15 Chapter Overview with Helpful Hints

Introduction Over the last 50 years, U.S. real GDP has grown about 3 percent per year. However, in some years, GDP has experienced a contraction. A period when output and incomes fall, and unemployment rises, is known as a recession when it is mild and a depression when it is severe. The U.S. economy experienced a deep recession from late 2007 to early 2009. This chapter focuses on the economy's short-run fluctuations around its long-term trend. To do this, we employ the model of aggregate demand and aggregate supply.

Three Key Facts about Economic Fluctuations

Economic fluctuations are irregular and unpredictable: Although economic fluctuations are often termed *the business cycle*, the term "business cycle" is misleading because it suggests that economic fluctuations follow a regular, predictable pattern. In reality, economic fluctuations are irregular and unpredictable.

Most macroeconomic quantities fluctuate together: Although real GDP is usually used to monitor short-run changes in the economy, it really doesn't matter which measure of economic activity is used because most macroeconomic variables that measure income, spending, or production move in the same direction, though by different amounts. Investment is one type of expenditure that is particularly volatile across the business cycle.

As output falls, unemployment rises: When real GDP declines, the rate of unemployment rises because when firms produce fewer goods and services, they lay off workers.

Explaining Short-Run Economic Fluctuations

Classical theory is based on the classical dichotomy and monetary neutrality. Recall, the classical dichotomy is the separation of economic variables into real and nominal while monetary neutrality is the property that changes in the money supply only affect nominal variables, not real variables. Most economists believe these classical assumptions are an accurate description of the economy in the long run but not in the short run. That is, over a period of a number of years, changes in the money supply should affect prices but should have no impact on real variables such as real GDP, unemployment, real wages, and so on. However, in the short run, from year to year, changes in nominal variables such as money and prices are likely to have an impact on real variables. That is, in the short run, nominal and real variables are not independent. As a result, in the short run, changes in money can temporarily move real GDP away from its long-run trend.

We use the model of aggregate supply and aggregate demand to explain economic fluctuations. This model can be graphed with the price level, measured by the CPI or the GDP deflator on the vertical axis and real GDP on the horizontal axis. The aggregate-demand curve shows the quantity of goods and services households, firms, the government, and customers abroad wish to buy at each price level. It slopes negatively. The aggregate-supply curve shows the quantity of goods and services that firms produce and sell at each price level. It slopes positively (in the short run). The price level and output adjust to balance aggregate supply and demand. This model looks like an ordinary microeconomic supply-and-demand model. However, the reasons for the slopes and the sources of the shifts in the aggregate-supply and -demand curves differ from those for the microeconomic model.

The Aggregate-Demand Curve

Exhibit 1 illustrates the model of aggregate supply and aggregate demand.

Exhibit 1

The aggregate-demand curve shows the quantity of goods and services demanded at each price level. Recall, $\text{GDP} = C + I + G + NX$. To address why aggregate demand slopes downward, we address the impact of the price level on consumption (C), investment (I), and net exports (NX). (We ignore government spending [G] because it is a fixed policy variable.) A decrease in the price level increases consumption, investment, and net exports for the following reasons:

The price level and consumption: *The wealth effect.* At a lower price level, the fixed amount of nominal money in consumers' pockets increases in value. Consumers are wealthier and spend more, increasing the consumption component of aggregate demand.

The price level and investment: *The interest-rate effect.* At a lower price level, households need to hold less money to buy the same products. They lend some money by buying bonds or depositing in banks, either of which lowers interest rates and stimulates the investment component of aggregate demand. (Lower interest rates may also stimulate spending on consumer durables.)

The price level and net exports: *The exchange-rate effect.* Since, as described earlier, a lower price level causes lower interest rates, some U.S. investors will invest abroad, increasing the supply of dollars in the foreign-currency exchange market. This act causes the real exchange rate of the dollar to depreciate, reduces the relative price of domestic goods compared to foreign goods, and increases the net exports component of aggregate demand.

The three effects described here also work in reverse. All three explanations of the downward slope of the aggregate-demand curve assume that the money supply is fixed.

When something causes a change in the quantity of output demanded at each price level, it causes a shift in the aggregate-demand curve. The following events and policies cause shifts in aggregate demand:

Shifts arising from changes in consumption: If consumers save more, if stock prices fall so that consumers feel poorer, or if taxes are increased, consumers spend less and aggregate demand shifts left.

Shifts arising from changes in investment: If firms become optimistic about the future and decide to buy new equipment, if an investment tax credit increases investment, or if the Fed increases the money supply, which reduces interest rates and increases investment, aggregate demand shifts right.

Shifts arising from changes in government purchases: If federal, state, or local governments increase purchases, aggregate demand shifts right.

Shifts arising from changes in net exports: If foreign countries have a recession and buy fewer goods from the United States or if the value of the dollar rises on foreign exchange markets, net exports are reduced and aggregate demand shifts left.

The Aggregate-Supply Curve

The aggregate-supply curve shows the quantity of goods and services firms produce and sell at each price level. In the long run, the aggregate-supply curve is vertical while in the short run, it slopes upward (positive slope). Both can be seen in Exhibit 1.

