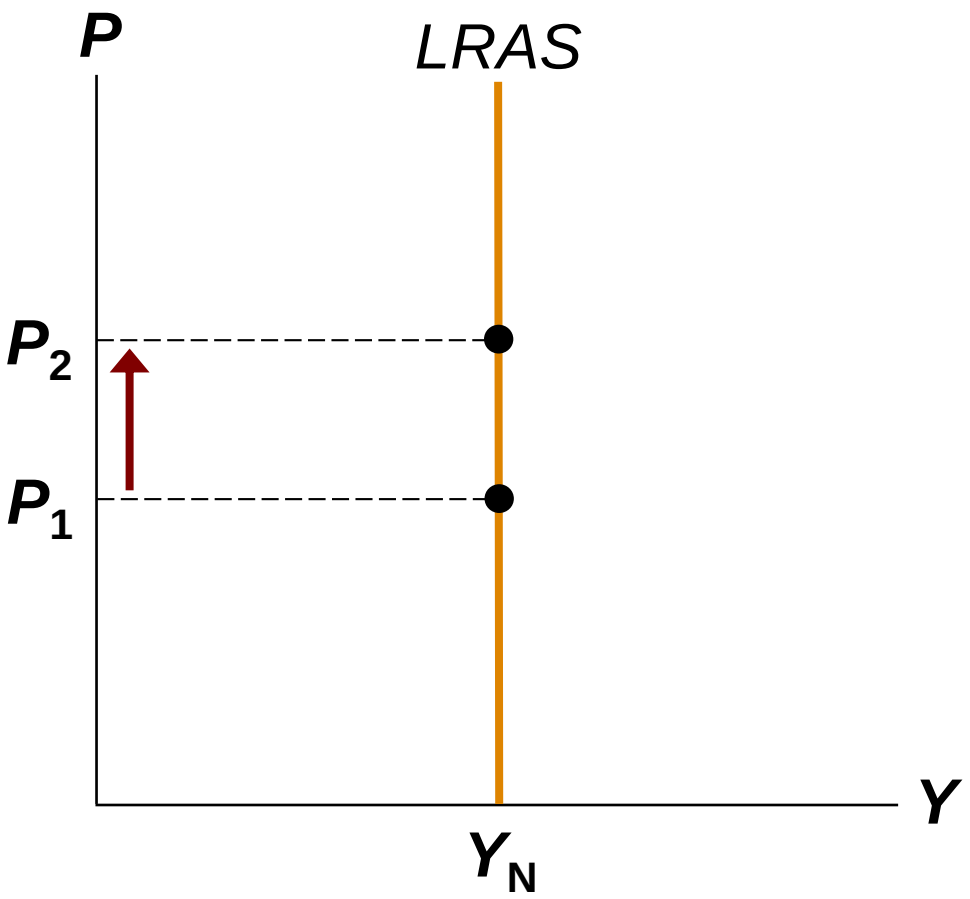


Why *LRAS* Is Vertical

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.

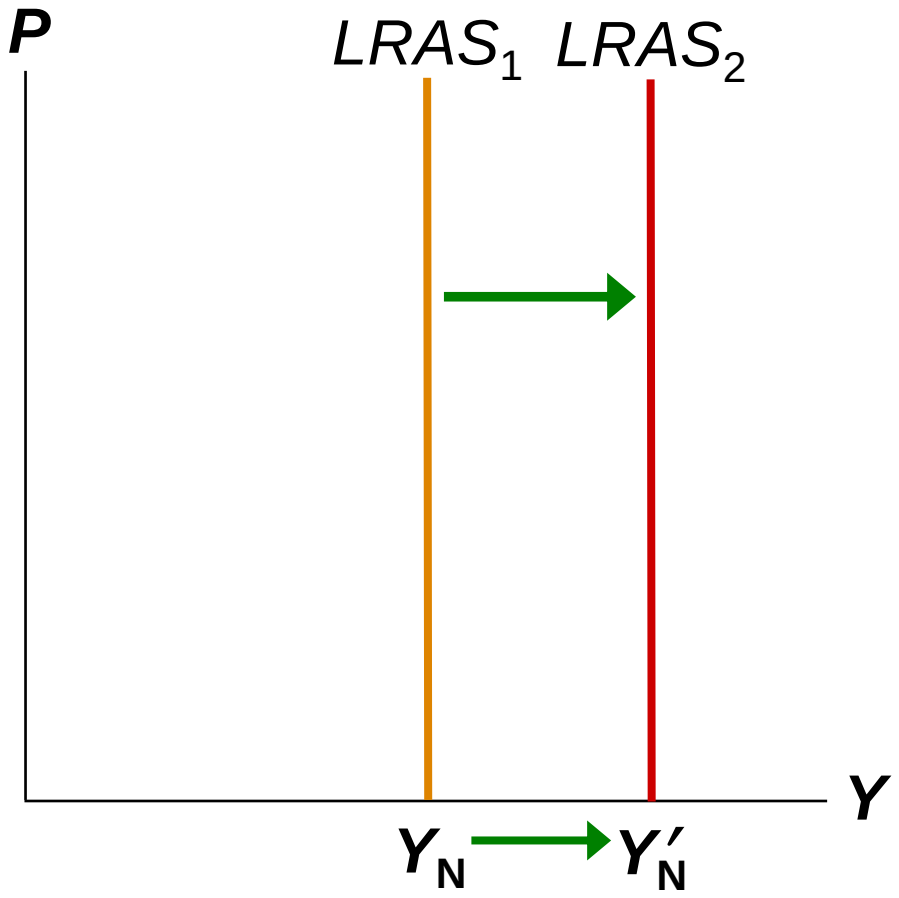
(Classical dichotomy)



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
  - Baby-boomers retire
  - Govt policies reduce natural u-rate
- Changes in ***K*** or ***H***
  - Investment in factories, equipment
  - More people get college degrees
  - Factories destroyed by a hurricane

