

Working With Our Basic Aggregate Demand/Supply Model

Full Length Text — Part: 3 Chapter: 10
Macro Only Text — Part: 3 Chapter: 10

To Accompany "Economics: Private and Public Choice 11th ed."
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Anticipated and Unanticipated Changes

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Anticipated & Unanticipated Changes

- **Anticipated changes** are fully expected by economic participants.
 - Decision makers have time to adjust to them before they occur.
- **Unanticipated changes** catch people by surprise.

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Shifts in Aggregate Demand

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Shifts in Aggregate Demand

- The **aggregate demand (AD)** curve indicates the quantity of goods and services that will be demanded at alternative price levels.
- An increase in **aggregate demand** (a shift of the **AD** curve to the right) indicates that decision makers will purchase a larger quantity of goods and services at each different price level.
- A decrease in **aggregate demand** (a shift of the **AD** curve to the left) indicates that decision makers will purchase a smaller quantity of goods and services at each different price level.

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Factors that Shift Aggregate Demand

- The following factors will cause a shift in **aggregate demand** outward (*inward*):
 - An increase (*decrease*) in real wealth.
 - A decrease (*increase*) in the real interest rate.
 - An increase in the optimism (*pessimism*) of businesses and consumers about future economic conditions.
 - An increase (*decline*) in the expected rate of inflation.
 - Higher (*lower*) real incomes abroad.
 - A reduction (*increase*) in the exchange rate value of the nation's currency.

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Shifts in Aggregate Demand

- An increase in real wealth, such as would result from a stock market boom, would increase **aggregate demand**, shifting the entire curve to the right (from AD_0 to AD_1).
- In contrast, a reduction in real wealth decreases **aggregate demand**, shifting AD left (from AD_0 to AD_2).

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Consumer Sentiment Index: A Measure of Optimism

- Below is the consumer sentiment index for 1978-2004.
- This measure attempts to capture consumers' optimism and pessimism regarding the future of the economy.
- Moves toward optimism tend to increase AD , while moves toward pessimism (*shaded*) tend to decrease AD .
- Note how the index turns down prior to (or during) the recessions of the period.


Source: <http://www.economic.com>

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Questions for Thought:

1. Explain how and why each of the following factors would influence current aggregate demand in the United States:
 - (a) An increased fear of recession.
 - (b) An increased fear of inflation.
 - (c) The rapid growth of real income in Canada and Western Europe.
 - (d) A reduction in the real interest rate.
 - (e) A higher price level (*be careful*).
 - (f) A stock market decline.

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Shifts in Aggregate Supply

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Long- and Short-Run Aggregate Supply

- When considering shifts in aggregate supply, it is important to distinguish between the *long run* and *short run*.
- **Shifts in LRAS:**
A long run change in aggregate supply indicates that it will be possible to achieve and sustain a larger rate of output.
 - A shift in the *long run aggregate supply* curve (**LRAS**) will cause the *short run aggregate supply* (**SRAS**) curve to shift in the same direction.
 - Shifts in **LRAS** are an alternative way of indicating that there has been a shift in the economy's production possibilities curve.

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Long- and Short-Run Aggregate Supply

- **Shifts in SRAS:**
Changes that *temporarily* alter the productive capability of an economy will shift the **SRAS** curve, but not the **LRAS** curve.

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Shifts in Aggregate Supply

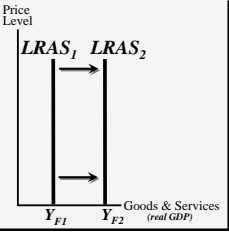
- Factors that increase (decrease) **LRAS**:
 - Increase (decrease) in the supply of resources.
 - Improvement (deterioration) in technology and productivity.
 - Institutional changes that increase (reduce) the efficiency of resource use.
- Factors that increase (decrease) **SRAS**:
 - A decrease (increase) in resource prices — hence, production costs.
 - A reduction (increase) in expected inflation.
 - Favorable (unfavorable) supply shocks, such as good (bad) weather or a reduction (increase) in the world price of a key imported resource.

