33

Aggregate Demand and Aggregate Supply

PRINCIPLES OF
ECONOMICS
FOURTH EDITION

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PowerPoint® Slides
by Ron Cronovich

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.

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

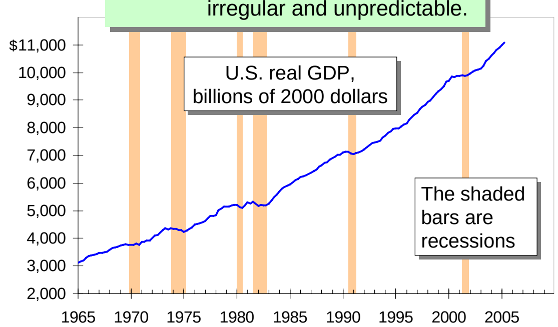
- What are economic fluctuations? What are their characteristics?
- How does the model of aggregate demand and aggregate supply explain economic fluctuations?
- Why does the Aggregate-Demand curve slope downward? What shifts the *AD* curve?
- What is the slope of the Aggregate-Supply curve in the short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

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**.

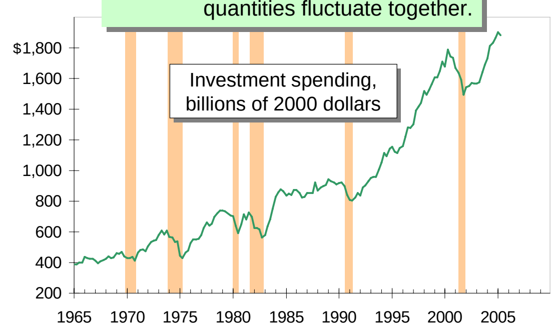
Three Facts About Economic Fluctuations

FACT 1: Economic fluctuations are irregular and unpredictable.

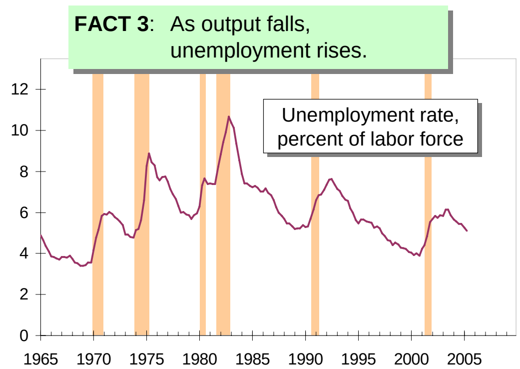


Three Facts About Economic Fluctuations

FACT 2: Most macroeconomic quantities fluctuate together.



Three Facts About Economic Fluctuations



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.

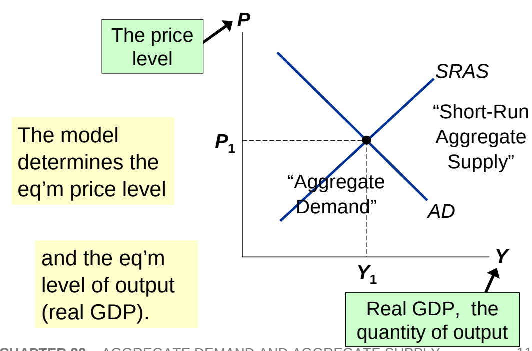
Classical Economics

- 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

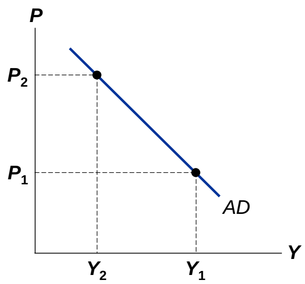
- Most economists believe classical theory describes the world in the long run, but not the short run.
- In the short run, changes in nominal variables (like the money supply or ***P***) can affect real variables (like ***Y*** or the u-rate).
- To study the short run, we use a new model.

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.



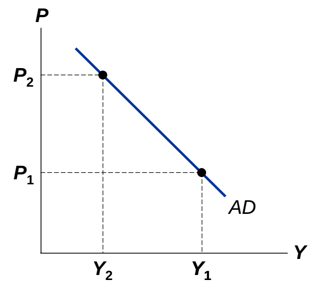
Why the *AD* Curve Slopes Downward

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.