Why the *LRAS* Curve Might Shift

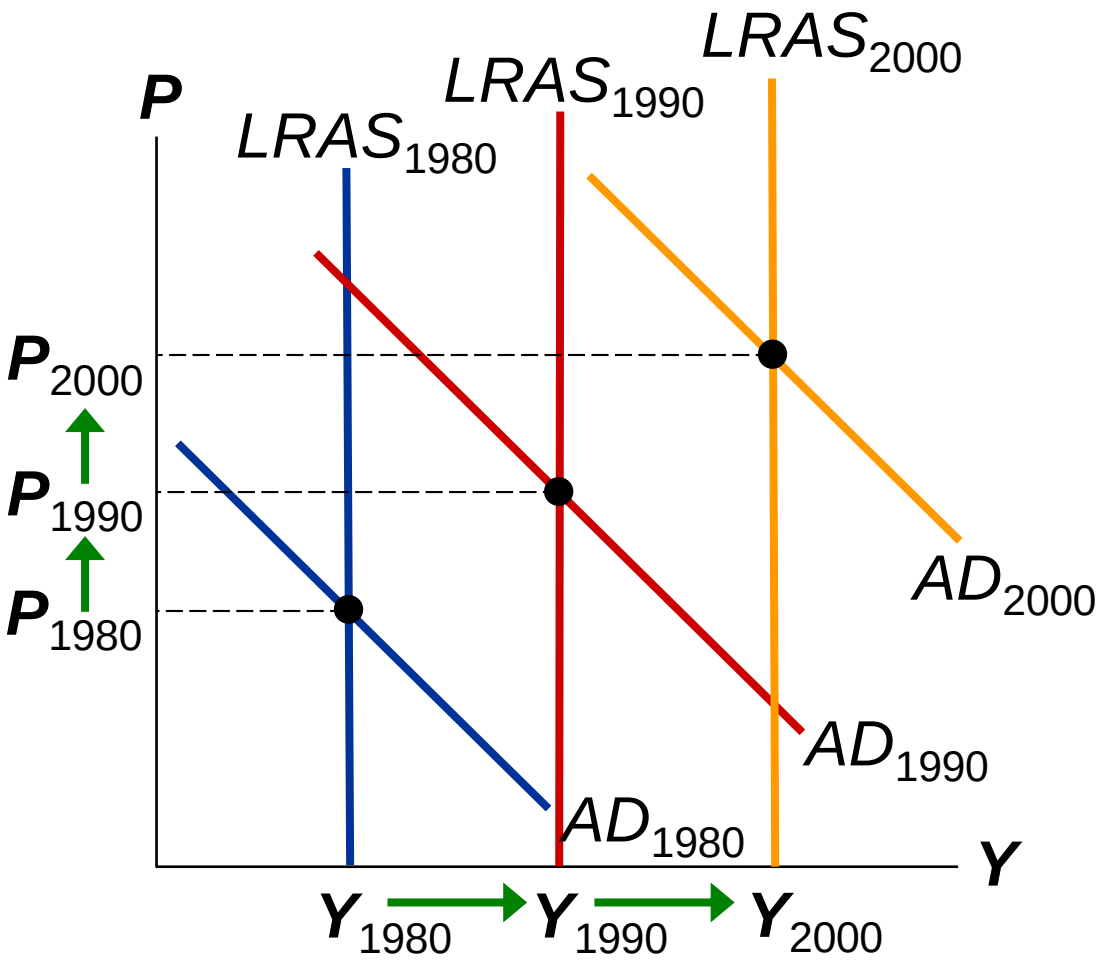
- Changes in natural resources
  - Discovery of new mineral deposits
  - Reduction in supply of imported oil
  - Changing weather patterns that affect agricultural production
- Changes in technology
  - Productivity improvements from technological progress

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.

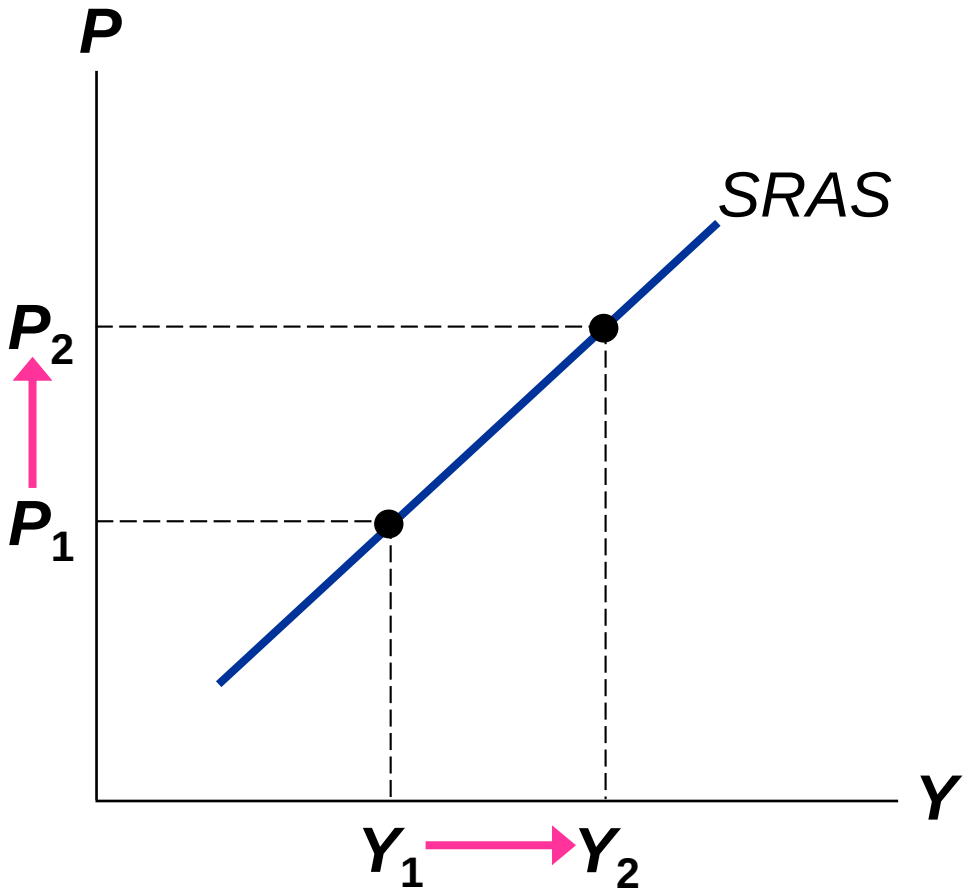
Result:
ongoing inflation and growth in output.



