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The Short-Run Tradeoff between Inflation and Unemployment

Unemployment and Inflation

- The natural rate of unemployment depends on various features of the labor market.
- Examples include minimum-wage laws, the market power of unions, the role of efficiency wages, and the effectiveness of job search.
- The inflation rate depends primarily on growth in the quantity of money, controlled by the Fed.

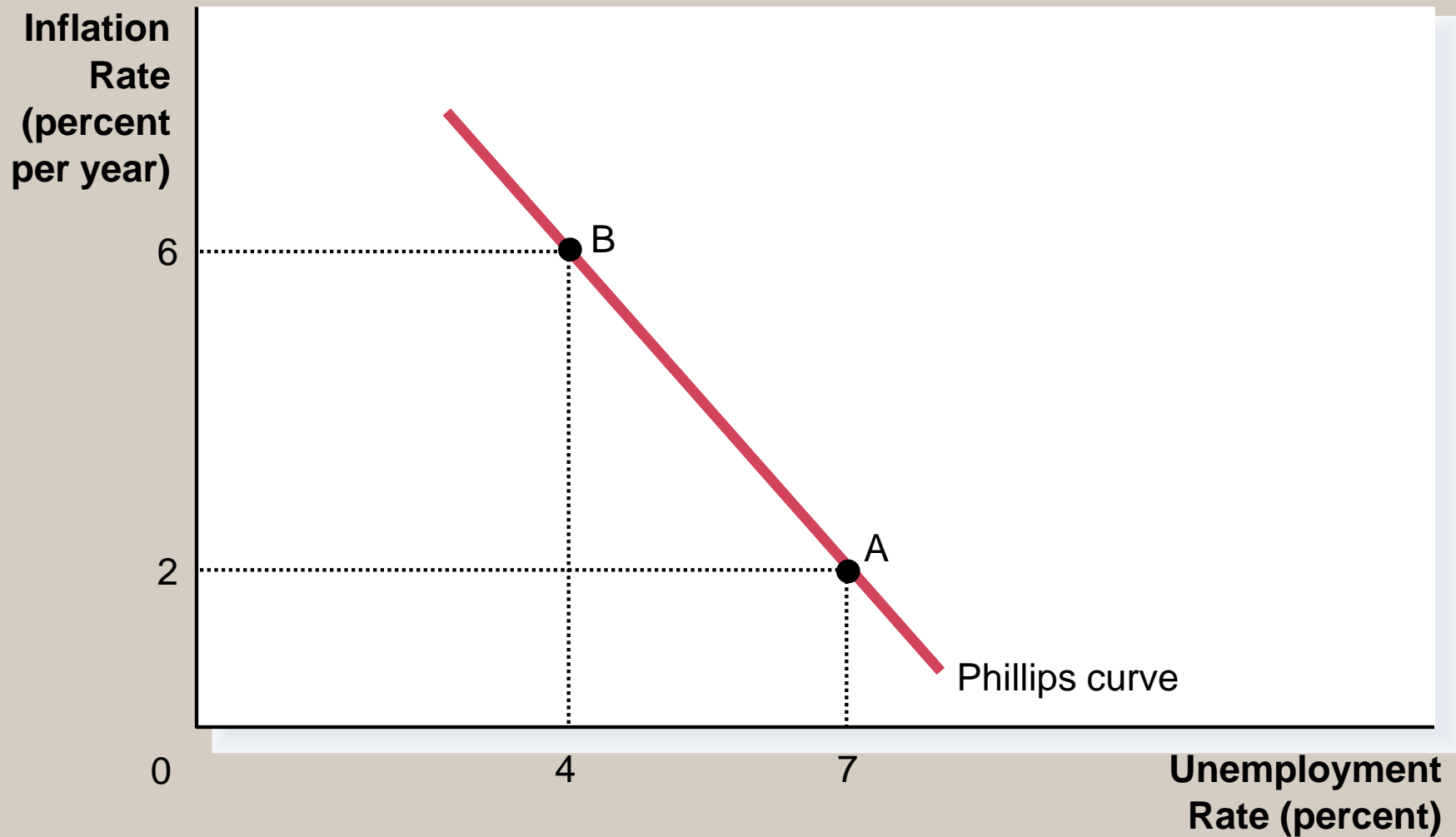
Unemployment and Inflation

- Society faces a short-run tradeoff between unemployment and inflation.
- If policymakers expand aggregate demand, they can lower unemployment, but only at the cost of higher inflation.
- If they contract aggregate demand, they can lower inflation, but at the cost of temporarily higher unemployment.

THE PHILLIPS CURVE

- The *Phillips curve* illustrates the short-run relationship between inflation and unemployment.

Figure 1 The Phillips Curve



Aggregate Demand, Aggregate Supply, and the Phillips Curve

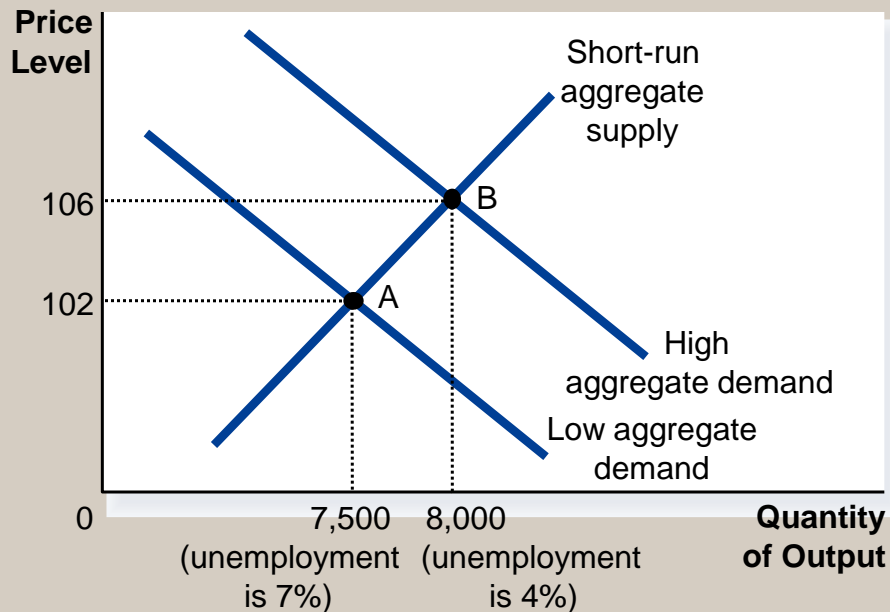
- The Phillips curve shows the short-run combinations of unemployment and inflation that arise as shifts in the aggregate demand curve move the economy along the short-run aggregate supply curve.

