CHAPTER 7: AGGREGATE DEMAND AND AGGREGATE SUPPLY

Learning goals of this chapter:

- What forces bring persistent and rapid expansion of real GDP?
- What causes inflation?
- Why do we have business cycles?
- How do policy actions by the government and the Federal Reserve affect output and prices?
- To learn the mechanics of the AS-AD model which provides a framework for understanding economic growth, inflation, business cycles, and the different schools of economic thought.

I. Aggregate Supply

A. The aggregate quantity of goods and services supplied depends on three factors:
   1. The quantity of labor ($L$)
   2. The quantity of capital ($K$)
   3. The state of technology ($T$)

B. The aggregate production function, $Y = F(L, K, T)$, shows how quantity of real GDP supplied ($Y$) depends on labor, capital, and technology.

   - At any point in time, the capital stock and state of technology is fixed; the employment of labor, however, can vary.
   - Firms’ demand for labor is negatively related to the wage rate.
   - Workers’ supply of labor is a positively related to the wage rate.
   - The wage rate that sets the quantity of labor demanded equal to the quantity supplied is the equilibrium wage rate and at that wage the level of employment is full employment.
   - At full employment, the unemployment rate is the natural rate of unemployment.

Graph of the labor market:
C. Aggregate supply depends on the amount of time allowed for factor adjustment to changes. We distinguish between two different time frames associated with different states of the labor market.
  - Long-run aggregate supply
  - Short-run aggregate supply

D. The macroeconomic long run is the period of time long enough for all adjustments to be made. In the long run, real GDP equals potential GDP and there is full employment.

  - The long-run aggregate supply curve \((LAS)\) is the relationship between the quantity of real GDP supplied and the price level when real GDP equals potential GDP.

    Graph of LAS

    • The \(LAS\) curve is vertical, which indicates that potential real GDP is independent of the price level.

    • Along the \(LAS\) curve the prices of outputs and the prices of all inputs vary by the same proportion

E. The macroeconomic short run is the period of time during which real GDP adjusts toward potential real GDP and full employment.

  - The short-run aggregate supply curve \((SAS)\) is the relationship between the quantity of real \(GDP\) supplied and the price level in the short run when the money wage rate and other resource prices are constant and potential GDP does not change.
Graph of SAS curve

• The SAS curve is upward sloping, indicating that a rise in the price level with no change in the money wage rate increases the quantity of real GDP supplied.

• The SAS curve is upward sloping because a rise in the price level with no change in costs induces firms to bear a higher marginal cost and increases production. Similarly, a fall in the price level with no change in costs induces firms to decrease production in order to lower marginal costs.

F. Movement along the LAS and SAS Curves

• A change in the price level with an equal percentage change in the money wage causes a movement along the LAS curve.

• A change in the price level with no change in the money wage causes a movement along the SAS curve.

Graph:
G. Shifts in the AS Curves

- When potential real GDP increases, both the LAS and SAS curves shift rightward. Potential real GDP changes for three reasons:
  1. Changes in the full-employment quantity of labor.
  2. Changes in the quantity of capital, either in the capital stock or in the quantity of human capital.
  3. Advances in technology.

Graph

- All the factors that shift the long-run aggregate supply curve have the same effect on the short-run aggregate supply curve.

- However, changes in resource prices changes the short-run aggregate supply but not the long-run aggregate supply curve.

- Example: Suppose money wage rates rise. Will the SAS, LAS or both curves shift?
Example: Suppose the government invests in education which raises human capital in the economy. Will the SAS, LAS or both curves shift?

II. Aggregate Demand

A. The quantity of real GDP demanded, \( Y \), is the total amount of final goods and services produced in the United States that people, businesses, governments, and foreigners plan to buy.