Short Run Aggregate Supply (*SRAS*)

The *SRAS* curve is upward sloping:

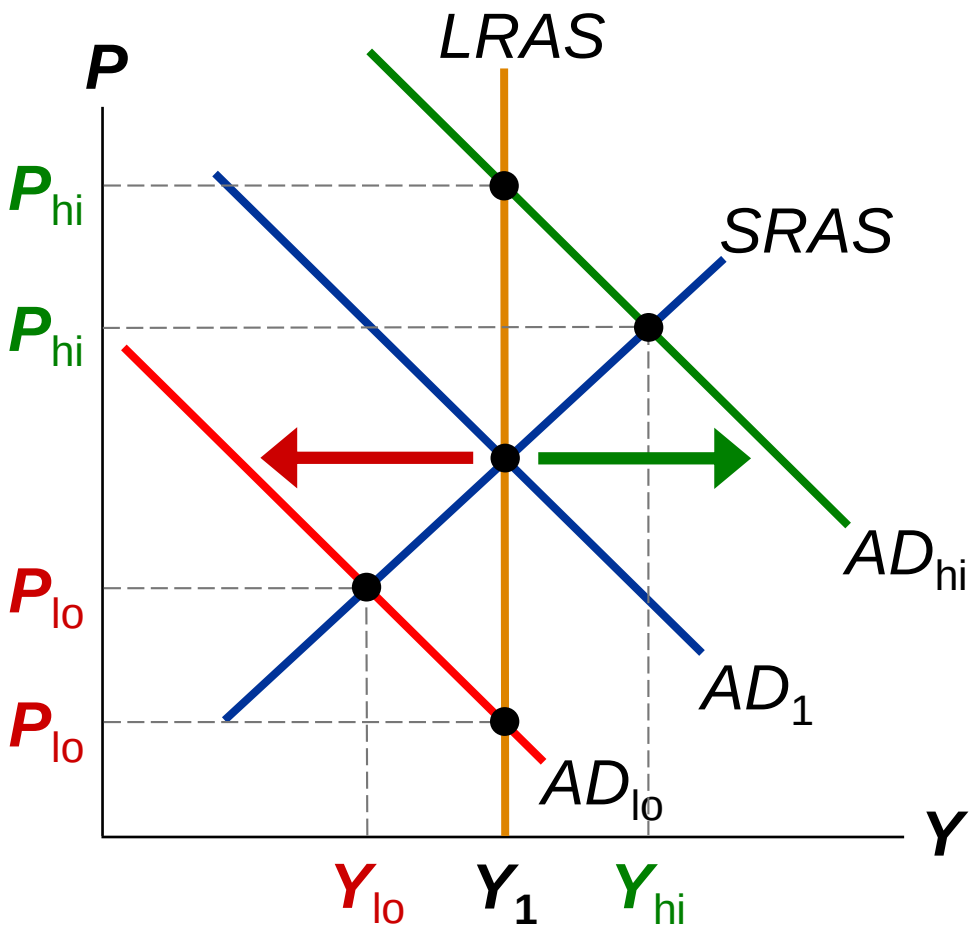
Over the period of 1-2 years, an increase in ***P*** causes an increase in the quantity of g & s supplied.



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* do affect output and employment.



Three Theories of *SRAS*

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.

1. The Sticky-Wage Theory

- Imperfection:
  Nominal wages are **sticky** in the short run, they adjust sluggishly.
  - Due to labor contracts, social norms
- Firms and workers set the nominal wage in advance based on P_E, the price level they expect to prevail.

1. The Sticky-Wage Theory

- If $P > P_E$,
  revenue is higher, but labor cost is not.

  Production is more profitable,
  so firms increase output and employment.

- Hence, higher ***P*** causes higher ***Y***,
  so the ***SRAS curve slopes upward***.

2. The Sticky-Price Theory

- Imperfection:
  Many prices are sticky in the short run.
  - Due to **menu costs**, the costs of adjusting prices.
  - Examples: cost of printing new menus, the time required to change price tags
- Firms set sticky prices in advance based on $\boldsymbol{P_E}$.

2. The Sticky-Price Theory

- Suppose the Fed increases the money supply unexpectedly. In the long run, ***P*** will rise.
- In the short run, firms without menu costs can raise their prices immediately.
- Firms with menu costs wait to raise prices. Meantime, their prices are relatively low, which increases demand for their products, so they increase output and employment.
- Hence, higher ***P*** is associated with higher ***Y***, so the ***SRAS curve slopes upward***.

3. The Misperceptions Theory

- Imperfection:
  Firms may confuse changes in ***P*** with changes in the relative price of the products they sell.

- If ***P*** rises above $\boldsymbol{P_E}$, a firm sees its price rise before realizing all prices are rising.

  The firm may believe its *relative* price is rising, and may increase output and employment.

- So, an increase in ***P*** can cause an increase in ***Y***, making the ***SRAS curve upward-sloping.***

What the 3 Theories Have in Common:

In all 3 theories, Y deviates from Y_N when P deviates from P_E.

$$Y = Y_N + a(P - P_E)$$

Output

Natural rate of output (long-run)

