Chapter 12
Aggregate Supply and Aggregate Demand

After reading Chapter 12, AGGREGATE SUPPLY AND AGGREGATE DEMAND, you should be able to:

• Use an Aggregate Demand and Aggregate Supply model to explain output, employment and the price level.
• Discuss the classical (view of) the economy and its relation to Say’s Law and Laissez-faire policy
• Discuss how the Great Depression led to the Keynesian view of the economy.
• Explain why the Aggregate Demand (AD) curve is downward sloping.
• Explain the differences between the classical and Keynesian Aggregate Supply (AS) and discuss how these beliefs affect the slope and shape of the AS curve.
• Explain how the short run aggregate supply curve depends on labor contracts and unanticipated increases in the price level.
• Combine the AD and AS curves to determine the macroeconomic equilibrium and illustrate the effects of demand and supply shocks the equilibrium.
• Discuss the long run Self-Correcting Mechanism and its policy implications.

Outline

I. Classical and Keynesian Economics
   A) Classical economists believe that the economy has strong stabilizing forces that keep it operating at close to full employment.
      1. Say’s Law states that whatever output is produced will be demanded.
      2. Classical economists believed that unemployment was caused by too high of wage. Unemployment would fall once wages fell.
      3. Classical economists suggest that laissez faire—hands off—is the best role for the government.
   B) Keynesian economists think that the economy can operate for extended periods of time at less than full employment. Keynes believed that only in the very long run will the economy operate at full employment. The Great Depression, when the unemployment rate rose to near 25 percent in 1932, is suggested as evidence in favor of the Keynesian view.

II. Aggregate Supply and Demand
   A) The Aggregate Demand Curve (AD) shows the quantities of total output agents are prepared to demand at different price levels.
   B) The Aggregate Supply Curve (AS) shows the quantities of total output all firms in the economy are willing to supply at different price levels.
C) Macroeconomic equilibrium occurs where the aggregate demand and aggregate supply curves cross, as illustrated below. The equilibrium price level is \( P \) and the equilibrium level of real GDP is \( Y \).

D) If either the aggregate demand or aggregate supply curve shifts, the equilibrium price level and amount of output and employment changes.

\[ \text{Price level} \]
\[ \text{Real GDP} \]

\( P \)

\( Y \)

III. Aggregate Demand

A) As illustrated above, the \( AD \) curve is negatively sloped, which means that at higher price levels, fewer goods are demanded. There are three reasons for the inverse slope:

1. The **Real Balance Effect**, which is that at higher price levels households will purchase less real consumption because their wealth will purchase less.

2. The **Interest Rate Effect**, which is higher prices raises interest rates and thereby discourages investment.

3. The **Foreign Trade Effect**, which occurs when a rise in the price level (holding foreign prices and the exchange rate constant) lowers the aggregate quantity demanded by pushing down net exports.

III. Aggregate Supply

A) The **Classical** believed that the price level would have no effect on real output.

1. Economic agents did not have **Money Illusion**, which could cause economic agents to think that a change in the price level is actually a change in the real wage and lead to a change in their production decisions.

2. In the short run, on average, wages and prices move together so the real wage does not change. Since the real wage does not change neither does employment or output decisions.

3. Therefore, the classical economists believed that the aggregate supply curve was vertical.

B) The **Keynesian AS Curve** has a backward-L shape. Until output reaches full employment, the \( AS \) curve is horizontal; after full employment is reached, the \( AS \) curve is vertical.
C) As shown above, the **Short Run AS (SRAS)** Curve is positively sloped. The slope of the SRAS curve is influenced by contracts that fix the wages firms pay their workers.

1. In the short-run, if prices increase more rapidly than expected, businesses find that their prices have risen more than the wages they must pay because contracts fix the wage rate. In this case, firms find it profitable to boost employment and produce more output.
2. If the price level unexpectedly falls, prices fall more than wages and firms therefore reduce employment and output.

### IV. Shifts in Aggregate Supply and Aggregate Demand

A) A **Demand Shock** is a shift in the $AD$ curve. The $AD$ curve shifts to the right (increases) whenever consumption ($C$), government purchases of goods and services ($G$), investment ($I$), or net exports ($X - M$) increase.

1. If the $AD$ curve shifts to the right, in the classical framework (with a classical $AS$ curve), real output does not change. The price level increases.
2. In the Keynesian model, if the economy is operating below full employment, a shift in the $AD$ curve to the right boosts output and lowers unemployment and leaves price level the same. If the economy is operating at full employment, an increase in $AD$ will have the same effect as in the classical model.
3. Along the short-run $AS$ curve, an increase in the $AD$ curve raises both prices and output and reduces unemployment.

