Depressions and Slumps

A **depression** is a deep and long-lasting recession.

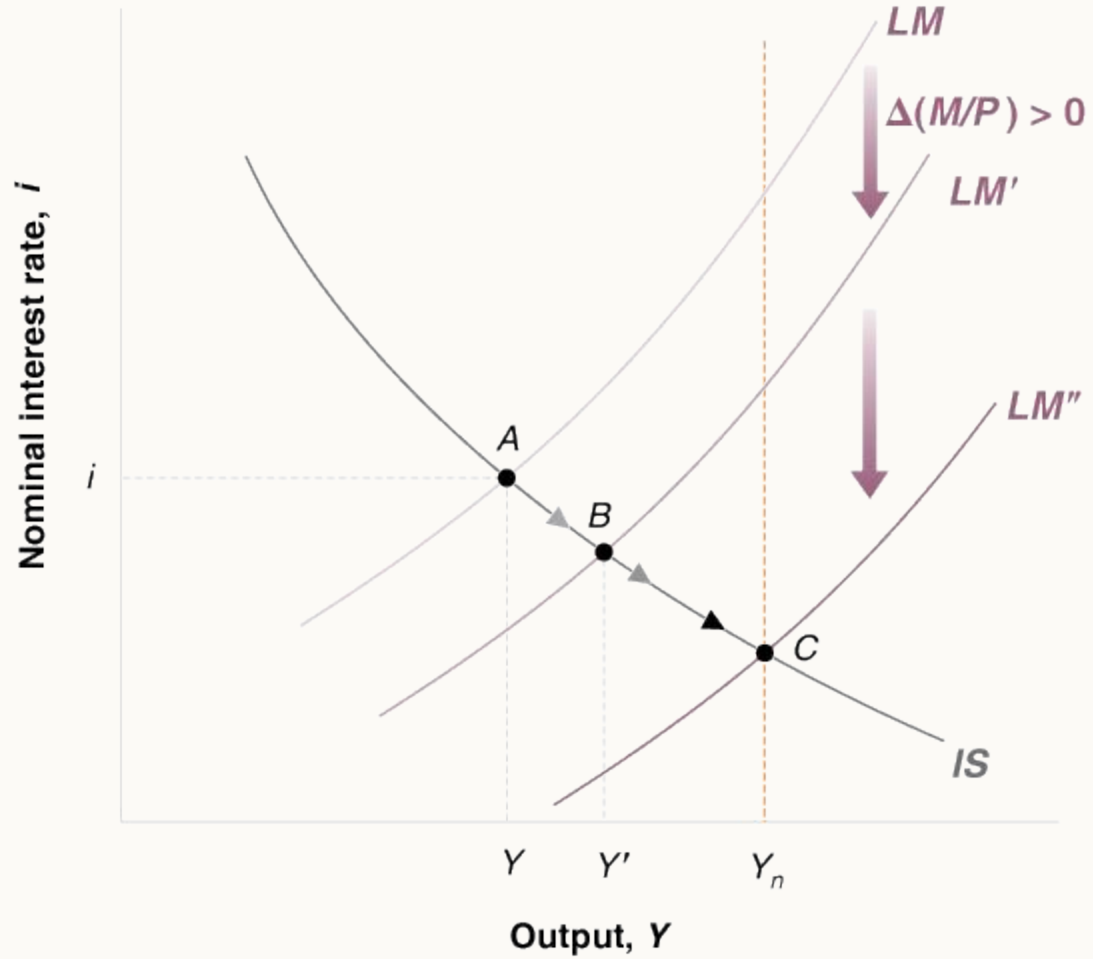
A **slump** is a long period of low or no growth, longer than a typical recession, but less deep than a depression.