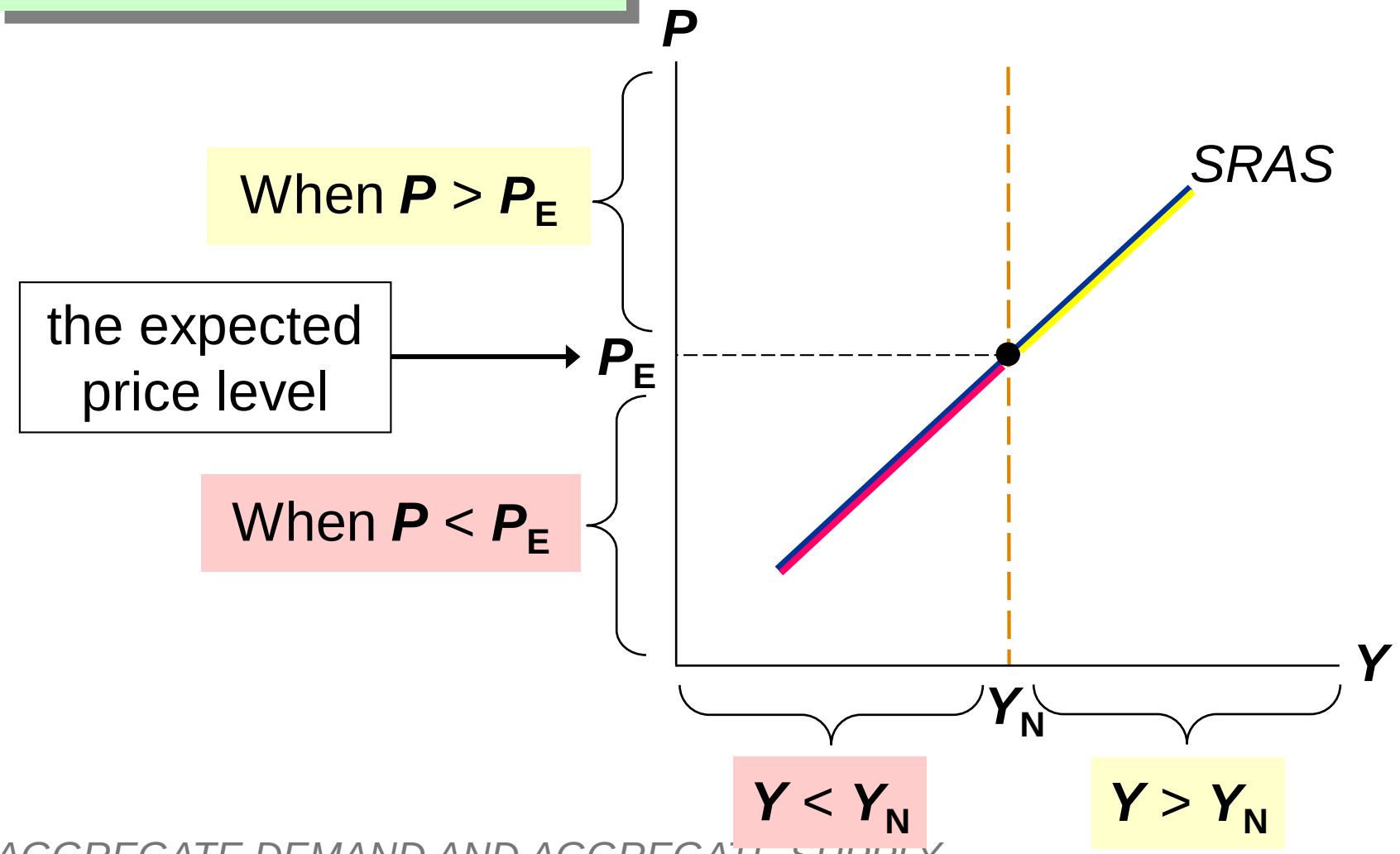
$a > 0$, measures how much Y responds to unexpected changes in P

Actual price level

Expected price level

What the 3 Theories Have in Common:

$$Y = Y_N + a(P - P_E)$$



SRAS and *LRAS*

- The imperfections in these theories are temporary. Over time,
  - sticky wages and prices become flexible
  - misperceptions are corrected
- In the LR,
  - $P_E = P$
  - *AS* curve is vertical

SRAS and *LRAS*

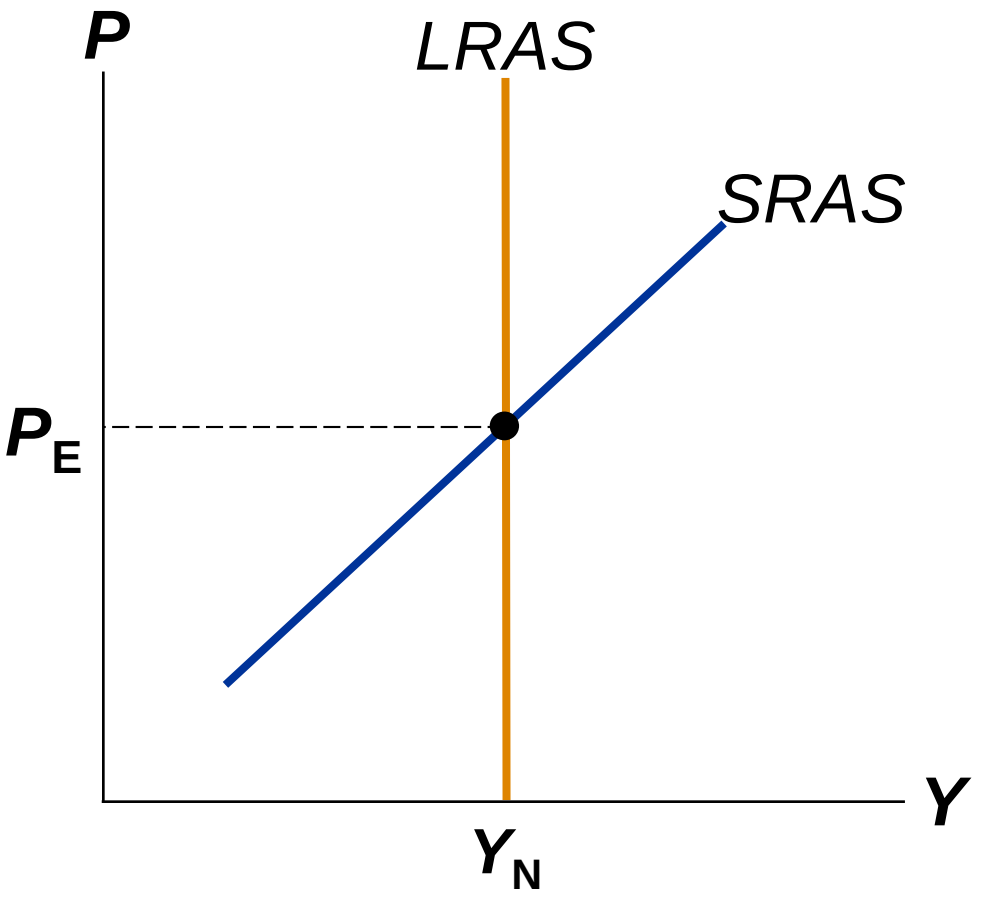
$$Y = Y_N + a(P - P_E)$$

In the long run,

$P_E = P$

and

$Y = Y_N$.