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Shifts in Aggregate Supply

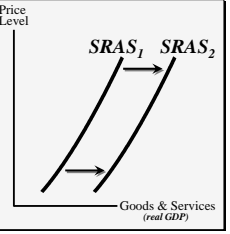
Price Level



$LRAS_1$ $LRAS_2$

Y_{F1} Y_{F2} Goods & Services (real GDP)

Price Level




$SRAS_1$ $SRAS_2$

Goods & Services (real GDP)

- Such factors as an increase in the stock of capital or an improvement in technology will expand an economy's potential output and shift **LRAS** to the right (note that when the **LRAS** curve shifts, so too does **SRAS**).
- Such factors as a reduction in resource prices or favorable weather would shift **SRAS** to the right (note that here the **LRAS** curve will remain constant).


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Questions for Thought:

1. Indicate how the following would influence U.S. aggregate supply in the short run:
 - (a) An increase in real wage rates.
 - (b) A severe freeze that destroys half of the orange crop in Florida.
 - (c) An increase in the expected rate of inflation.
 - (d) An increase in the world price of oil.
 - (e) Abundant rainfall during the growing season of agricultural states.

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Questions for Thought:

2. Which of the following would be most likely to shift the *long run aggregate supply (LRAS)* to the left?

- a. Unfavorable weather conditions that reduced the size of this year's grain harvest.
- b. An increase in labor productivity as the result of improved computer technology and expansion in the Internet.
- c. An increase in the cost of security as the result of terrorist activities.


3. How would an increase in the economy's production possibilities influence the *LRAS*?

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Growth in Aggregate Supply

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The Impact of Steady Economic Growth

- Expansions in the productive capacity of the economy like those resulting from capital formation or improvements in technology will shift the economy's *LRAS* curve to the right.
- When growth of the economy is steady and predictable, it will be anticipated by decision makers.
- Anticipated increases in output (*LRAS*) need not disrupt macroeconomic equilibrium.

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Growth in Aggregate Supply

- Consider the impact that capital formation or a technological advancement has on an economy.
- Both *LRAS* and *SRAS* increase (to *LRAS*₂ and *SRAS*₂); full employment output expands from *Y*_{F1} to *Y*_{F2}.
- A sustainable, higher level of real output is the result.

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Unanticipated Changes and Market Adjustments

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Unanticipated Changes in Aggregate Demand

- In the short-run, output will deviate from full employment capacity as prices in the goods and services market deviate from the price level that people expected.
- Unanticipated changes in aggregate demand often lead to such deviations.

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Unanticipated Increase in Aggregate Demand

- Impact of *unanticipated increase* in *AD*:
 - Initially, the strong demand and higher price level in the goods & services market will temporarily improve profit margins.
 - Output will increase, the rate of unemployment will drop below the natural rate, and output will temporarily exceed the economy's long-run potential.
 - With time, however, contracts will be modified and resource prices will rise and return to their competitive relation with product prices.
 - Once this happens, output will recede to the economy's long-run potential.

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Increase in *AD*: Short Run

The graph shows the short-run effects of an unanticipated increase in aggregate demand. The vertical axis is Price Level, with points P_{100} and P_{105} . The horizontal axis is Goods & Services (real GDP), with points Y_F and Y_2 . A vertical line represents the Long-Run Aggregate Supply (*LRAS*) at Y_F . Two downward-sloping aggregate demand curves, AD_1 and AD_2 , are shown, with AD_2 shifted to the right of AD_1 . Two upward-sloping short-run aggregate supply curves, $SRAS_1$ and $SRAS_2$, are shown, with $SRAS_2$ shifted to the right of $SRAS_1$. The initial equilibrium is at the intersection of AD_1 and $SRAS_1$, corresponding to price level P_{100} and output Y_F . The short-run equilibrium after the increase in aggregate demand is at the intersection of AD_2 and $SRAS_1$, corresponding to a higher price level P_{105} and higher output Y_2 . A text box notes: "Short-run effects of an unanticipated increase in *AD*".

- In response to an unanticipated increase in *AD* for goods & services (shift from AD_1 to AD_2), prices rise to P_{105} and output will increase to Y_2 , temporarily exceeding full-employment capacity.

