Lecture 11
5.5.2015

The Short-Run Tradeoff between Inflation and Unemployment

Previous lecture

- How monetary policy influences aggregate demand
  - Shifts in AD curve
  - An increase in the money supply
    - Shifts money supply curve to the right
    - Interest rate must fall to induce people to hold additional money that CB created
    - The costs of borrowing and the return to saving are reduced
    - The demand for goods and services at given price level increase
    - The aggregate-demand curve shifts to the right.

Previous lecture

- How monetary policy influences aggregate demand
  - An increase in government purchases or a cut in taxes shifts the aggregate-demand curve to the right.
  - The shift in aggregate demand can be larger or smaller than the fiscal change.
  - 2 effects:
    - The multiplier effect tends to amplify the effects of fiscal policy on aggregate demand
    - The crowding-out effect tends to dampen the effects of fiscal policy on aggregate demand.

Outline

- Inflation and unemployment
  - How are these two measures of economic performance related to each other?
  - Society faces a short run trade-off between inflation and unemployment
  - The Philips curve
    - The short-run and the long-run
    - The role of expectations
    - The role of supply shocks

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.

- In the long run – inflation and unemployment are largely unrelated

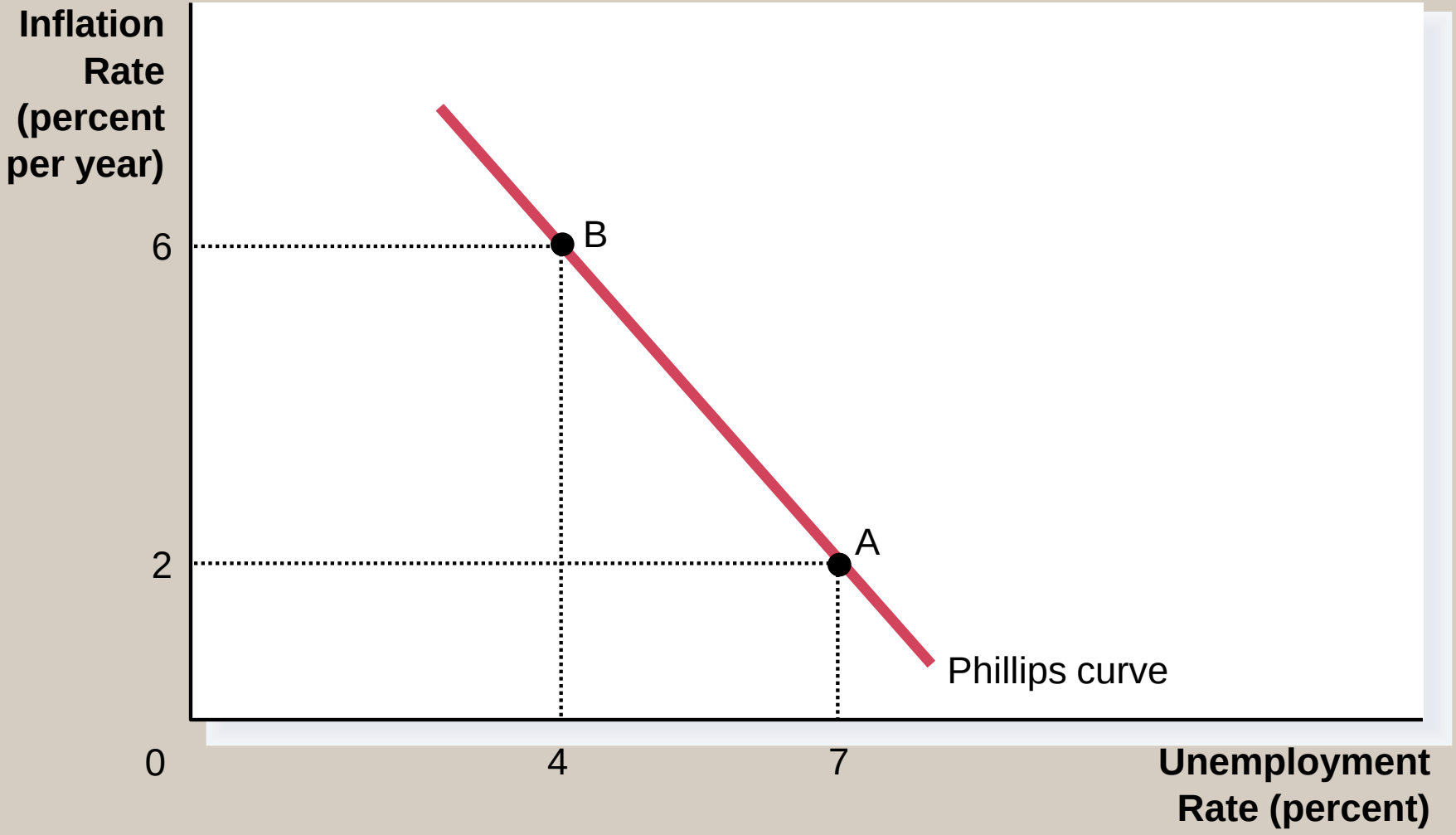
Unemployment and Inflation

- 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.

