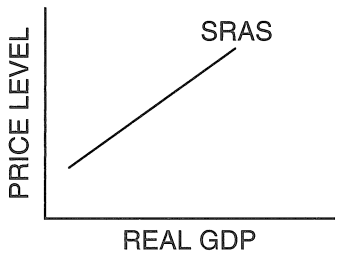
An Introduction to Short-Run Aggregate Supply

Why Is the Short-Run Aggregate Supply Curve Upward Sloping?

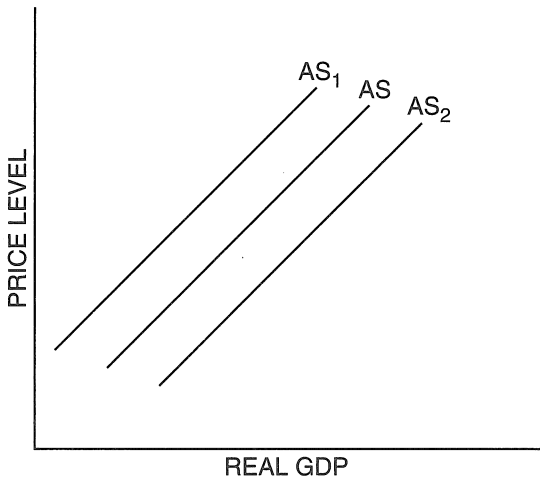
The short-run aggregate supply (SRAS) curve shows the relationship between real gross domestic product (GDP) and the price level. This positive relationship exists because producers seek to maximize profits and production costs are inflexible. Since firms seek to maximize profits, change in the price level will affect the quantity that they produce. When the price level rises, but production costs stay the same, firms make more profit on each unit sold, so they increase the quantity that they produce. When the price level decreases, but production costs stay the same, firms make less profit, and they reduce the quantity that they produce. In the long run, when production costs are flexible, this relationship does not hold true. But in the short run, inflexible production costs lead to a positive relationship between the price level and real GDP and therefore an upward sloping SRAS curve.



What Shifts the Short-Run Aggregate Supply Curve?

SRAS will increase if firms produce more at any given price level, and it will decrease if firms produce less at any given price level. Therefore, the SRAS curve will shift as a result of changes in input prices (e.g., nominal wages or oil prices) or productivity (e.g., technological advances), as shown in Figure 3-3.1.

Figure 3-3.1
Shifts in Short-Run Aggregate Supply



1. Determine whether each change listed in Table 3-3.1 will cause an increase, decrease, or no change in aggregate supply (AS). Always start with AS.

2. In column 1, list which component of AS is affected: input prices or productivity.

3. In column 2, draw an up arrow if the change will cause an increase in AS, a down arrow if it will cause a decrease in AS, and write NC if it will not change AS.

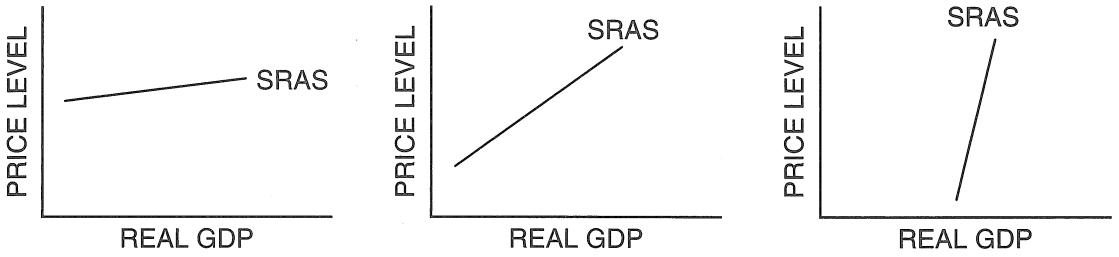
4. In column 3, write the number of the AS curve after the change.

Table 3-3.1
Changes in Aggregate Supply

Change	1. Determinant of AS	2. Change in AS	3. Resulting AS curve
(A) Unions are more effective so that wage rates increase.			
(B) OPEC successfully increases oil prices.			
(C) Labor productivity increases dramatically.			
(D) Giant natural gas discovery decreases energy prices.			
(E) Computer technology brings new efficiency to industry.			
(F) Government spending increases.			
(G) Cuts in tax rates increase incentives to save and invest.			
(H) Low birth rate will decrease the labor force in the future.			
(I) Research shows that improved schools have increased the skills of American workers and managers.			

