23. Aggregate Demand and Aggregate Supply

Seoul National University

Questions in this chapter

- 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)?

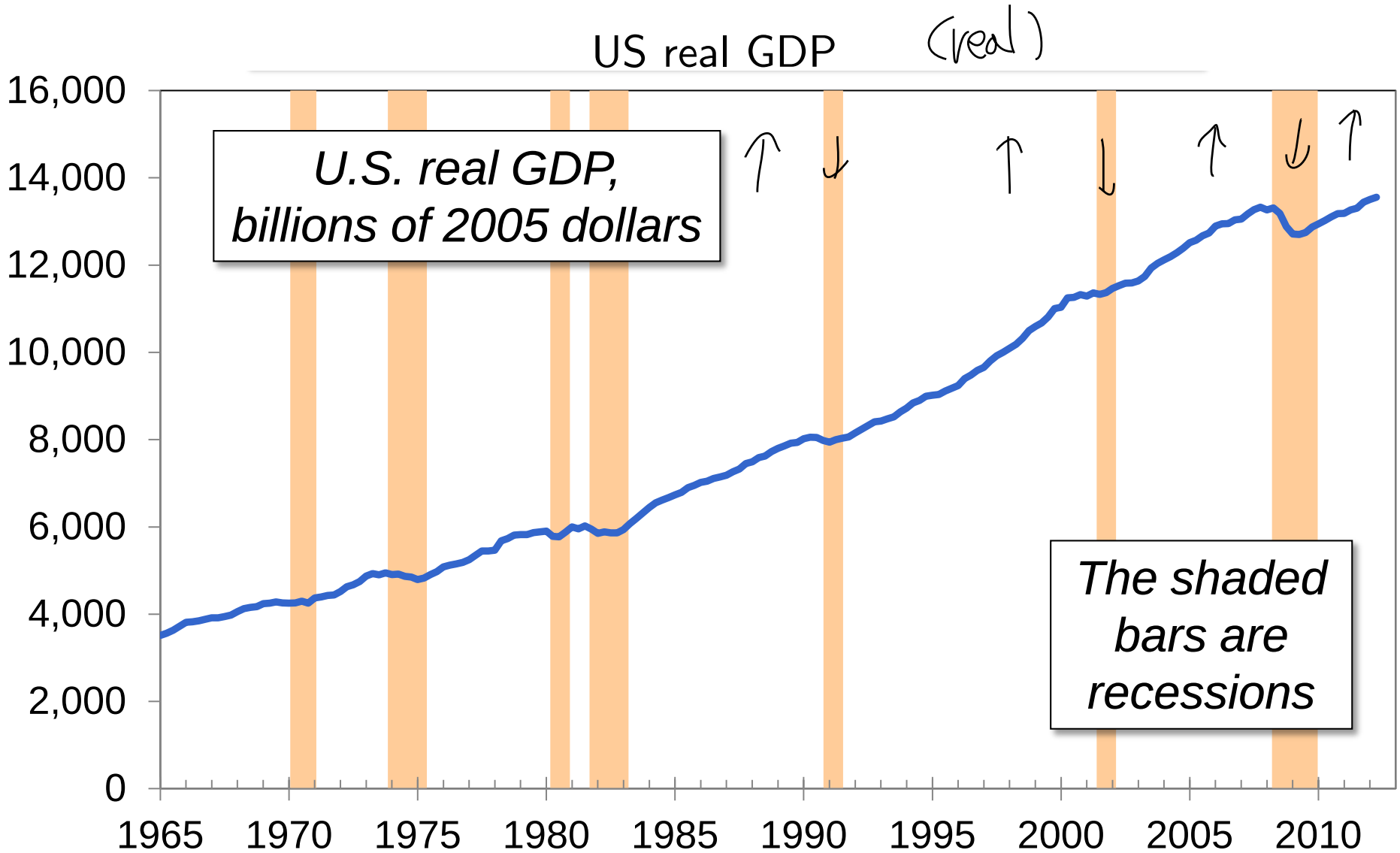
Introduction

- 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.