1. This quantity is the sum of consumption expenditures, \( C \), investment, \( I \), government purchases, \( G \), and net exports, \( X - M \). That is:

\[
Y = C + I + G + X - M.
\]

2. Buying plans depend on many factors and some of the main ones are:
   a) The price level
   b) Expectations
   c) Fiscal and monetary policy
   d) The world economy

B. The Aggregate Demand Curve

1. Aggregate demand is the relationship between the quantity of real GDP demanded and the price level.

2. The aggregate demand (\( AD \)) curve plots the quantity of real GDP demanded against the price level.

Graph of AD curve:
3. The AD curve slopes downward for two reasons: a wealth effect and two substitution effects.

a) **Wealth effect**: A rise in the price level, other things remaining the same, decreases the quantity of real wealth (money, bonds, stocks, etc.). To restore their real wealth, people increase saving and decrease spending, so the quantity of real GDP demanded decreases. Similarly, a fall in the price level, other things remaining the same, increases the quantity of real wealth. With more real wealth, people decrease saving and increase spending, so the quantity of real GDP demanded increases.

b) **Intertemporal substitution effect**: A rise in the price level, other things remaining the same, decreases the real value of money and raises the interest rate. Faced with a higher interest rate, people try to borrow and spend less so the quantity of real GDP demanded decreases. Similarly, a fall in the price level increases the real value of money and lowers the interest rate. Faced with a lower interest rate, people borrow and spend more so the quantity of real GDP demanded increases.

c) **International substitution effect**: A rise in the price level, other things remaining the same, increases the price of domestic goods relative to foreign goods, so imports increase and exports decrease, which decreases the quantity of real GDP demanded. Similarly, a fall in the price level, other things remaining the same, decreases the price of domestic goods relative to foreign goods, so imports decrease and exports increase, which increases the quantity of real GDP demanded.

4. **Movement along the AD schedule** takes place due to a change in the price level.

C. **Changes in Aggregate Demand**

1. A change in any influence on buying plans other than the price level changes aggregate demand.

2. The main influences are: expectations, fiscal and monetary policy, and the world economy.

   a) **Expectations about future income, future inflation, and future profits** shift the AD curve.

      (i) Increases in expected future income increase people’s consumption today, thereby shifting the AD curve rightward.
(ii) A rise in the expected inflation rate makes buying goods cheaper today and shifts the current $AD$ curve rightward.

(iii) An increase in expected future profits boosts firms’ investment demand, which shifts the $AD$ curve rightward.

b) Fiscal policy is the government’s attempt to influence economic activity by changing its taxes, spending, deficit, and debt policies.

(i) A decrease in taxes or an increase in transfer payments increases households’ **disposable income**. An increase in disposable income raises people’s consumption demand, thereby shifting the $AD$ curve rightward.

(ii) Because government purchases of goods and services is one component of aggregate demand, an increase in these purchases shifts the $AD$ curve rightward.

c) Monetary policy is changes in the interest rate and quantity of money.

(i) An increase in the quantity of money raises people’s spending and leads to an increase in aggregate demand; that is, the $AD$ curve shifts rightward.

(ii) If the Fed lowers interest rates, the $AD$ curve shifts rightward.

d) The **world economy factors** that affect the aggregate demand for output are the foreign exchange rate and foreign income.

(i) A drop in the **foreign exchange rate** makes domestically produced products cheaper relative to foreign products and increases the demand for domestic goods, thereby shifting the $AD$ curve rightward.

(ii) An increase in **foreigners’ income** increases their demand for exports and shifts the $AD$ curve rightward.

Examples of shifts in the $AD$ curve:
Examples of shifts in the AD curve:

3. In general, when aggregate demand increases, the AD curve shifts rightward and when aggregate demand decreases, the AD curve shifts leftward.

III. Macroeconomic Equilibrium

A. Long-run macroeconomic equilibrium is the state towards which the economy moves.

B. Short-run macroeconomic equilibrium is the normal situation as the economy fluctuates around potential GDP moving toward its long-run equilibrium.

C. **Short-run macroeconomic equilibrium** occurs when the quantity of real GDP demanded equals the quantity of real GDP supplied. This point determines the equilibrium level of GDP and the equilibrium price level.

  - Short-run macroeconomic equilibrium occurs where the $AD$ curve crosses the short-run $AS$ curve.

  - It does not necessarily have to intersect at full employment.

*Graph of short-run macroeconomic equilibrium:*
D. **Long-run macroeconomic equilibrium** occurs when real GDP equals potential GDP; that is, when the economy is on its *LAS* curve.

- Long-run equilibrium occurs where the *AD* and *LAS* curves cross and results because the money wage adjusts so that *SAS* curve also goes through this long-run equilibrium point.

Graph of long-run macroeconomic equilibrium

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E. **Economic growth** occurs when the *LAS* curve shifts rightward because

a) the quantity of labor grows  

b) more capital is accumulated, or  

c) technology advances.

