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Principles of
Macroeconomics
Sixth Edition

22



The Short-Run Tradeoff Between Inflation and Unemployment

*Premium
PowerPoint
Slides by
Ron Cronovich*

*In this chapter,
look for the answers to these questions:*

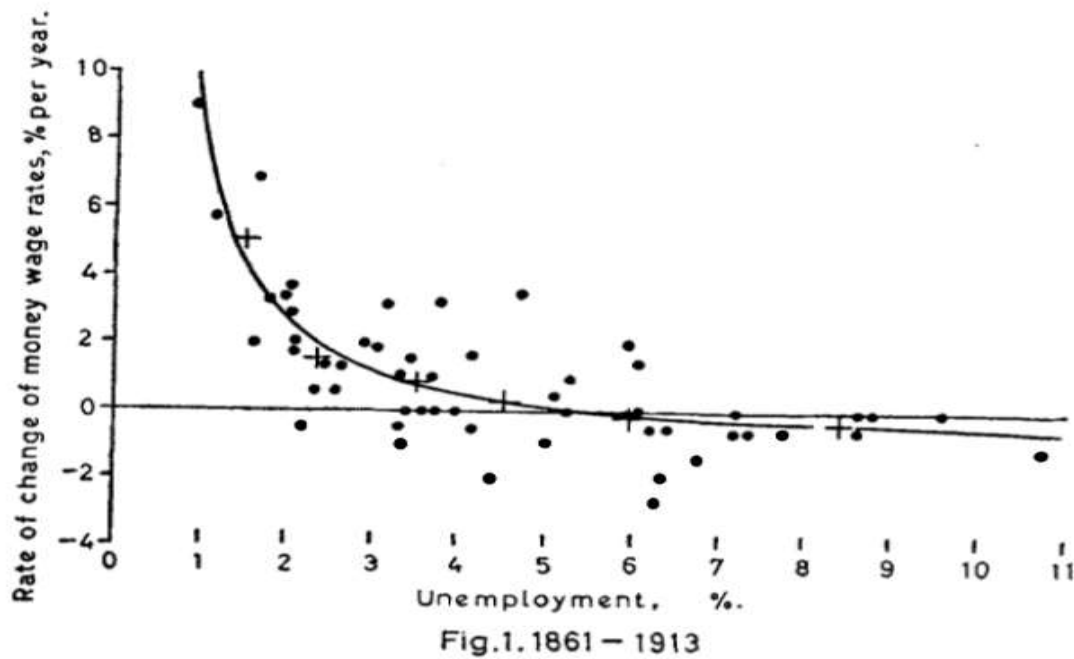
- **How are inflation and unemployment related in the short run? In the long run?**
- **What factors alter this relationship?**
- **What is the short-run cost of reducing inflation?**
- **Why were U.S. inflation and unemployment both so low in the 1990s?**

Introduction

- In the long run, inflation & unemployment are unrelated:
 - The inflation rate depends mainly on growth in the money supply.
 - Unemployment (the “natural rate”) depends on the minimum wage, the market power of unions, efficiency wages, and the process of job search.

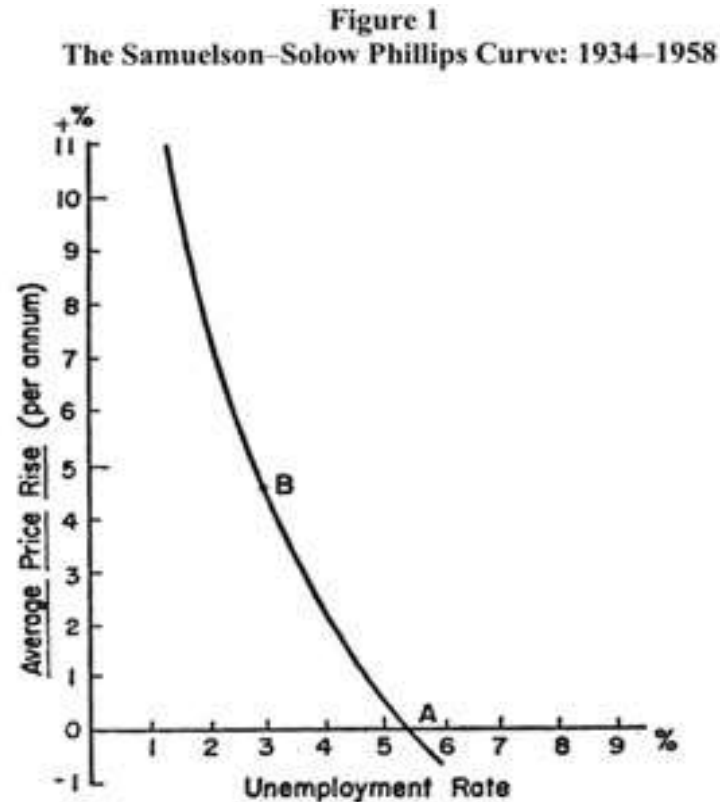
The Phillips Curve

- **Phillips curve:** shows the short-run trade-off between inflation and unemployment
- 1958: A.W. Phillips showed that nominal wage growth was negatively correlated with unemployment in the U.K.



The Phillips Curve

- 1960: Paul Samuelson & Robert Solow found a negative correlation between U.S. inflation & unemployment, named it “the Phillips Curve.”