B) A **Supply Shock** is an unanticipated shift in the $AS$ curve. As illustrated below, an adverse supply shock (caused perhaps by an increase in the price of oil) shifts the $SRAS$ left. As a result, the price level increases and real GDP falls. The fall in output means that unemployment rises. A beneficial supply shock, due to lower costs, will cause the $AS$ curve to shift to the right. The price level falls, output and employment increase.
V. The Long Run Self-Correcting Mechanism

A) Whether or not the economy will self correct will depend on how well and how quickly economic agents realize and can adjust to an unanticipated increase in the price level.

B) After an aggregate demand shock, when people realize the correct price level, the short-run AS curve shifts to the left until the ultimate equilibrium level of output equals the natural level of real GDP. The new equilibrium price level is higher than the beginning price level.

C) The existence of the self-correcting mechanism means that government policy is not necessary to restore full employment. If the self-correcting mechanism takes a long period of time, however, government policies may be desirable.

Review Questions

True/False

If the statement is correct, write True in the space provided; if it is wrong, write False. Below the question give a short statement that supports your answer.

_____ 1. The aggregate demand curve shows how the quantity of output demanded depends on the price level.

_____ 2. The AD curve is negatively sloped for the same reasons that all demand curves are downward sloping.

_____ 3. Classical and Keynesian economists agree about the slope of the AD curve.

_____ 4. Classical and Keynesian economists agree about the slope of the AS curve.

_____ 5. With a Keynesian AS curve, at less than full employment, an increase in aggregate demand lowers unemployment.

_____ 6. With a Keynesian AS curve, at full employment, an increase in aggregate demand raises the price level and does not change real output.
_____ 7. Using a classical AS curve, an increase in aggregate demand raises the price level and does not change real output.

_____ 8. A decrease in the price level shifts the AD curve to the right.

_____ 9. An increase in government spending shifts the AD curve to the right.

_____ 10. The classical AS curve is vertical because it assumes people are subject to money illusion.

_____ 11. Along a short-run aggregate supply curve, higher than expected prices lead to greater than normal levels of output.

Multiple Choice Questions

Circle the letter corresponding to the correct answer.

1. A decrease in investment, I, causes the
   (a) AD curve to shift to the right.
   (b) AD curve to shift to the left.
   (c) Keynesian AS curve to shift to the left.
   (d) Classical AS curve to shift to the left.
   (e) SRAS curve to shift to the left.

Use the Keynesian AS curve to answer the next 3 questions. Assume the initial equilibrium is one with unemployment greatly exceeding full employment.

2. Suppose aggregate demand increases due to an increase in government purchases of goods and services, G. This _______ the price level and _______ real GDP.
   (a) raises; raises
   (b) raises; does not change
   (c) lowers; does not change
   (d) does not change; does not change
   (e) does not change; raises

3. Assume that aggregate demand increases due to an increase in investment, I. This _______ the price level and _______ real GDP.
   (a) raises; raises
   (b) raises; does not change
   (c) lowers; does not change
   (d) does not change; does not change
   (e) does not change; raises
4. A decrease in \( AD \) ______ the price level and ______ output.
   (a) raises; lowers
   (b) lowers; raises
   (c) lowers; does not change
   (d) does not change; lowers
   (e) lowers; lowers

Use the classical \( AS \) curve to answer the next 3 questions.

5. Suppose aggregate demand increases due to an increase in government purchases of goods and services, \( G \). This ______ the price level and ______ real GDP.
   (a) raises; raises
   (b) raises; does not change
   (c) lowers; does not change
   (d) does not change; does not change
   (e) does not change; raises

6. Assume that aggregate demand increases due to an increase in investment, \( I \). This ______ the price level and ______ real GDP.
   (a) raises; raises
   (b) raises; does not change
   (c) lowers; does not change
   (d) does not change; does not change
   (e) does not change; raises

7. A decrease in \( AD \) ______ the price level and ______ output.
   (a) raises; lowers
   (b) lowers; raises
   (c) lowers; does not change
   (d) does not change; lowers
   (e) lowers; lowers

Use the short-run aggregate supply curve to answer the next two questions.