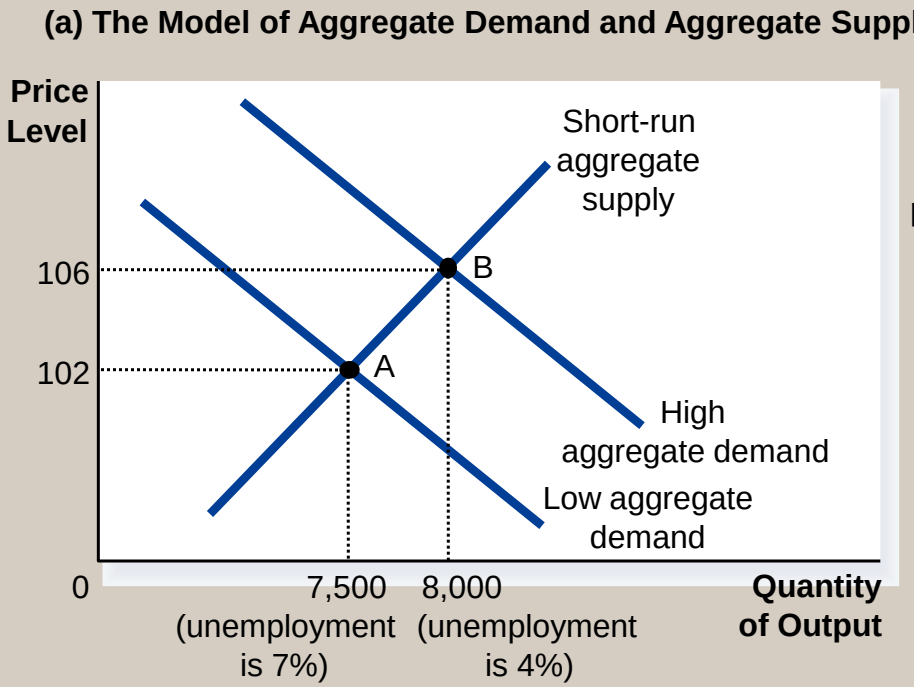
Figure 1 The Phillips Curve

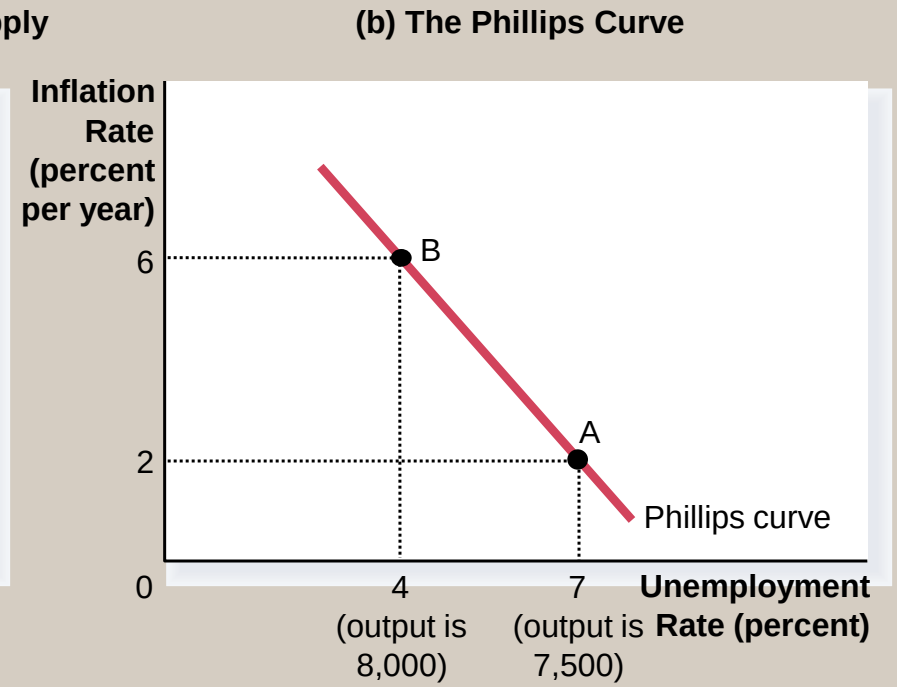


Aggregate Demand, Aggregate Supply, and the Phillips Curve

- 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.

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





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.

