Aggregate Demand and Aggregate Supply

• Short-Run Economic Fluctuations
  – Economic activity fluctuates from year to year.
    • In most years production of goods and services rises.
    • On average over the past 50 years, production in the
      U.S. economy has grown by about 3 percent per year.
    • In some years normal growth does not occur, indicating
      a recession.
  – A recession is a period of declining real incomes,
    and rising unemployment.
  – A depression is a severe recession.

THREE KEY FACTS ABOUT ECONOMIC FLUCTUATIONS

1. Economic fluctuations are irregular and unpredictable.
   – Fluctuations in the economy are often called the
     business cycle.
   – These fluctuations do not follow regular or easily
     predictable patterns.
THREE KEY FACTS ABOUT ECONOMIC FLUCTUATIONS

2. Most macroeconomic variables fluctuate together.
   - Most macroeconomic variables that measure some type of income or production fluctuate closely together.
   - Although many macroeconomic variables fluctuate together, they fluctuate by different amounts.

3. As output falls, unemployment rises.
   - Changes in real GDP are inversely related to changes in the unemployment rate.
   - During times of recession, unemployment rises substantially.
EXPLAINING SHORT-RUN ECONOMIC FLUCTUATIONS

• The Assumptions of Classical Economics
  – Most economists believe that classical theory describes the world in the long run but not in the short run.
  – Changes in the money supply affect nominal variables but not real variables in the long run.
  – The assumption of monetary neutrality is not appropriate when studying year-to-year changes in the economy.

EXPLAINING SHORT-RUN ECONOMIC FLUCTUATIONS

• If the quantity of money in the economy were to double, prices would double and so would incomes. Real variables would remain constant.
• HOWEVER: These changes will not occur instantaneously. It takes time for prices and incomes to change, and in the meantime, there can be real effects.

The Model of Aggregate Demand and Aggregate Supply

• Two variables are used to develop a model to analyze the short-run fluctuations.
• The economy’s output of goods and services measured by real GDP.
• The average level of prices measured by the CPI or the GDP deflator.
The Model of Aggregate Demand and Aggregate Supply

- Economist use the *model of aggregate demand and aggregate supply* to explain short-run fluctuations in economic activity around its long-run trend.

![Graph showing economic activity over time with a business cycle]

The Model of Aggregate Demand and Aggregate Supply

- The *aggregate-demand curve* shows the quantity of goods and services that households, firms, and the government want to buy at each price level.
- The *aggregate-supply curve* shows the quantity of goods and services that firms choose to produce and sell at each price level.

**THE AGGREGATE-DEMAND CURVE**

- The four components of GDP ($Y$) contribute to the aggregate demand for goods and services.
  
  \[ Y = C + I + G + NX \]
Figure 3 The Aggregate-Demand Curve...

Why the Aggregate-Demand Curve Is Downward Sloping

- The Price Level and Consumption:
  - The Wealth Effect
    - A lower price level raises the real value of money and makes consumers wealthier, which encourages them to spend more.
    - This increase in consumer spending means larger quantities of goods and services demanded.

- The Price Level and Investment:
  - The Interest Rate Effect
    - A lower price level reduces the interest rate and makes borrowing less expensive, which encourages greater spending on investment goods.
    - This increase in investment spending means a larger quantity of goods and services demanded.

- The Price Level and Net Exports:
  - The Exchange-Rate Effect

1. A decrease in the price level . . .

2. . . . increases the quantity of goods and services demanded.
Why the Aggregate-Demand Curve Is Downward Sloping

- The Price Level and Net Exports:
  - The Exchange-Rate Effect
    - A lower price level in the U.S. causes U.S. interest rates to fall and the real exchange rate to depreciate, which stimulates U.S. net exports.
    - The increase in net export spending means a larger quantity of goods and services demanded.

Why the Aggregate-Demand Curve Might Shift

- Shifts might arise from changes in:
  - Consumption
  - Investment
  - Government Purchases
  - Net Exports

Why the Aggregate-Demand Curve Might Shift

- The downward slope of the aggregate-demand curve shows that a fall in the price level raises the overall quantity of goods and services demanded.
- Many other factors, however, affect the quantity of goods and services demanded at any given price level.
- When one of these other factors changes, the aggregate demand curve shifts.

Shifts in the Aggregate Demand Curve

- Price Level
  - Aggregate demand, \( D_1 \)
  - Price Level, \( P_1 \)
  - Quantity of Output
    - \( Y_1 \)
    - \( Y_2 \)
Table 1 The Aggregate Demand Curve: Summary

<table>
<thead>
<tr>
<th>Why Does the Aggregate Demand Curve Slope Downward?</th>
</tr>
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<tbody>
<tr>
<td>1. The Wealth Effect: A lower price level increases real wealth, which encourages spending on consumption.</td>
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<tr>
<td>2. The Interest Rate Effect: A lower price level reduces the interest rate, which encourages spending on investment.</td>
</tr>
<tr>
<td>3. The Exchange Rate Effect: A lower price level causes the real exchange rate to depreciate, which encourages spending on net exports.</td>
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Why Might the Aggregate-Demand Curve Shift?