22-1 Disinflation, Deflation, and the Liquidity Trap

Figure 22 – 1

The Return of Output to Its Natural Level

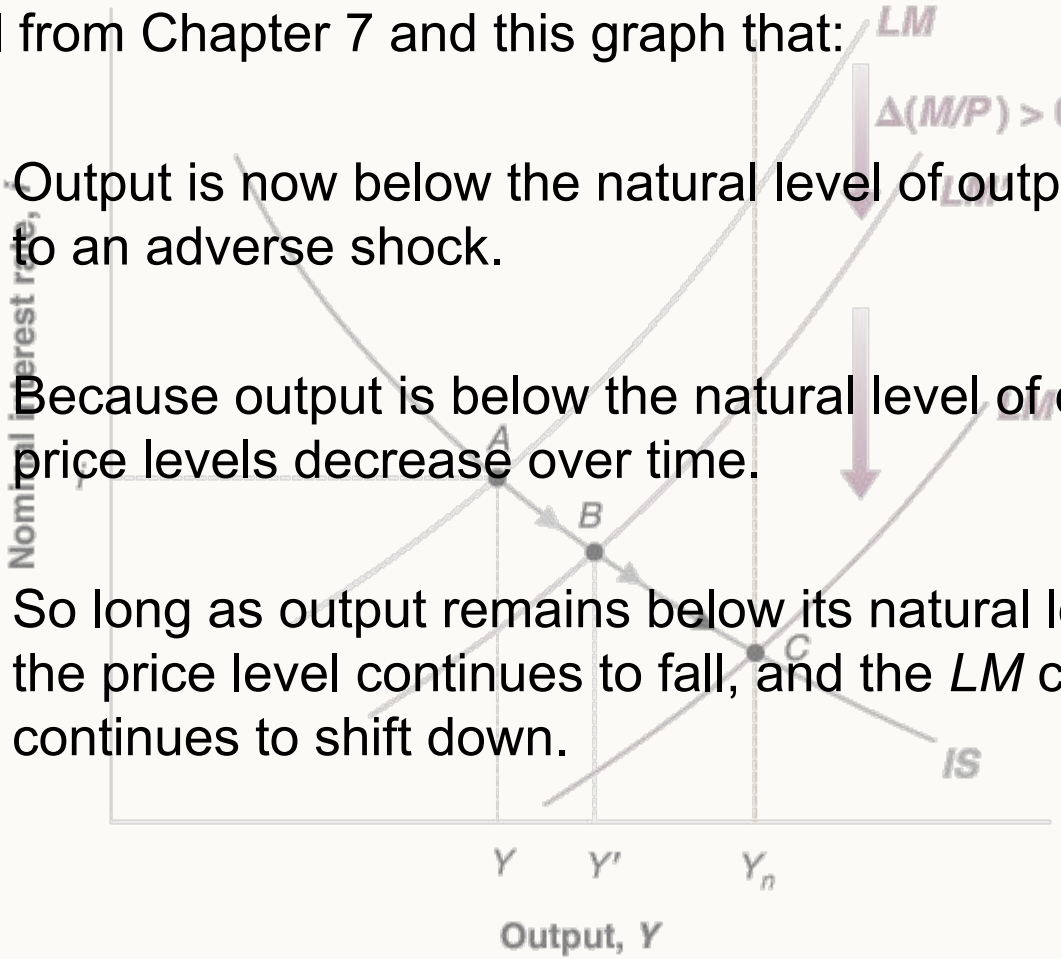
Low output leads to a decrease in the price level. The decrease in the price level leads to an increase in the real money stock. The *LM* curve shifts down and continues to shift down until output has returned to the natural level of output.



22-1 Disinflation, Deflation, and the Liquidity Trap

Recall from Chapter 7 and this graph that:

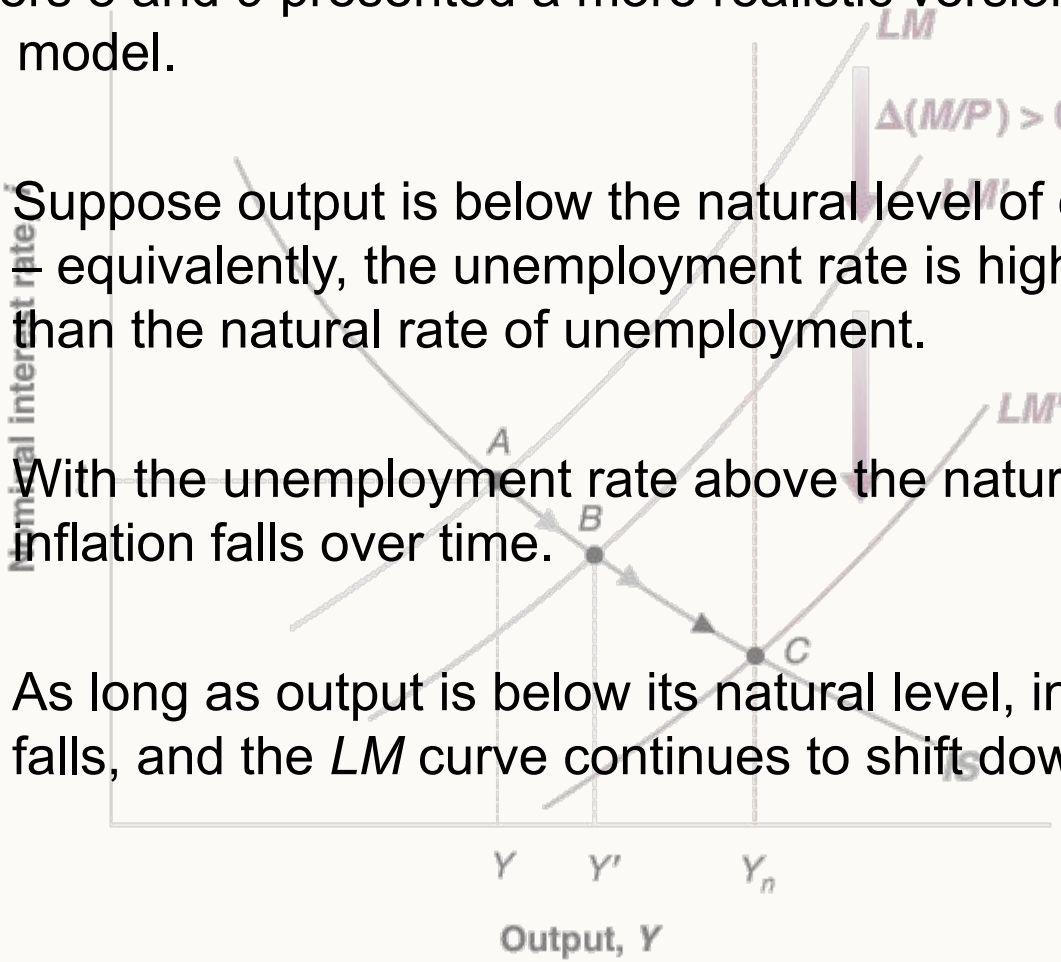
- Output is now below the natural level of output due to an adverse shock.
- Because output is below the natural level of output, price levels decrease over time.
- So long as output remains below its natural level, the price level continues to fall, and the *LM* curve continues to shift down.