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Increase in *AD*: Long Run

The graph shows the long-run effects of an unanticipated increase in aggregate demand. The vertical axis is Price Level, with points P_{100} , P_{105} , and P_{110} . The horizontal axis is Goods & Services (real GDP), with points Y_F and Y_2 . A vertical line represents the Long-Run Aggregate Supply (*LRAS*) at Y_F . Two downward-sloping aggregate demand curves, AD_1 and AD_2 , are shown, with AD_2 shifted to the right of AD_1 . Two upward-sloping short-run aggregate supply curves, $SRAS_1$ and $SRAS_2$, are shown, with $SRAS_2$ shifted to the right of $SRAS_1$. The initial long-run equilibrium is at the intersection of AD_1 and $SRAS_1$, corresponding to price level P_{100} and output Y_F . The short-run equilibrium after the increase in aggregate demand is at the intersection of AD_2 and $SRAS_1$, corresponding to price level P_{105} and output Y_2 . The new long-run equilibrium is at the intersection of AD_2 and $SRAS_2$, corresponding to a higher price level P_{110} and output Y_F . A text box notes: "Long-run effects of an unanticipated increase in *AD*".

- With time, resource market prices, including labor, rise due to the strong demand. Higher costs reduce $SRAS_1$ to $SRAS_2$.
- In the long-run, a new equilibrium at a higher price level, P_{110} , and output consistent with long-run potential will occur.
- So, the increase in demand only *temporarily* expands output.

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Unanticipated Decrease in Aggregate Demand

- Impact of *unanticipated reduction* in *AD*:
 - Weak demand and lower prices in the goods & services market will reduce profit margins. Many firms will incur losses.
 - Firms will reduce output, the unemployment rate will rise above the natural rate, and output will temporarily fall short of the economy's long-run potential.
 - With time, long-term contracts will be modified.
 - Eventually, lower resource prices and a lower real interest rate will direct the economy back to long-run equilibrium, but this may be a lengthy and painful process.

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Decrease in AD: Short Run

The graph shows the short-run aggregate demand model. The vertical axis is Price Level, with P_{100} and P_{95} marked. The horizontal axis is Goods & Services (real GDP), with Y_2 and Y_F marked. A vertical line represents LRAS at Y_F . Two downward-sloping aggregate demand curves, AD_1 and AD_2 , are shown, with AD_2 to the left of AD_1 . Two upward-sloping short-run aggregate supply curves, $SRAS_1$ and $SRAS_2$, are shown, with $SRAS_2$ to the right of $SRAS_1$. The initial equilibrium is at the intersection of AD_1 and $SRAS_1$, corresponding to P_{100} and Y_F . The short-run equilibrium after the unanticipated reduction in AD is at the intersection of AD_2 and $SRAS_1$, corresponding to P_{95} and Y_2 . A text box notes: "Short-run effects of an unanticipated reduction in AD".

- The short-run impact of an unanticipated reduction in *AD* (shift from AD_1 to AD_2) will be a decline in output (to Y_2), and a lower price level (P_{95}).
- Temporarily, profit margins decline, output falls, and unemployment rises above its natural rate.


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Decrease in AD: Long Run

The graph shows the long-run aggregate demand model. The vertical axis is Price Level, with P_{100} , P_{95} , and P_{90} marked. The horizontal axis is Goods & Services (real GDP), with Y_2 and Y_F marked. A vertical line represents LRAS at Y_F . Two downward-sloping aggregate demand curves, AD_1 and AD_2 , are shown, with AD_2 to the left of AD_1 . Two upward-sloping short-run aggregate supply curves, $SRAS_1$ and $SRAS_2$, are shown, with $SRAS_2$ to the right of $SRAS_1$. The initial equilibrium is at the intersection of AD_1 and $SRAS_1$, corresponding to P_{100} and Y_F . The short-run equilibrium after the unanticipated reduction in AD is at the intersection of AD_2 and $SRAS_1$, corresponding to P_{95} and Y_2 . The long-run equilibrium is at the intersection of AD_2 and $SRAS_2$, corresponding to P_{90} and Y_F . A text box notes: "Long-run effects of an unanticipated reduction in AD".