8. Suppose aggregate demand unexpectedly increases due to an increase in government purchases of goods and services, \( G \). This ______ the price level and ______ real GDP.
   (a) raises; raises
   (b) raises; does not change
   (c) lowers; raises
   (d) does not change; does not change
   (e) does not change; raises

9. A decrease in \( AD \) ______ the price level and ______ output.
   (a) raises; lowers
   (b) lowers; raises
   (c) lowers; does not change
   (d) does not change; lowers
   (e) lowers; lowers
10. After the self-correcting mechanism has worked, the long-run effect of a demand shock that shifted the \( AD \) curve to the right is to _________ the price level and _________ output.
   (a) raise; raise
   (b) raise; not change
   (c) not change; raise
   (d) not change; not change
   (e) lower; lower

**Essay Questions**

*Write a short essay or otherwise answer each question.*

1. How is the shape of the Keynesian \( AS \) curve different from the classical \( AS \) curve?

2. Use the Keynesian \( AS \) curve to illustrate the effect on the price level and real GDP of an increase in aggregate demand.

3. Use the classical \( AS \) curve to illustrate the effect on the price level and real GDP of an increase in aggregate demand.

4. Use the short-run \( AS \) curve to illustrate the effect on the price level and real GDP of an unexpected increase in aggregate demand.

5. Assume government policymakers think the Keynesian \( AS \) curve is correct and that they believe output is below its full employment level. What effect would they expect from an increase in aggregate demand? Suppose the classical \( AS \) curve is actually correct and output is at its full employment level. In this case, what would be the actual effect of an increase in aggregate demand? Draw two diagrams supporting your answers.

6. Suppose the self-correcting mechanism is very slow. Would this affect your view about the desirability of government policies designed to return the economy to the natural level of output?

### Answers to Review Questions

**True/False**

1. True. In the sense that the aggregate demand curve shows how demand depends on a price, it is similar to all demand curves. But, the reason for the negative slope of the aggregate demand curve is quite different than the reason why other demand curves have a negative slope. See the next question for details.

2. False. “Ordinary” demand curves are negatively sloped because of the principle of substitution. The \( AD \) curve, however, has a negative slope due to the real balance effect, the interest rate effect, and the foreign trade effect.

3. True. Classical and Keynesian economists agree that the \( AD \) curve has a negative slope.

4. False. Keynesian economists believe the \( AS \) curve is horizontal at output levels below full employment and vertical at the full employment level of production. Classical economists assume the economy always produces at the full employment level of output and hence the \( AS \) curve is vertical at this level of real GDP.
5. True. An increase in the $AD$ curve causes equilibrium output to rise and unemployment to fall.

6. True. When the $AD$ shifts right along the vertical part of the Keynesian $AS$ curve, the equilibrium price level is raised and output is not changed.

7. True. Because the classical $AS$ curve is vertical, an expansion in $AD$ merely raises prices. Questions 6 and 7 illustrate how Keynesian and classical economists agree on the results from an expansionary monetary policy when the economy is fully employed.

8. False. The fall in the price level causes a movement along the $AD$ curve, not a shift in it!

9. True. An increase in $G$ as well as in $C$, $I$, or $X – M$ shifts the $AD$ curve to the right.

10. False. The classical $AS$ curve is vertical because it assumes people are not subject to money illusion.

11. True. The higher than expected prices imply that firms’ costs lag behind the prices they can charge for their production. Hence, firms find it profitable to hire more workers and to produce more output.

**Multiple Choice Questions**

1. (b) Similar to a decrease in consumption, government spending, or net exports, a decrease in investment causes a decrease in $AD$.

2. (e) Along the horizontal part of the Keynesian $AS$ curve, an increase in aggregate demand raises output but does not change the price level.

3. (e) Along the flat part of the Keynesian $AS$ curve, this raises output and does not change the price level. These effects are identical to those from an increase in government spending, explored in Question 2, since both the increase in $I$ and $G$ shift the $AD$ curve to the right.

4. (d) The decrease in $AD$ reduces GDP and does not change the price level.

5. (b) The classical $AS$ curve is vertical. Thus, the increase in $AD$ raises the price level but does not change real GDP.

6. (b) Just like the previous question, this increase in the $AD$ curve raises prices but does not change output.

7. (c) Using the classical vertical $AS$ curve, the shift in $AD$ curve to the left lowers the price level but does not affect real GNP.

8. (a) Because the $AS$ curve is upward sloping, the increase in $AD$ raises both prices and output.

9. (e) Once again, the upward slope of the $AS$ curve means that the shift to the left of the $AD$ curve lowers both the price level and real GDP.

The point of the last 8 questions is to stress the crucial role played by the $AS$ curve. Notice how the effects of changes in the aggregate demand curve depend quite crucially on the shape and slope of the aggregate supply curve.