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

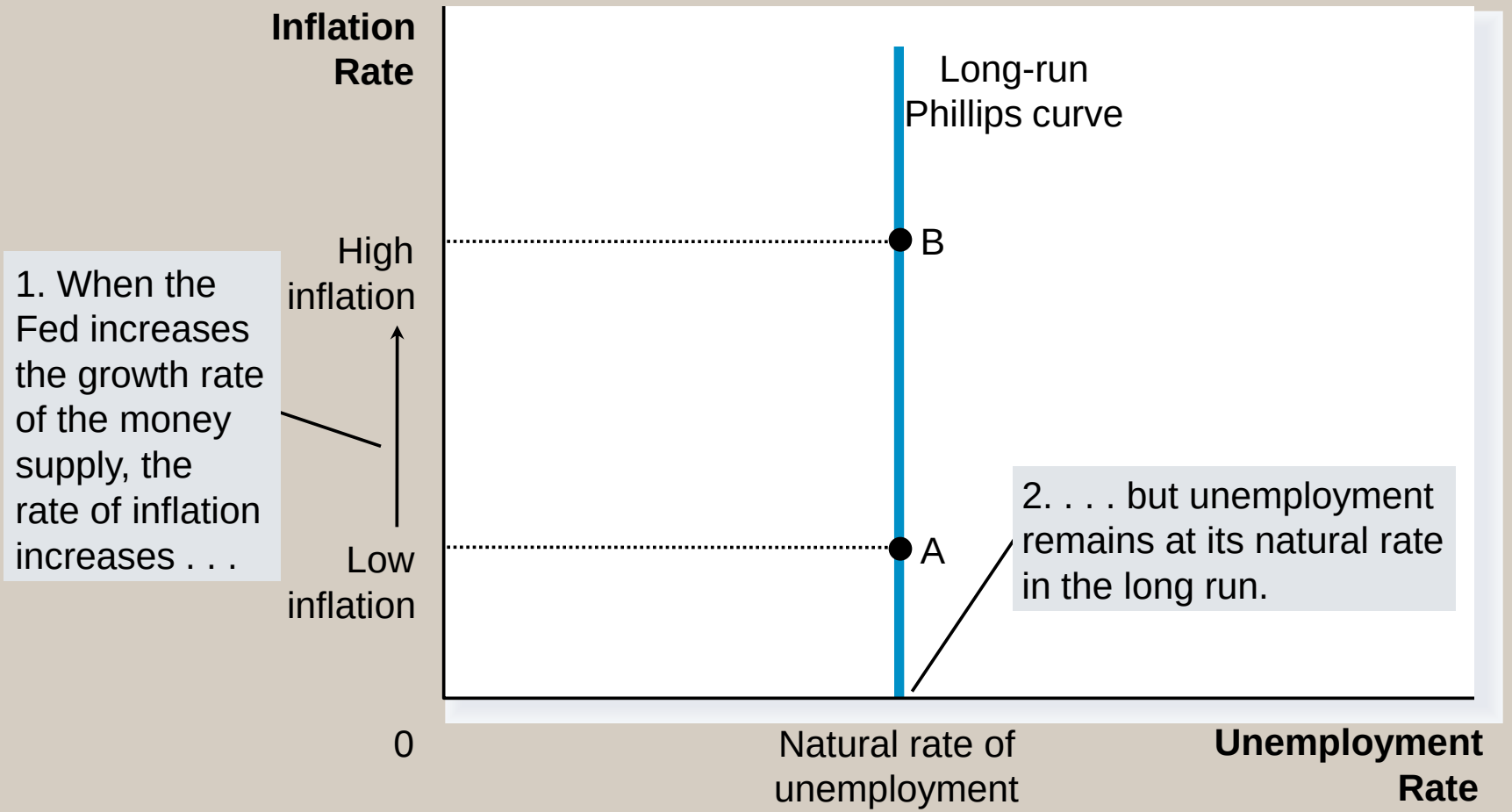
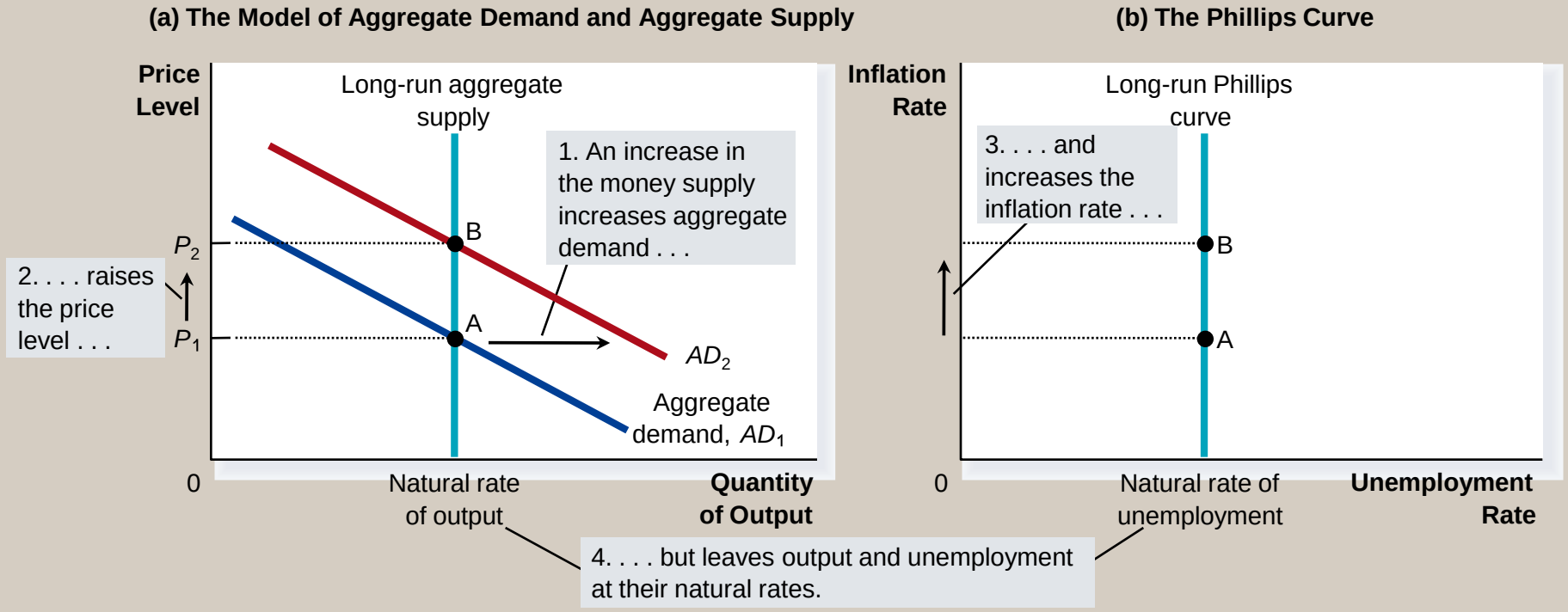


Figure 4 How the Phillips Curve is Related to Aggregate Demand and Aggregate Supply