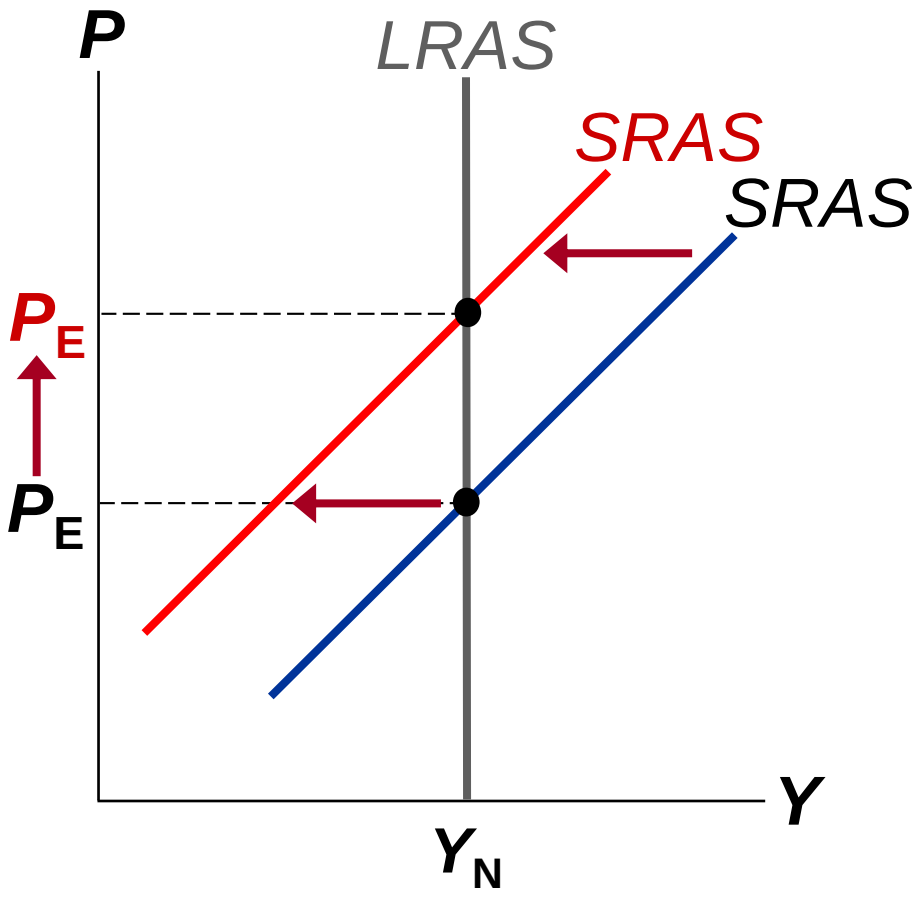
Why the *SRAS* Curve Might Shift

Everything that shifts *LRAS* shifts *SRAS*, too.

Also, P_E shifts *SRAS*:

If P_E rises, workers & firms set higher wages.

At each P, production is less profitable, Y falls, *SRAS* shifts left.



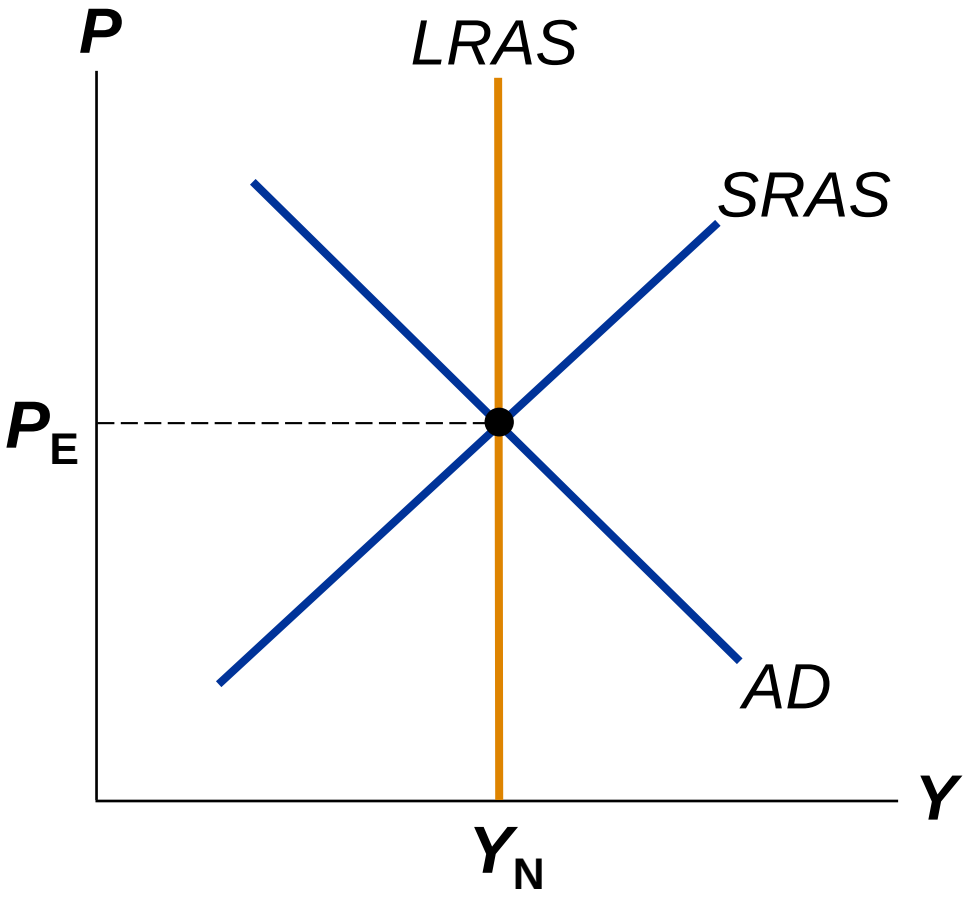
The Long-Run Equilibrium

In the long-run equilibrium,

$P_E = P$,

$Y = Y_N$,

and unemployment is at its natural rate.