Aggregate Demand, Aggregate Supply, and the Phillips Curve

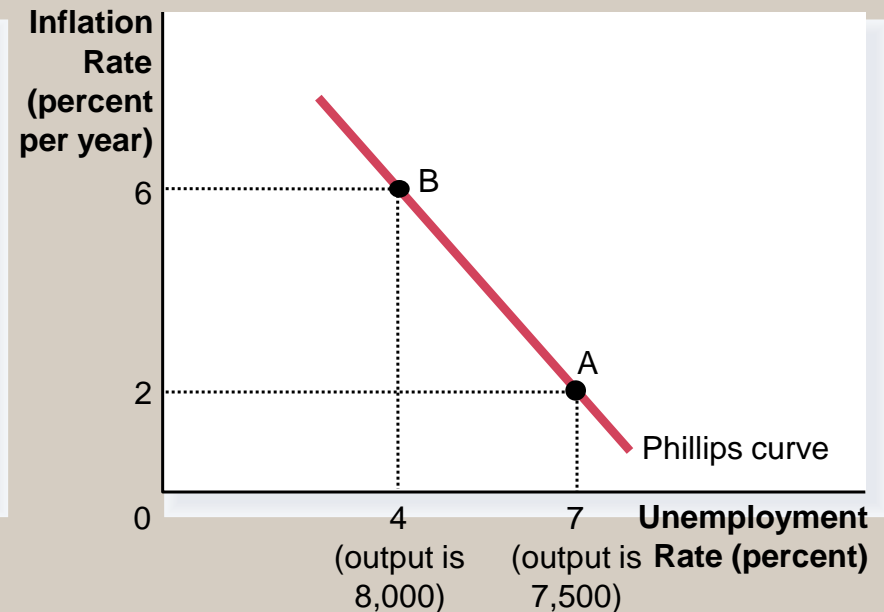
- The greater the aggregate demand for goods and services, the greater is the economy's output, and the higher is the overall price level.
- A higher level of output results in a lower level of unemployment.

Figure 2 How the Phillips Curve is Related to Aggregate Demand and Aggregate Supply

(a) The Model of Aggregate Demand and Aggregate Supply



(b) The Phillips Curve



SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF EXPECTATIONS

- The Phillips curve seems to offer policymakers a menu of possible inflation and unemployment outcomes.

The Long-Run Phillips Curve

- In the 1960s, Friedman and Phelps concluded that inflation and unemployment are unrelated in the long run.
 - As a result, the long-run Phillips curve is vertical at the *natural rate of unemployment*.
 - Monetary policy could be effective in the short run but not in the long run.

Figure 3 The Long-Run Phillips Curve

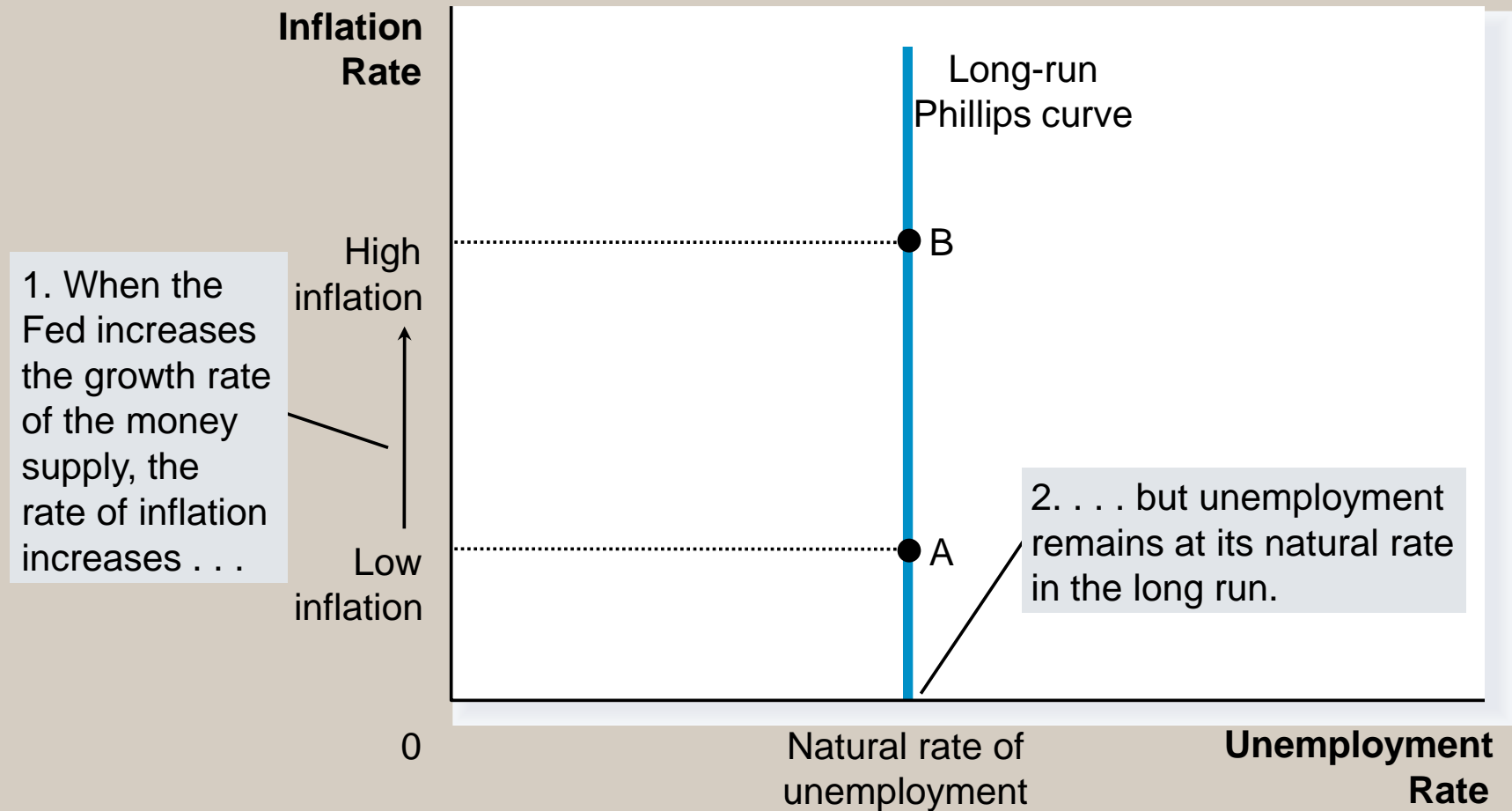
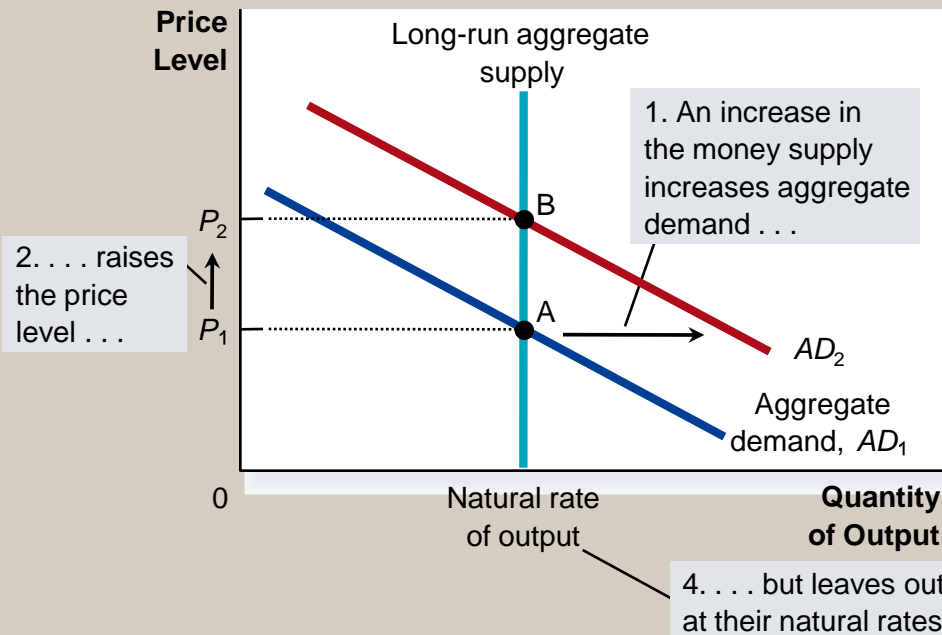
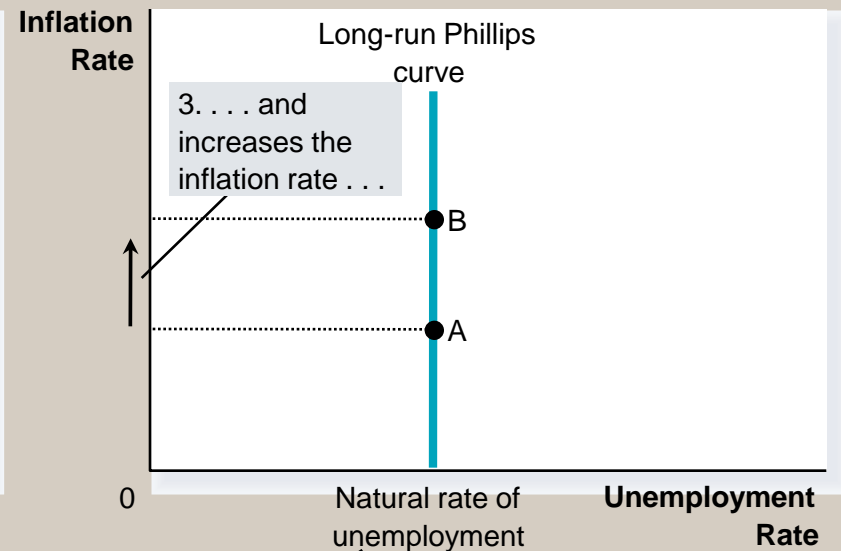


