Objectives

After studying this chapter, you will be able to

- Distinguish between inflation and a one-time rise in the price level
- Explain how demand-pull inflation is generated
- Explain how cost-push inflation is generated
- Describe the effects of inflation
- Explain the short-run and long-run relationships between inflation and unemployment
- Explain the short-run and long-run relationships between inflation and interest rates
Inflation is a very old problem and some countries even in recent times have experienced rates as high as 40% per month.

The United States has low inflation now, but during the 1970s the price level doubled.

Why does inflation occur, how do our expectations of inflation influence the economy, is there a tradeoff between inflation and unemployment, and how does inflation affect the interest rate?

**Inflation and the Price Level**

**Inflation** is a process in which the price level is rising and money is losing value.

Inflation is a rise in the price level, not in the price of a particular commodity.

And inflation is an ongoing process, not a one-time jump in the price level.
Inflation and the Price Level

Figure 28.1 illustrates the distinction between inflation and a one-time rise in the price level.

The inflation rate is the percentage change in the price level. That is, where $P_1$ is the current price level and $P_0$ is last year’s price level, the inflation rate is

$$\left[\frac{(P_1 - P_0)}{P_0}\right] \times 100$$

Inflation can result from either an increase in aggregate demand or a decrease in aggregate supply and be

- Demand-pull inflation
- Cost-push inflation
Demand-Pull Inflation

**Demand-pull inflation** is an inflation that results from an initial increase in aggregate demand.

Demand-pull inflation may begin with any factor that increases aggregate demand.

Two factors controlled by the government are increases in the quantity of money and increases in government purchases.

A third possibility is an increase in exports.

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**Initial Effect of an Increase in Aggregate Demand**

Figure 28.2(a) illustrates the start of a demand-pull inflation.

Starting from full employment, an increase in aggregate demand shifts the $AD$ curve rightward.
Demand-Pull Inflation

Real GDP increases, the price level rises, and an inflationary gap arises. The rising price level is the first step in the demand-pull inflation.

Money Wage Rate Response

Figure 28.2(b) illustrates the money wage response. The higher level of output means that real GDP exceeds potential GDP—an inflationary gap.
Demand-Pull Inflation

The money wages rises and the SAS curve shifts leftward.
Real GDP decreases back to potential GDP but the price level rises further.

A Demand-Pull Inflation Process

Figure 28.3illustrates a demand-pull inflation spiral.
Aggregate demand keeps increases and the process just described repeats indefinitely.
Demand-Pull Inflation

Although any of several factors can increase aggregate demand to start a demand-pull inflation, only an ongoing increase in the quantity of money can sustain it. Demand-pull inflation occurred in the United States during the late 1960s and early 1970s.

Cost-Push Inflation

Cost-push inflation is an inflation that results from an initial increase in costs. There are two main sources of increased costs:

- An increase in the money wage rate
- An increase in the money price of raw materials, such as oil.
Cost-Push Inflation

Initial Effect of a Decrease in Aggregate Supply

Figure 28.4 illustrates the start of cost-push inflation. A rise in the price of oil decreases short-run aggregate supply and shifts the SAS curve leftward.

Cost-Push Inflation

Real GDP decreases and the price level rises—a combination called stagflation. The rising price level is the start of the cost-push inflation.
Cost-Push Inflation

Aggregate Demand Response

The initial increase in costs creates a one-time rise in the price level, not inflation.

To create inflation, aggregate demand must increase.

Figure 28.5 illustrates an aggregate demand response to stagflation, which might arise because the Fed stimulates demand to counter the higher unemployment rate and lower level of real GDP.
Cost-Push Inflation

The increase in aggregate demand shifts the AD curve rightward. Real GDP increases and the price level rises again.

A Cost-Push Inflation Process

Figure 28.6 illustrates a cost-push inflation spiral.
Cost-Push Inflation

If the oil producers raise the price of oil to try to keep its relative price higher, and the Fed responds with an increase in aggregate demand, a process of cost-push inflation continues.


Effects of Inflation

Unanticipated Inflation in the Labor Market

Unanticipated inflation has two main consequences in the labor market:

- Redistributions of income
- Departure from full employment
Effects of Inflation

Higher than anticipated inflation lowers the real wage rate and employers gain at the expense of workers.

Lower than anticipated inflation raises the real wage rate and workers gain at the expense of employers.

Higher than anticipated inflation lowers the real wage rate, increases the quantity of labor demanded, makes jobs easier to find, and lowers the unemployment rate.

Lower than anticipated inflation raises the real wage rate, decreases the quantity of labor demanded, and increases the unemployment rate.

Effects of Inflation

Unanticipated Inflation in the Market for Financial Capital

Unanticipated inflation has two main consequences in the market for financial capital: it redistributes income and results in too much or too little lending and borrowing.

If the inflation rate is unexpectedly high, borrowers gain but lenders lose.

If the inflation rate is unexpectedly low, lenders gain but borrowers lose.
Effects of Inflation

When the inflation rate is higher than anticipated, the real interest rate is lower than anticipated, and borrowers want to have borrowed more and lenders want to have loaned less.

When the inflation rate is lower than anticipated, the real interest rate is higher than anticipated, and borrowers want to have borrowed less and lenders want to have loaned more.

