CHAPTER 16 LECTURE - INFLATION, DISINFLATION, AND DEFLATION

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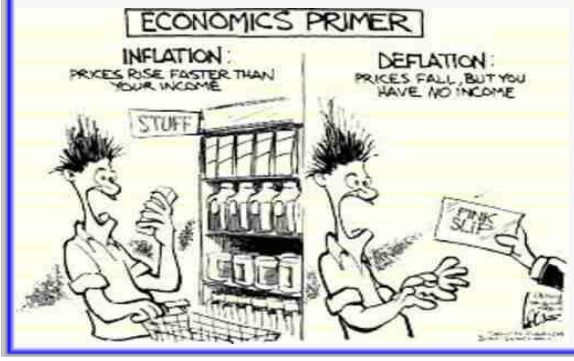

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WHAT YOU WILL LEARN IN THIS CHAPTER

- Why can printing money lead to higher rates of inflation and hyperinflation?
- How does the Phillips curve describe the short run trade-off between inflation and unemployment?
- Why does the trade off between inflation and unemployment cease in the long run?
- Why can even moderate levels of inflation be hard to end?
- Why is deflation a problem for economic policy makers?

2

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Inflation	Deflation
Prices of goods and services rise over time, reducing the purchasing power of money.	Prices of goods and services decrease over time, increasing the purchasing power of money.
Effects on Borrowers Inflation erodes the value of money, making it easier for borrowers to repay debts.	**Effects on Borrowers** Deflation increases the value of money, making it harder for borrowers to repay debts.
Effects on Savers Inflation reduces the purchasing power of money, negatively impacting savers.	**Effects on Savers** Deflation increases the purchasing power of money, benefiting savers.
Economic Impact Inflation can stimulate economic growth, but high inflation can lead to instability.	**Economic Impact** Deflation can discourage spending and investment, potentially causing economic contraction.
Central Bank Response Central banks aim to manage inflation by adjusting interest rates and implementing monetary policies.	**Central Bank Response** During deflation, central banks may use expansionary policies to stimulate spending.
Asset Prices Inflation can inflate the value of assets like real estate and stocks.	**Asset Prices** Deflation can lead to a decrease in asset prices.

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3

3

MONEY AND INFLATION

- What caused 500 billion percent inflation in Zimbabwe (2008) and Germany (1922–1923)?
- Why did inflation spiral out of control in Armenia (27,000%) and Nicaragua (60,000%)?

4

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CHAPTER 16 LECTURE - INFLATION, DISINFLATION, AND DEFLATION

THE CLASSICAL MODEL OF MONEY AND PRICES

- High inflation is always associated with rapid increases in the money supply.
- Previously, we learned that in the long run, an increase in the money supply leads to an equal percentage rise in the overall price level.
- The **classical model of the price level**: the real quantity of money is always at its long-run equilibrium level.

Real quantity of money = M/P

where M = nominal money supply and P = price level.

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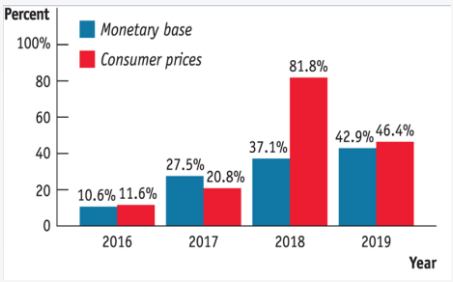
MONEY SUPPLY GROWTH AND INFLATION IN VENEZUELA

- In general, inflation and money supply move together, especially during periods of high inflation.



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ZIMBABWE'S INFLATION

- **Over 8 years, consumer prices rose by 80 trillion percent.**
- **Why? When Robert Mugabe rose to power he seized farms owned by the descendants of white colonists and gave them to his supporters.**
- **Production fell, the tax base fell, and Zimbabwe couldn't borrow money in world markets because of its instability.**
- **What's left? The printing press.**

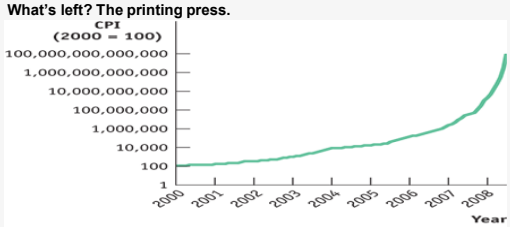

FIGURE 16-3 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers
Data from: International Monetary Fund.