Expectations and the Short-Run Phillips Curve

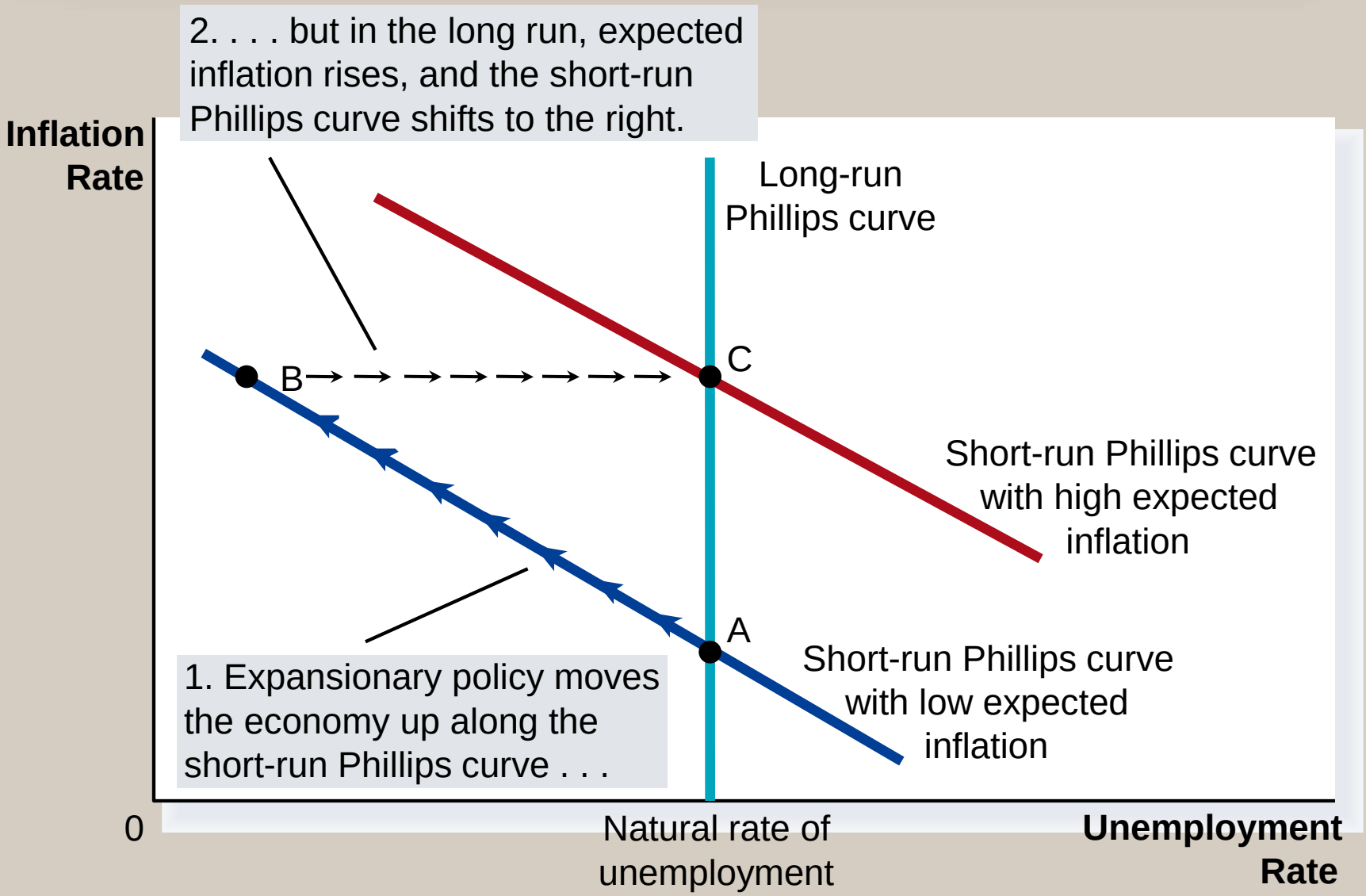
- Expected inflation measures how much people expect the overall price level to change.
- In the long run, expected inflation adjusts to changes in actual inflation.
- The Fed's ability to create unexpected inflation exists only in the short run.
  - Once people anticipate inflation, the only way to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

Expectations and the Short-Run Phillips Curve

$$\text{Unemployment Rate} = \text{Natural rate of unemployment} - a\left(\text{Actual inflation} - \text{Expected inflation}\right)$$

- 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*.

- A few years after Friedman and Phelps proposed this hypothesis, monetary and fiscal policy makers in the U.S. inadvertently created a natural experiment to test it.