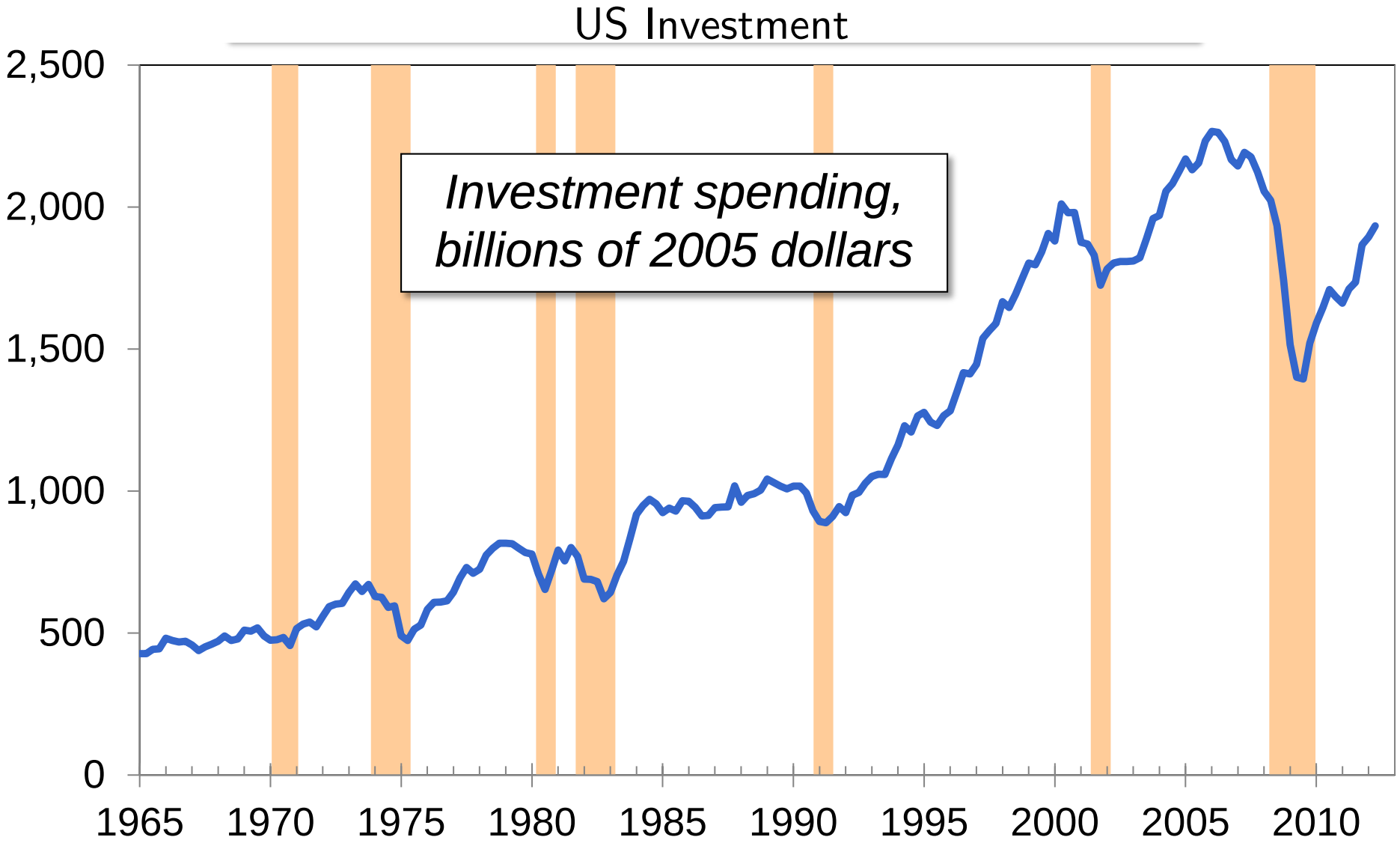
Three Facts About Economic Fluctuations

- FACT 1: Economic fluctuations are irregular and unpredictable.
- FACT 2: Most macroeconomic quantities fluctuate together.
- FACT 3: As output falls, unemployment rises.