The *long-run aggregate-supply curve* is vertical because, in the long run, the supply of goods and services depends on the supply of capital, labor, and natural resources, and on production technology. In the long run, the supply of goods and services is independent of the level of prices. It is the graphical representation of the classical dichotomy and monetary neutrality. That is, if the price level rises and all prices rise together, there should be no impact on output or any other real variable.

The long-run aggregate-supply curve shows the level of production that is sometimes called *potential output or full-employment output.* Since in the short run output can be temporarily above or below this level, a better name is the natural level of output because it is the amount of output produced when unemployment is at its natural, or normal, rate. Anything that alters the natural level of output shifts the long-run aggregate-supply curve to the right or left. Since in the long run, output depends on labor, capital, natural resources, and technological knowledge, we group the sources of the shifts in long-run aggregate supply into these categories:

Shifts arising from changes in labor: If there is immigration from abroad or a reduction in the natural rate of unemployment, long-run aggregate supply shifts right.

Shifts arising from changes in capital: If there is an increase in physical or human capital, productivity rises and long-run aggregate supply shifts right.

Shifts arising from changes in natural resources: If there is a discovery of new resources, or a favorable change in weather patterns, long-run aggregate supply shifts right.

Shifts arising from changes in technical knowledge: If new inventions are employed, or international trade opens up, long-run aggregate supply shifts right.

Long-run growth and inflation may be depicted as a rightward shift in the long-run aggregate-supply curve (from the events described above) and an even larger rightward shift in the aggregate-demand curve due to increases in the money supply. Thus, over time, output grows and prices rise.

The short-run aggregate-supply curve slopes upward (positively) because a change in the price level causes output to deviate from its long-run level for a short period of time, say, a year or two. There are three theories that explain why the short-run aggregate-supply curve slopes upward, and they all share a common theme: Output rises above the natural level when the actual price level exceeds the expected price level. The three theories are:

1. *The sticky-wage theory:* Suppose firms and workers agree on a nominal wage contract based on what they expect the price level to be. If the price level falls below what was expected, firms pay the same wage but receive lower prices for their output. This reduces profits, causing the firm to hire less labor and reduce the quantity of goods and services supplied.
2. *The sticky-price theory:* Because there is a cost to firms for changing prices, termed *menu costs*, some firms will resist reducing their prices when the price level unexpectedly falls. Thus, their prices are "too high" and their sales decline, causing the quantity of goods and services supplied to fall.
3. *The misperceptions theory:* When the price level unexpectedly falls, suppliers only notice that the price of their particular product has fallen. Hence, they mistakenly believe that there has been a fall in the *relative price* of their product, causing them to reduce the quantity of goods and services supplied.

The three effects described above also work in reverse.

Note two features of the explanations above:

1. In each case, the quantity of output supplied changed because actual prices deviated from expected prices, and
2. the effect will be temporary because people will adjust their expectations over time.

We can express aggregate supply mathematically with the following equation:

$$\text{Quantity of Output Supplied} = \text{Natural Level of Output} + a(\text{Actual Price Level} - \text{Expected Price Level})$$

where a is a number that determines how much output responds to unexpected changes in the price level.

Events that shift the long-run aggregate-supply curve also tend to shift the short-run aggregate-supply curve in the same direction. However, the short-run aggregate-supply curve can shift while the long-run aggregate-supply curve remains stationary. In the short run, the quantity of goods and services supplied depends on perceptions, wages, and prices, all of which were set based on the expected price level. If people and firms expect higher prices, they set wages higher, reducing the profitability of production and reducing the quantity supplied of goods and services at each price level. Thus, the short-run aggregate-supply curve shifts left. A lower expected price level shifts the short-run aggregate-supply curve to the right. In general, things that cause an increase in the cost of production (an increase in wages or oil prices) cause the short-run aggregate-supply curve

to shift left while a decrease in the cost of production causes the short-run aggregate-supply curve to shift right.

Two Causes of Economic Fluctuations

Exhibit 1 shows the model of aggregate supply and aggregate demand in long-run equilibrium. That is, the level of output is at the long-run natural level where aggregate demand and long-run aggregate supply intersect, and perceptions, wages, and prices have fully adjusted to the actual price level as demonstrated by short-run aggregate supply intersecting at the same point.

There are two basic causes of a recession: a leftward shift in aggregate demand and a leftward shift in aggregate supply.

A Shift in Aggregate Demand We use a four-step approach:

1. Determine which curve the event affects.
2. Determine which way the curve moves.
3. Determine the new short-run equilibrium.
4. Determine the transition from the short-run equilibrium to the long-run equilibrium.