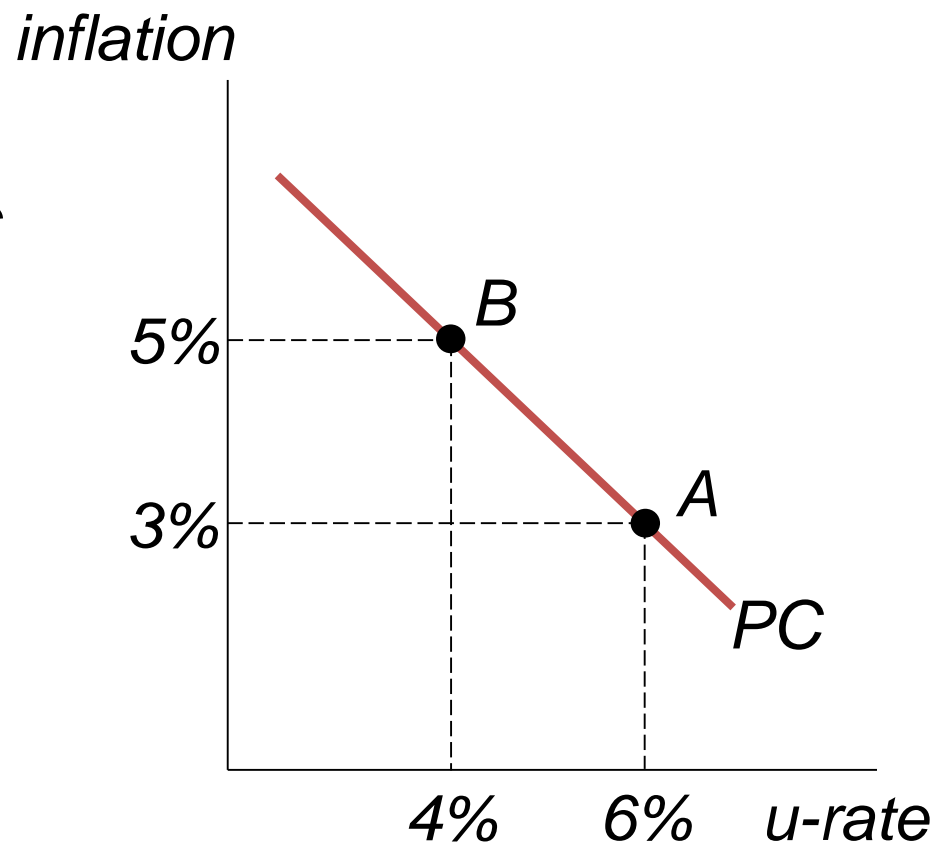
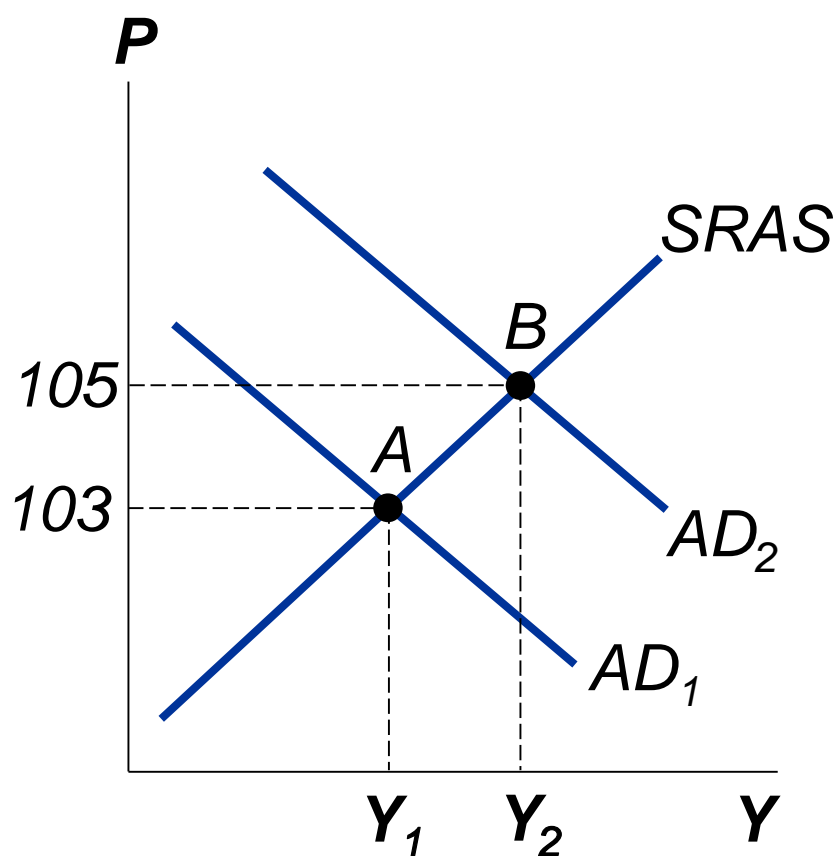


Deriving the Phillips Curve

- Suppose $P = 100$ this year.
- The following graphs show two possible outcomes for next year:
 - A. Agg demand low, small increase in P (i.e., low inflation), low output, high unemployment.
 - B. Agg demand high, big increase in P (i.e., high inflation), high output, low unemployment.