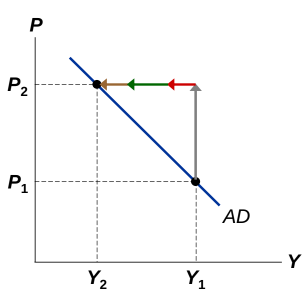
The Interest-Rate Effect (*P* and *I*)

- 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:

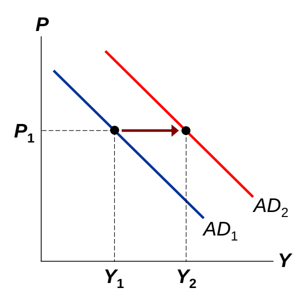
- the wealth effect (***C*** falls)
- the interest-rate effect (***I*** falls)



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

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

C. State governments eliminates sales taxes.

ACTIVE LEARNING 1: Answers

A. A ten-year-old investment tax credit expires.
I falls, *AD* curve shifts left.

B. A fall in prices increases the real value of consumers' wealth.
Move down along *AD* curve (wealth-effect).

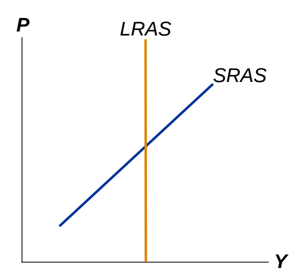
C. State governments eliminates sales taxes. ***C*** rises, *AD* shifts right.

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.

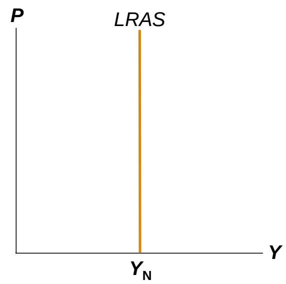
In the long run, *AS* is vertical.



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**.

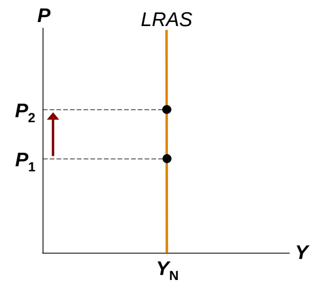


Why *LRAS* Is Vertical

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.

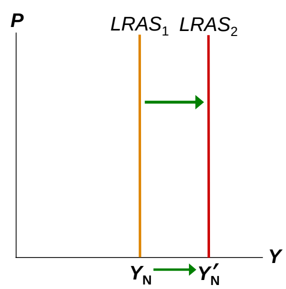
(Classical dichotomy)



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:

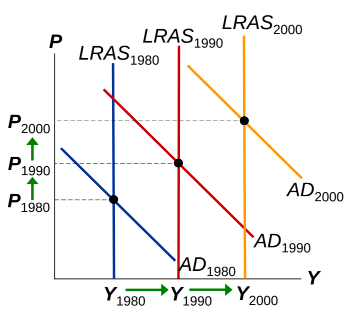
- Anything that affects growth shifts LRAS!

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.

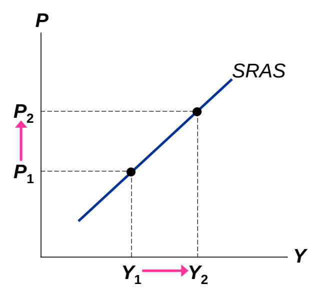
Result:
ongoing inflation and growth in output.



Short Run Aggregate Supply (*SRAS*)

The *SRAS* curve is upward sloping:

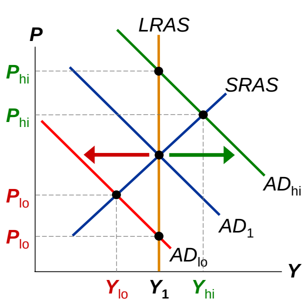
Over the period of 1-2 years, an increase in ***P*** causes an increase in the quantity of g & s supplied.



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.

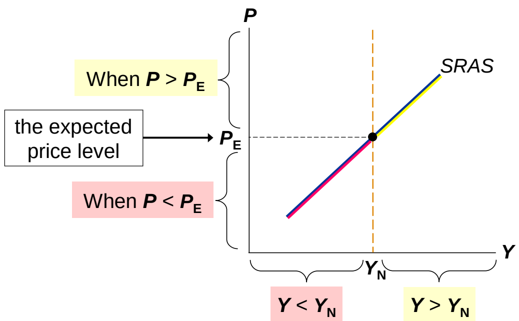


Three Theories of *SRAS*

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

Actual price level

Expected price level

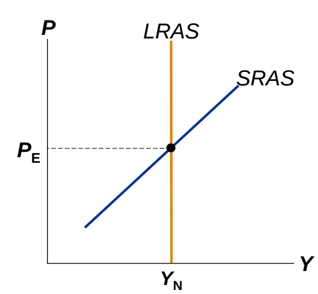
SRAS and *LRAS*

- 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
$Y = Y_N$.