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MONEY SUPPLY GROWTH AND INFLATION

- In general, inflation and money supply move together, especially during periods of high inflation.

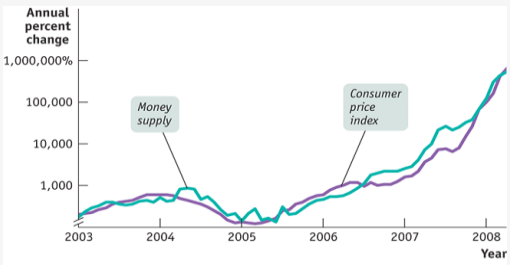

FIGURE 16-2 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers
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HOW DOES MONEY AFFECT PRICES?

- As we have established, an increase in the money supply changes only prices in the long run.
- According to the *classical model of the price level,* the real quantity of money is always at its long-run equilibrium level.

Real quantity of money= M/P

- where M = nominal money supply and P = price level.

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THE EFFECTIVENESS OF MONETARY POLICY

- If money supply increases, what happens?
- The increase in *AD* will increase the price level and output and eventually pull up nominal wages, which moves the *SRAS* curve leftward.

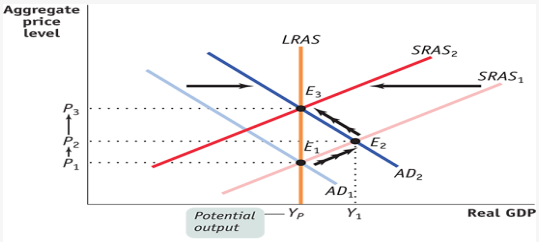

FIGURE 16-1 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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THE CLASSICAL MODEL OF THE PRICE LEVEL

- The "classical" (pre-Keynes) model assumes the economy moves directly from E_1 to E_3—not necessarily a good assumption during normal times of low inflation.

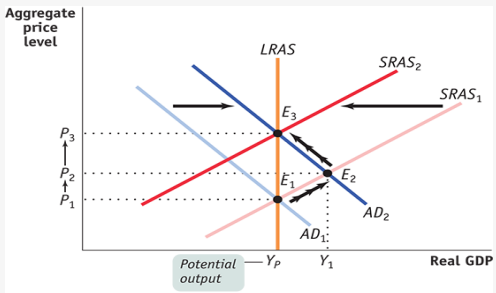

FIGURE 16-1 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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LEARN BY DOING: PRACTICE QUESTION 1

- Governments that run large deficits can:
  - a) reduce the deficit by raising taxes.
  - b) reduce the deficit by reducing spending.
  - c) finance the deficit by printing money.
  - d) Answers (a), (b), and (c) are all correct.

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LEARN BY DOING: PRACTICE QUESTION 1 (ANSWER)

- Governments that run large deficits can:
  a) reduce the deficit by raising taxes.
  b) reduce the deficit by reducing spending.
  c) finance the deficit by printing money.
  d) Answers (a), (b), and (c) are all correct. (correct answer)

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THE INFLATION TAX

- What is to prevent a government from paying for its expenses by printing money? Nothing.
- The Treasury issues debt, and the Fed monetizes it by buying it back from the public through open-market purchases of Treasury bills.
- The U.S. government can and does raise revenue by printing money.
- Seigniorage: the revenue generated by a government's right to print money (usually less than 1% of the U.S. government's budget).
- By printing money, a government increases the money supply, which triggers inflation.
- Inflation erodes the purchasing power of money.
- The **inflation tax**: the reduction in the real value of money held by the public caused by inflation.

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THE LOGIC OF HYPERINFLATION

$$\text{Seigniorage} = \Delta M$$

where Δ = monthly change and M = money supply

- It's more useful to look at real seigniorage, the revenue created by printing money, divided by the price level, P:

$$\text{Real seigniorage} = \Delta M/P$$

- This can be rewritten to:

$$\text{Real seigniorage} = (\Delta M/M) \times (M/P) \text{ or}$$

Real seigniorage = rate of growth of the money supply × real money supply

- In the face of high inflation, the public reduces the real amount of money it holds, so M/P gets smaller. The government responds by accelerating the rate of growth of the money supply, $\Delta M/M$. This leads to an even higher rate of inflation, and people respond by reducing their real money holdings, M/P, yet again.
- This self-reinforcing process can easily spiral out of control.