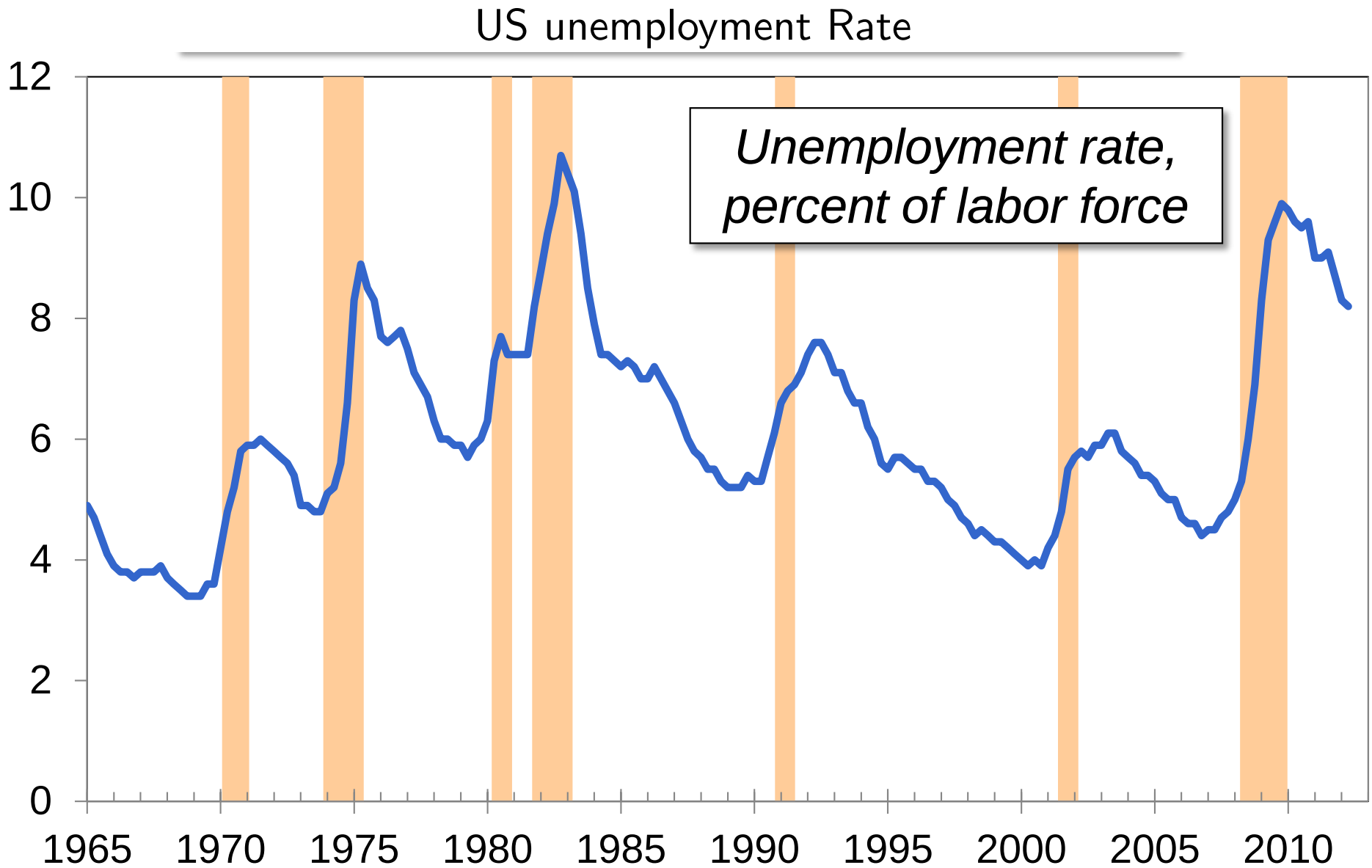
Three Facts About Economic Fluctuations



Three Facts About Economic Fluctuations



Three Facts About Economic Fluctuations



Introduction, cont'd

- 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.