Suppose households cut back on their spending because they are pessimistic or nervous about the future. Consumers spend less at each price level so aggregate demand shifts left in Exhibit 2. In the short run, the economy moves to point B because the drop in the price level was unexpected. When prices fall below expectations, sticky wages, sticky prices, and misperceptions about relative prices cause firms to cut back on production. We can see that the economy is in a recession at P_2, Y_2 because output is below the natural level. The recession will remedy itself or self-correct over time. Since actual prices are below prior expectations, price expectations will be reduced over time and wages and prices will fall to levels commensurate with P_3. In particular, the sticky-wage theory suggests that once workers and firms expect lower prices, they will negotiate lower wages. This encourages production, the short-run aggregate-supply curve shifts right, and the economy arrives at point C. Policymakers could try to eliminate the recession by increasing aggregate demand with an increase in government spending or an increase in the money supply. If properly done, the government moves the economy back to point A. To summarize, in the short run, shifts in aggregate demand cause fluctuations in output. In the long run, shifts in aggregate demand only cause changes in prices. Policymakers can potentially mitigate the severity of economic fluctuations.

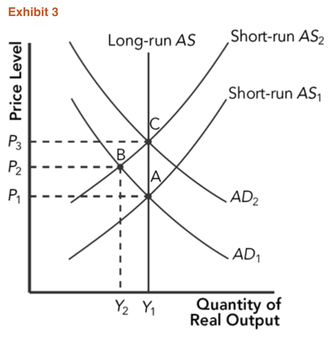
Exhibit 2

Exhibit 2 can be used to demonstrate that money matters in the short run, but money is neutral in the long run. Starting at point A, if the Fed reduces the money supply, the economy moves to point B and experiences a recession. Since output falls, we say that money matters. In the long run, price expectations and wages are reduced, and the economy moves to point C. Output returns to the natural level and prices have fallen; therefore, money is neutral in the long run.

The two biggest shocks to aggregate demand in the United States were the leftward shift during the Great Depression and the rightward shift during World War II. The recession of 2008–2009 caused a significant reduction in aggregate demand. Housing prices started to fall in 2006 causing borrowers to default on their loans. Banks foreclosed and sold the homes causing spending on new home construction to collapse. Financial institutions that owned mortgage-backed securities suffered losses and reduced their lending. All of these events caused aggregate demand to shift left. The government attempted to shift aggregate demand back to the right. The Fed lowered interest rates, Congress rescued the financial system, and the government increased its spending.

A Shift in Aggregate Supply Use the same four-step method described above. Suppose OPEC raises the price of oil, which raises the cost of production for many firms. This reduces profitability, firms produce less at each price level, and short-run aggregate supply shifts to the left in Exhibit 3. In the short run, prices rise, reducing the quantity demanded along the aggregate-demand curve and the economy arrives at point B. Since output has fallen (stagnation) and the price level has risen (inflation), the economy has experienced stagflation. Higher prices may temporarily cause workers to demand higher wages, further shifting short-run aggregate supply to the left and temporarily causing a *wage-price spiral*. However, in the long run, the unemployment at Y_2 will, in time, put downward pressure on workers' wages, will increase profitability, and will shift aggregate supply back to its original position, and the economy returns to point A. Alternatively, policymakers could increase aggregate demand and move the economy to point C, avoiding point B altogether. Here, policymakers *accommodate* the shift in aggregate supply by allowing the increase in costs to raise prices permanently. Output is returned to long-run equilibrium, but prices are higher. To summarize, a reduction in short-run aggregate supply causes stagflation. If policymakers shift aggregate demand in a manner to increase output, it causes more inflation.

Exhibit 3



Helpful Hints

1. There are no changes in real variables along the long-run aggregate-supply curve. When all prices change equally, no real variables have changed. A vertical long-run aggregate-supply curve simply demonstrates this classical lesson. Pick any point on the long-run aggregate-supply curve. Now double the price level and all nominal values such as wages. Although the price level has doubled, relative prices have remained constant including the real wage, W/P. There has been no change in anyone's incentive to produce and, thus, no change in output. It follows that if the economy is temporarily producing a level of output other than the long-run natural level, then at least some wages or prices have failed to adjust to the long-run equilibrium price level. This causes at least some relative prices to change, which stimulates or discourages production. This is, in fact, what is happening along a short-run aggregate-supply curve.
2. Output can fluctuate to levels both above and below the natural level of output. The examples of economic fluctuations in the text tend to focus on recessions. That is, the examples deal with periods when output is less than the natural level. Note, however, that output can be above the natural level temporarily because unemployment can be below its natural rate. This economic condition is known as a boom. A boom will occur when there is a positive aggregate-demand shock—for example, if there is an increase in the money supply, an increase in domestic investment, or an increase in government purchases. A boom will also occur if there is a positive aggregate-supply shock—for example, if the price of oil were to fall or union wage demands were to decrease.
3. You may shift the short-run aggregate-supply curve left and right or upward and downward. Suppose there is an increase in the wage of workers. We have suggested that the rise in the wage will increase the cost of production, decrease profitability at each price level, and decrease production at each price level. That is, it will shift the short-run aggregate-supply curve to the left. However, we could have suggested that the increase in the wage will increase the cost of production, requiring firms to charge a higher price in order to continue the same level of production. That is, it shifts the short-run aggregate-supply curve upward on the graph. In the first case, we lowered the quantity supplied at each price. In the second case, we raised the price at each quantity supplied. The resulting shift is the same.