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A VICIOUS CYCLE

- To avoid paying the inflation tax, people reduce their real money holdings and force the government to increase inflation to capture the same amount of real inflation tax.
- In some cases, this leads to a vicious circle of a shrinking real money supply and a rising rate of inflation.
- This leads to ***hyperinflation*** and a fiscal crisis.

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MODERATE INFLATION AND DISINFLATION

- In the United States, the inflation rate peaked at 14% at the beginning of the 1980s. In Britain, the inflation rate reached 26% in 1975.
- Why did policy makers allow this to happen?
  - In the short run, policies that produce a booming economy lead to higher inflation, and
  - Policies that reduce inflation tend to depress the economy.
- This creates both temptations and dilemmas for governments:
  - Inflationary policies produce short-term political gains.
  - Policies to bring inflation down carry short-term political costs.

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THE OUTPUT GAP AND THE UNEMPLOYMENT RATE

- Recall that aggregate output fluctuates around potential output in the short run:
  - When aggregate output falls short of potential output, a recessionary gap arises.
  - When aggregate output exceeds potential output, an inflationary gap arises.
- The output gap: the percentage difference between the actual level of real GDP and potential output.
  1. When actual aggregate output is equal to potential output, the actual unemployment rate is equal to the natural rate of unemployment.
  2. When the output gap is positive (an inflationary gap), the unemployment rate is *below* the natural rate. When the output gap is negative (a recessionary gap), the unemployment rate is *above* the natural rate.
- Fluctuations of aggregate output around the long-run potential output correspond to fluctuations of the unemployment around the natural rate.

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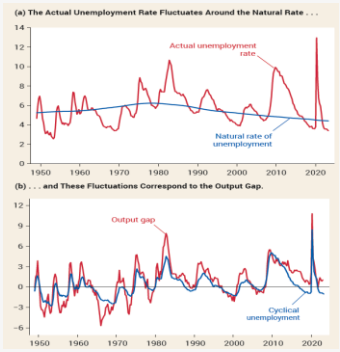
CYCLICAL UNEMPLOYMENT AND THE OUTPUT GAP

The actual unemployment rate fluctuates around the natural rate—and these fluctuations correspond to the output gap.



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LEARN BY DOING: PRACTICE QUESTION 2

- A positive output gap implies an unemployment rate:
  a) above the natural rate of unemployment.
  b) below the natural rate of unemployment.

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LEARN BY DOING: PRACTICE QUESTION 2 (ANSWER)

- A positive output gap implies an unemployment rate:
  a) above the natural rate of unemployment.
  b) **below the natural rate of unemployment. (correct answer)**

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OKUN'S LAW

- Cyclical unemployment seems to move *less* than the output gap.
  - The output gap reached −8% in 1982, but cyclical unemployment reached only 4%.
- Arthur Okun, John F. Kennedy's chief economic adviser, discovered this.
- Okun's law: There is a predictable negative relationship between the output gap and the unemployment rate. Modern estimates find that a rise in the output gap of 1% reduces the unemployment rate by about 0.5%.

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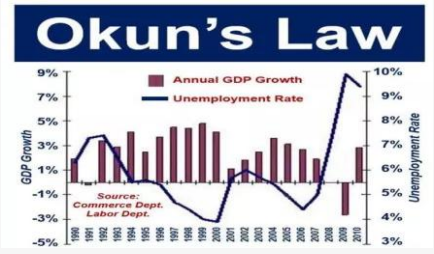
OKUN'S LAW: EXAMPLE

- If the natural rate of unemployment is 5.2% and the economy is producing at only 98% of potential output, the output gap is −2%, then **Okun's law predicts an unemployment rate of 5.2% − 0.5 × (−2%) = 6.2%.**



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LEARN BY DOING: PRACTICE QUESTION 3

- Cyclical unemployment and the output gap:
  a) move together, but cyclical unemployment fluctuates more than the output gap.
  b) have a relationship that Okun's law quantifies.
  c) are negatively related: In the United States, when the output gap rises by 1%, cyclical unemployment rate decreases by 0.5%.
  d) Answers (a), (b), and (c) are all correct.