Deriving the Phillips Curve

A. *Low agg demand, low inflation, high u-rate*



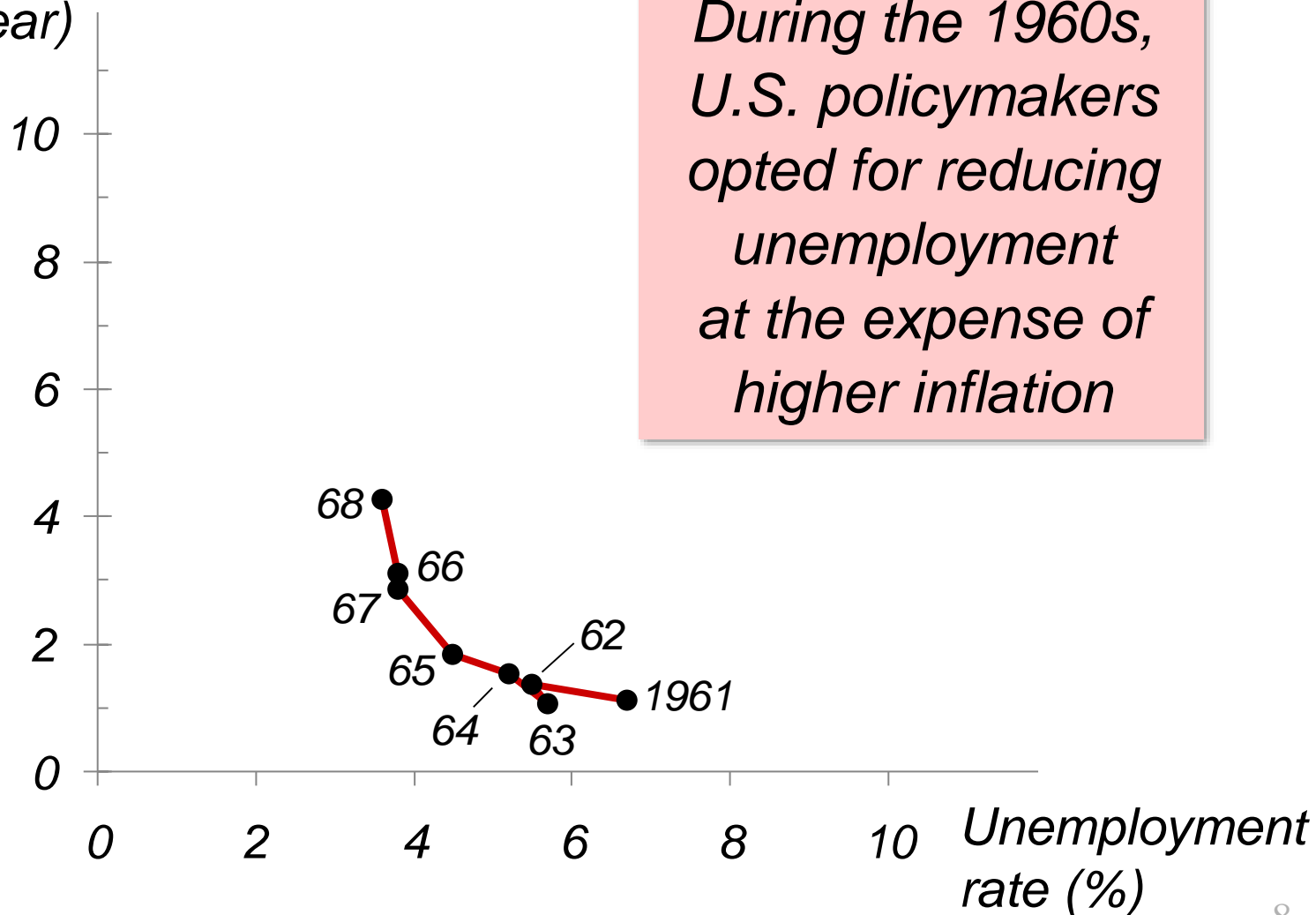
B. *High agg demand, high inflation, low u-rate*

The Phillips Curve: A Policy Menu?

- Since fiscal and mon policy affect agg demand, the *PC* appeared to offer policymakers a menu of choices:
 - low unemployment with high inflation
 - low inflation with high unemployment
 - anything in between
- 1960s: U.S. data supported the Phillips curve. Many believed the *PC* was stable and reliable.