Figure 4 How the Phillips Curve is Related to Aggregate Demand and Aggregate Supply

(a) The Model of Aggregate Demand and Aggregate Supply



(b) The Phillips Curve



Expectations and the Short-Run Phillips Curve

- Expected inflation measures how much people expect the overall price level to change.

Expectations and the Short-Run Phillips Curve

- In the long run, expected inflation adjusts to changes in actual inflation.
- The Fed's ability to create unexpected inflation exists only in the short run.
 - Once people anticipate inflation, the only way to get unemployment below the natural rate is for actual inflation to be above the anticipated rate.

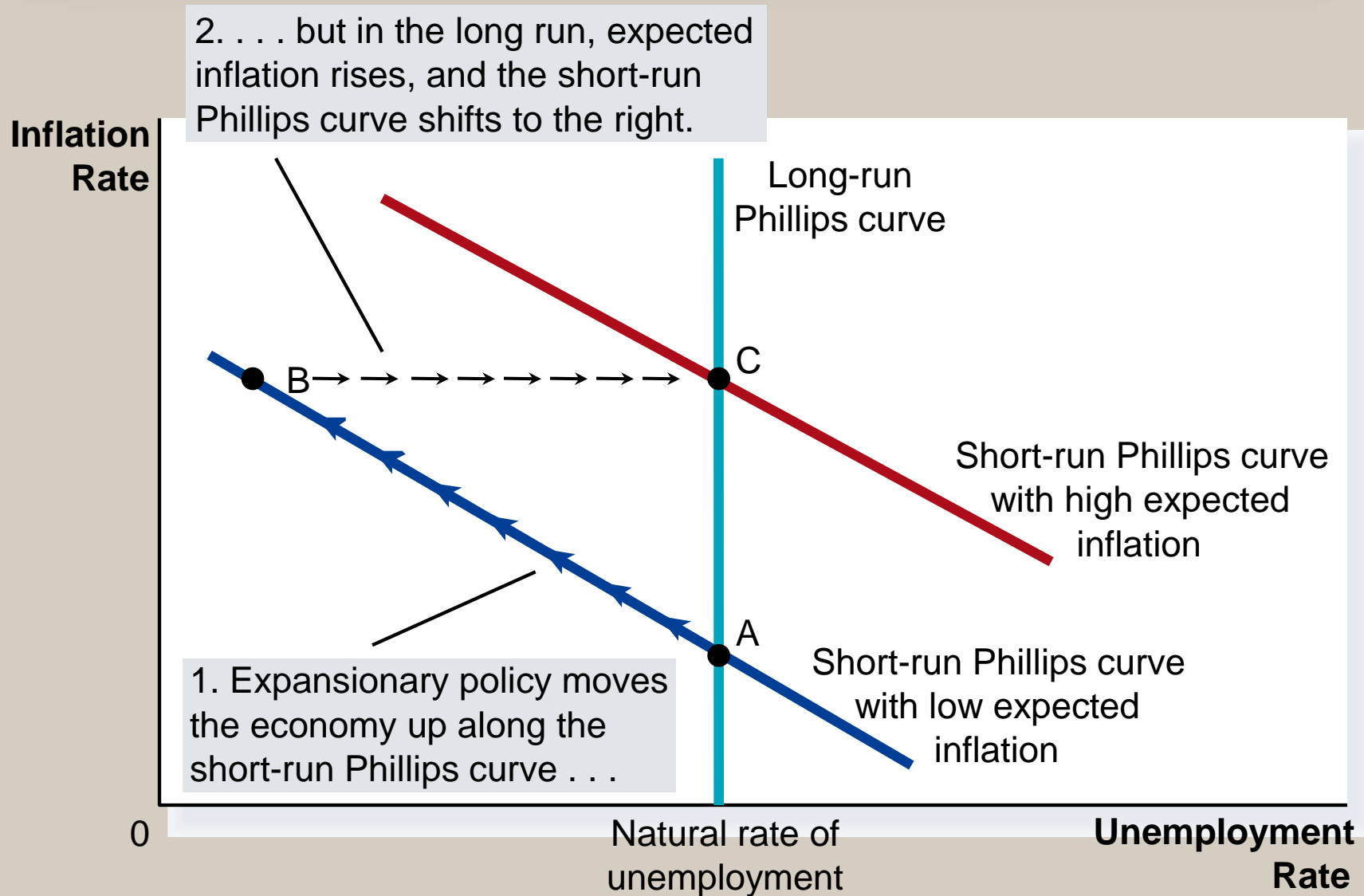
Expectations and the Short-Run Phillips Curve