- In the long-run, weak demand and excess supply in the resource market leads to lower resource prices (including labor) resulting in an expansion in *SRAS* ($SRAS_1$ to $SRAS_2$).
- A new equilibrium at a lower price level, P_{90} , and an output consistent with long-run potential will result.


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Unanticipated Changes in Short-Run Aggregate Supply

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Unanticipated Changes in Short-Run Aggregate Supply

- Unanticipated changes in short-run aggregate supply (*SRAS*) can catch people by surprise.
- Thus, they are often referred to as *supply shocks*.
- A supply shock is an unexpected event that temporarily increases or decreases aggregate supply.

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Impact of Increase in *SRAS*

- *SRAS* shifts to the right – output temporarily exceeds the economy's long-run potential.
- Since the temporarily favorable supply conditions cannot be counted on in the future, the economy's long-term production capacity will not be altered.
- If individuals recognize that they will be unable to maintain their current high level of income, they will increase their saving. Lower interest rates, and additional capital formation may result.

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Unanticipated Increase in *SRAS*

- Consider an unanticipated, temporary, increase in *SRAS*, such as may result from a bumper crop from good weather.
- The increase in aggregate supply (to *SRAS*₂) would lead to a lower price level *P*₉₅ and an increase in current GDP to *Y*₂.
- As the supply conditions are temporary, *LRAS* persists.

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Impact of Decrease in *SRAS*

- *SRAS* shifts to the left – output falls short of the economy's long-run potential temporarily.
- If an unfavorable supply shock is expected to be temporary, *long-run aggregate supply* will be unaffected.
- Households may reduce their current saving (dip into past savings).

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Supply Shock: Resource Market

- Suppose there is an adverse supply shock, perhaps as the result of a crop failure or a sharp increase in the world price of a major resource, such as oil.
- Here we show the impact in the resource market: prices rise from *P*₁ to *P*₂.

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Supply Shock: Product Market

The graph shows the AD-AS model. The vertical axis is Price Level, and the horizontal axis is Goods & Services (real GDP). A downward-sloping AD curve is shown. Two upward-sloping short-run aggregate supply curves are shown: $SRAS_1(P_{r1})$ and $SRAS_2(P_{r2})$, with an arrow indicating a leftward shift. A vertical long-run aggregate supply curve $LRAS$ is at Y_F . The initial equilibrium is at point A with price level P_{100} and output Y_F . The new short-run equilibrium is at point B with price level P_{110} and output Y_2 .

- As shown here, the higher resource prices shift $SRAS$ to the left in the product market; in the short-run, the price level rises to P_{110} and output falls to Y_2 .
- What happens in the long-run depends on whether the supply shock is temporary or permanent.

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Effects of Adverse Supply Shock

The graph shows the AD-AS model. The vertical axis is Price Level, and the horizontal axis is Goods & Services (real GDP). A downward-sloping AD curve is shown. Two upward-sloping short-run aggregate supply curves are shown: $SRAS_1(P_{r1})$ and $SRAS_2(P_{r2})$, with an arrow indicating a rightward shift. A vertical long-run aggregate supply curve $LRAS$ is at Y_F . The initial equilibrium is at point A with price level P_{100} and output Y_F . The new short-run equilibrium is at point B with price level P_{110} and output Y_2 .

- If the adverse supply shock is *temporary*, resource prices will eventually fall in the future, shifting $SRAS_2$ back to $SRAS_1$, returning equilibrium to (A).
- If the adverse supply factor is *permanent*, the productive potential of the economy will shrink ($LRAS$ shifts left and Y_2 becomes Y_{F2}) and (B) will become the long-run equilibrium.


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Unanticipated Changes in Inflation and the Price Level in the AD-AS Model

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Price Level, Inflation, and the *AD-AS* Model

- The basic *AD-AS model* focuses on how the general level of prices influence the choices of business decision makers.
- Disequilibrium occurs when the actual price level is either greater than or less than the anticipated level.