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LEARN BY DOING: PRACTICE QUESTION 3 (ANSWER)

- Cyclical unemployment and the output gap:
  a) move together, but cyclical unemployment fluctuates more than the output gap.
  b) have a relationship that Okun's law quantifies.
  c) are negatively related: In the United States, when the output gap rises by 1%, cyclical unemployment rate decreases by 0.5%.
  d) **Answers (a), (b), and (c) are all correct. (correct answer)**

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THE SHORT-RUN PHILLIPS CURVE: EVIDENCE

- The ***short-run Phillips curve:*** the negative short-run relationship between the unemployment rate and the inflation rate

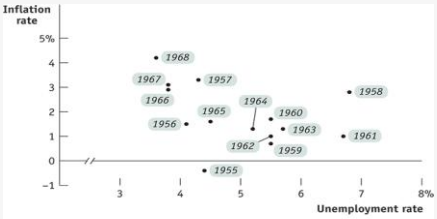

FIGURE 16-5 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers
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THE SHORT-RUN PHILLIPS CURVE: GRAPH

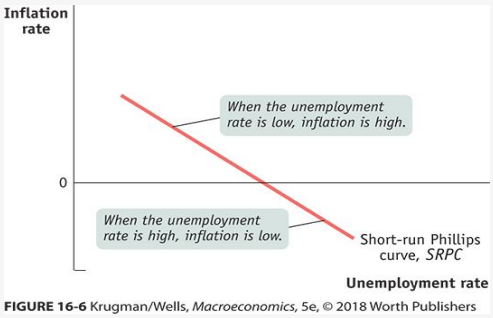

FIGURE 16-6 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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THE AD–AS MODEL AND THE SHORT-RUN PHILLIPS CURVE

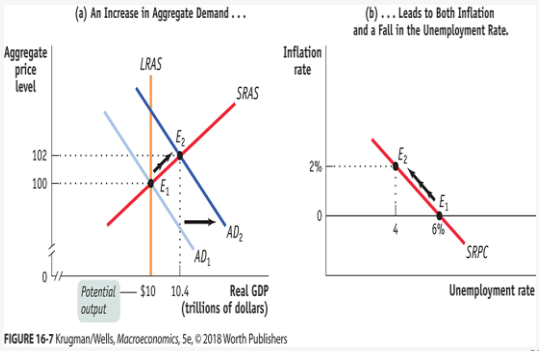

FIGURE 16-7 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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THE SHORT-RUN PHILLIPS CURVE AND SUPPLY SHOCKS

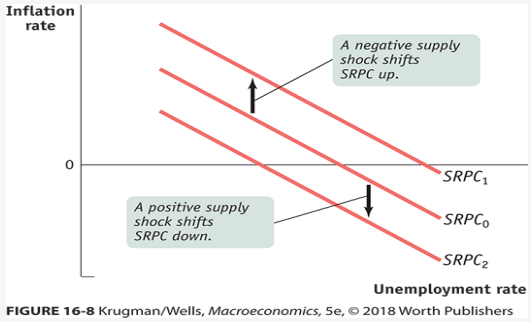

FIGURE 16-8 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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INFLATION EXPECTATIONS AND THE SHORT-RUN PHILLIPS CURVE

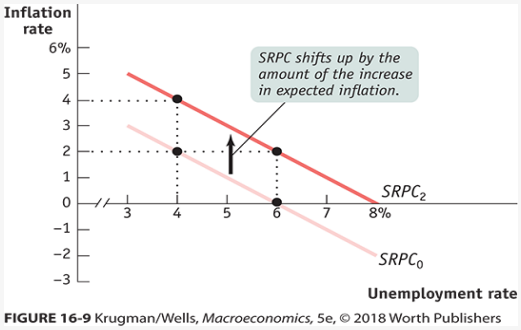

FIGURE 16-9 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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UNEMPLOYMENT AND INFLATION, 1961–1990

- The Phillips curve explained fluctuations very well in the 1950s and 1960s. Then along came stagflation. Oil shocks and rising inflationary expectations created real problems.

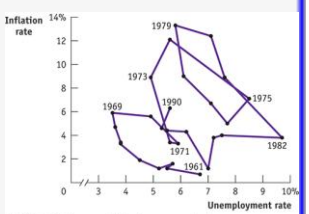

FIGURE 16-10 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers
Data from: Bureau of Labor Statistics.