Unemployment Rate =

Natural rate of unemployment - $a \left(\frac{\text{Actual Inflation} - \text{Expected Inflation}}{\text{Expected Inflation}} \right)$

- This equation relates the unemployment rate to the natural rate of unemployment, actual inflation, and expected inflation.

Figure 5 How Expected Inflation Shifts the Short-Run Phillips Curve



The Natural Experiment for the Natural-Rate Hypothesis

- The view that unemployment eventually returns to its natural rate, regardless of the rate of inflation, is called the *natural-rate hypothesis*.
- Historical observations support the natural-rate hypothesis.

The Natural Experiment for the Natural Rate Hypothesis

- The concept of a stable Phillips curve broke down in the in the early '70s.
- During the '70s and '80s, the economy experienced high inflation and high unemployment simultaneously.

Figure 6 The Phillips Curve in the 1960s

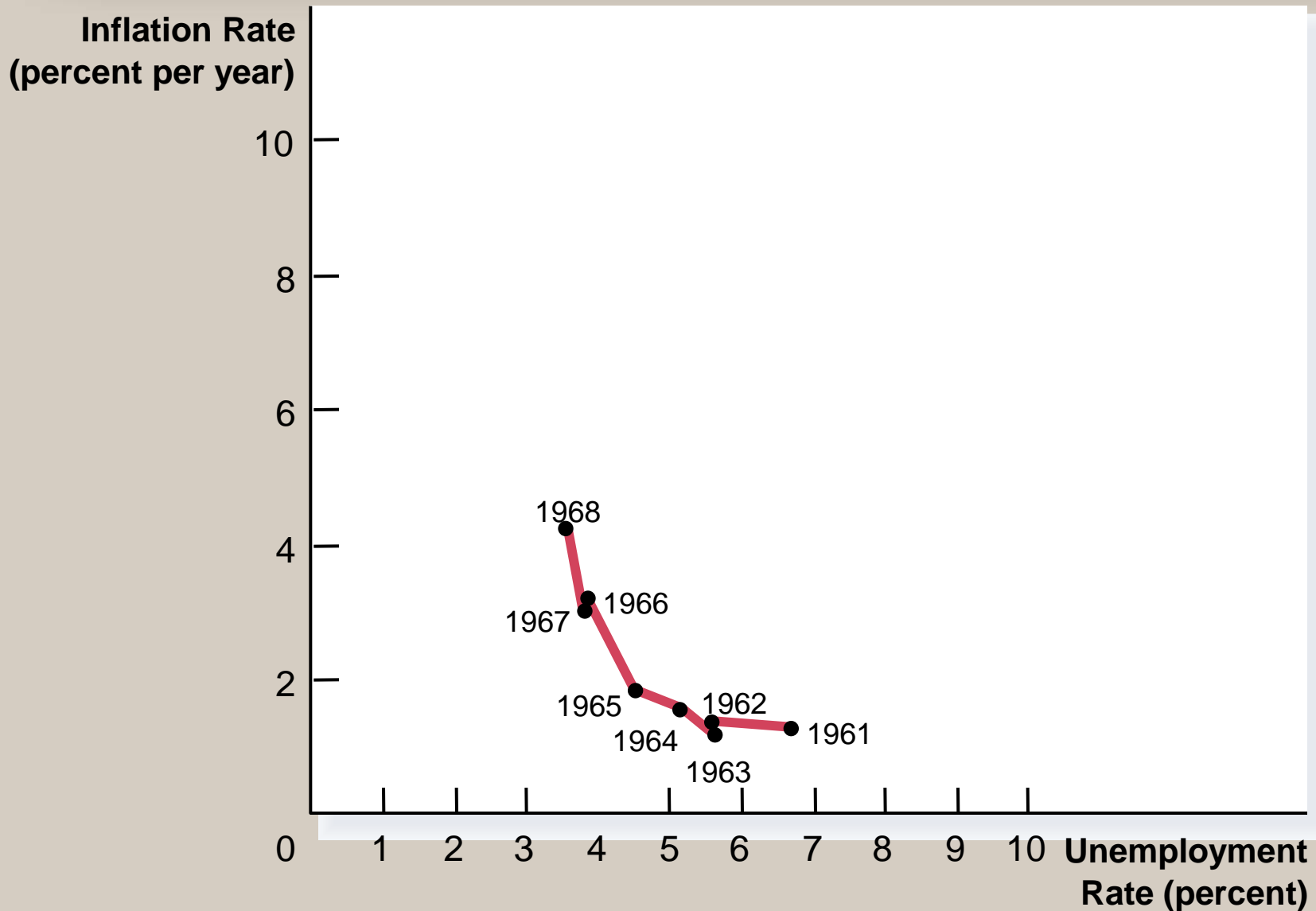
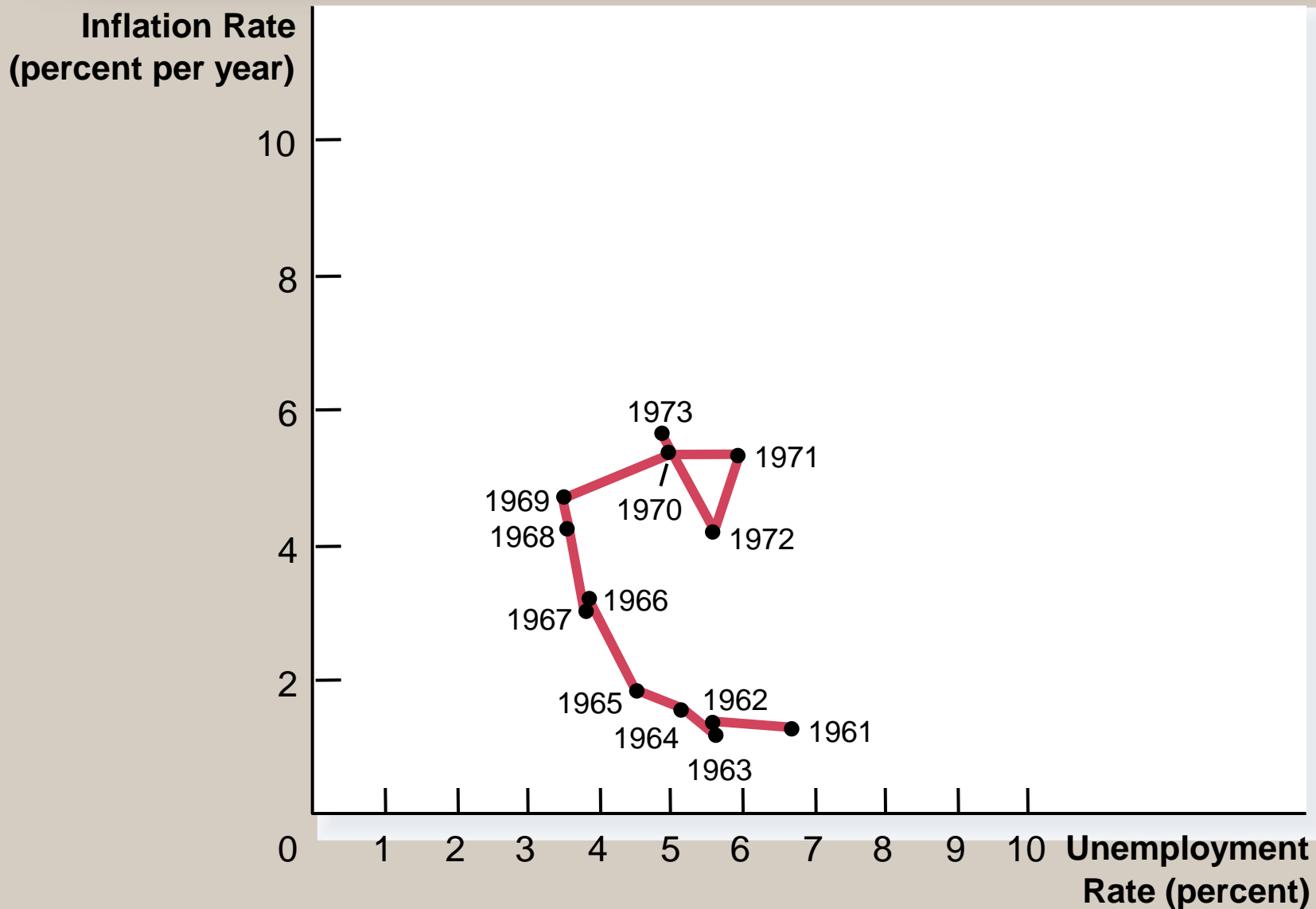