Possible Shapes of Short-Run Aggregate Supply Curve

In general, the SRAS has a positive slope. However, in special situations, the SRAS may be very flat or very steep, as shown below.



5. What does it tell you about the relationship between the price level and real GDP if the SRAS is flat? Under what conditions would an economy have a flat SRAS curve?

6. What does it tell you about the relationship between the price level and real GDP if the SRAS is steep? Under what conditions would an economy have a steep SRAS curve?

Sticky versus Flexible Wages and Prices

In macroeconomics there is both a short run and a long run. The short run is the time period in which at least one factor is fixed. For example, the price of inputs (hourly wages paid to labor and other unit resource prices) remains fixed, or sticky, in the short run. However, the price of firms' output in the product markets varies directly with the price level. Input prices remain fixed for many reasons, e.g., wage contracts, menu pricing, and delays in recognizing unanticipated inflation. The lag between changes in output prices and changes in input prices results in firms earning short-run profits when there is inflation or losses when there is deflation. The long run in macroeconomics is the period of time in which input prices adjust to changes in the overall price level.

With price level increases, product market prices increase while factor market prices remain fixed. Fixed input prices and higher output prices leads to profit. This profit provides firms with an incentive to increase production. Refer to Figure 3-4.1. Notice that as price level increases from PL_1 to PL_2 that real gross domestic product (GDP) increases from Y_1 to Y_2.

The opposite would occur if product market prices fall with a decrease in the price level. Firms experience losses when input prices remain high and output prices decrease. The losses result in a decrease in production which leads to a decrease in real GDP.

The result of firms varying their production directly with changes in the price level is an upward sloping AS curve in the short run. Hence, in the short run, the level of real GDP is directly related to the price level. Figure 3-4.2 illustrates the SRAS.

