

# 33

## Aggregate Demand and Aggregate Supply

PRINCIPLES OF  
**ECONOMICS**  
FOURTH EDITION

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PowerPoint® Slides  
by Ron Cronovich

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### Long run v.s. short run

- Long run growth: what determines long-run output (and the related employment...)?
  - Capital accumulation;
  - Technological advancement.
- Short run fluctuations: what determines short-run output (and the related employment...)?
  - Aggregate demand and aggregate supply.

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### 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 curve slope downward? What shifts the AD curve?
- What is the slope of the Aggregate-Supply curve in the short run? In the long run? What shifts the AS curve(s)?

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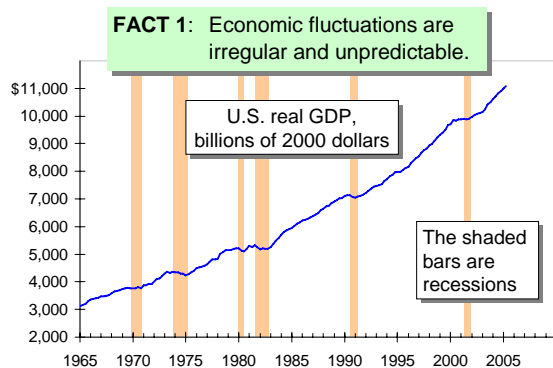
### Introduction

- 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**.

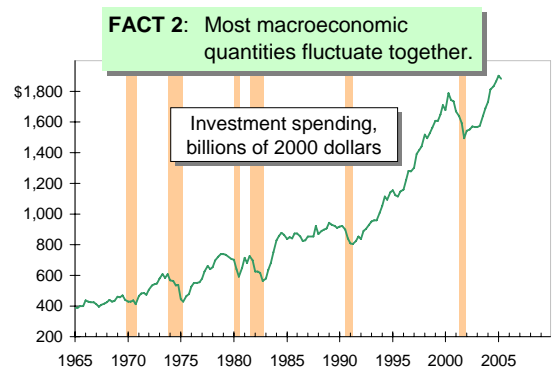
CHAPTER 33 AGGREGATE DEMAND AND AGGREGATE SUPPLY

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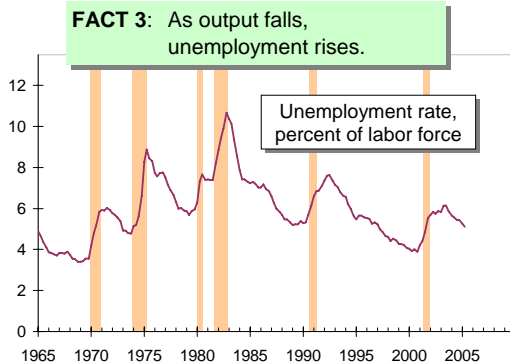
### Three Facts About Economic Fluctuations



### Three Facts About Economic Fluctuations



### Three Facts About Economic Fluctuations



### Explaining the short-run fluctuations

- Warning! This chapter is very theoretical.

### Introduction, *continued*

- Explaining these fluctuations is difficult, and the theory of economic fluctuations is controversial.
- Most economists use the **model of aggregate demand and aggregate supply** to study fluctuations.
- This model differs from the classical economic theories economists use to explain the long run.

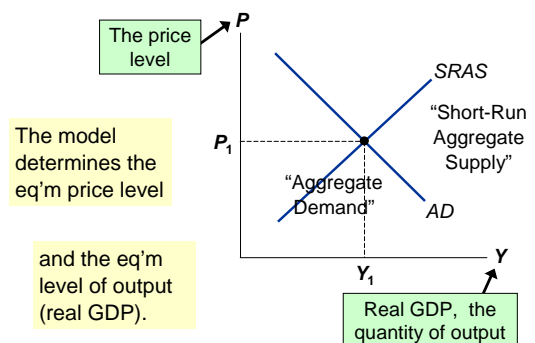
### Classical Economics

- 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

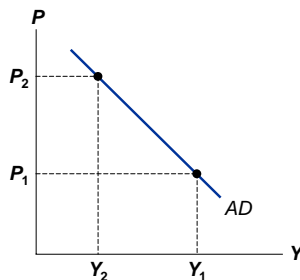
- Most economists believe classical theory describes the world in the long run, but not the short run.
- In the short run, changes in nominal variables (like the money supply or  $P$ ) can affect real variables (like  $Y$  or the u-rate).
- To study the short run, we use a new model.