Figure 7 The Breakdown of the Phillips Curve



SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF SUPPLY SHOCKS

- Historical events have shown that the short-run Phillips curve can shift due to changes in expectations.

SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF SUPPLY SHOCKS

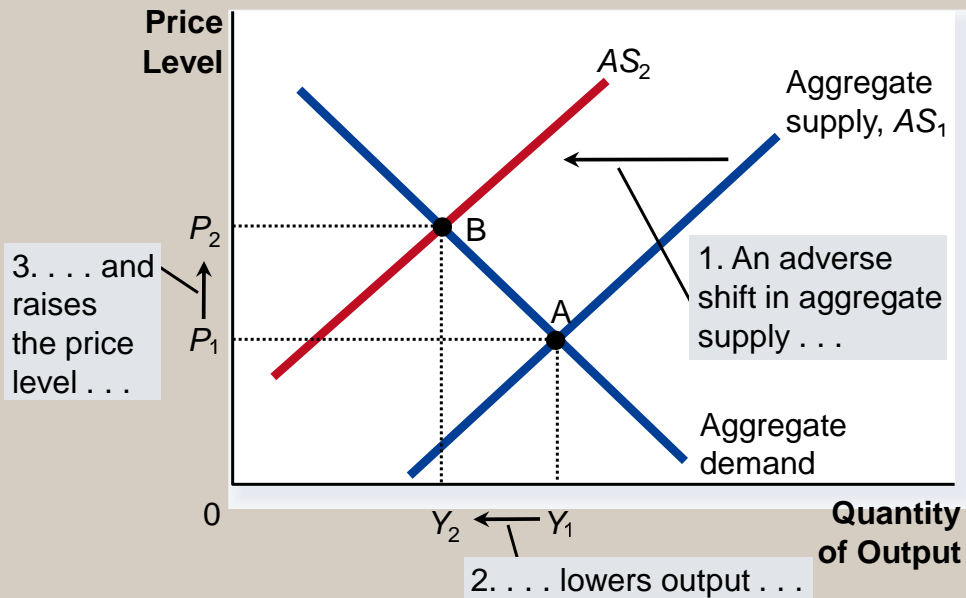
- The short-run Phillips curve also shifts because of shocks to aggregate supply.
 - Major adverse changes in aggregate supply can worsen the short-run tradeoff between unemployment and inflation.
 - An adverse *supply shock* gives policymakers a less favorable tradeoff between inflation and unemployment.

SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF SUPPLY SHOCKS

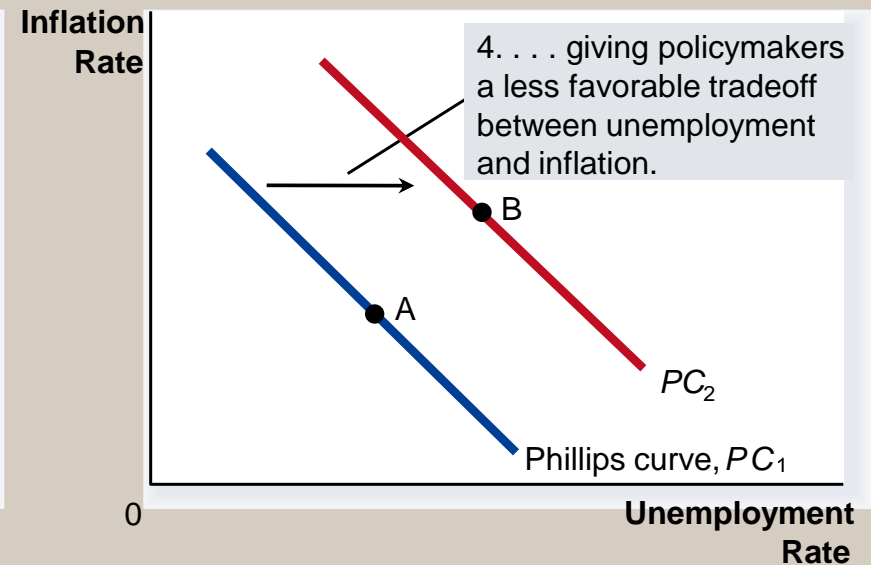
- A *supply shock* is an event that directly alters the firms' costs, and, as a result, the prices they charge.
- This shifts the economy's aggregate supply curve. . .
- . . . and as a result, the Phillips curve.