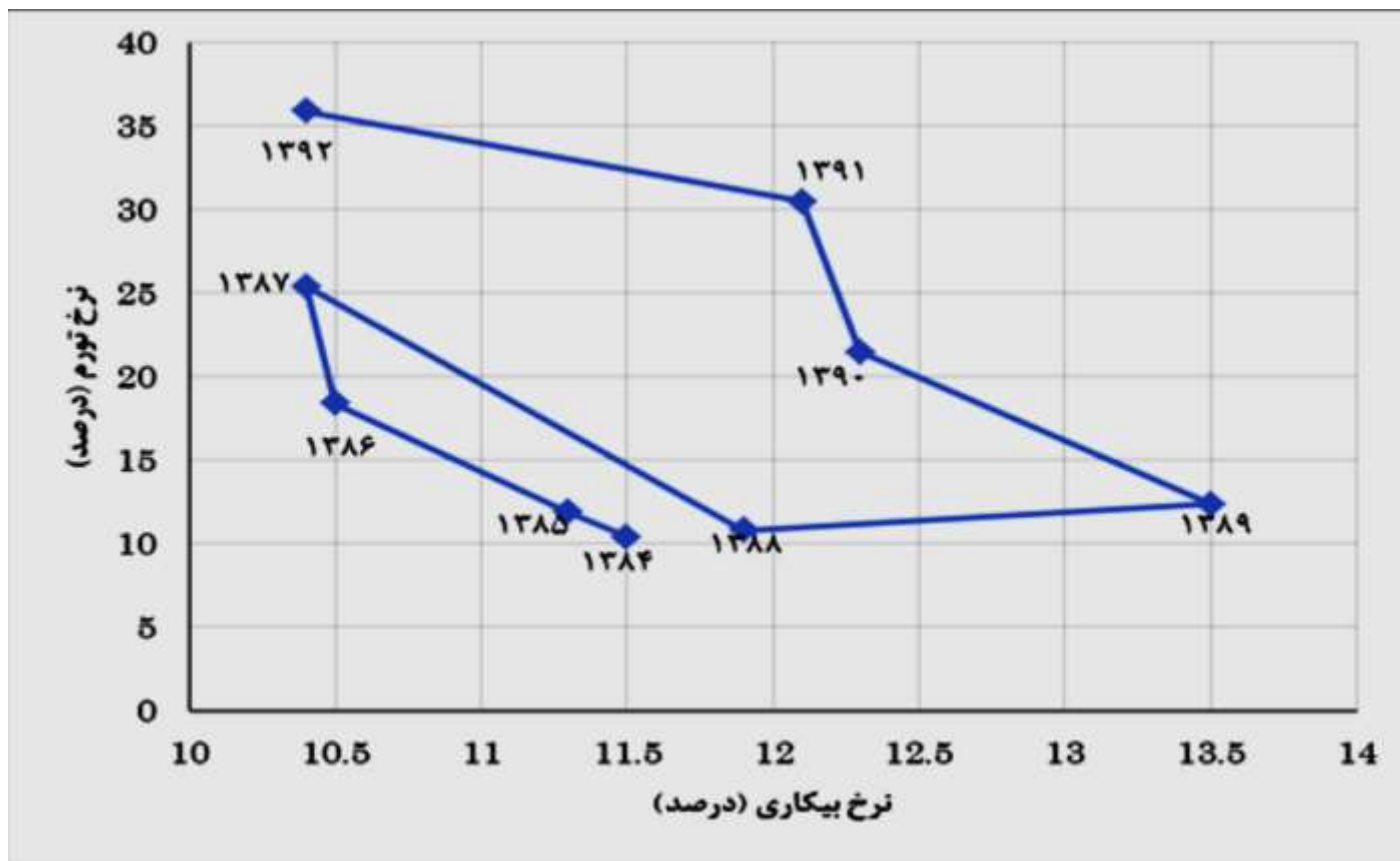
Evidence for the Phillips Curve?

*Inflation rate
(% per year)*



*During the 1960s,
U.S. policymakers
opted for reducing
unemployment
at the expense of
higher inflation*

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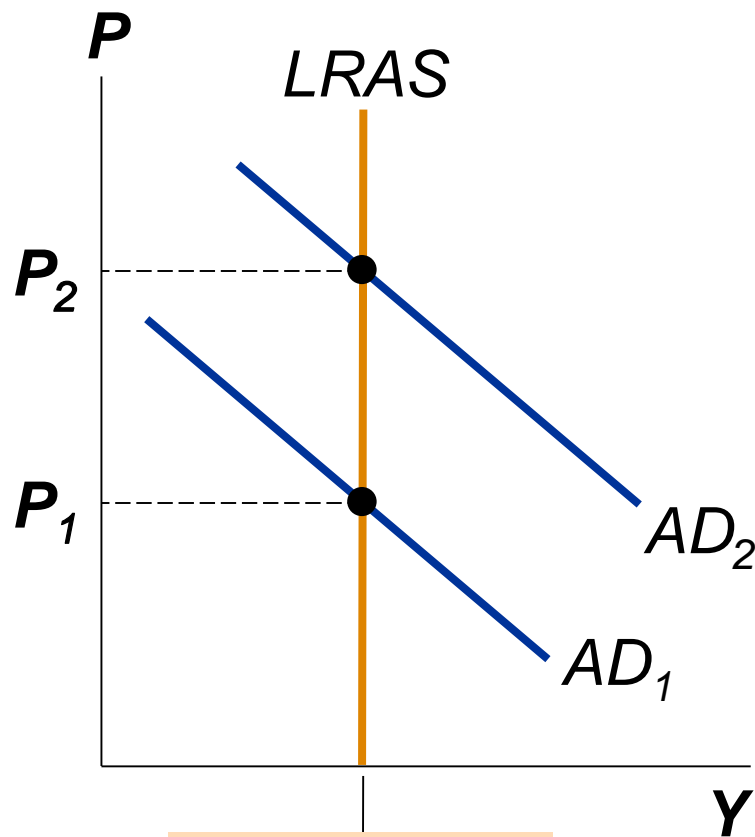