Figure 3-4.1
Price Level and Real GDP

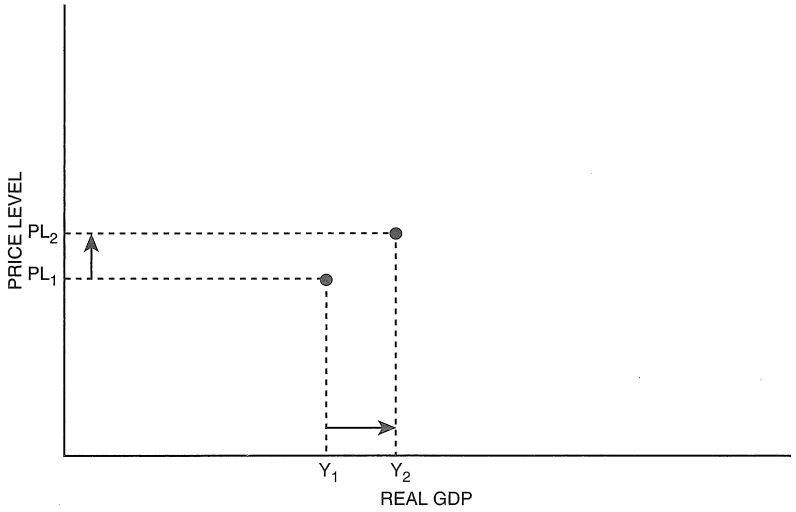
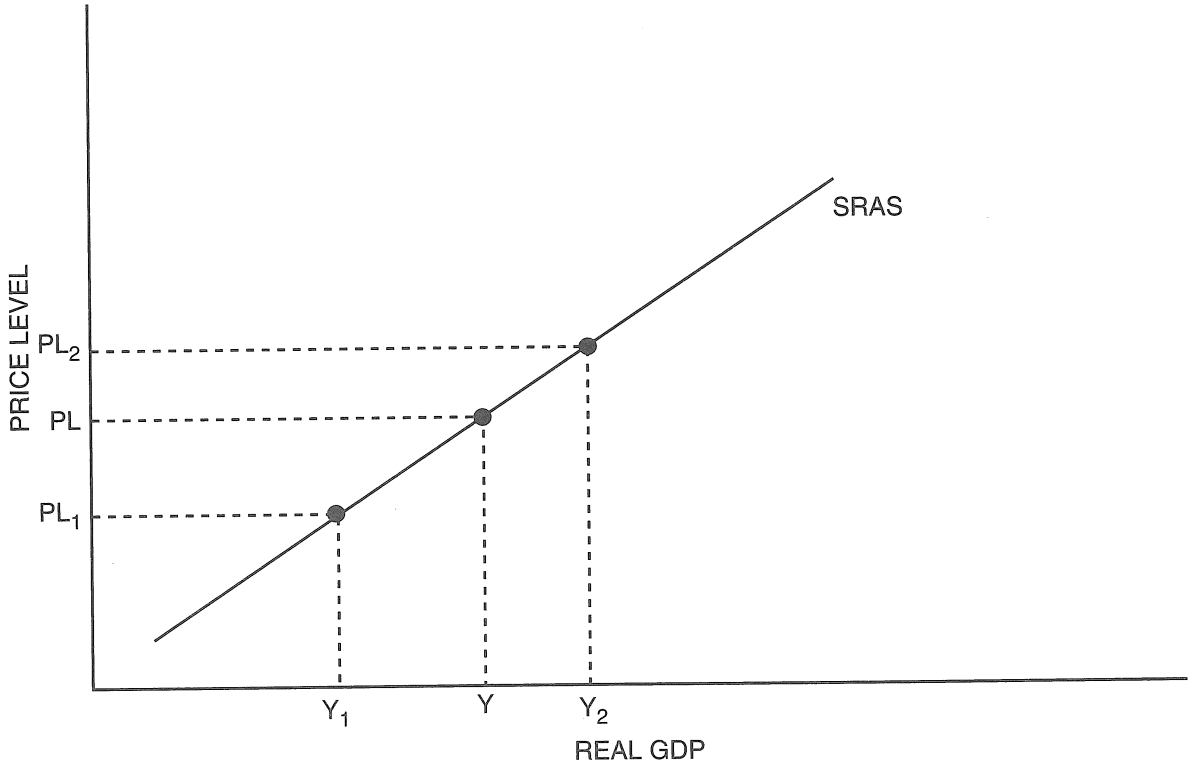


Figure 3-4.2
Short-Run Aggregate Supply Curve

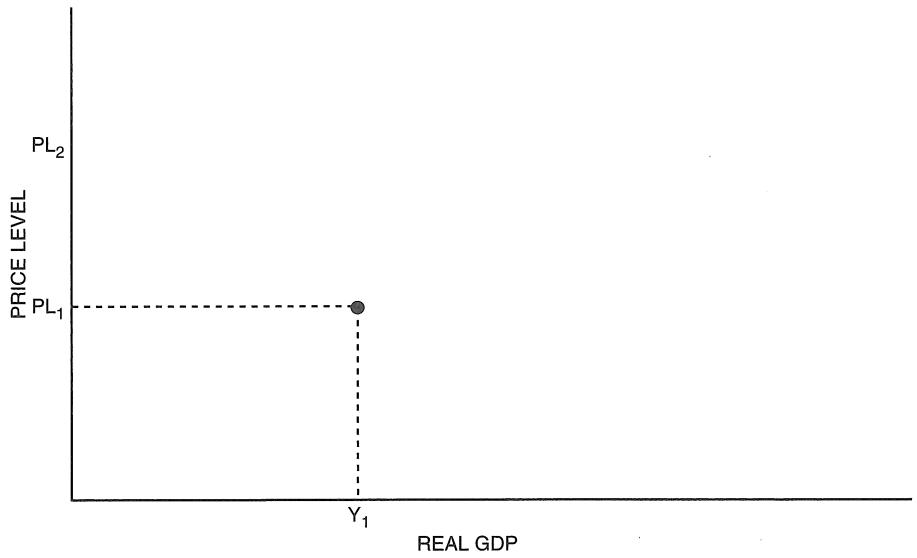


1. Identify at least two reasons that input prices remain fixed in the short run.

2. Explain why firms' profits increase when the price level increases in the short run.

3. Would firms have an incentive to change their level of production if input prices adjusted immediately to output price changes? Why?