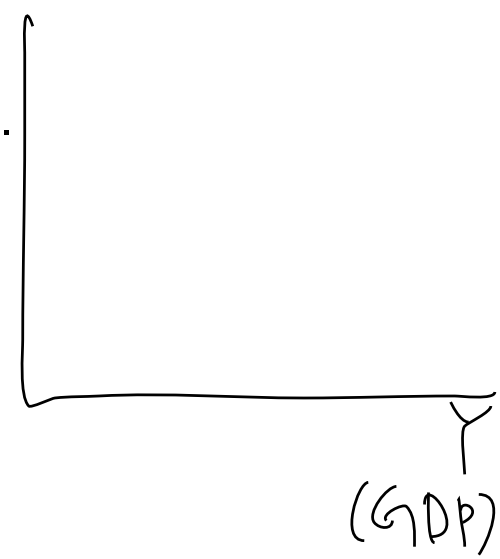
Classical Economics—A Recap

- 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.
- 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

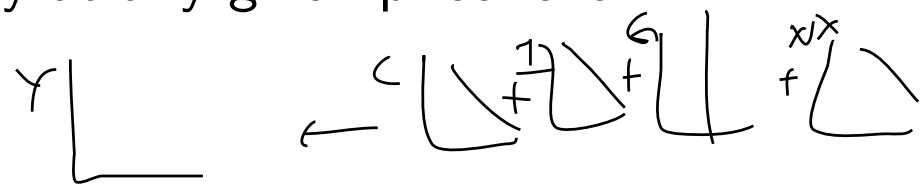
AD- AS Model

- Exactly same as we studied Supply and Demand in microeconomics, we will study "Aggregate Demand" and "Aggregate Supply"
- The model determines the equilibrium price level (P) and equilibrium output (Y)
- We will first look at short-run and move to long-run.



The Aggregate-Demand (AD) Curve

- The AD curve shows the quantity of all goods & services demanded in the economy at any given price level.
- Recall that



$$Y = C + I + G + NX$$

- Assume G fixed by govt policy.
- To understand the shape 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 goods & services, so real wealth is lower.
- People feel poorer.
- Result: C falls.

$P \uparrow \rightarrow$real wealth is lower$\rightarrow$ C falls

The Interest-Rate Effect (P and I)

- Suppose P rises.
- Buying goods & services 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.)

$$\boxed{P \uparrow \rightarrow r \uparrow \rightarrow I \text{ (and } C\text{) fall}}$$

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. (domestic currency gets more expensive)
- U.S. exports more expensive to people abroad, imports cheaper to U.S. residents.
- Result: NX falls.

$$\boxed{P \uparrow \rightarrow r \uparrow \rightarrow NX \text{ falls}}$$

The Slope of the AD Curve: Summary

An increase in P reduces the quantity of goods & services demanded because:

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

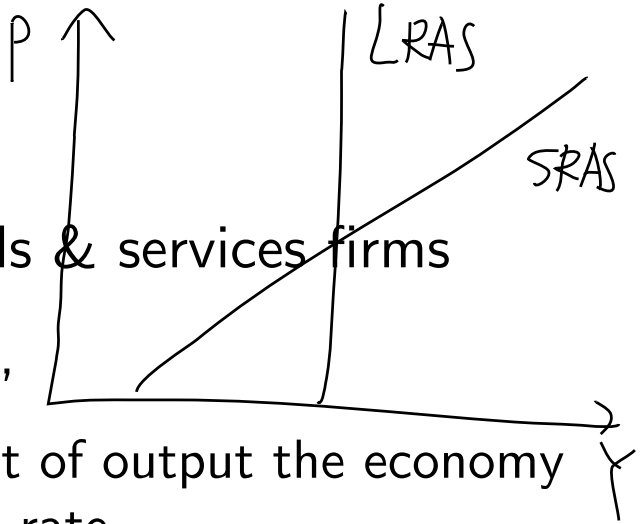
Why the AD Curve Might Shift

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

주식시장↑ → 부자라고 생각 → C↑ → AD↑

- Changes in C
  - Stock market boom/crash
  - Preferences (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
- 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