Figure 8 An Adverse Shock to Aggregate Supply

(a) The Model of Aggregate Demand and Aggregate Supply



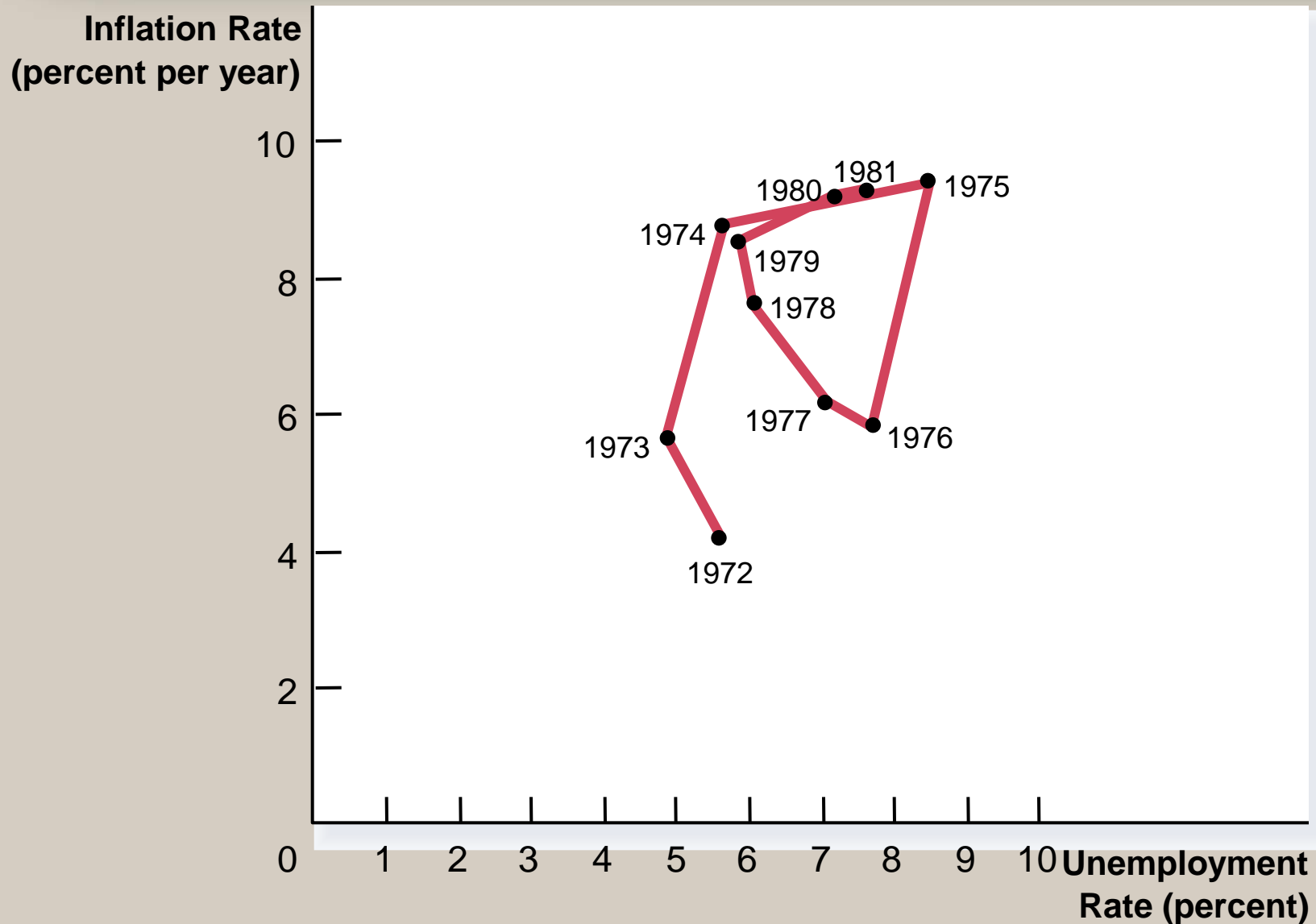
(b) The Phillips Curve



SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF SUPPLY SHOCKS

- In the 1970s, policymakers faced two choices when OPEC cut output and raised worldwide prices of petroleum.
 - Fight the unemployment battle by expanding aggregate demand and accelerate inflation.
 - Fight inflation by contracting aggregate demand and endure even higher unemployment.