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Price Level, Inflation, and the *AD-AS* Model

- The actual price level will also differ from the level people anticipated when the rate of inflation differs from what is expected.
- **When the inflation rate is greater than anticipated**, this implies a higher than anticipated price level. As a result, profit margins will be attractive and business firms will respond with an expansion in output.
- **When the inflation rate is less than anticipated**, this implies a lower than anticipated price level. As a result, profit margins will be unattractive and businesses will reduce their output.

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The Business Cycle -- *Revisited*

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The Business Cycle -- Revisited

- **Recessions** occur because prices in the goods and services market are low relative to the costs of production and resource prices.
 - The two causes of **recessions**:
 - unanticipated reductions in **AD**, and,
 - unfavorable supply shocks.
- An **unsustainable economic boom** occurs when prices in the goods and services market are high relative to resource prices and other costs.
 - The two causes of **booms** are:
 - unanticipated increases in **AD**, and,
 - favorable supply shocks.

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Expansions, Recessions, & Unemployment

- Here we illustrate the periods of expansion and contraction (*recession*) in the U.S. economy since 1960.
- Note how reductions in real GDP (*shaded periods*) in the top graph relate with increases in the rate of unemployment above the natural rate (*bottom graph*).
- The **AD/AS** model indicates that recessions are caused by unanticipated reductions in **AD** that are likely to accompany abrupt reductions in inflation and/or adverse supply shocks.

Real GDP (billions of 2000 \$)

% Labor force unemployed


Sources: Derived from computerized data supplied by FAME Economics.

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Questions for Thought:

1. Suppose consumers and investors suddenly become more pessimistic about the future and therefore decide to reduce their consumption and investment spending. How will a market economy adjust to this increase in pessimism?
2. If the general level of prices is higher than business decision makers anticipated when they entered into long-term contracts for raw materials and other resources, profit margins will be abnormally low and the economy will fall into a recession. Is this statement true?

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Questions for Thought:

3. Which of the following would be most likely to throw the U.S. economy into a recession?

- a. A reduction in transaction costs as the result of the growth and development of the Internet.
- b. An unanticipated reduction in the world price of oil.
- c. An unanticipated reduction in *AD* as the result of a sharp decline in consumer confidence.


4. During 2000 there was a sharp reduction in stock prices and a sharp increase in the world price of crude oil. Within the framework of the *AD/AS model*, how would these two changes influence the U.S. economy?

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Does the Market Have a Self-Corrective Mechanism That Will Keep it on Track?

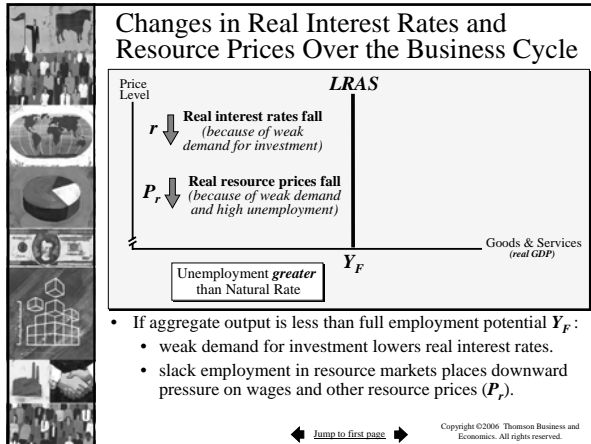
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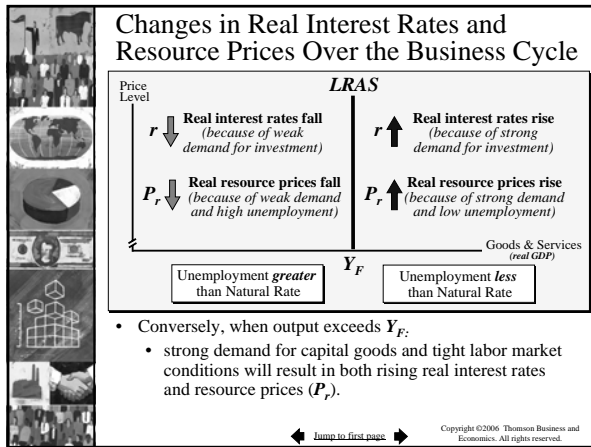