### The Model of Aggregate Demand and Aggregate Supply



## The Aggregate-Demand (AD) Curve

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



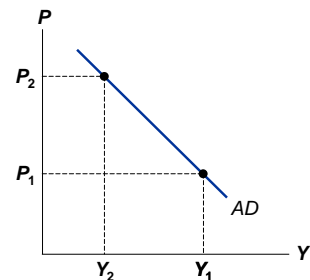
## Why the AD Curve Slopes Downward

$$Y = C + I + G$$

$C$ ,  $I$ ,  $G$  are the components of agg. Demand for a closed economy.

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, so they spend less.
- Thus, an increase in  $P$  causes a fall in  $C$  ...which means a smaller quantity of g&s demanded.

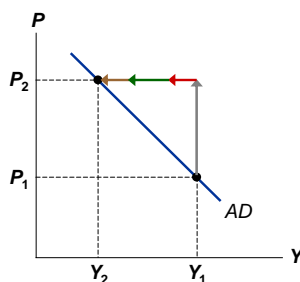
## The Interest-Rate Effect ( $P$ and $I$ )

- Suppose  $P$  rises.
- Buying g&s requires more dollars.
- To get these dollars, people sell some of their bonds or other assets, which drives up interest rates. ...which increases the cost of borrowing to fund investment projects.
- Thus, an increase in  $P$  causes a decrease in  $I$  ...which means a smaller quantity of g&s demanded.

## 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)

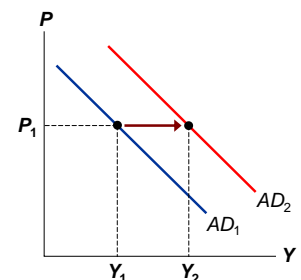


## Why the AD Curve Might Shift

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

Example:

A stock market boom makes households feel wealthier, **consume more**, and the AD curve shifts right.



### AD Shifts arising from things affecting C:

- The world becomes more uncertain, people decide to save more:  
C falls, AD shifts left
- The stock market crashes, the consumer confidence drops:  
C falls, AD shifts left
- tax cut:  
C falls, AD shifts right

### AD Shifts Arising from things affecting I

- Firms decide to upgrade their computers:  
I rises, AD shifts right
- Firms become pessimistic about future demand:  
I falls, AD shifts left
- Central bank uses monetary policy to reduce interest rates:  
I rises, AD shifts right
- Investment Tax Credit or other tax incentive:  
I rises, AD shifts right

### AD Shifts Arising from Changes in G

- Congress increases spending on homeland security:  
G rises, AD shifts right
- State govts cut spending on road construction:  
G falls, AD shifts left

### ACTIVE LEARNING 1: Exercise

Try this without looking at your notes.

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

- A ten-year-old investment tax credit expires.
- A fall in prices increases the real value of consumers' wealth.
- State governments eliminates sales taxes.

### ACTIVE LEARNING 1: Answers

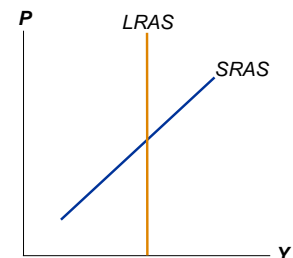
- A ten-year-old investment tax credit expires.  
I falls, AD curve shifts left.
- A fall in prices increases the real value of consumers' wealth.  
Move down along AD curve (wealth-effect).
- State governments eliminates sales taxes. C rises, AD shifts right.

### The Aggregate-Supply (AS) Curves

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

In the short run, AS is upward-sloping.

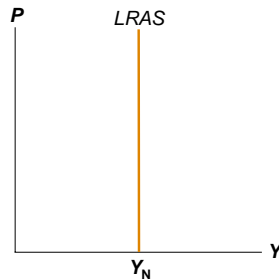
In the long run, AS is vertical.