Forecasting Inflation

To minimize the costs of incorrectly anticipating inflation, people form rational expectations about the inflation rate.

A rational expectation is one based on all relevant information and is the most accurate forecast possible, although that does not mean it is always right; to the contrary, it will often be wrong.
Effects of Inflation

Anticipated Inflation

Figure 28.7 illustrates an anticipated inflation.

Aggregate demand increases, but the increase is anticipated, so its effect on the price level is anticipated.

The money wage rate rises in line with the anticipated rise in the price level.

The $AD$ curve shifts rightward and the SAS curve shifts leftward so that the price level rises as anticipated and real GDP remains at potential GDP.
Effects of Inflation

Unanticipated Inflation

If aggregate demand increases by more than expected, inflation is higher than expected.

Money wages do not adjust enough, and the SAS curve does not shift leftward enough to keep the economy at full employment.

Real GDP exceeds potential GDP.

Wages eventually rise, which leads to a decrease in the SAS.

Effects of Inflation

The economy experiences more inflation as it returns to full employment.

This inflation is like a demand-pull inflation.
Effects of Inflation

If aggregate demand increases by less than expected, inflation is less than expected.

Money wages rise too much and the SAS curve shifts leftward more than the AD curve shifts rightward.

Real GDP is less than potential GDP.

This inflation is like a cost-push inflation.

Effects of Inflation

The Costs of Anticipated Inflation

Anticipated inflation occurs at full employment with real GDP equal to potential GDP.

But anticipated inflation, particularly high anticipated inflation, inflicts three costs

- Transactions costs
- Tax effects
- Increased uncertainty
Inflation and Unemployment: The Phillips Curve

A **Phillips curve** is a curve that shows the relationship between the inflation rate and the unemployment rate.

There are two time frames for Phillips curves

- The short-run Phillips curve
- The long-run Phillips curve

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The Short-Run Phillips Curve

The **short-run Phillips curve** shows the tradeoff between the inflation rate and unemployment rate holding constant

- The expected inflation rate
- The natural unemployment rate
Inflation and Unemployment: The Phillips Curve

Figure 28.8 illustrates a short-run Phillips curve (SRPC)—a downward-sloping curve. If the unemployment rate falls, the inflation rate rises. And if the unemployment rate rises, the inflation rate falls.

Inflation and Unemployment: The Phillips Curve

The negative relationship between the inflation rate and unemployment rate is explained by the AS-AD model. Figure 28.9 shows how.
Inflation and Unemployment: The Phillips Curve

An anticipated increase in aggregate demand from $AD_0$ to $AD_1$ brings a 10 percent inflation at full employment.

Point A shows this outcome.

Inflation and Unemployment: The Phillips Curve

A larger than anticipated increase in aggregate demand from $AD_0$ to $AD_2$ raises the inflation rate to 13 percent.

Real GDP increases above potential GDP and the unemployment rate falls below the natural rate—a movement along a short-run Phillips curve.
Inflation and Unemployment: The Phillips Curve

A smaller than anticipated increase in aggregate demand—remains at $AD_0$ lowers the inflation rate to 7 percent.

Real GDP falls below potential GDP and the unemployment rate rises above the natural rate—a movement along a short-run Phillips curve.

The Long-Run Phillips Curve

The long-run Phillips curve shows the relationship between inflation and unemployment when the actual inflation rate equals the expected inflation rate.
Inflation and Unemployment: The Phillips Curve

Figure 28.10 illustrates the long-run Phillips curve (LRPC) which is vertical at the natural rate of unemployment.

Along the long-run Phillips curve, because a change in the inflation rate is anticipated, it has no effect on the unemployment rate.

Inflation and Unemployment: The Phillips Curve

Figure 28.10 also shows how the short-run Phillips curve shifts when the expected inflation rate changes.

A lower expected inflation rate shifts the short-run Phillips curve downward by an amount equal to the fall in the expected inflation rate.
Inflation and Unemployment: The Phillips Curve

Changes in the Natural Unemployment Rate

A change in the natural unemployment rate shifts both the long-run and short-run Phillips curves. Figure 28.11 illustrates.

The U.S. Phillips Curve

The data for the United States are consistent with a shifting short-run Phillips curve. The Phillips curve has shifted because of changes in the expected inflation rate and changes in the natural rate of unemployment.
Inflation and Unemployment: The Phillips Curve

Figure 28.12 (a) shows the actual path traced out in inflation rate-unemployment rate space.

Inflation and Unemployment: The Phillips Curve

Figure 28.12(b) interprets the data as four separate short-run Phillips curves.
Interest Rates and Inflation

Interest rates and inflation rates are correlated, although they differ around the world.

Figure 28.13(a) shows a positive correlation between the inflation rate and the nominal interest rate over time in the United States.
Figure 28.13(b) shows a positive correlation between the inflation rate and the nominal interest rate across countries.

Interest Rates and Inflation

How Interest Rates are Determined

The real interest rate is determined by investment demand and saving supply in the global capital market.

The real interest rate adjusts to make the quantity of investment equal the quantity of saving.

National rates vary because of differences in risk.

The nominal interest rate is determined by the demand for money and the supply of money in each nation’s money market.
Interest Rates and Inflation

Why Inflation Influences the Nominal Interest Rate

Inflation influences the nominal interest rate to maintain an equilibrium real interest rate.