The Aggregate-Supply (AS) Curves



- The AS curve shows the total quantity of goods & services firms produce and sell at any given price level.
- In the long run (LR): "Natural level of Output"
  - 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.
  - 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)

LRAS

AS is vertical in long run

LRAS

SRAS

- In the short run (SR): "Market Imperfection" and output deviates from its natural level
  - Three theories for market imperfection
  - An increase in P does affect Y temporarily
  - This effect disapears in the long run

SRAS

AS is upward sloping in short run

Why the LRAS Curve Might Shift

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

- Changes in L or natural rate of unemployment
  - Immigration
  - Baby-boomers retire
  - Govt policies reduce natural u-rate
- Changes in K or H (Physical Capital or Human Capital)
  - Investment in factories, equipment
  - More people get college degrees
  - Factories destroyed by a hurricane
- 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

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 goods & services supplied.
- Why is it upward sloping? Three Theories
- In each, some type of market imperfection
- As a result, output deviates from its natural rate when the actual price level deviates from the price level people expected.

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

1. The Sticky-Wage Theory

- Imperfection: Nominal wages are sticky in the short run, they adjust sluggishly.
- This is 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.
- 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 P_E.
- 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. Meanwhile, 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.

혼란

3. The Misperceptions Theory

P↑ 인지 아니면 갑자기 돈이 많아진건지 혼란 ↑↓

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

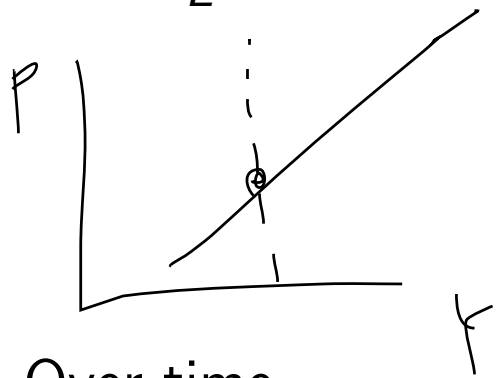
What the 3 Theories Have in Common:

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

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

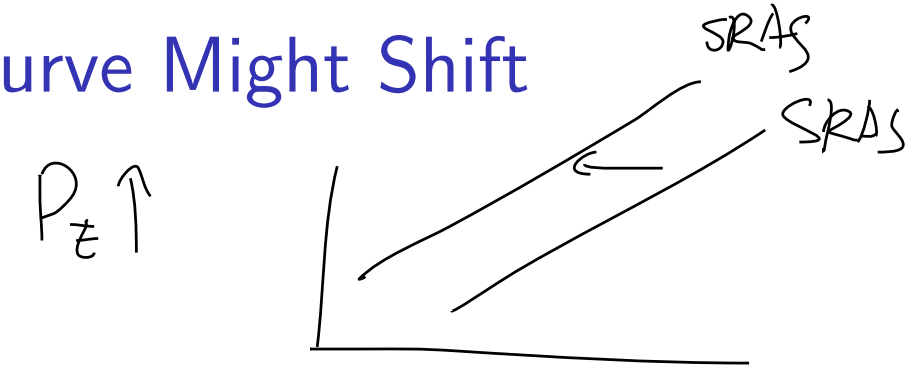
LRAS

$a > 0$



- 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
  - and $Y = Y_N$
  - unemployment is at its natural rate