The Vertical Long-Run Phillips Curve

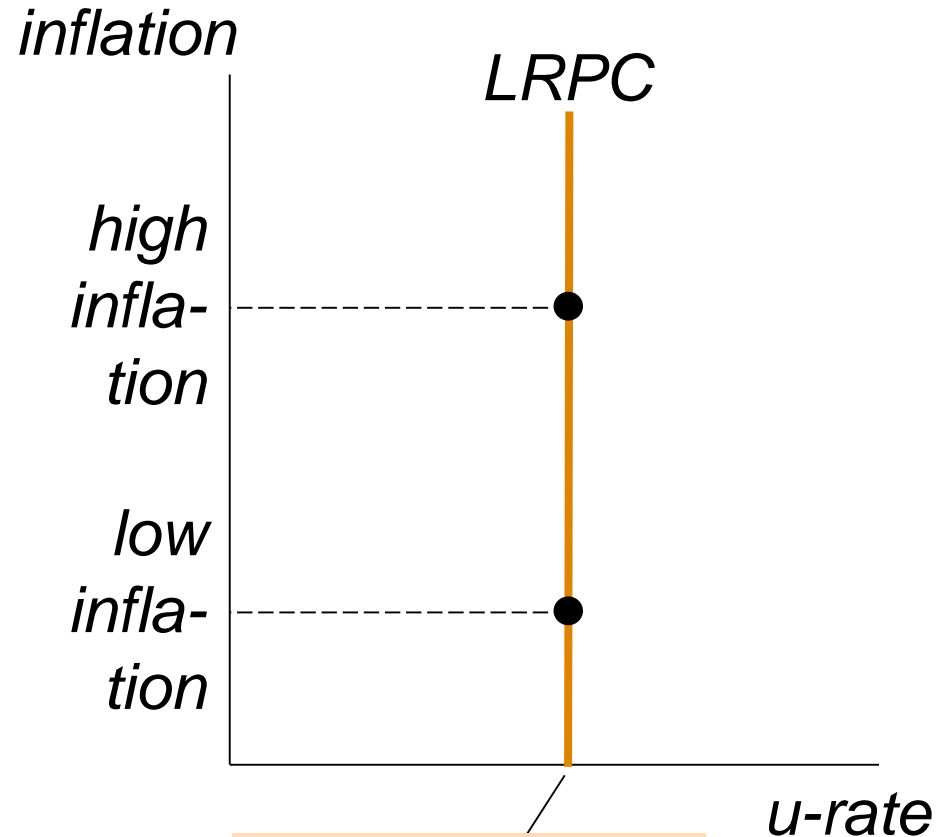
- 1968: Milton Friedman and Edmund Phelps argued that the tradeoff was temporary.
- **Natural-rate hypothesis:** the claim that unemployment eventually returns to its normal or “natural” rate, regardless of the inflation rate
- Based on the classical dichotomy and the vertical *LRAS* curve (chapters 12 and 17)

The Vertical Long-Run Phillips Curve

In the long run, faster money growth only causes faster inflation.



Natural rate of output



Natural rate of unemployment

Reconciling Theory and Evidence

- Evidence (from '60s):
PC slopes downward.
- Theory (Friedman and Phelps):
PC is vertical in the long run.
- To bridge the gap between theory and evidence, Friedman and Phelps introduced a new variable: **expected inflation** – a measure of how much people expect the price level to change.

The Phillips Curve Equation

$$\text{Unemp. rate} = \text{Natural rate of unemp.} - a \left(\text{Actual inflation} - \text{Expected inflation} \right)$$

Short run

Fed can reduce u-rate below the natural u-rate by making inflation greater than expected.

Long run

Expectations catch up to reality, u-rate goes back to natural u-rate whether inflation is high or low.

The Phillips Curve Equation

$$\text{Unemp. rate} = \text{Natural rate of unemp.} - a \left(\text{Actual inflation} - \text{Expected inflation} \right)$$

the SRAS is

$$Y = Y_N + a(P - P_E)$$

The Phillips Curve Equation

$$\text{Unemp. rate} = \text{Natural rate of unemp.} - a \left(\text{Actual inflation} - \text{Expected inflation} \right)$$

When expected inflation goes up,

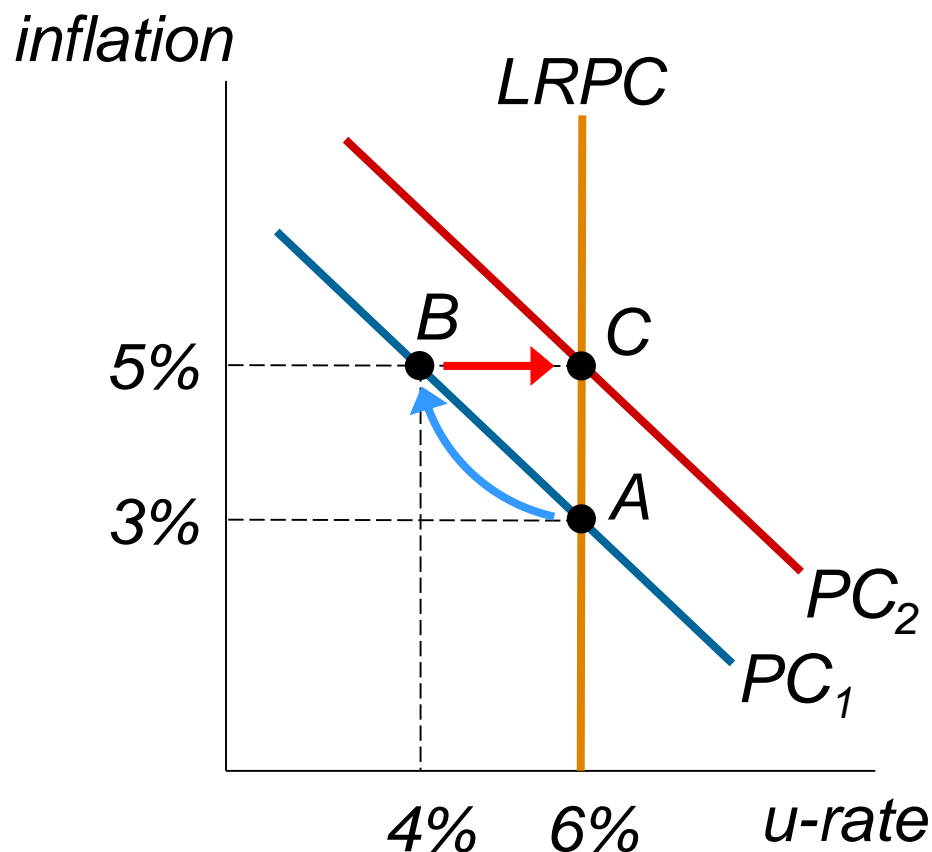
- 1. (Actual inflation – Expected inflation) gets less positive or even negative*
- 2. -(Actual inflation – Expected inflation) becomes a smaller negative or even a positive number*
- 3. Unemployment rate goes up*

How Expected Inflation Shifts the *PC*

Initially, expected & actual inflation = 3%,
unemployment = natural rate (6%).