4. Review your answers to (2) and (3). Assume that input prices are not fixed, but that they change directly with output prices. If firms are initially producing output Y_1 as seen in the graph below, then an increase in the price level from PL_1 to PL_2 will have what effect on real GDP? Illustrate the relationship between price level and real GDP in the long run, and label it LRAS for long-run aggregate supply.

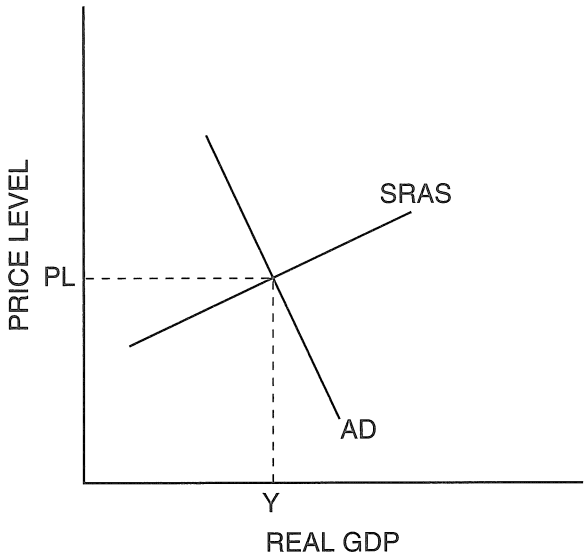


Short-Run Equilibrium Price Level and Output

The first section of the course presented the supply and demand model as a way to determine price and quantity in individual markets. The aggregate supply (AS) and aggregate demand (AD) model uses AS and AD to determine the equilibrium price level and aggregate quantity of output (real GDP) in the economy. It is important to correctly label the AS/AD graph to distinguish it from the market supply and demand graph. As shown in Figure 3-5.1, the axes labels should clearly indicate price level (PL), real GDP (Y), AS, and AD. Equilibrium in the model is found at the intersection of AS and AD. The equilibrium PL is identified on the vertical axis and the equilibrium Y is found on the horizontal axis.

Student Alert: **Make sure you label the equilibrium values on the axes rather than as a point in the middle of the graph.**

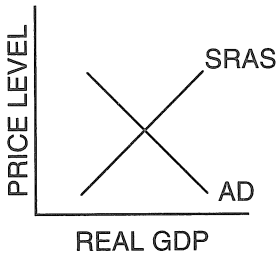
Figure 3-5.1
Equilibrium Price and Output Levels



Summarizing Aggregate Demand and Aggregate Supply Shifts

For each of the graphs below, identify the starting equilibrium PL and Y. Then show the shift given for each graph and identify the new equilibrium PL and Y. Indicate the resulting change in price level, unemployment, and real GDP by circling the up arrow for an increase or the down arrow for a decrease.

1. Increase in AD

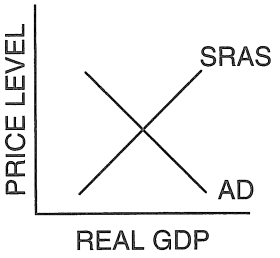


Real GDP: ↑ ↓

Price level: ↑ ↓

Unemployment: ↑ ↓

2. Increase in AD

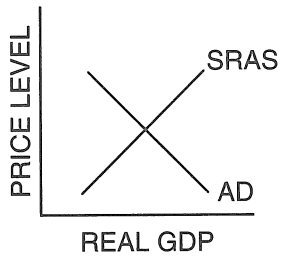


Real GDP: ↑ ↓

Price level: ↑ ↓

Unemployment: ↑ ↓

3. Decrease in AD

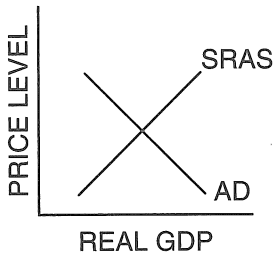


Real GDP: ↑ ↓

Price level: ↑ ↓

Unemployment: ↑ ↓

4. Decrease in AS



Real GDP: ↑ ↓

Price level: ↑ ↓

Unemployment: ↑ ↓

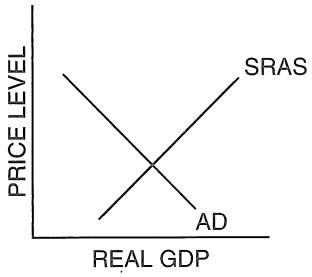
Changes in Short-Run Aggregate Supply and Aggregate Demand