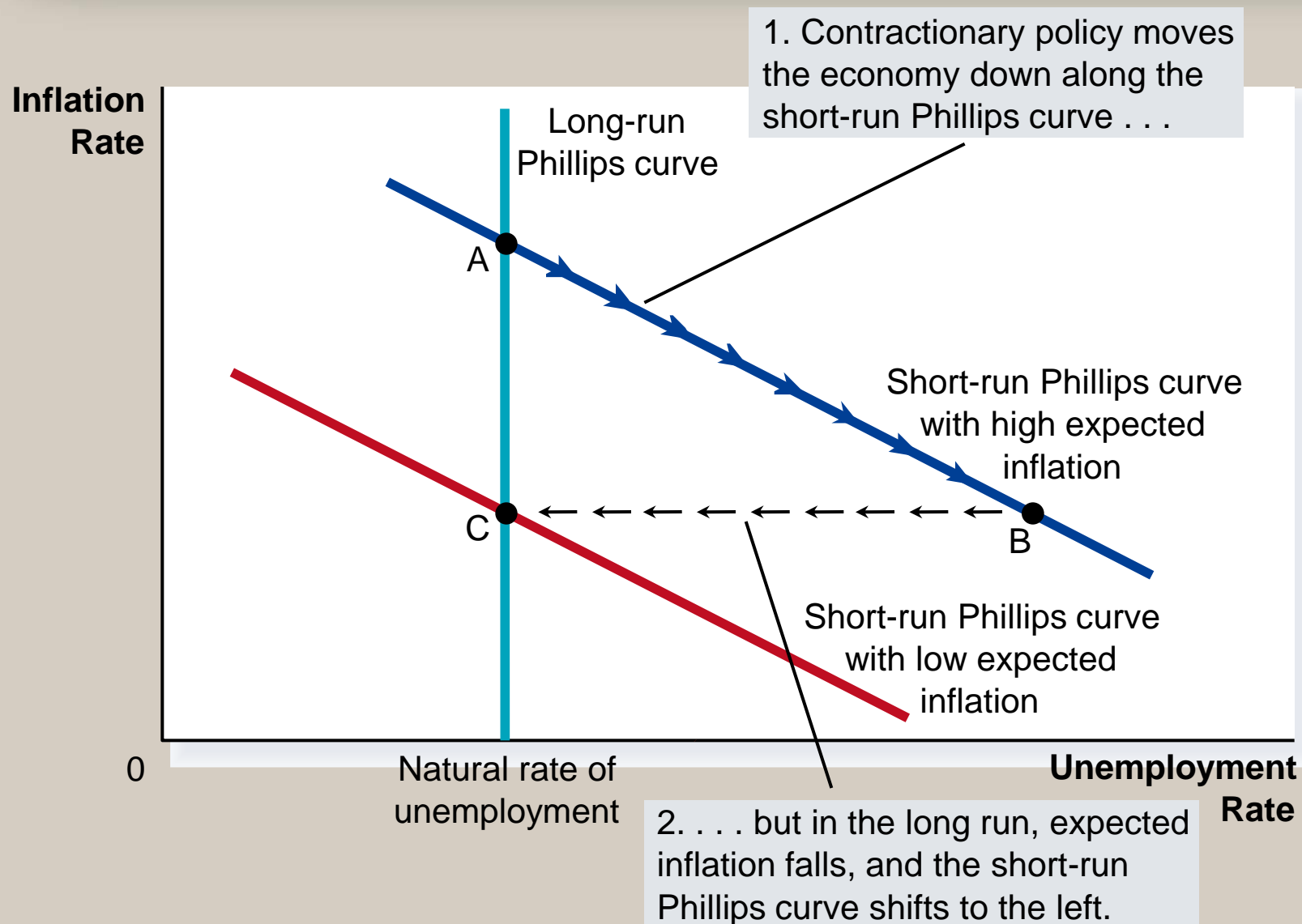
Figure 9 The Supply Shocks of the 1970s



THE COST OF REDUCING INFLATION

- To reduce inflation, the Fed has to pursue contractionary monetary policy.
- When the Fed slows the rate of money growth, it contracts aggregate demand.
- This reduces the quantity of goods and services that firms produce.
- This leads to a rise in unemployment.

Figure 10 Disinflationary Monetary Policy in the Short Run and the Long Run



THE COST OF REDUCING INFLATION

- To reduce inflation, an economy must endure a period of high unemployment and low output.
 - When the Fed combats inflation, the economy moves down the short-run Phillips curve.
 - The economy experiences lower inflation but at the cost of higher unemployment.

THE COST OF REDUCING INFLATION

- The *sacrifice ratio* is the number of percentage points of annual output that is lost in the process of reducing inflation by one percentage point.
 - An estimate of the sacrifice ratio is *five*.
 - To reduce inflation from about 10% in 1979-1981 to 4% would have required an estimated sacrifice of 30% of annual output!

Rational Expectations and the Possibility of Costless Disinflation

- The theory of *rational expectations* suggests that people optimally use all the information they have, including information about government policies, when forecasting the future.

Rational Expectations and the Possibility of Costless Disinflation

- Expected inflation explains why there is a tradeoff between inflation and unemployment in the short run but not in the long run.
- How quickly the short-run tradeoff disappears depends on how quickly expectations adjust.

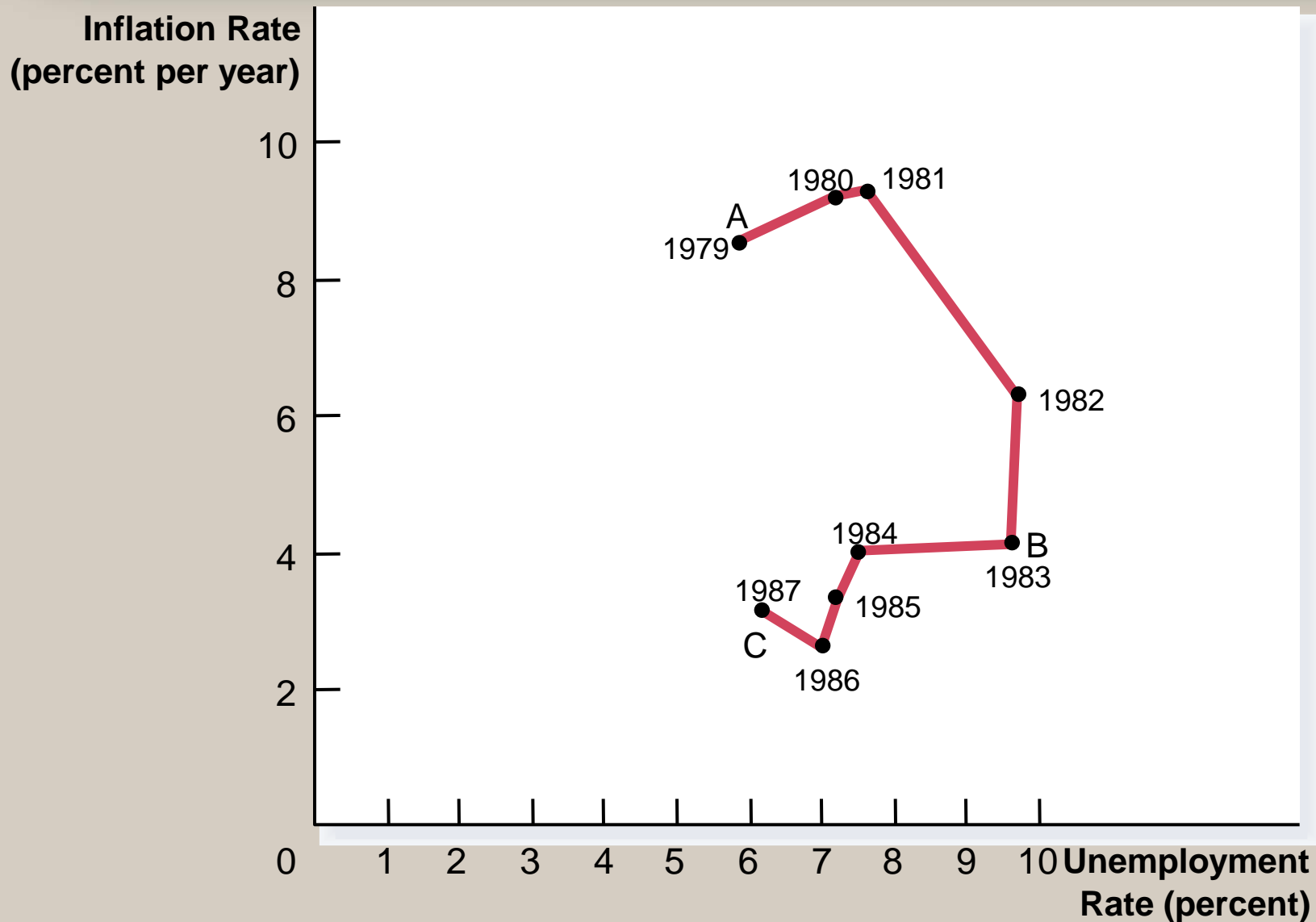
Rational Expectations and the Possibility of Costless Disinflation