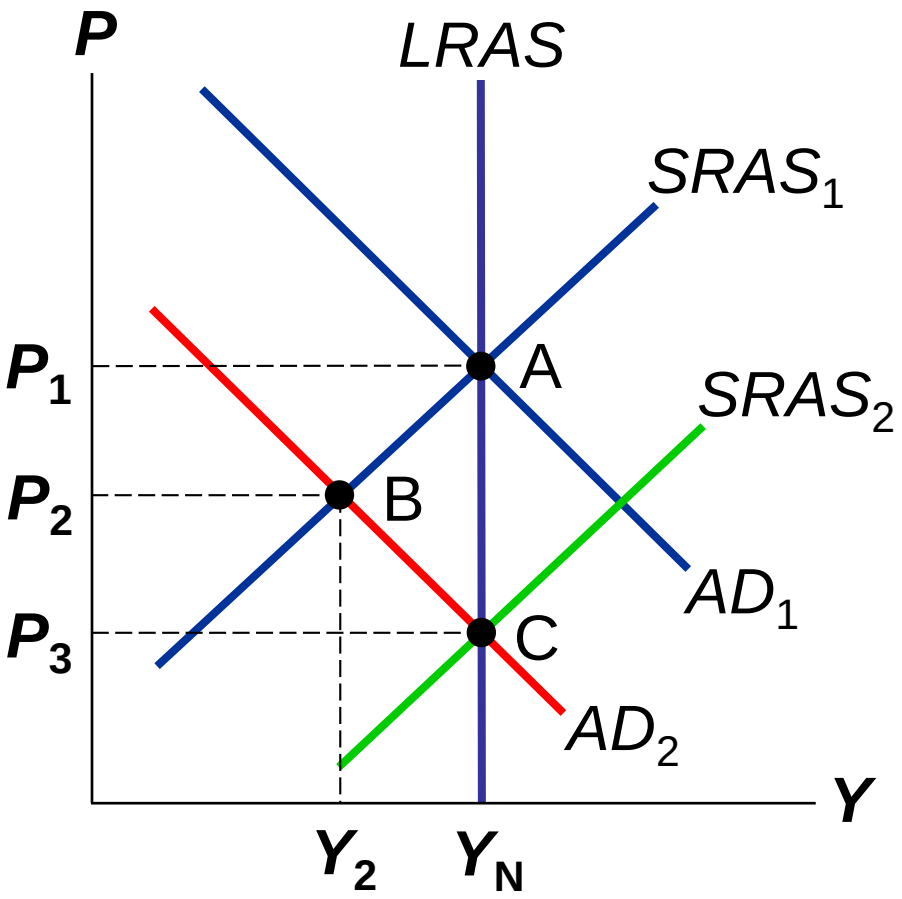
Economic Fluctuations

- Caused by events that shift the *AD* and/or *AS* curves.
- 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.

The Effects of a Shift in *AD*

Event: Stock market crash

1. Affects ***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, $\boldsymbol{P_E}$ falls,
   SRAS shifts right,
   until LR eq'm at C.
   Y and unemp back
   at initial levels.