The equilibrium price and quantity in the economy will change when either the short-run aggregate supply (SRAS) or the aggregate demand (AD) curve shifts. The AD curve shifts when any of the components of AD change—consumption (C), investment (I), government spending (G), exports (X), or imports (M). The aggregate supply (AS) curve shifts when there are changes in the price of inputs (e.g., nominal wages, oil prices) or changes in productivity.

Changes in the Equilibrium Price Level and Output

For each situation described below, illustrate the change on the AD and AS graph and describe the effect on the equilibrium price level and real gross domestic product (GDP) by circling the correct symbol: ↑ for increase, ↓ for decrease, or — for unchanged

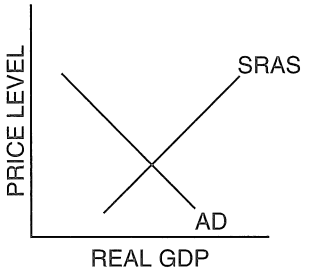
1. Business investment increases.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

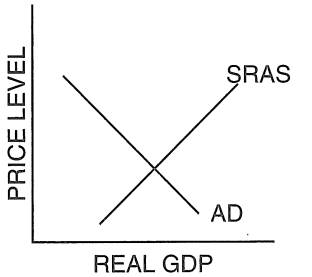
2. The government increases spending.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

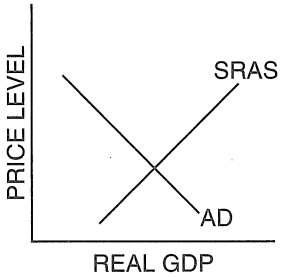
3. New oil discoveries cause large decreases in energy prices.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

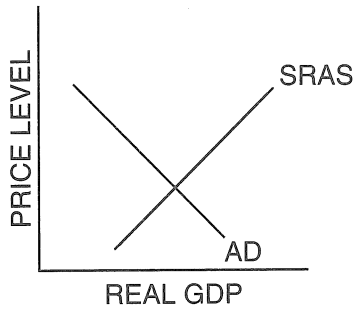
4. Consumer spending increases.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

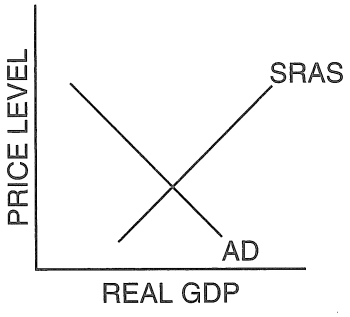
5. Production costs increase.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

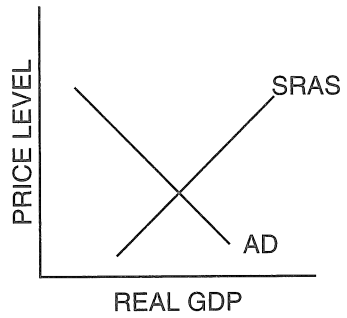
6. New technology and better education increase labor productivity.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

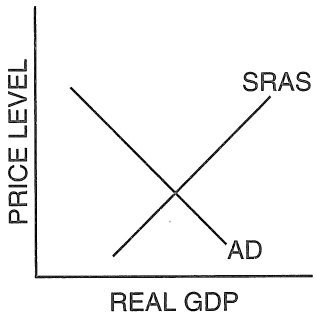
7. Consumers' confidence improves.



Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

8. Net exports decrease.



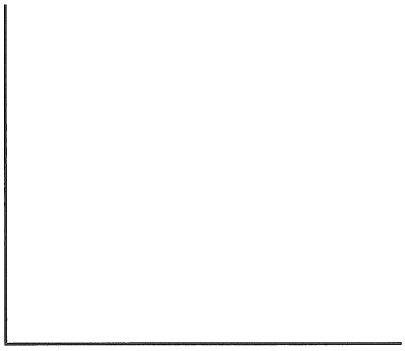
Price level: ↑ ↓ —

Real GDP: ↑ ↓ —

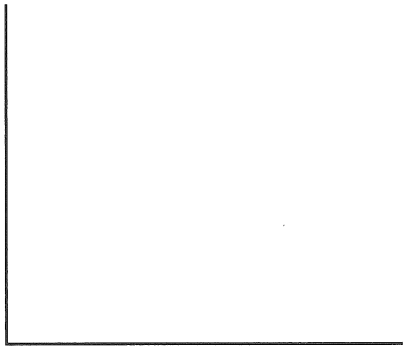
Graphing Demand and Supply Shocks

Draw an AS/AD graph to illustrate the change given in each of the questions below. On your graph be sure to label the axes (PL and Y), the AS and AD curves, and the starting and ending equilibrium PL and Y (these should be placed on the axes).

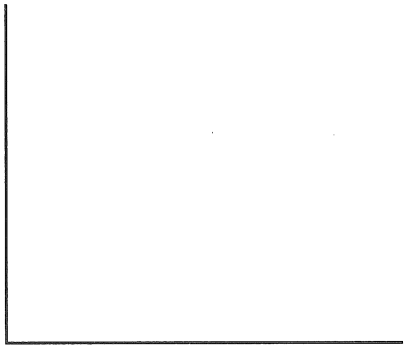
9. Economic booms in both Japan and Europe result in massive increases in orders for exported goods from the United States.



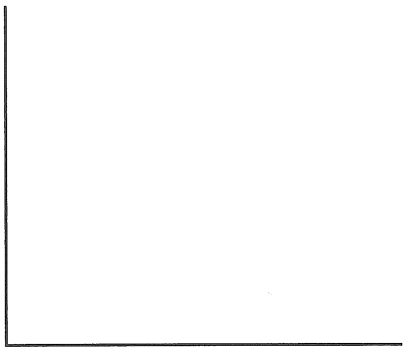
10. The government reduces taxes and increases transfer payments.



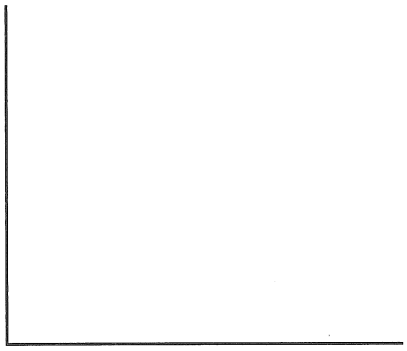
11. Fine weather results in the highest corn and wheat yields in 40 years.



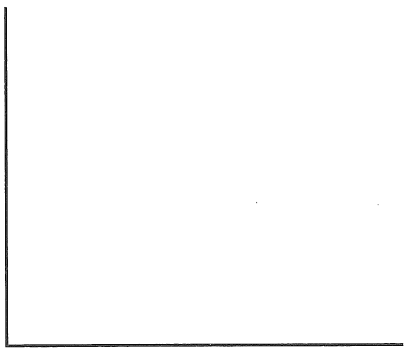
12. While the United States was in the midst of the Great Depression, a foreign power attacked, Congress declared war, and more than 1,000,000 soldiers were drafted in the first year while defense spending was increased several times over.



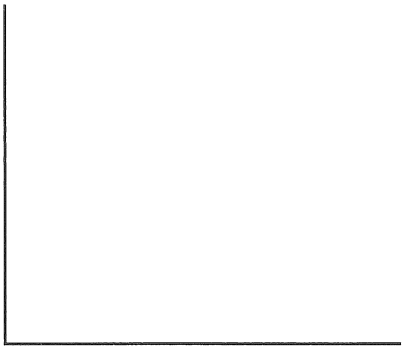
13. To balance the budget, the federal government cuts Social Security payments by 10 percent and federal aid to education by 20 percent.



14. During a long, slow recovery from a recession, consumers postponed major purchases. Suddenly they begin to buy cars, refrigerators, televisions, and furnaces to replace their failing models.



15. In response to other dramatic changes, the government raises taxes and reduces transfer payments in the hope of balancing the federal budget.



16. News of possible future layoffs frightens the public into reducing spending and increasing saving for the feared "rainy day."