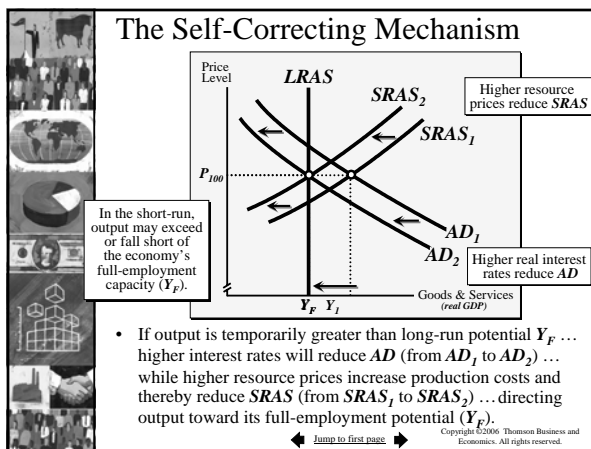
Does the Market Have a Self-Corrective Mechanism?

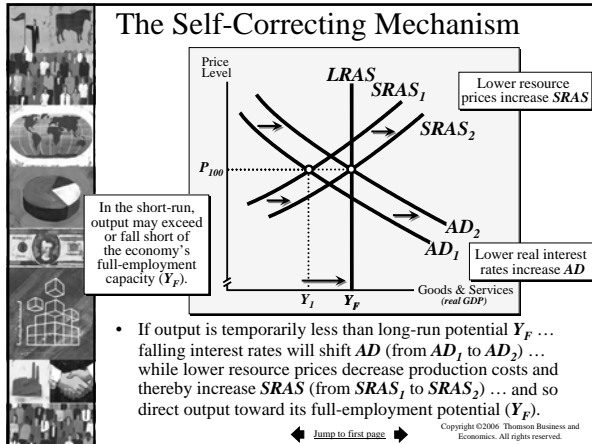
- There are three means by which the economy seems to have a *self-corrective mechanism* keeping it 'on-track':
 - Consumption demand is relatively stable over the business cycle.
 - Changes in real interest rates will help to stabilize aggregate demand and redirect economic fluctuations.
 - Interest rates tend to fall during a recession and rise during an economic boom.
 - Changes in real resource prices will redirect economic fluctuations.
 - Real resource prices tend to fall during a recession and rise during an expansion.

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The Great Debate: *How rapidly does the self-corrective mechanism work?*

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How Rapidly Does The Self-Corrective Mechanism Work?

- Many economists believe that the self-corrective mechanism works slowly.
 - If this is the case, then market economies will experience prolonged periods of abnormally high unemployment & below-capacity output.
- Others believe the self-corrective mechanism works fairly rapidly when it is not disrupted by perverse monetary and fiscal policy.
- This is an important and continuing debate that we will return to and analyze in more detail as we proceed.


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Questions for Thought:

1. Which of the following is likely to occur when an economy is in a recession?
 - a. An unemployment rate that is less than the economy's natural unemployment rate.
 - b. Falling real interest rates as the result of weak demand for investment.
 - c. Reductions in real resource prices as the result of weak demand.
2. Suppose that an unexpectedly rapid growth in real income abroad leads to a sharp increase in the demand for U.S. exports. What impact will this change have on the price level, output, and employment in the *short run*? In the *long run*?


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Questions for Thought:

3. Explain how, when output is less than full employment capacity, the self-corrective mechanism directs the economy toward its long-run potential. Can you think of any reason why this mechanism might not work?
4. When current output exceeds the economy's long run capacity, which of the following is most likely to occur?
 - a. A reduction in the general level of prices
 - b. An abnormally high rate of unemployment.
 - c. Increases in real interest rates and real resource prices.


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Questions for Thought:

5. Construct the *AD*, *SRAS*, and *LRAS* curves for an economy experiencing:
 - (a) full employment equilibrium,
 - (b) an economic boom, and,
 - (c) a recession.

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**End
Chapter 10**

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