## 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**.

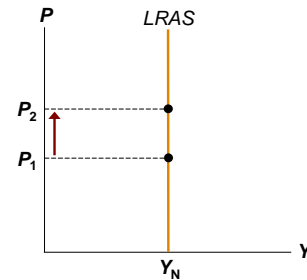


## Why LRAS Is Vertical

$Y_N$  depends on 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  $Y_N$ .

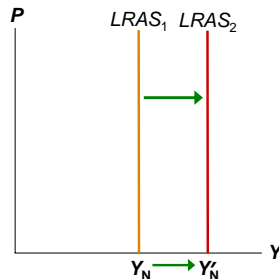
(Classical dichotomy)



## 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.



## LRAS Shifts Arising from Changes in $L$

- The Baby Boom generation retires:  $L$  falls, LRAS shifts left
- New govt policies reduce the natural rate of unemployment: the % of the labor force normally employed rises, LRAS shifts right

## LRAS Shifts Arising from Changes in Physical or Human Capital

- Investment in factories or equipment:  $K$  rises, LRAS shifts right
- More people get college degrees: Human capital rises, LRAS shifts right
- Earthquakes or hurricanes destroy factories:  $K$  falls, LRAS shifts left

## LRAS Shifts Arising from Changes in Natural Resources

- A change in weather patterns makes farming more difficult: LRAS shifts left
- Discovery of new mineral deposits: LRAS shifts right
- Reduction in supply of imported oil or other resources: LRAS shifts right

### LRAS Shifts Arising from Changes in Technology

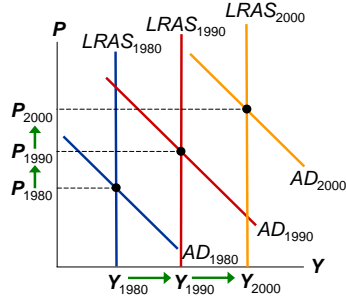
- Technological advances allow more output to be produced from a given bundle of inputs: LRAS shifts right.

### In short:

- Anything that affects growth shifts LRAS!

### Using AD & AS to Depict LR Growth and Inflation

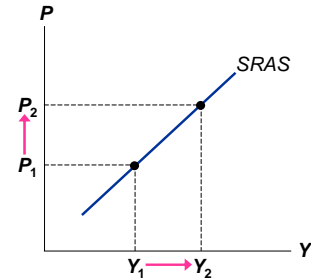
Over the long run, tech. progress shifts LRAS to the right and growth in the aggregate demand shifts AD to the right. Result: ongoing inflation and growth in output.



### Short Run Aggregate Supply (SRAS)

The SRAS curve is upward sloping:

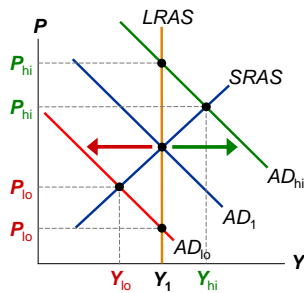
Over the period of 1-2 years, an increase in  $P$  causes an increase in the quantity of  $g$  &  $s$  supplied.



### 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.

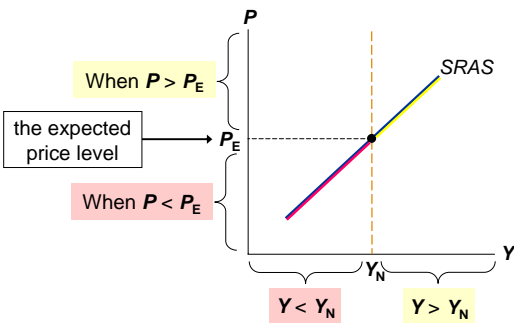


### Three Theories of SRAS

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.**

### Three Theories of SRAS



### 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.

### The Sticky-Wage Theory

- The labor contract sets nominal wages according to expected prices.
- 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**.

### The Sticky-Wage Theory

The sticky wage theory implies  $Y$  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  $P$

Expected price level

Actual price level

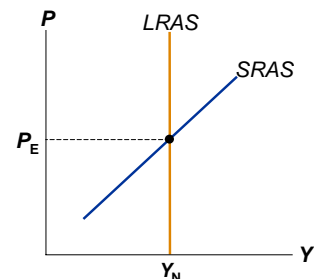
### SRAS and LRAS

- 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  
 $Y = Y_N$ .