- The theory of rational expectations suggests that the sacrifice-ratio could be much smaller than estimated.

The Volcker Disinflation

- When Paul Volcker was Fed chairman in the 1970s, inflation was widely viewed as one of the nation's foremost problems.
- Volcker succeeded in reducing inflation (from 10 percent to 4 percent), but at the cost of high employment (about 10 percent in 1983).

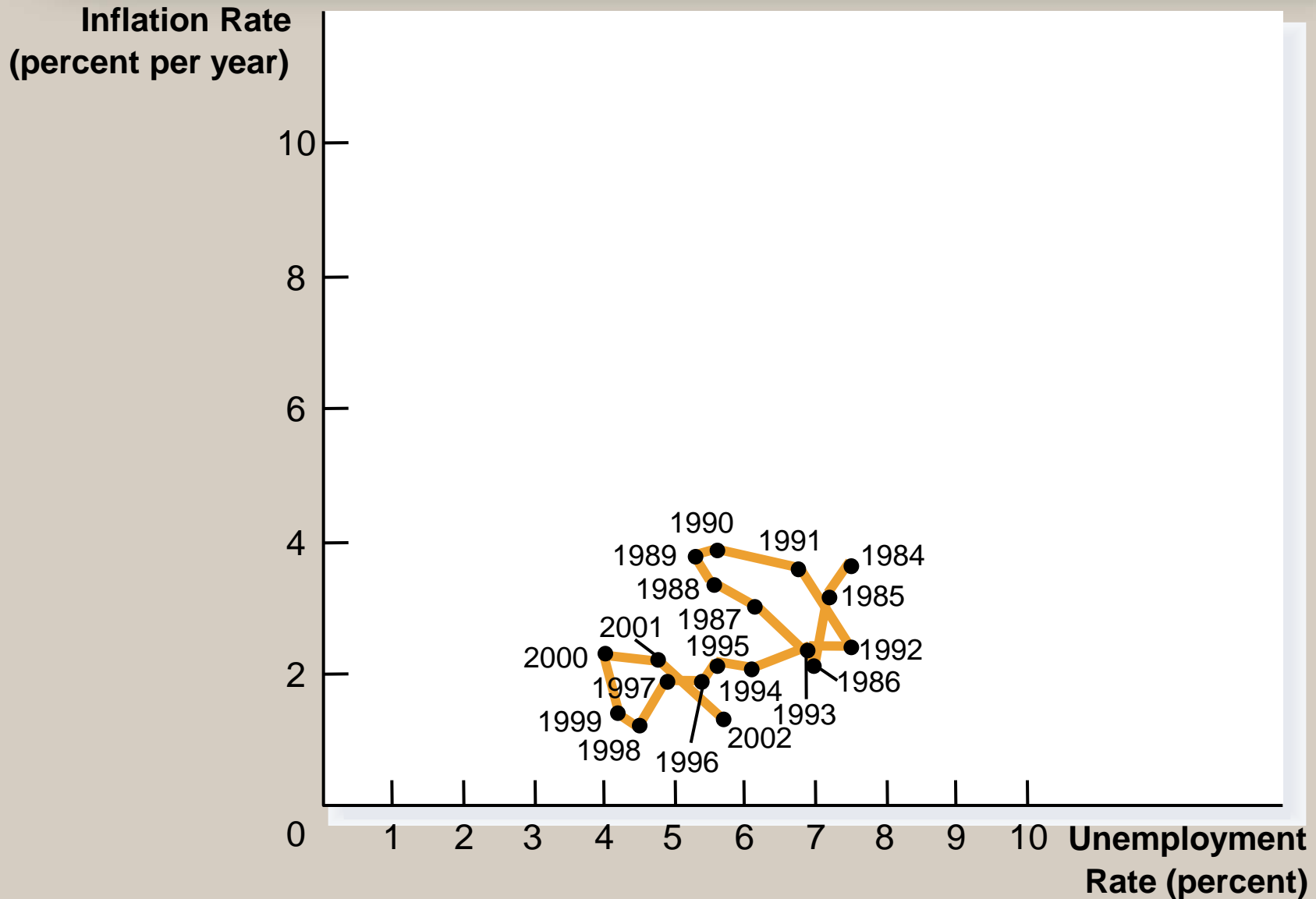
Figure 11 The Volcker Disinflation



The Greenspan Era

- Alan Greenspan's term as Fed chairman began with a favorable supply shock.
 - In 1986, OPEC members abandoned their agreement to restrict supply.
 - This led to falling inflation and falling unemployment.

Figure 12 The Greenspan Era



The Greenspan Era

- Fluctuations in inflation and unemployment in recent years have been relatively small due to the Fed's actions.

Summary

- The Phillips curve describes a negative relationship between inflation and unemployment.
- By expanding aggregate demand, policymakers can choose a point on the Phillips curve with higher inflation and lower unemployment.
- By contracting aggregate demand, policymakers can choose a point on the Phillips curve with lower inflation and higher unemployment.

Summary

- The tradeoff between inflation and unemployment described by the Phillips curve holds only in the short run.
- The long-run Phillips curve is vertical at the natural rate of unemployment.

Summary

- The short-run Phillips curve also shifts because of shocks to aggregate supply.
- An adverse supply shock gives policymakers a less favorable tradeoff between inflation and unemployment.

Summary

- When the Fed contracts growth in the money supply to reduce inflation, it moves the economy along the short-run Phillips curve.
- This results in temporarily high unemployment.
- The cost of disinflation depends on how quickly expectations of inflation fall.