1. Shifts Arising from Consumption: An event that makes consumers spend more at a given price level (e.g., tax cut, a stock market boom) shifts the aggregate demand curve to the right. An event that makes consumers spend less at a given price level (e.g., tax hike, a stock market decline) shifts the aggregate demand curve to the left.
2. Shifts Arising from Investment: An event that increases the demand for capital (e.g., a government investment program) shifts the aggregate demand curve to the right. An event that decreases the demand for capital (e.g., a decrease in business confidence) shifts the aggregate demand curve to the left.
3. Shifts Arising from Government Purchases: An increase in government purchases of goods and services (e.g., a government investment program) shifts the aggregate demand curve to the right. A decrease in government purchases of goods and services (e.g., a reduction in government spending) shifts the aggregate demand curve to the left.
4. Shifts Arising from the Exports: An event that makes exports more competitive (e.g., a decrease in the exchange rate) shifts the aggregate demand curve to the right. An event that makes exports less competitive (e.g., an increase in the exchange rate) shifts the aggregate demand curve to the 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. 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 their sales taxes with new taxes on interest, dividends, and capital gains. C rises, AD shifts right.

Active Learning 1: Answers

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The Aggregate-Supply Curve

- In the long run, the aggregate-supply curve is vertical because the price level does not affect long run determinants of real GDP.
- In the short run, the aggregate-supply curve is upward sloping.
THE AGGREGATE-SUPPLY CURVE

• In the long run, an economy’s production of goods and services depends on its supplies of labor, capital, and natural resources and on the available technology used to turn these factors of production into goods and services.
• The price level does not affect these variables in the long run.
• The long-run aggregate supply represents the classical dichotomy and money neutrality.

THE AGGREGATE-SUPPLY CURVE

• The long-run aggregate-supply curve is vertical at the natural rate of output, which is the production of goods and services that an economy achieves in the long run when unemployment is at its normal rate.
  – This level of production is also referred to as potential output or full-employment output.
  – The natural rate of output is level of output towards which the economy gravitates in the long run.

\[ Y_N \]

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)

Figure 4 The Long-Run Aggregate-Supply Curve

Why the Long-Run Aggregate-Supply Curve Might Shift

• Any change in the economy that alters the natural rate of output shifts the long-run aggregate-supply curve.
• The shifts may be categorized according to the various factors in the classical model that affect output.
• Shifts might arise from changes in:
  • Labor
  • Capital
  • Natural Resources
**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.
Using Aggregate Demand and Aggregate Supply to Depict Long-Run Growth and Inflation

- The most important forces that govern the economy in the long run are technology and monetary policy.
- Short-run fluctuations in output and the price level should be viewed as deviations from the continuing long-run trends of output growth and inflation.

Why the Aggregate-Supply Curve Slopes Upward in the Short Run

- In the short run, an increase in the overall level of prices in the economy tends to raise the quantity of goods and services supplied.
- A decrease in the level of prices tends to reduce the quantity of goods and services supplied.
- As a result, the short-run aggregate-supply curve is upward sloping.
Why the Aggregate-Supply Curve Slopes Upward in the Short Run

• Three Theories:
  • The Sticky-Wage Theory
  • The Sticky-Price Theory
  • The Misperceptions Theory

Why the Aggregate-Supply Curve Slopes Upward in the Short Run

• The Sticky-Wage Theory
  • Nominal wages are slow to adjust to changing economic conditions, or are “sticky” in the short run
  • Nominal wages do not adjust immediately to a fall in the price level. A lower price level makes employment and production less profitable.
  • This induces firms to reduce the quantity of goods and services supplied.

Why the Aggregate-Supply Curve Slopes Upward in the Short Run

• The Sticky-Price Theory
  • Prices of some goods and services adjust sluggishly in response to changing economic conditions.
  • An unexpected fall in the price level leaves some firms with higher-than-desired prices. For a variety of reasons, they may not want to or be able to change prices immediately.
  • This depresses sales, which induces firms to reduce the quantity of goods and services they produce.

Why the Aggregate-Supply Curve Slopes Upward in the Short Run

• The Misperceptions Theory
  • Changes in the overall price level temporarily mislead suppliers about what is happening in the markets in which they sell their output.
  • A lower price level causes misperceptions about relative prices.
  • These misperceptions induce suppliers to decrease the quantity of goods and services supplied.
Why the Aggregate-Supply Curve Slopes Upward in the Short Run

• All three theories suggest that output deviates in the short run from the natural rate when the actual price level deviates from the price level that people had expected to prevail.

\[
\text{Quantity of output supplied} = \text{Natural rate of output} + a \left( \frac{\text{Actual price level}}{\text{Expected price level}} \right)
\]

Why the Short-Run Aggregate-Supply Curve Might Shift

• Shifts might arise from changes in:
  • Expected Price Level.
  • Labor.
  • Capital.
  • Natural Resources.
  • Technology.