Fed makes inflation 2% higher than expected,
u-rate falls to 4%.

In the long run, expected inflation increases to 5%,
PC shifts upward,
unemployment returns to its natural rate.



ACTIVE LEARNING 1

A numerical example

Natural rate of unemployment = 5%

Expected inflation = 2%

In *PC* equation, $a = 0.5$

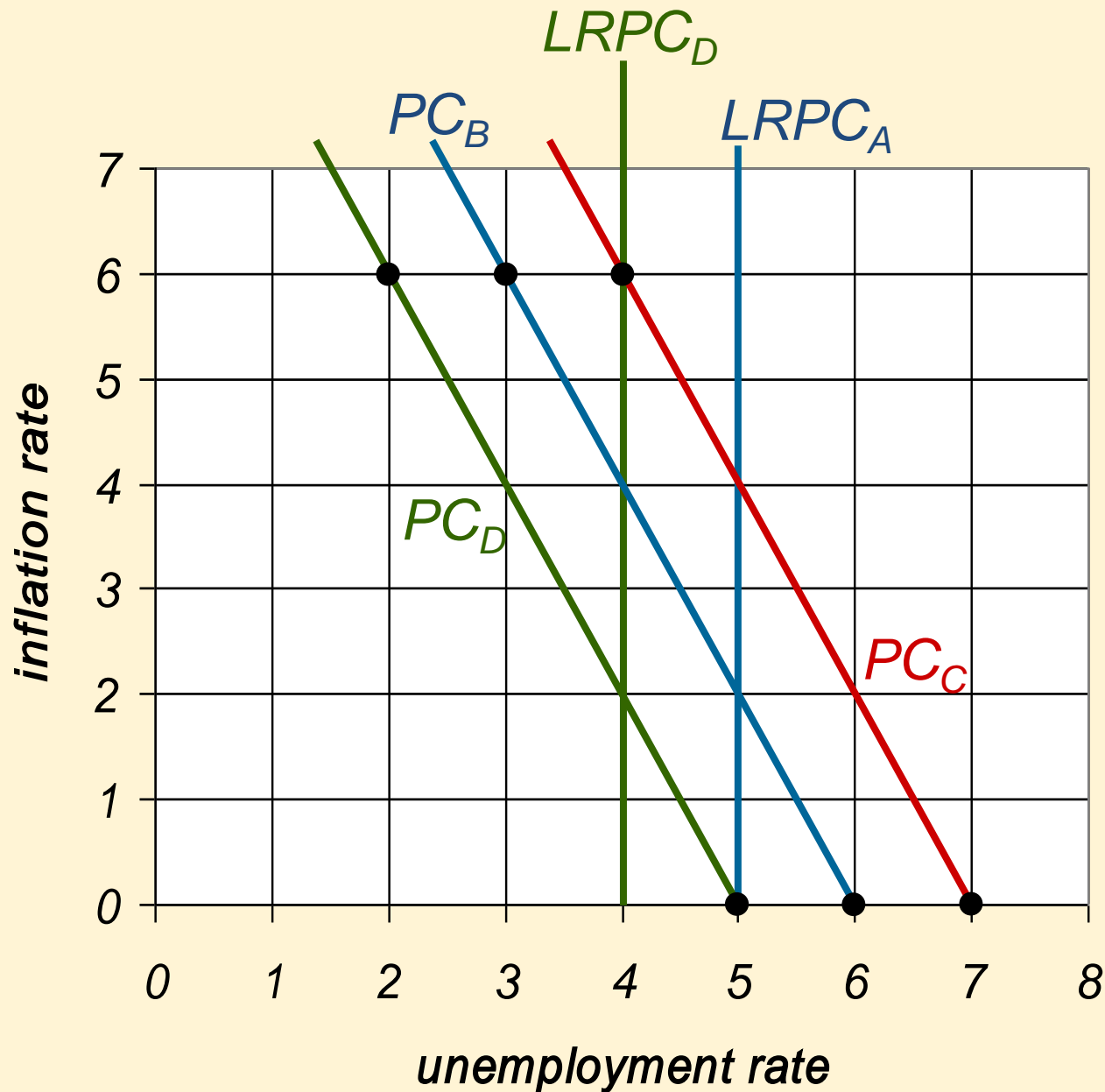
- A.** Plot the long-run Phillips curve.
- B.** Find the u-rate for each of these values of actual inflation: 0%, 6%. Sketch the short-run *PC*.
- C.** Suppose expected inflation rises to 4%. Repeat part B.
- D.** Instead, suppose the natural rate falls to 4%. Draw the new long-run Phillips curve, then repeat part B.