Figure 6 The Phillips Curve in the 1960s

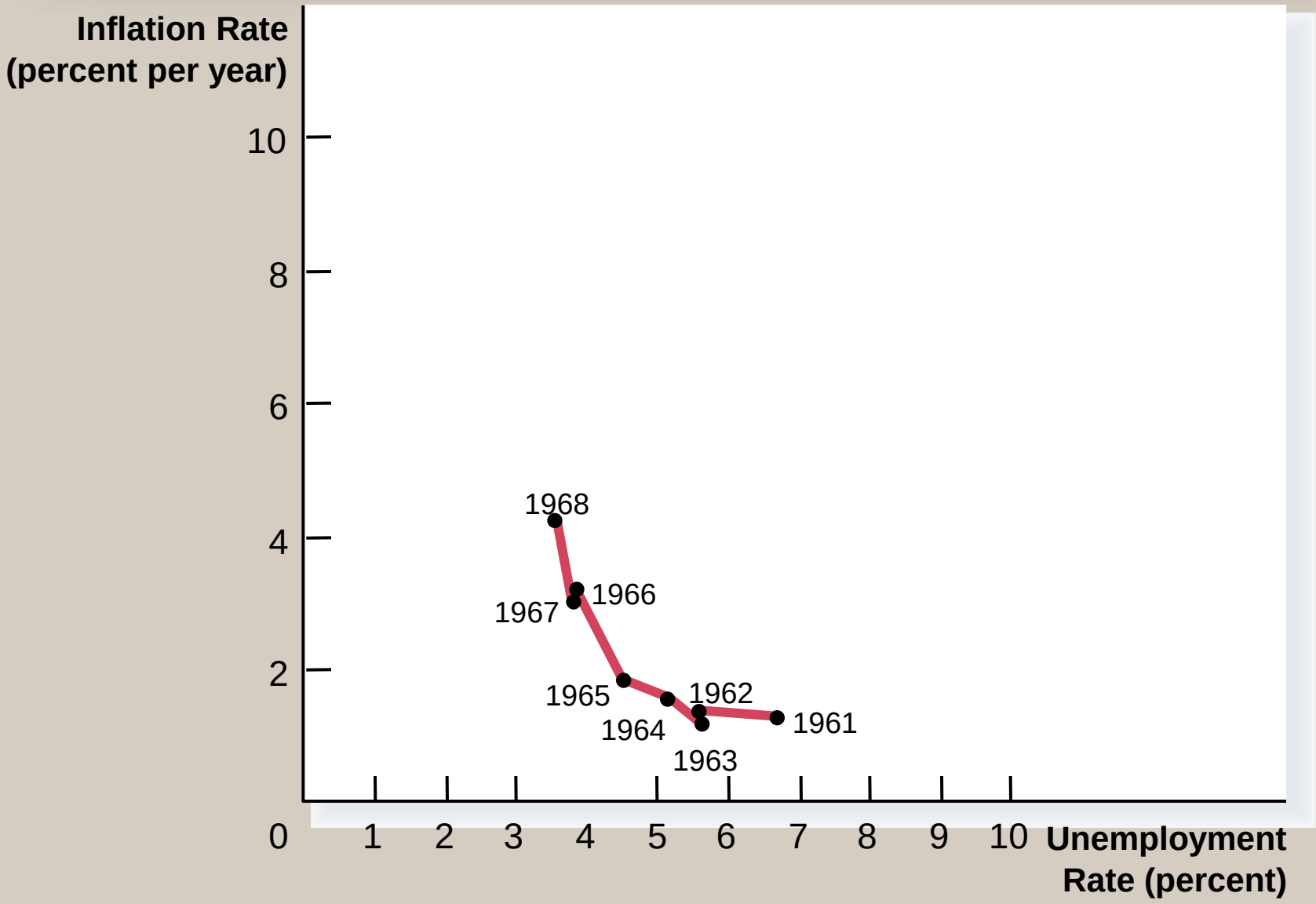
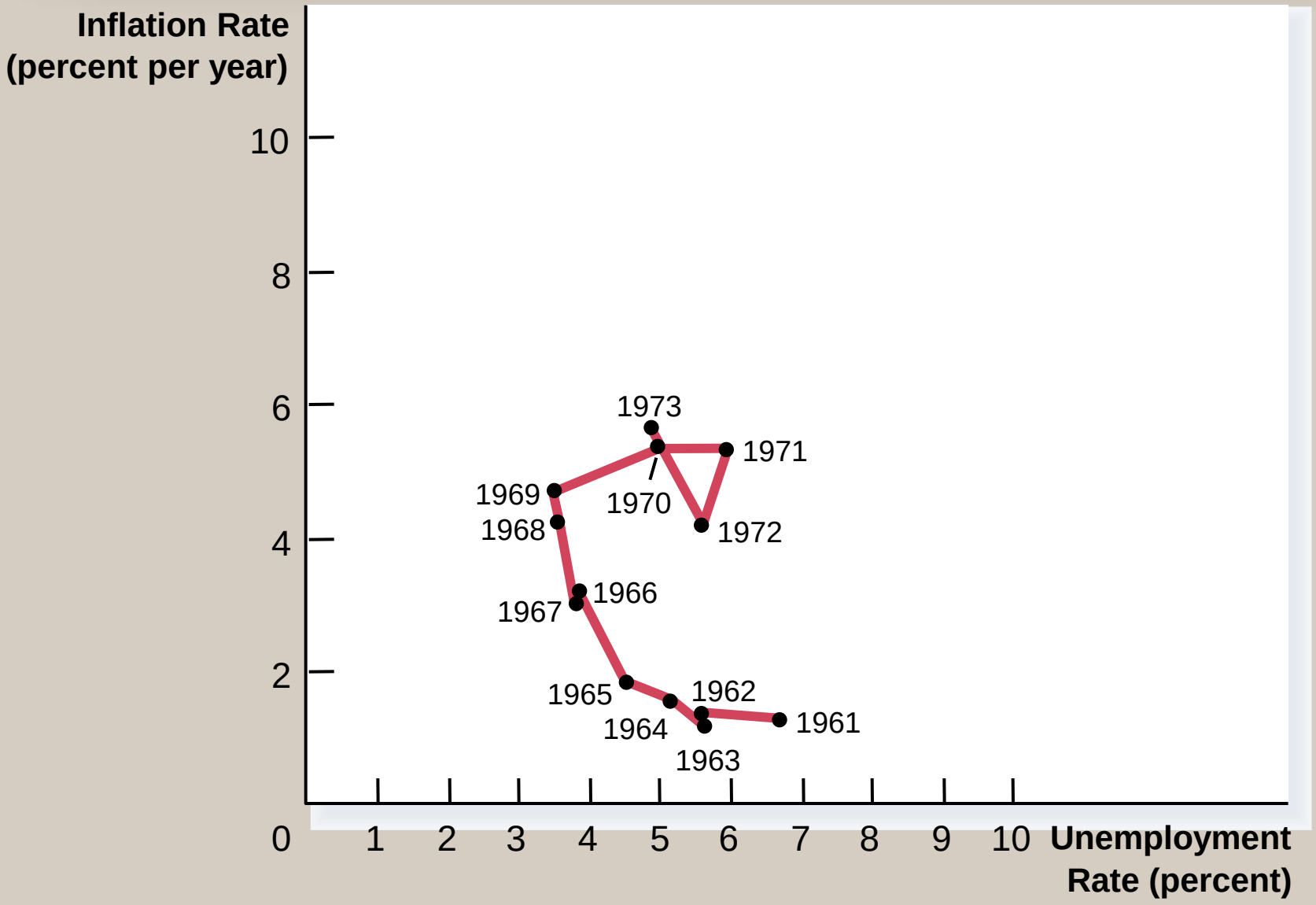