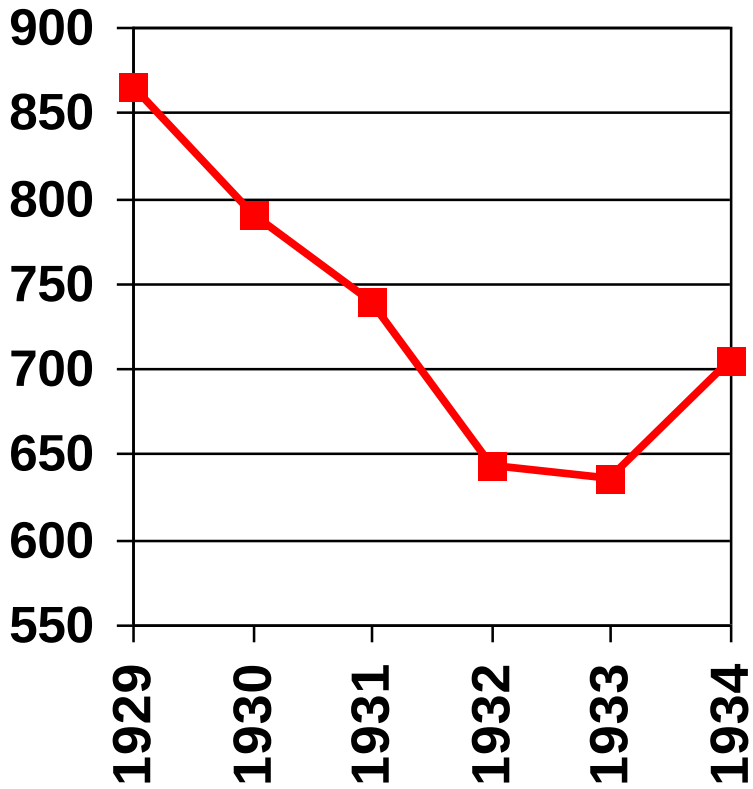


Two Big *AD* Shifts:
1. The Great Depression

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%

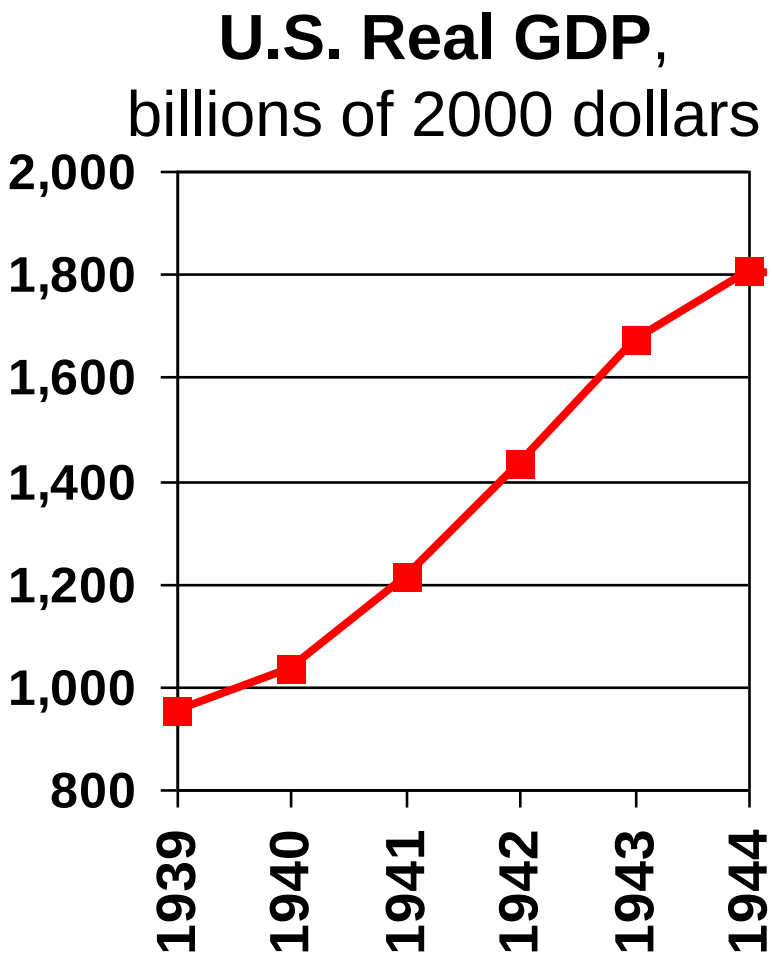
U.S. Real GDP, billions of 2000 dollars



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%
- unemp fell from 17% to 1%



ACTIVE LEARNING 2

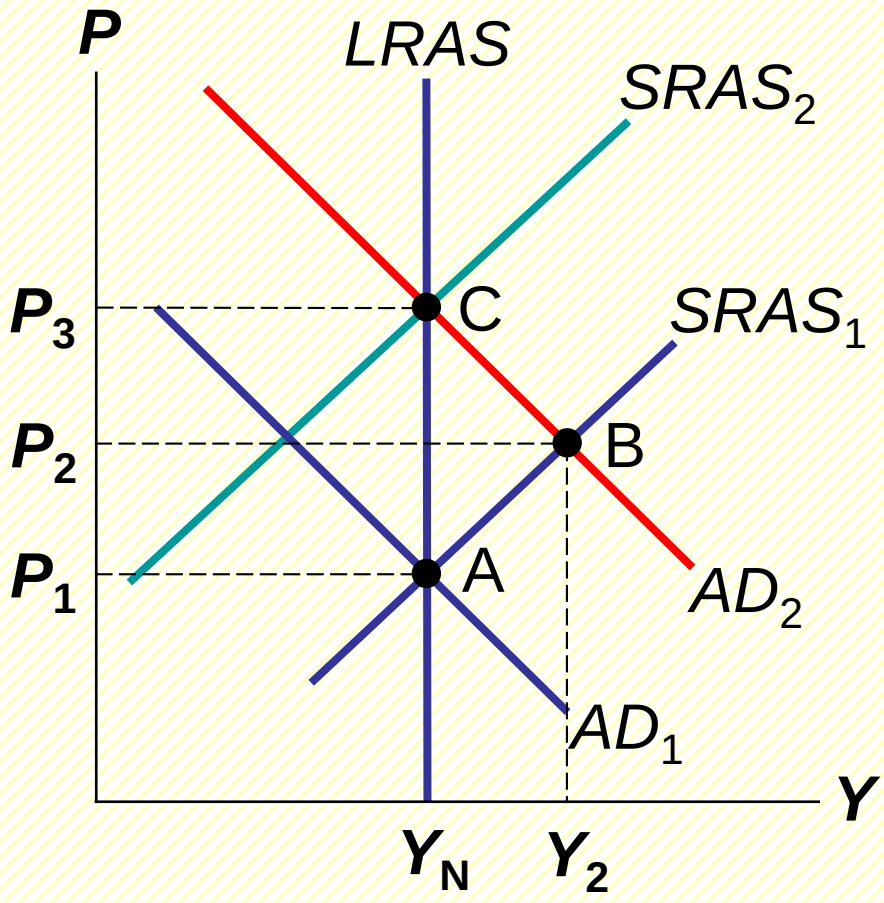
Working with the model

- Draw the *AD-SRAS-LRAS* diagram for the U.S. economy starting in a long-run equilibrium.
- A boom occurs in Canada. Use your diagram to determine the SR and LR effects on U.S. GDP, the price level, and unemployment.

ACTIVE LEARNING 2
Answers

Event: Boom in Canada

1. Affects ***NX***, *AD* curve
2. Shifts *AD* right
3. SR eq'm at point B. ***P*** and ***Y*** higher, unemp lower
4. Over time, $\boldsymbol{P_E}$ rises, *SRAS* shifts left, until LR eq'm at C. ***Y*** and unemp back at initial levels.