22-1 Disinflation, Deflation, and the Liquidity Trap

Chapters 8 and 9 presented a more realistic version of the model.

- Suppose output is below the natural level of output – equivalently, the unemployment rate is higher than the natural rate of unemployment.
- With the unemployment rate above the natural rate, inflation falls over time.
- As long as output is below its natural level, inflation falls, and the *LM* curve continues to shift down.



22-1 Disinflation, Deflation, and the Liquidity Trap

The built-in mechanism that can lift economies out of recessions is this:

- Output below the natural level of output leads to lower inflation.
- Lower inflation leads in turn to higher real money growth.
- Higher real money growth leads to an increase in output over time.

This mechanism, however, is not foolproof.

The Nominal Interest Rate, the Real Interest Rate, and Expected Inflation

Recall from Chapter 14 that:

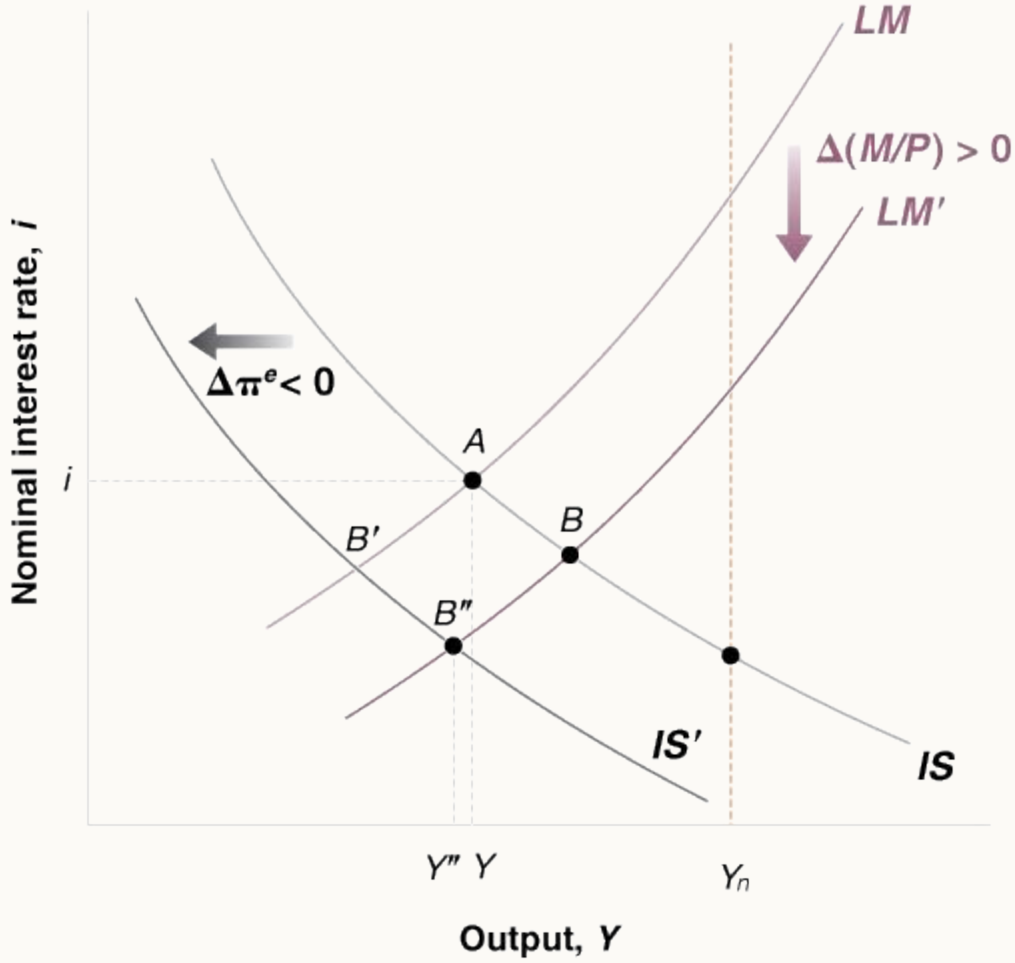
- What matters for spending decisions, and thus what enters the *IS* relation, is the *real interest rate*—the interest rate in terms of goods.
- What matters for the demand for money, and thus enters the *LM* relation, is the *nominal interest rate*—the interest rate in terms of dollars.