Why the SRAS Curve Might Shift

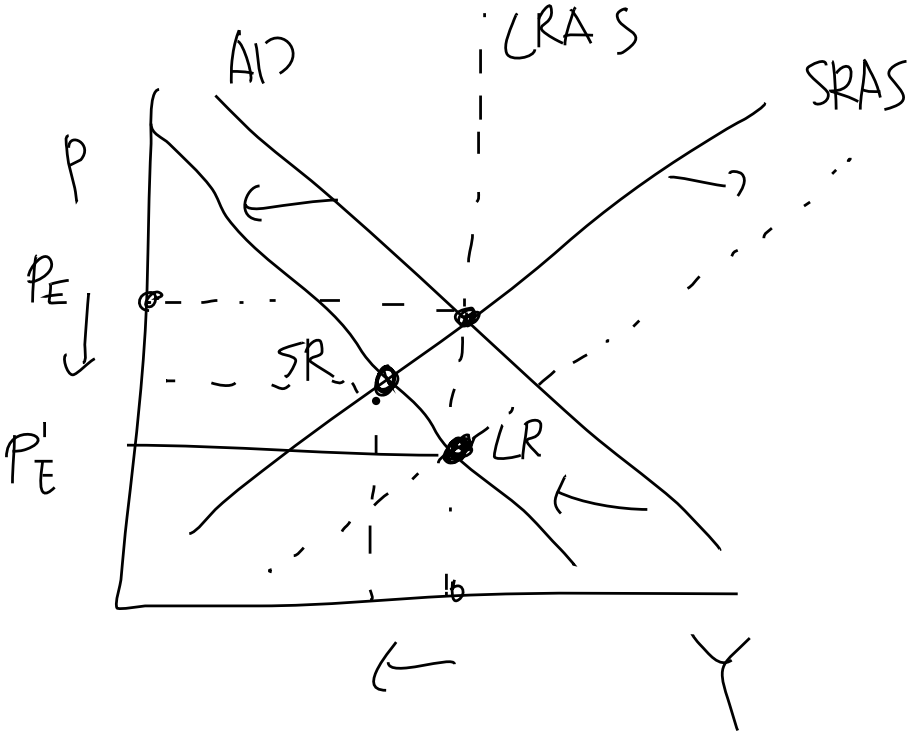


- Everything that shifts LRAS shifts SRAS, too.
- Also, P_E shifts SRAS:
- If P_E rises, workers & firms set higher wages.
- At each P, production is less profitable, Y falls, SRAS shifts left.

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

- Affects C, AD curve
- C falls, so AD shifts left
- SR eq'm : P and Y lower, unemp higher
- Over time, P_E falls, SRAS shifts right, until LR eq'm goes back to the original eq'm. 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%
- unemp fell from 17% to 1%

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 : P higher, Y lower, unemp higher stagflation, a period of falling output and rising prices.
4. If policymakers do nothing, Low employment causes wages to fall, SRAS shifts right, until LR eq'm goes back to its original eq'm.
5. 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.

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.

CASE STUDY: The 2008–2009 Recession

- From 12/2007 to 6/2009, real GDP fell about 4%
- Unemployment rose from 4.4% in 5/2007 to 10.1% in 10/2009
- The housing market played a central role in this recession...
- Rising house prices during 2002–2006 due to:
  - low interest rates
  - easier credit for "sub-prime" borrowers
  - government policies to increase homeownership
  - securitization of mortgages: Mortgage-backed securities perceived as safe, since house prices "never fall"

CASE STUDY: The 2008–2009 Recession

- Consequences of 2006–2009 housing market crash:
  - Millions of homeowners "underwater"—owed more than house was worth
  - Millions of mortgage defaults and foreclosures
  - Banks selling foreclosed houses increased surplus and downward price pressures
  - Housing crash badly damaged construction industry: 2010 unemployment rate was 20.6% in construction vs. 9.6% overall
  - Mortgage-backed securities became "toxic," heavy losses for institutions that purchased them, widespread failures of banks and other financial institutions
  - Sharply rising unemployment and falling GDP
- The policy response:
  - Federal Reserve reduced Fed Funds rate target to near zero.
  - Federal Reserve purchased mortgage-backed securities and other private loans.
  - U.S. Treasury injected capital into the banking system, to increase banks' liquidity and solvency in hopes of staving off a "credit crunch"
  - Fiscal policymakers increased government spending and reduced taxes by $800 billion