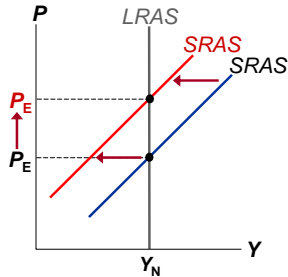
### Why the SRAS Curve Might Shift

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.



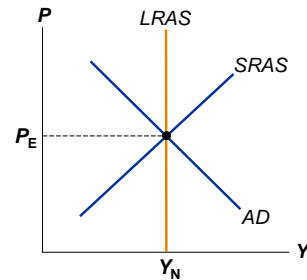
### The Long-Run Equilibrium

In the long-run equilibrium,

$$P_E = P,$$

$$Y = Y_N,$$

and unemployment is at its natural rate.



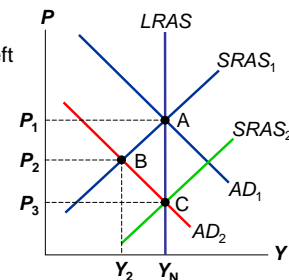
### Economic Fluctuations

- 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,  $P_E$  falls, SRAS shifts right, until LR eq'm at C.  $Y$  and unemp back at initial levels.

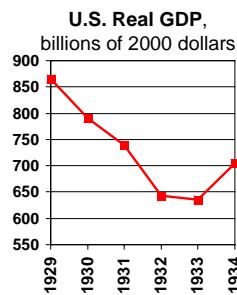


### Two Big AD Shifts:

#### 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%
- unemp rose from 3% to 25%

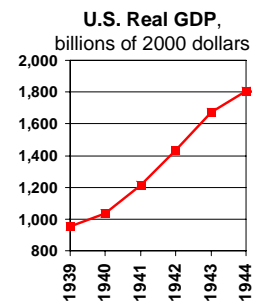


### Two Big AD Shifts:

#### 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%
- unemp fell from 17% to 1%



**ACTIVE LEARNING 2:  
Exercise**

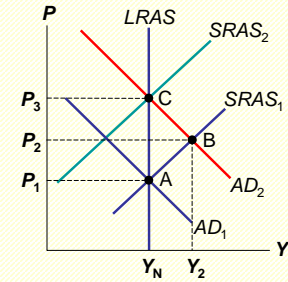
- Draw the AD-SRAS-LRAS diagram for the U.S. economy, starting in a long-run equilibrium.
- A boom occurs in Canada. Use your diagram to determine the SR and LR effects on U.S. GDP, the price level, and unemployment.

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**ACTIVE LEARNING 2:  
Answers**

Event: a tax cut

- affects **C**, AD curve
- shifts AD right
- SR eq'm at point B. **P** and **Y** higher, unemp lower
- Over time,  $P_E$  rises, SRAS shifts left, until LR eq'm at C. **Y** and unemp back at initial levels.

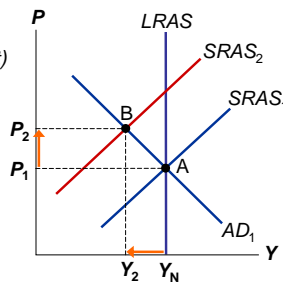


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**The Effects of a Shift in SRAS**

Event: oil prices rise

- increases costs, shifts SRAS (assume LRAS constant)
  - SRAS shifts left
  - 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.

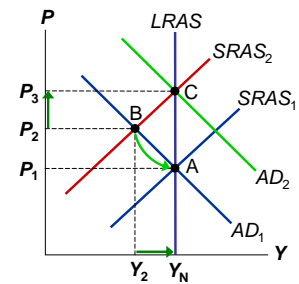


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**Accommodating an Adverse Shift in SRAS**

If policymakers do nothing,

- 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.



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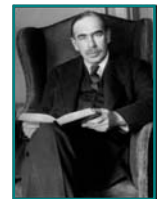
**The 1970s Oil Shocks and Their Effects**

	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

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**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.*

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## 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 explained by the models we learned in previous chapters.
- 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.