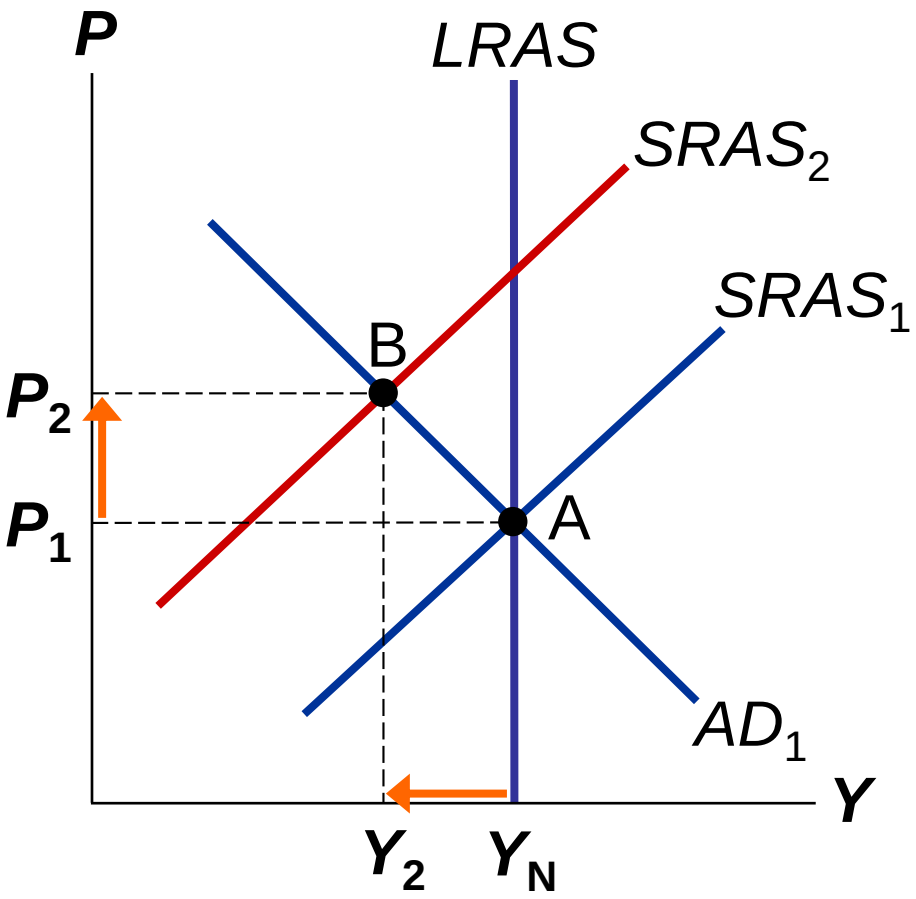


The Effects of a Shift in *SRAS*

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.

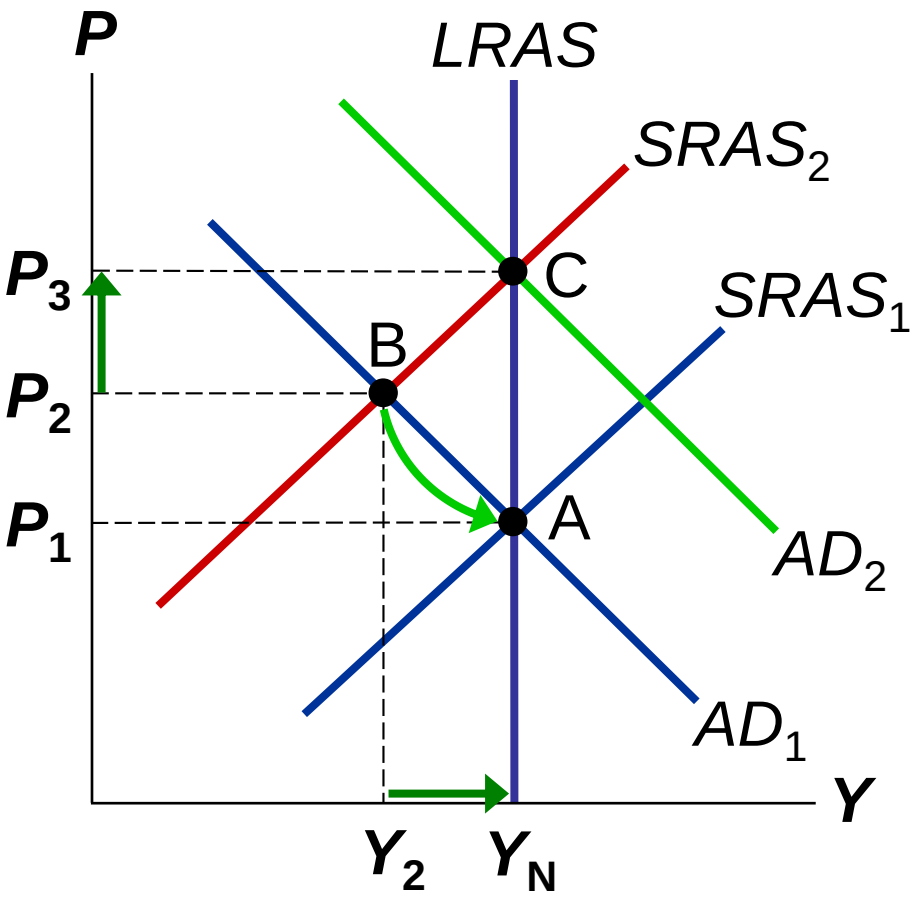


Accommodating an Adverse Shift in *SRAS*

If policymakers do nothing,

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

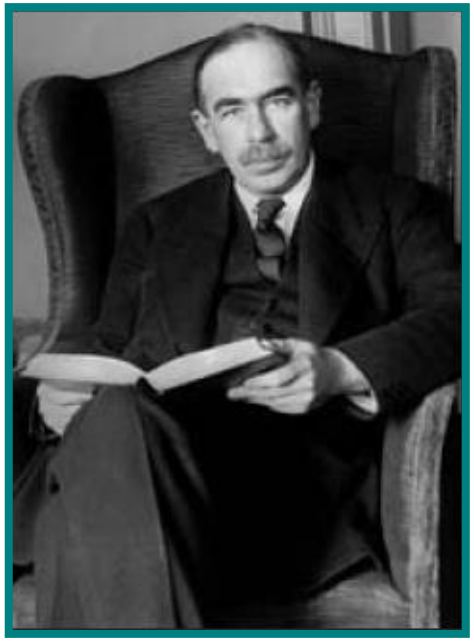
Or, policymakers could use fiscal or monetary policy to increase *AD* and accommodate the *AS* shift:
Y back to Y_N, but
P permanently higher.



The 1970s Oil Shocks and Their Effects

	1973-75	1978-80
Real oil prices	+ 138%	+ 99%
CPI	+ 21%	+ 26%
Real GDP	– 0.7%	+ 2.9%
# of unemployed persons	+ 3.5 million	+ 1.4 million

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. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us when the storm is long past, the ocean will be flat.