Figure 7 The Breakdown of the Phillips Curve



SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF SUPPLY SHOCKS

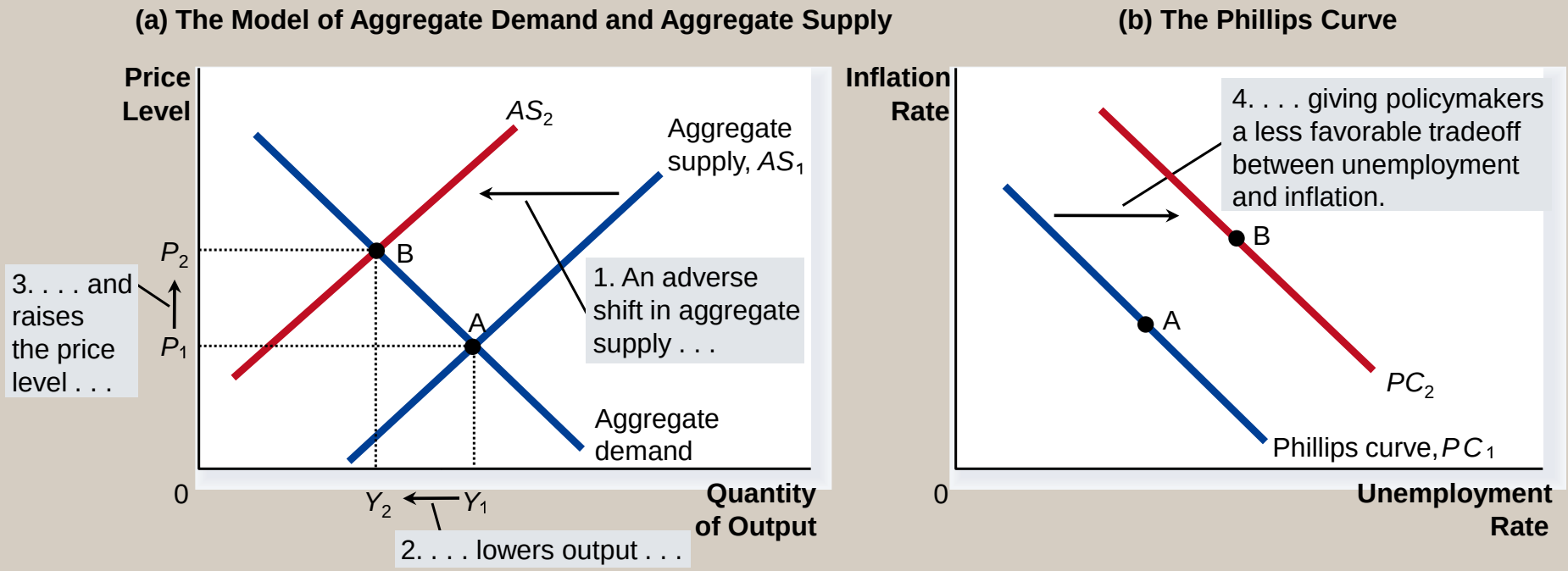
- Historical events have shown that the short-run Phillips curve can shift due to changes in expectations.

SHIFTS IN THE PHILLIPS CURVE: THE ROLE OF SUPPLY SHOCKS

- The short-run Phillips curve also shifts because of shocks to aggregate supply.

- 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.