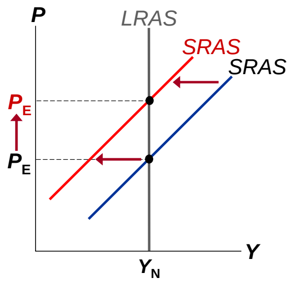
Why the *SRAS* Curve Might Shift

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

Also, $\boldsymbol{P}_{\mathrm{E}}$ shifts *SRAS*:

If $\boldsymbol{P}_{\mathrm{E}}$ rises, workers & firms set higher wages.

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



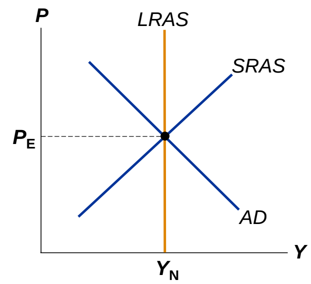
The Long-Run Equilibrium

In the long-run equilibrium,

$P_E = P$,

$Y = Y_N$,

and unemployment is at its natural rate.



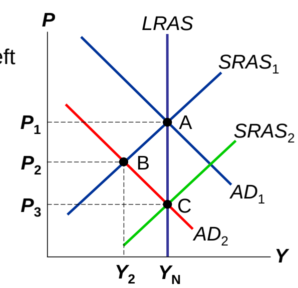
Economic Fluctuations

- 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, $\boldsymbol{P}_{\mathrm{E}}$ falls, *SRAS* shifts right, until LR eq'm at C. ***Y*** and unemp back at initial levels.

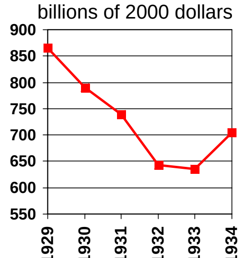


Two Big *AD* Shifts:
1. The Great Depression

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%

U.S. Real GDP, billions of 2000 dollars

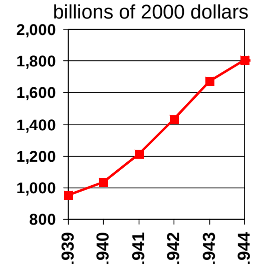


Two Big *AD* Shifts:
2. The World War II Boom

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%

U.S. Real GDP, billions of 2000 dollars



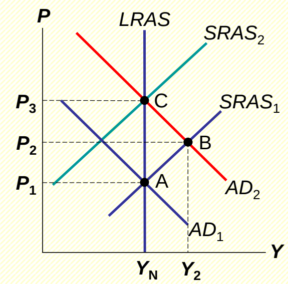
ACTIVE LEARNING 2:
Exercise

- 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.

ACTIVE LEARNING 2:
Answers

Event: a tax cut

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

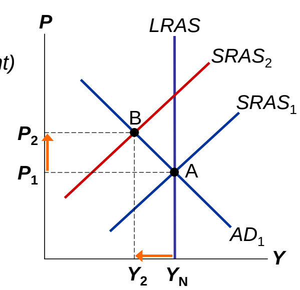


The Effects of a Shift in *SRAS*

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.

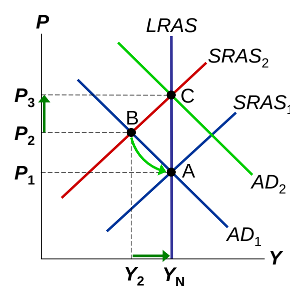


Accommodating an Adverse Shift in *SRAS*

If policymakers do nothing,

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

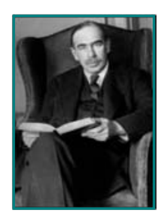
Or, policymakers could use fiscal or monetary policy to increase *AD* and accommodate the *AS* shift:
Y back to Y_N, but
P permanently higher.



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.

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.