Why the Aggregate Supply Curve Might Shift

• An increase in the expected price level reduces the quantity of goods and services supplied and shifts the short-run aggregate supply curve to the left.
• A decrease in the expected price level raises the quantity of goods and services supplied and shifts the short-run aggregate supply curve to the right.

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.

\[
P \quad \text{LRAS} \quad \text{SRAS} \quad \text{SRAS}
\]

\[
P \quad P_E \quad P_E \quad Y_N \quad Y
\]
TWO CAUSES OF ECONOMIC FLUCTUATIONS

- Shifts in Aggregate Demand
  - In the short run, shifts in aggregate demand cause fluctuations in the economy’s output of goods and services.
  - In the long run, shifts in aggregate demand affect the overall price level but do not affect output.
  - Policymakers who influence aggregate demand can potentially mitigate the severity of economic fluctuations.

Table 2 The Short-Run Aggregate Supply Curve: Summary

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<td>1. The Stripped-Wage Theory: An unexpectedly low price level raises the real wage, which causes firms to hire fewer workers and produce a smaller quantity of goods and services.</td>
</tr>
<tr>
<td>2. The Sticky-Wage Theory: An unexpectedly low price level causes some firms with higher-than-expected prices, which depresses their sales and leads them to cut back production.</td>
</tr>
<tr>
<td>3. The Misappraisals Theory: An unexpectedly low price level leads some suppliers to think their relative prices have fallen, which induces a fall in production.</td>
</tr>
</tbody>
</table>

Why might the Short-Run Aggregate Supply Curve Shift?

1. Shifts Arising from Labor: An increase in the quantity of labor available (perhaps due to a fall in the natural rate of unemployment) shifts the aggregate-supply curve to the right. A decrease in the quantity of labor available (perhaps due to a rise in the natural rate of unemployment) shifts the aggregate-supply curve to the left.
2. Shifts Arising from Capital: An increase in physical or human capital shifts the aggregate-supply curve to the right. A decrease in physical or human capital shifts the aggregate-supply curve to the left.
3. Shifts Arising from Natural Resources: An increase in the availability of natural resources shifts the aggregate-supply curve to the right. A decrease in the availability of natural resources shifts the aggregate-supply curve to the left.
4. Shifts Arising from Technology: An advance in technological knowledge shifts the aggregate-supply curve to the right. A decrease in the available technology (perhaps due to government regulation) shifts the aggregate-supply curve to the left.
5. Shifts Arising from the Expected Price Level: A decrease in the expected price level shifts the short-run aggregate-supply curve to the right. An increase in the expected price level shifts the short-run aggregate-supply curve to the left.

Figure 7 The Long-Run Equilibrium

Figure 8 A Contraction in Aggregate Demand
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.

Exercise 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, Pe rises, SRAS shifts left, until LR eq’m at C. Y and unemp back at initial levels.

TWO CAUSES OF ECONOMIC FLUCTUATIONS

• Shifts in Aggregate Supply
  – Consider an adverse shift in aggregate supply:
    • A decrease in one of the determinants of aggregate supply shifts the curve to the left.
    • Output falls below the natural rate of employment.
    • Unemployment rises.
    • The price level rises.

Figure 10 An Adverse Shift in Aggregate Supply

1. An adverse shift in the short-run aggregate-supply curve . . .
2. . . . causes output to fall . . .
3. . . . and the price level to rise.
4. Long-run aggregate supply, AS2
5. Short-run aggregate supply, AS1
6. Aggregate demand

Quantity of Output

Price Level

0

Y

LRAS

SRAS2

C

B

Y2

Y1

P2

P3

P1

A

AD1

AD2

0
The Effects of a Shift in Aggregate Supply

- Adverse shifts in aggregate supply cause stagflation—a period of recession and inflation.
- Output falls and prices rise.
- Policymakers who can influence aggregate demand cannot offset both of these adverse effects simultaneously.

The Effects of a Shift in Aggregate Supply

- Policy Responses to Recession
  - Policymakers may respond to a recession in one of the following ways:
    - Do nothing and wait for prices and wages to adjust.
    - Take action to increase aggregate demand by using monetary and fiscal policy.

Figure 11 Accommodating an Adverse Shift in Aggregate Supply

1. When short-run aggregate supply falls . . .
2. . . . policymakers can accommodate the shift by expanding aggregate demand . . .
3. . . . which causes the price level to rise further . . .
4. . . . but keeps output at its natural rate.