- All of these factors cause potential GDP to increase.  
- Note that these factors will also cause the SAS curve to shift.

Graph:
F. **Inflation** occurs because the quantity of money grows more rapidly than potential GDP, which increases aggregate demand by more than the long-run aggregate supply. In this case, the $AD$ curve shifts rightward faster than the rightward shift of the $LAS$ curve.

Graph

G. **Stagflation** occurs when we have a combination of recession and inflation. This occurs when there is a reduction in aggregate supply.

H. **Business cycles** occur because aggregate demand and the short-run aggregate supply fluctuate but the money wage does not change rapidly enough to keep real GPD at potential GDP.

1. A **below full-employment equilibrium** is when equilibrium GDP is less than potential GDP.

Graph

- This type of equilibrium creates a **recessionary gap** which equals
potential real GDP minus actual real GDP.

2. A **full-employment equilibrium** occurs when equilibrium GDP equals potential GDP.

Graph

3. An **above full-employment equilibrium** takes place when equilibrium real GDP exceeds potential real GDP.

Graph

- This type of equilibrium creates an **inflationary gap**, which equals the difference between actual GDP and potential GDP.
I. Fluctuations in Aggregate Demand

- There are both short-run adjustments and long-run adjustments to changes in aggregate demand.

- Example 1: Assume the economy is at full-employment and that income increases in foreign countries. What is the impact on the domestic economy in the short-run and in the long-run?

**Economic reasoning** behind the short-run and long-run adjustments in example 1:
J. Fluctuations in Aggregate Supply

- Example 2: Assume the economy is at full-employment and that the price of crude oil rises in the economy. What is the impact on the domestic economy in the short-run and in the long-run?

Economic reasoning
Example 3: Assume the economy is at full-employment and that the price of crude oil rises in the economy. However, in this case the policy maker wants to fix the ensuing stagflation. What policy options are available to the government? To the Fed?
IV. U.S. Economic Growth, Inflation, and Cycles

A. Figure 7.14 is a scatter diagram of real GDP and the price level each year from 1963 to 2003. The figure also interprets the data in terms of shifting $AD$, $SAS$, and $LAS$ curves. The data show economic growth, inflation, and the business cycle between 1963 and 2003.

1. Real GDP and potential GDP grew from $2.8$ trillion to $10.3$ trillion.
2. The price level rose from 22 to 105.

B. Economic Growth
Real GDP growth was rapid during the 1960s and 1990s and slower during the 1970s and 1980s.

C. Inflation
Inflation was the most rapid during the 1970s.

D. Business Cycles
V. Macroeconomic Schools of Thought

A. Macroeconomics is an active field of research in which there is much consensus, but also some differing viewpoints, especially about the business cycle.

B. The Keynesian View
1. A Keynesian macroeconomist believes that left alone, the economy would rarely operate at full employment and that to achieve and maintain full employment, active help from fiscal policy and monetary policy is required.
2. Keynesians believe that expectations ("animal spirits") are the most significant influence on aggregate demand and business cycle fluctuations.
3. Keynesians believe that the money wage rate is extremely sticky, especially in the downward direction. A new Keynesian believes that not only is the money wage rate sticky but that prices of goods and services are also sticky.
4. The Keynesian view calls for fiscal policy and monetary policy to actively offset changes in aggregate demand.

C. The Classical View
1. A classical macroeconomist believes that the economy is self-regulating and that it is always at full employment.
2. Classical macroeconomists believe that technological change is the most significant influence on both aggregate demand and aggregate supply. They believe fluctuations in potential GDP are responsible for business cycle fluctuations.
3. Classical macroeconomists believe that the money wage rate is flexible and that the economy adjusts to long-run aggregate supply very quickly.
4. The classical view emphasizes the potential for taxes to stunt incentives and create inefficiency.

D. The Monetarist View
1. A monetarist macroeconomist believes that the economy is self-regulating and that it will normally operate at full employment provided that monetary policy is not erratic and that the pace of money growth is kept steady.
2. Monetarists believe that the quantity of money is the most significant influence on aggregate demand and business cycle fluctuations.
3. Monetarists believe that the money wage rate is sticky, leading to a distinction between short-run and long-run aggregate supply.
4. The monetarist view is that, provided that the quantity of money is kept on a steady growth path, no active stabilization is needed to offset changes in aggregate demand.