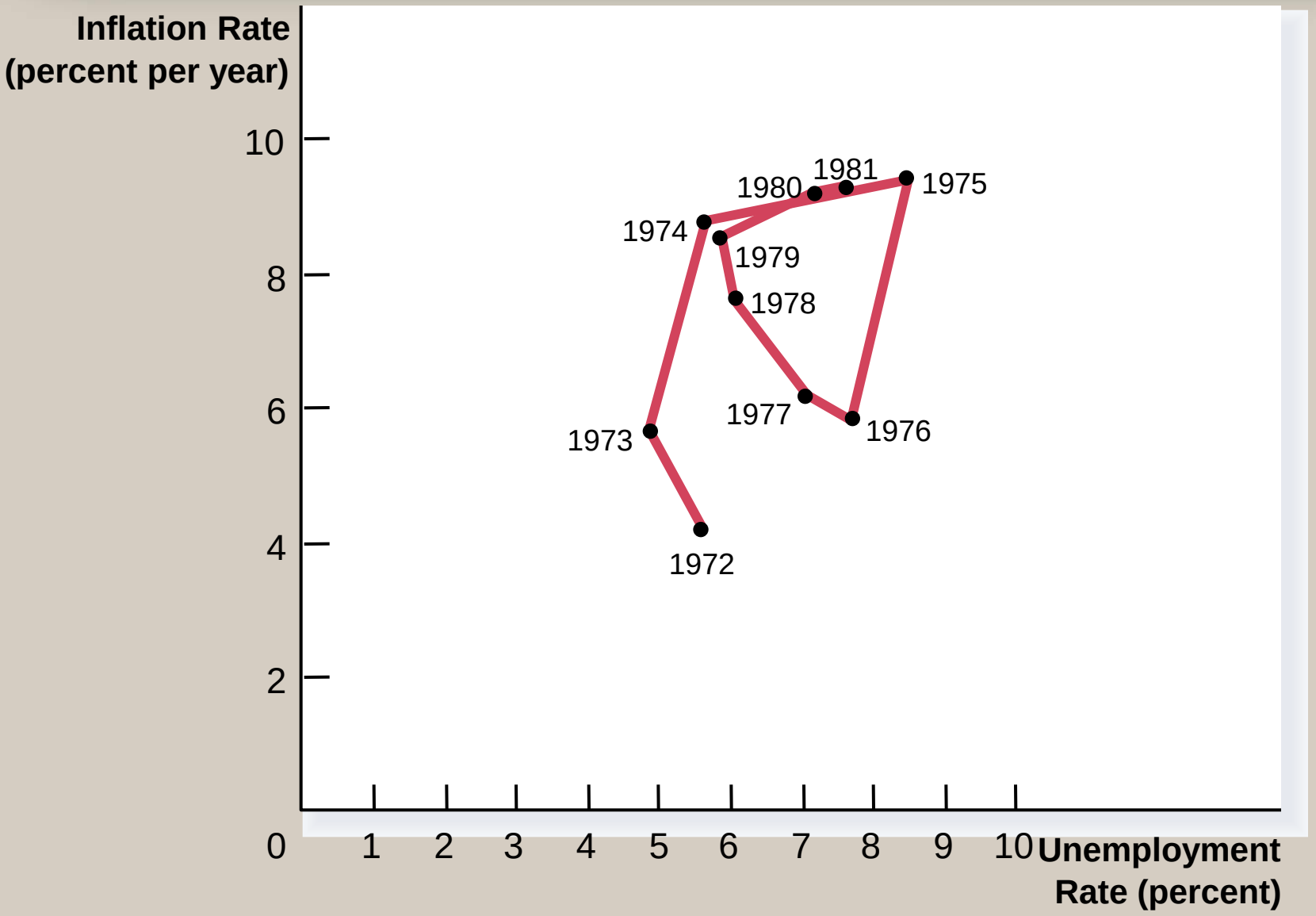
Figure 8 An Adverse Shock to Aggregate Supply



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.

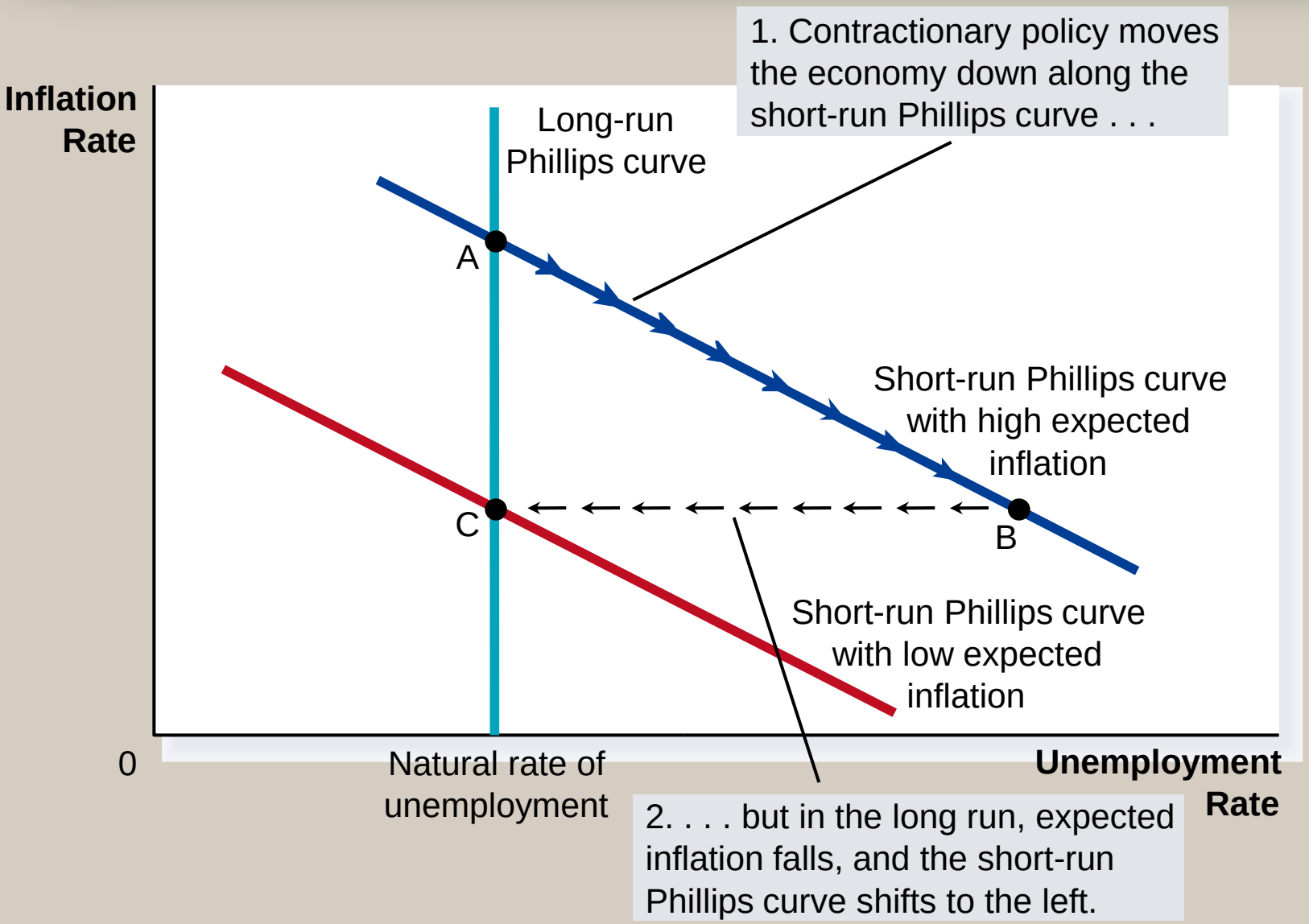
Figure 9 The Supply Shocks of the 1970s



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 (point B).