ACTIVE LEARNING 1

Answers

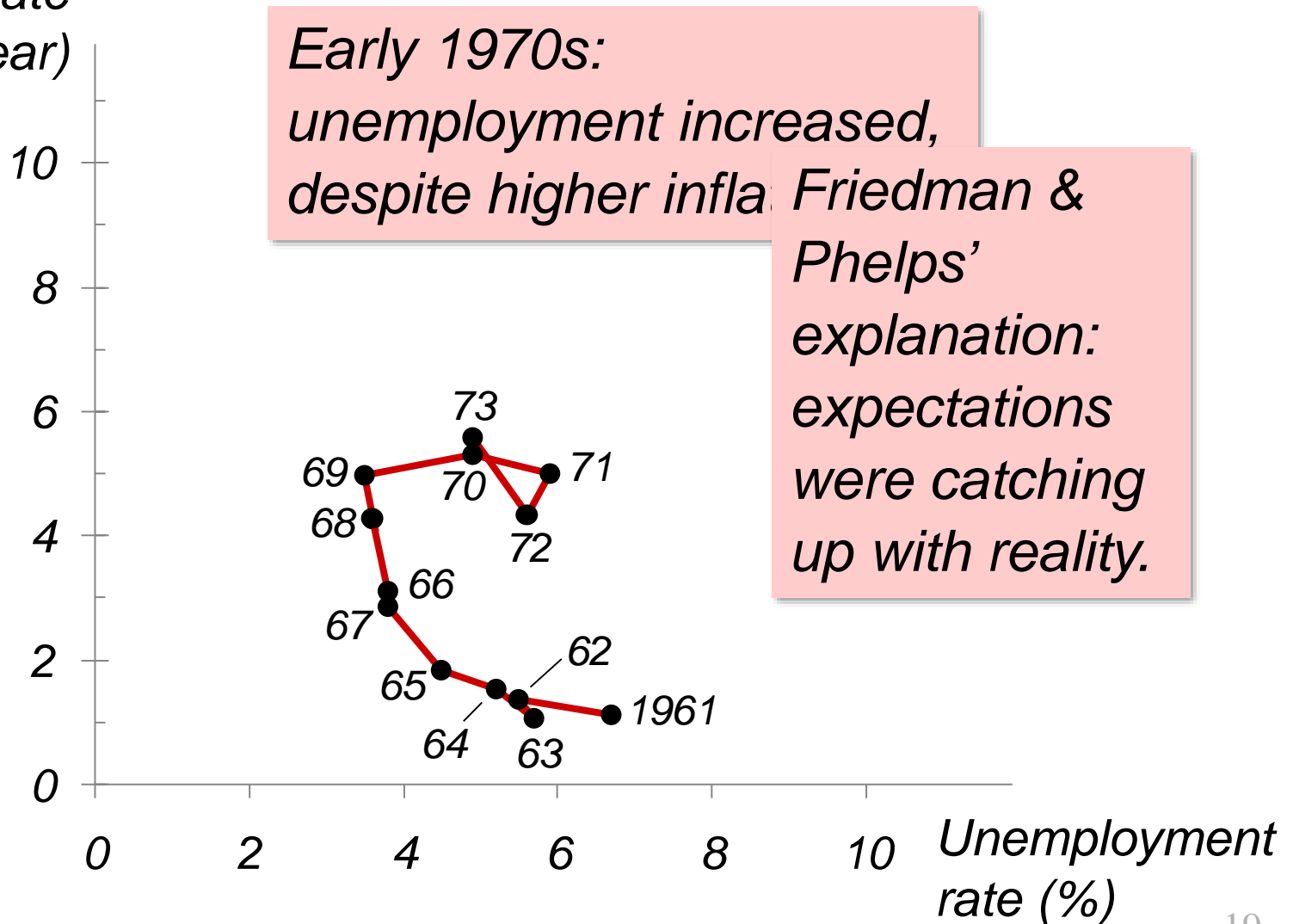
An increase in expected inflation shifts PC to the right.

A fall in the natural rate shifts both curves to the left.



The Breakdown of the Phillips Curve

Inflation rate
(% per year)

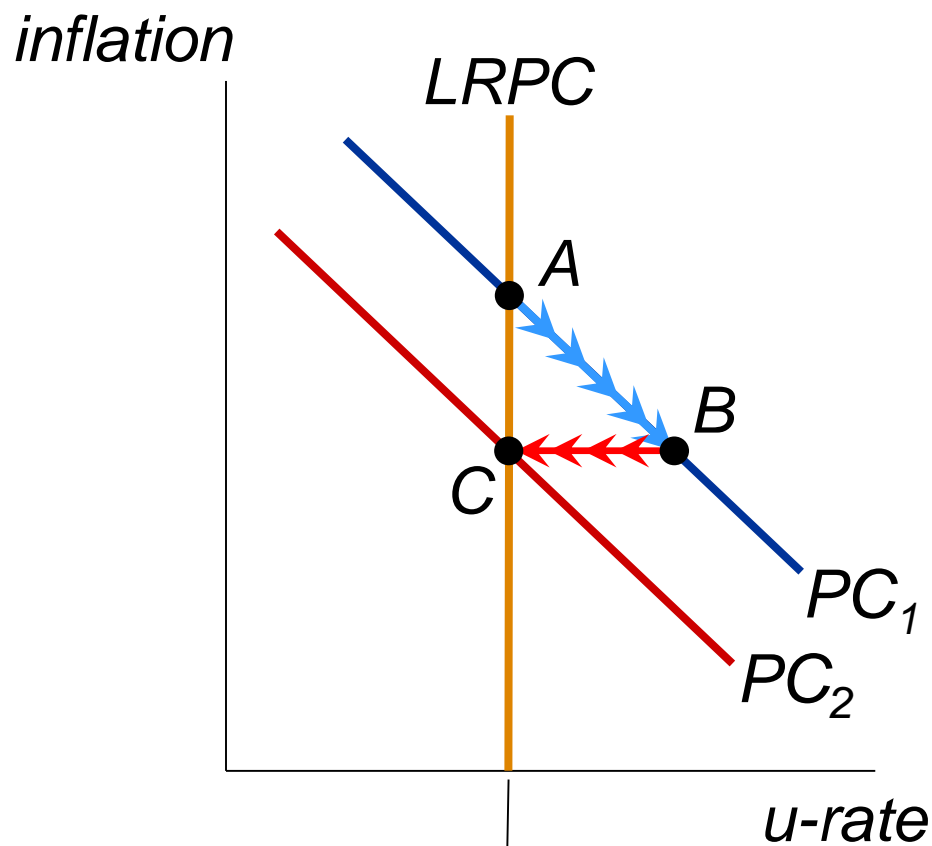


Disinflationary Monetary Policy

Contractionary monetary policy moves economy from A to B.

