Unemployment and Inflation
Part 1

Agenda
• Unemployment and Inflation:
  ➢ Is There a Trade-Off?

Unemployment and Inflation
• Is there a trade-off between inflation and unemployment?
  ➢ In 1958, A.W. Phillips found a negative relationship between unemployment and nominal wage growth in Britain.
  ➢ The inverse relationship between inflation and the unemployment rate is called the Phillips Curve.
    • $\pi = f(u)$

Unemployment and Inflation
• The Phillips Curve:
  ➢ In the 1950s and 1960s many nations seemed to have a negative relationship between inflation and the unemployment rate.
    • The United States appeared to be on a Phillips curve in the 1960s.
The U.S. Phillips curve in the 1960s

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- The Phillips Curve:
  
  ➢ Both the position and slope of the Phillips curve are important:
  
    • The position identifies the attainable goals.
    
    • Slope identifies the trade-offs:
      
      - A steep curve implies a big change in inflation for a small change in unemployment.
      
      - A flat curve implies a small change in inflation for a big change in unemployment.

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- The Phillips Curve:
  
  ➢ In the late 1960s, Milton Friedman and Edmund Phelps argued that the cyclical unemployment rate depends only on unanticipated inflation.
  
  • The cyclical unemployment rate is the difference between the actual and natural unemployment rates, i.e., \( u - \bar{u} \).

• Unanticipated inflation is the difference between the actual and expected inflation rates, i.e., \( \pi - \pi' \).
The expectations-augmented Phillips curve:

- The inverse relationship between the cyclical unemployment rate and unanticipated inflation hypothesized by Friedman and Phelps is called the expectations-augmented Phillips curve.

\[ \pi - \pi^e = -f(u - \bar{u}) \] or \[ \pi = \pi^e - f(u - \bar{u}) \]

- When \( u = \bar{u} \), then \( \pi = \pi^e \).
- When \( u > \bar{u} \), then \( \pi < \pi^e \).
- When \( u < \bar{u} \), then \( \pi > \pi^e \).

This suggests the relationship between inflation and the unemployment rate is NOT stable.

In the 1970s, both inflation and unemployment rose, which is inconsistent with the Phillips Curve.

The relationship between inflation and unemployment was quite unstable for the following three decades.

But the expectations-augmented Phillips curve has been fairly stable since 1970.
The expectations-augmented Phillips curve:

- How does this work in the classical model?
  - Two cases:
    - An anticipated increase in the money supply.
    - An unanticipated increase in the money supply.

Anticipated inflation in the classical model:

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- The expectations-augmented Phillips curve:
  - How does this work in the classical model?
    - First case: An anticipated increase in money supply.
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• The *expectations-augmented* Phillips curve:
  
  ➢ How does this work in the *classical* model?

  • An *anticipated increase* in money supply:
    
    ➢ *AD* shifts to the right.
    ➢ *SRAS* shifts up (with no misperceptions).
    ➢ Result: *P* rises, *Y* unchanged.
    ➢ Inflation rises with no change in unemployment.

Unanticipated inflation in the classical model

• The *expectations-augmented* Phillips curve:
  
  ➢ How does this work in the *classical* model?

  • An *unanticipated increase* in money supply.
    
    ➢ *AD* expected to shift right to *AD*₁ based on *expected increase* in the money supply.
    ➢ *SRAS* shifts up to *SRAS*₁ based on *expected increase in the money supply*.
    ➢ *AD actually* shifts further to the right to *AD*₂ because money supply unexpectedly rises by more than anticipated.
The expectations-augmented Phillips curve:

- How does this work in the classical model?
  - An unanticipated increase in the money supply.
    - Result: $P$ rises and $Y$ rises in Year 1 as misperceptions occur.
    - So higher inflation occurs with lower unemployment.
    - Long run: $P$ rises further, $Y$ declines to full-employment level.

\[ \pi = \pi^e - f(u - \bar{u}) \]

The expectations-augmented Phillips curve is drawn such that $\pi = \pi^e$ when $u = \bar{u}$.

Changes in the expected rate of inflation:

- For a given expected rate of inflation, the Phillips curve shows the trade-off between cyclical unemployment and actual inflation.
- A higher expected inflation shifts the Phillips curve to the right.
The expectations-augmented Phillips curve

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• The expectations-augmented Phillips curve:
  ➢ Changes in the natural rate of unemployment:
    • For a given natural rate of unemployment, the Phillips curve shows the trade-off between unemployment and unanticipated inflation.
    • A higher natural rate of unemployment shifts the Phillips curve to the right.

An increase in the natural unemployment rate

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• Long-run supply shocks and the Phillips curve:
  ➢ A long-run adverse supply shock increases both expected inflation and the natural unemployment rate.
    • In both the classical and Keynesian models.
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• Long-run supply shocks and the Phillips curve:
  ➢ A long-run adverse supply shock shifts the Phillips curve to the right.
  • Thus, the Phillips curve will be unstable during periods with many supply shocks.

• The shifting Phillips curve in practice:
  ➢ Why did the U.S. Phillips curve hold in the 1960s?
    • The relationship between inflation and unemployment holds as long as expected inflation and the natural rate of unemployment are approximately constant.
    – This was true in the United States in the 1960s, so the Phillips curve appeared to be stable.

• The shifting Phillips curve in practice:
  ➢ Why did the U.S. Phillips curve fail after 1970?
    • Monetary policy was also highly expansionary in the 1970s, leading to high and volatile actual and expected inflation.
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• The shifting Phillips curve in practice:
  ➢ Why did the U.S. Phillips curve fail after 1970?
    • The natural rate of unemployment varied considerably more in the 1970s than it did in the 1960s.
      - The composition of the labor force changed in the 1970s.
      - There were also other structural changes in the economy.

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• Macroeconomic policy and the Phillips curve:
  ➢ Can policymakers exploit the Phillips curve to choose an optimal combination of unemployment and inflation?
    • Classical model: NO.
    • Keynesian model: YES, but only temporarily.

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• Can policymakers exploit the Phillips?
  ➢ Classical model: NO.
    • The unemployment rate returns to its natural level quickly as people’s expectations adjust.
    • People also catch on to policy games—they try to anticipate policy changes, so there is no way to fool people systematically.

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• Can policymakers exploit the Phillips curve?
  ➢ Keynesian model: YES, but only temporarily.
    • Because of sticky wages and prices, it takes time for actual and expected prices to adjust, so unemployment may differ from the natural rate for some period of time.
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• The long-run Phillips curve:
  ➢ In the long run \( u = \bar{\pi} \).
    • In both the classical and Keynesian models.
  ➢ So the long-run Phillips curve is vertical.
    • When, \( u = \bar{\pi} \), then \( \pi = \bar{\pi} \).

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• The long-run Phillips curve:
  ➢ Changes in the **level** of money supply have no long-run real effects.
  ➢ Changes in the **growth rate** of money supply have no long-run real effects.

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• The long-run Phillips curve:
  ➢ Although expansionary policies will reduce unemployment only temporarily, policymakers may still want to do so to minimize the impact of a recession.