10. (b) In the long-run, the $AS$ curve is vertical at the natural rate of GDP. Thus, an increase in $AD$ ultimately raises the price level but does not change the level of production.
Essay Questions

1. The Keynesian $AS$ curve is shaped like a backward L. The flat part of the $AS$ curve applies to levels of output with large amounts of unemployment. Along the horizontal part of the $AS$ curve, it is assumed that an increase in demand for output causes firms to produce more and not raise their prices. Classical economists assumed that production would take place at the full employment level of output, so the classical $AS$ curve is vertical at this level of output. If the demand for goods rises, firms cannot increase the amount they produce. Instead they raise their prices.

2. As shown below, the increase in aggregate demand shifts the $AD$ curve to the right, from $AD$ to $AD'$. In this (Keynesian) case with the Keynesian aggregate supply curve, real GDP increases from $Y$ to $Y'$ and the price level remains fixed at $P$.

Note however that if the economy was already operating at full employment an increase in aggregate demand would increase the price level and have no effect on output.

3. As in the last question, the $AD$ curve shifts to the right. However, in this (classical) situation, the level of GNP is pinned at $Y$. The only effect is an increase in the price level, from $P$ to $P'$.
4. The aggregate demand curve still shifts right. Due to the shape of the AS curve, however, now both the price level and level of real GDP increase, from $P$ to $P'$ and from $Y$ to $Y'$. The last three questions reveal the crucial role played by the shape of the aggregate supply curve: Notice how the results from the increase in aggregate demand depend on the shape of the aggregate supply curve.

5. If policymakers believe that the Keynesian model is correct, they expect output to rise and the price level to remain constant. This is illustrated to the left, above. If, however, the actual “real world” AS curve is vertical, output does not change and the price level rises. This is shown to the right, above. This question points out the importance of basing policy upon the correct model. If policy is formulated using the wrong model, the results of the policy can be unfavorable.

6. If the self-correcting mechanism is very slow, you might view government policy more favorably. If unemployment is above its natural rate, rather than wait a long time for the self-correcting mechanism to work, some sort of policy to lower unemployment rapidly back to its natural rate might well be desirable.

## Additional Questions

1. Keynes remarked, “that in the long run we are all dead.” What did he mean by that and why does it lead to the conclusion that the government should intervene when the economy operates at an output level less than full employment.

2. Joseph Stiglitz, a leading economist, has commented that the difference between the classical and Keynesian view can be answered by the question, “who rules the roost, demand or supply.” Explain. In which case does demand rule and in which case does supply rule?

3. Assume the economy is operating at full employment and the short run aggregate supply has a positive slope over all price levels. Suppose that firms become more optimistic about future sales and the price of oil falls. What is the impact on output, employment and the price level in the short run?

4. Assume the economy is operating at full employment and the short run aggregate supply has a positive slope over all price levels. Suppose there is a drought and households decide to increase the amount of consumption spending. What is the impact on output, employment and the price level in the short run?
5. Suppose the aggregate supply curve has a positive slope and there is an adverse supply shock. If the government decides to intervene by increasing government spending to bring the economy back to full employment, what is a negative consequence? If most supply shocks are temporary, what is your advice for government policy makers?

**Answers**

1. Keynes believed that the classical self-correction mechanism was a special case and in general, the economy is unstable and could get stuck at high levels of unemployment. He believed that the self-correction mechanism would *eventually* work but it could take a long time. Since there are significant costs to high and persistent unemployment government intervention may be necessary.

2. Supply rules the roost in the classical model. Whatever output is produced (supplied) will be demanded. Demand rules the roost in a Keynesian model. Decreases in household spending or business investment can cause the aggregate demand curve to fall, which would reduce output and increase unemployment.

3. If firms are more optimistic about future sales, investment spending will increase and the aggregate demand will shift to the right. All else equal, this will cause output, employment and the price level to increase. Lower oil prices will cause production costs to decrease. As a result the aggregate supply curve will shift to the right. All else equal, this will cause output and employment to increase and the price level to fall. Thus, with both the aggregate demand and aggregate supply curve shifting to the right, output and employment will increase. The effect on the price level is unknown unless you know the amount by which each curve shifts.

4. This is similar to the previous question except in this case the price level will definitely increase but it is uncertain what happens to output and employment. The increase in aggregate demand due to greater consumption spending will lead to a higher price level and greater output and employment. The decrease in aggregate supply due to the drought will lead to a higher price level and lower output and employment. Therefore, the price level will increase but the impact on output and employment is unknown.

5. The adverse supply shock will lead to a higher unemployment and a higher price level. If the government decides to increase government spending, the aggregate demand curve will shift to the right. Although this will reduce unemployment and increase output, the price level increases even further. If supply shocks are temporary it may be best to do nothing and allow the economy to get back to full employment on its own once the adverse supply shock has abated.