- The size of this cost depends on
  - the slope of Phillips curve
  - and how quickly expectations of inflation adjust to the new monetary policy.

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

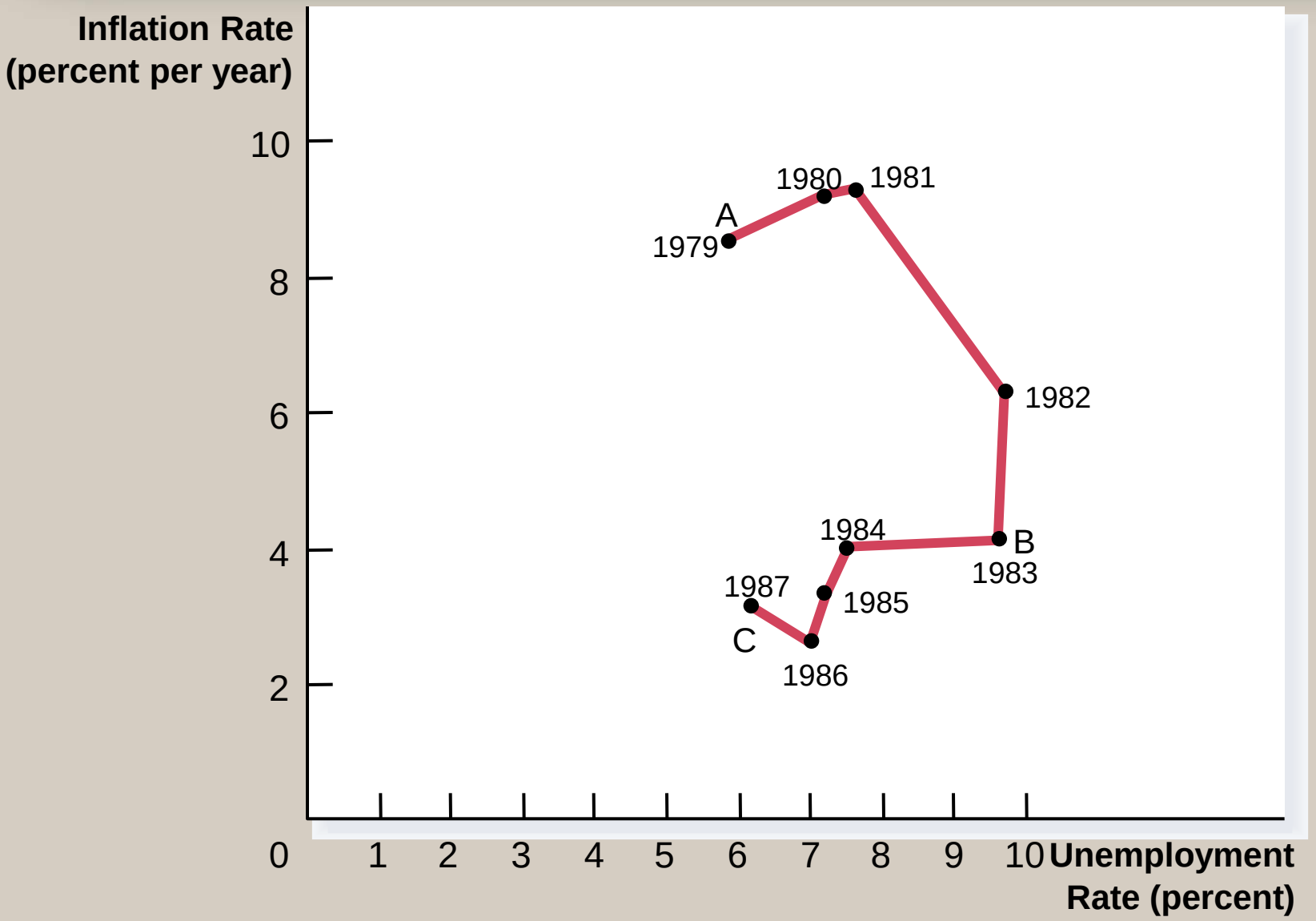
- The theory of *rational expectations* suggests that people optimally use all the information they have, including information about government policies, when forecasting the future.

- 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



Macroeconomic policy – summing up
View of modern mainstream

Most economist agree on:

- ***in "short run" Changes in AD will change U and Y*** (higher public budget deficits and higher growth of MS will increase Y and U)
- In the ***long run the economy stays at the potential*** given by level of technology and availability of factors of production
- In the long run higher growth of MS will only increase price level and higher public budget deficits will crowd out investment and lower growth

Remaining disagreements:

- ***How long is "short run"?***
- ***Role of policy:***
  - If "short run" is very short i.e. economy comes back to potential quickly, then macroeconomic policies should be limited – there should be binding rules which limit public debt and set stable increase in money supply
  - If "short run" is relatively long, then macroeconomic policies should be more flexible

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.
  - 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.
  - 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.