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INFLATION AND UNEMPLOYMENT IN THE LONG RUN

- Since the *SRPC* shifts whenever inflationary expectations change, **attempts to reduce unemployment below the natural rate may be effective only in raising prices.**
- **The long-run Phillips curve:** the relationship between unemployment and inflation after expectations of inflation have had time to adjust to experience

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THE PHILLIPS CURVE IN THE GREAT RECESSION

- Data from the Great Recession show that there was generally a **fall in inflation for most countries that experienced rising unemployment.**

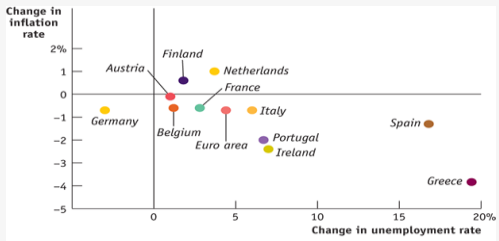

FIGURE 16-11 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers
Data from: IMF World Economic Outlook.

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THE NAIRU AND THE LONG-RUN PHILLIPS CURVE

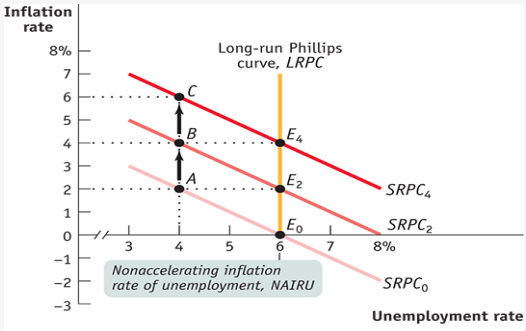

FIGURE 16-12 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers

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INFLATION AND UNEMPLOYMENT IN THE LONG RUN

- **The nonaccelerating inflation rate of unemployment, or NAIRU,** is the unemployment rate at which inflation does not change over time.
- To **avoid accelerating inflation** over time, the **unemployment rate** must be **high enough that the actual rate of inflation matches the expected rate of inflation.**
- **Disinflation** is the process of bringing down inflation that is embedded in expectations.

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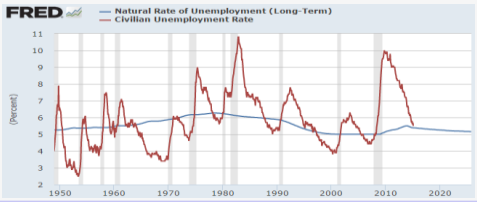
THE NATURAL RATE OF UNEMPLOYMENT

- **The natural rate of unemployment** is the part of the unemployment rate unaffected by the swings of the business cycle.
- **The NAIRU is another name for the natural rate.**
  - **As of the end of 2018, the CBO estimate of the U.S. natural rate was 5.3%.**



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COST OF DISINFLATION

- **Once inflation has become embedded in peoples' expectations, reducing it can be difficult.**
- Disinflation can require a recession.
- However, policy makers in the United States and other wealthy countries were willing to pay that price to bring down the high inflation of the 1970s.

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THE GREAT DISINFLATION OF THE 1980S

- Beginning in late **1979, the Federal Reserve imposed strongly contractionary monetary policies,** which pushed the economy into its worst recession since the Great Depression. It cost 18% of our annual output.

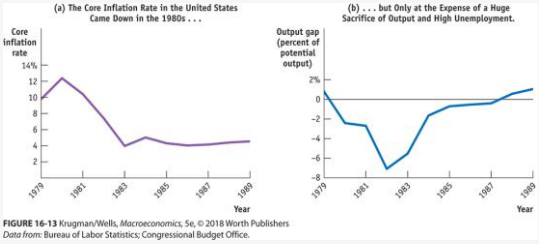

FIGURE 16-13 Krugman/Wells, *Macroeconomics*, 5e, © 2018 Worth Publishers
Data from: Bureau of Labor Statistics; Congressional Budget Office.

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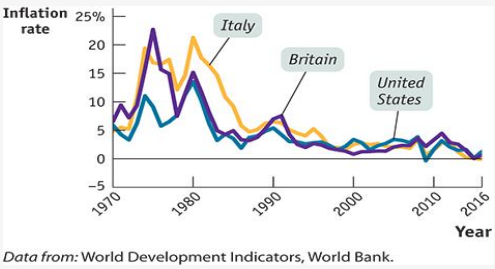
DISINFLATION AROUND THE WORLD

- Other nations also brought inflation under control in the 1980s after the oil shocks and inflation of the 1970s.