Over time, expected inflation falls, *PC* shifts downward.

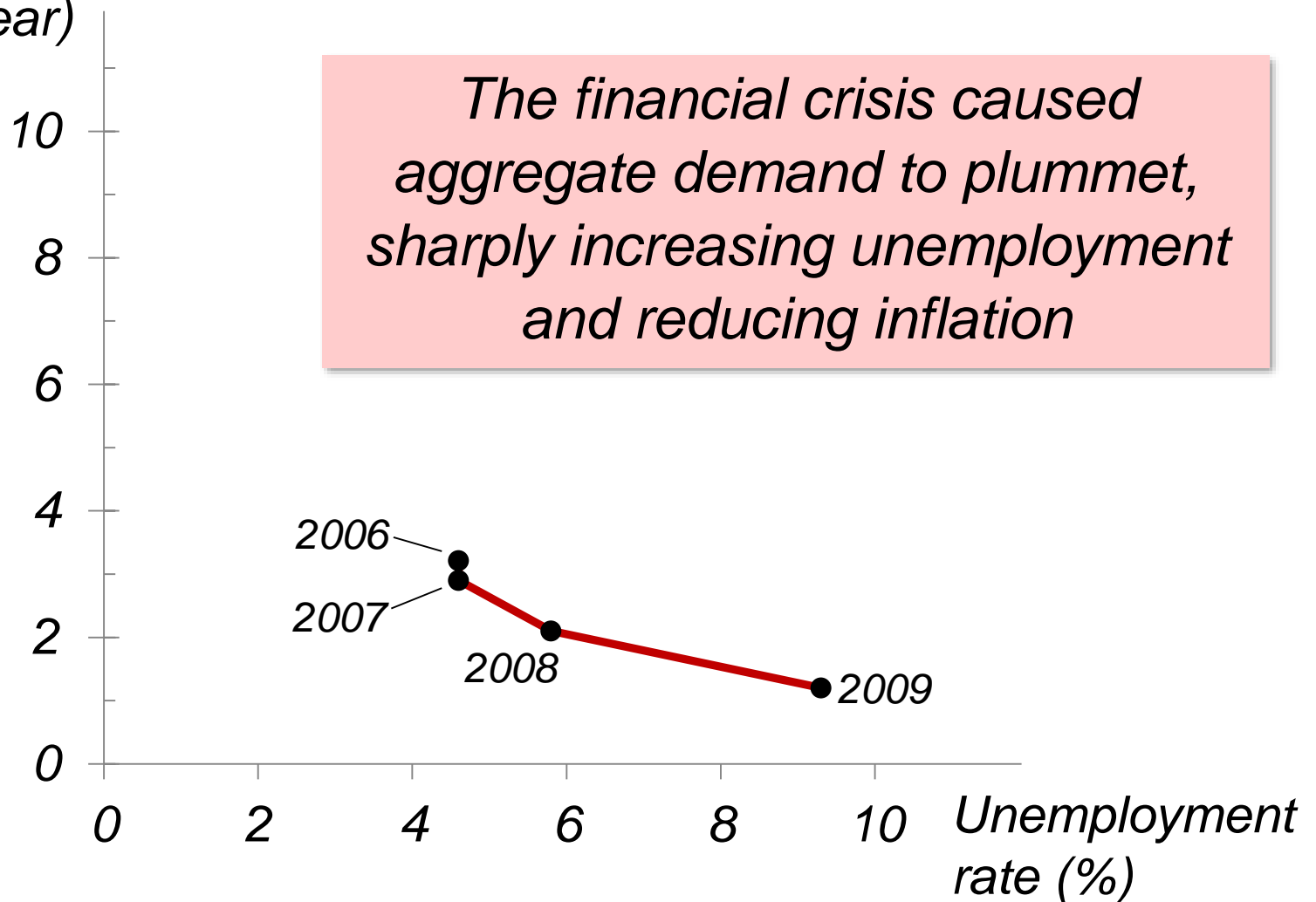
In the long run, point C:
the natural rate of unemployment,
lower inflation.



natural rate of unemployment

The Phillips Curve During the Financial Crisis

*Inflation rate
(% per year)*



CONCLUSION

- The theories in this chapter come from some of the greatest economists of the 20th century.
- They teach us that inflation and unemployment are
 - unrelated in the long run
 - negatively related in the short run
 - affected by expectations, which play an important role in the economy's adjustment from the short-run to the long run

SUMMARY

- The Phillips curve describes the short-run tradeoff between inflation and unemployment.
- In the long run, there is no tradeoff: inflation is determined by money growth, while unemployment equals its natural rate.
- Supply shocks and changes in expected inflation shift the short-run Phillips curve, making the tradeoff more or less favorable.

SUMMARY

- The Fed can reduce inflation by contracting the money supply, which moves the economy along its short-run Phillips curve and raises unemployment. In the long run, though, expectations adjust and unemployment returns to its natural rate.
- Some economists argue that a credible commitment to reducing inflation can lower the costs of disinflation by inducing a rapid adjustment of expectations.