Data from: World Development Indicators, World Bank.

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EFFECTS OF EXPECTED DEFLATION

- There is a **zero bound** on the nominal interest rate: it cannot go below zero.
- **Liquidity trap:** the inability to use monetary policy because nominal interest rates are too low and cannot fall below the zero bound
- **A liquidity trap can occur whenever there is a sharp reduction in demand for loanable funds.**

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LIQUIDITY TRAP

- A liquidity trap is when a change in monetary policy has no effect on interest rates.
- This would be the case if the money demand curve were horizontal at some interest rate, as shown.
- If a change in the money supply from *M* to *M*′ cannot change interest rates, then, unless there is some other change in the economy, there is no reason for investment or any other component of aggregate demand to change.

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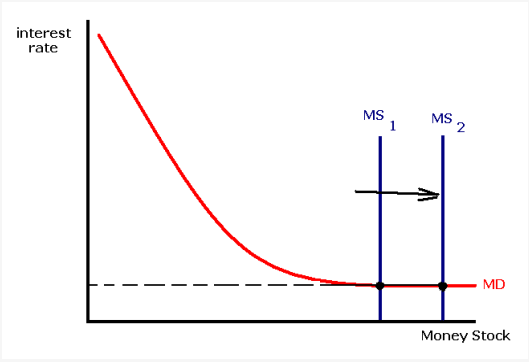
LIQUIDITY TRAP



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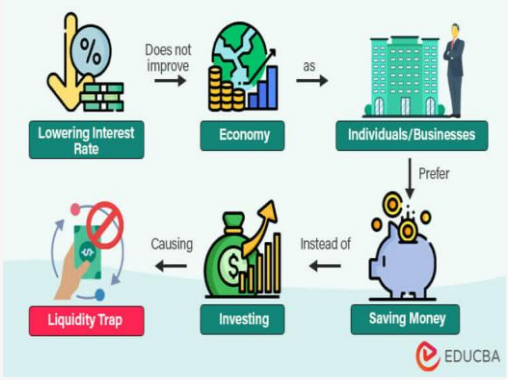

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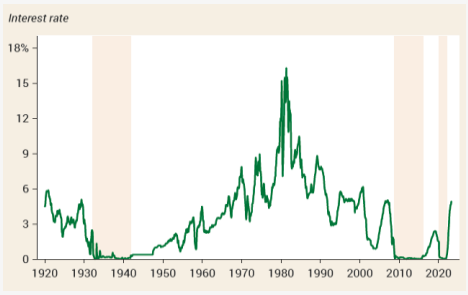
CHAPTER 16 LECTURE - INFLATION, DISINFLATION, AND DEFLATION

THE ZERO LOWER BOUND IN THE U.S. ECONOMY



The U.S. experienced the zero lower bound in the 1930s and in 2009–2017 when interest rates were virtually zero.

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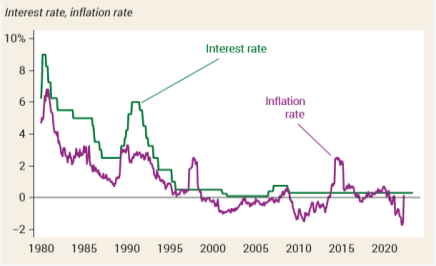
DEFLATION AND THE LIQUIDITY TRAP IN THE JAPANESE ECONOMY

A prolonged economic slump in Japan led to deflation from the late 1990s on. The Bank of Japan responded by cutting interest rates, but eventually ran up against the zero lower bound.



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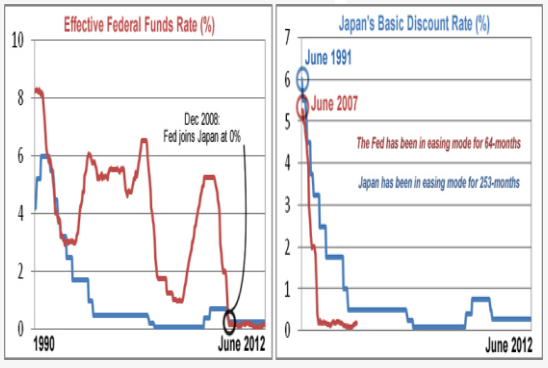
DID THE USA TURN JAPANESE?



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