The Nominal Interest Rate, the Real Interest Rate, and Expected Inflation

Figure 22 – 2

The Effects of Lower Inflation on Output

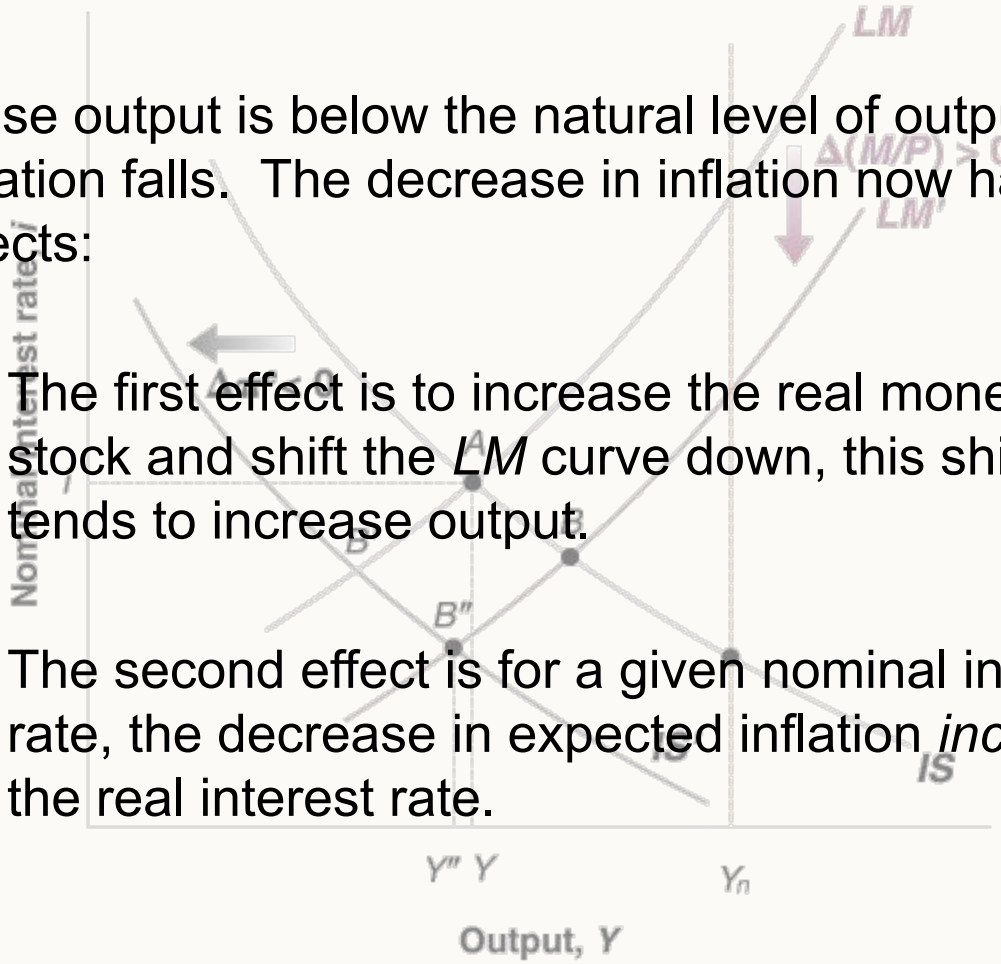
When inflation decreases in response to low output, there are two effects: (1) The real money stock increases, leading the *LM* curve to shift down, and (2) expected inflation decreases, leading the *IS* curve to shift to the left. The result may be a further decrease in output.



The Nominal Interest Rate, the Real Interest Rate, and Expected Inflation

Because output is below the natural level of output, inflation falls. The decrease in inflation now has two effects:

- The first effect is to increase the real money stock and shift the *LM* curve down, this shift tends to increase output.
- The second effect is for a given nominal interest rate, the decrease in expected inflation *increases* the real interest rate.

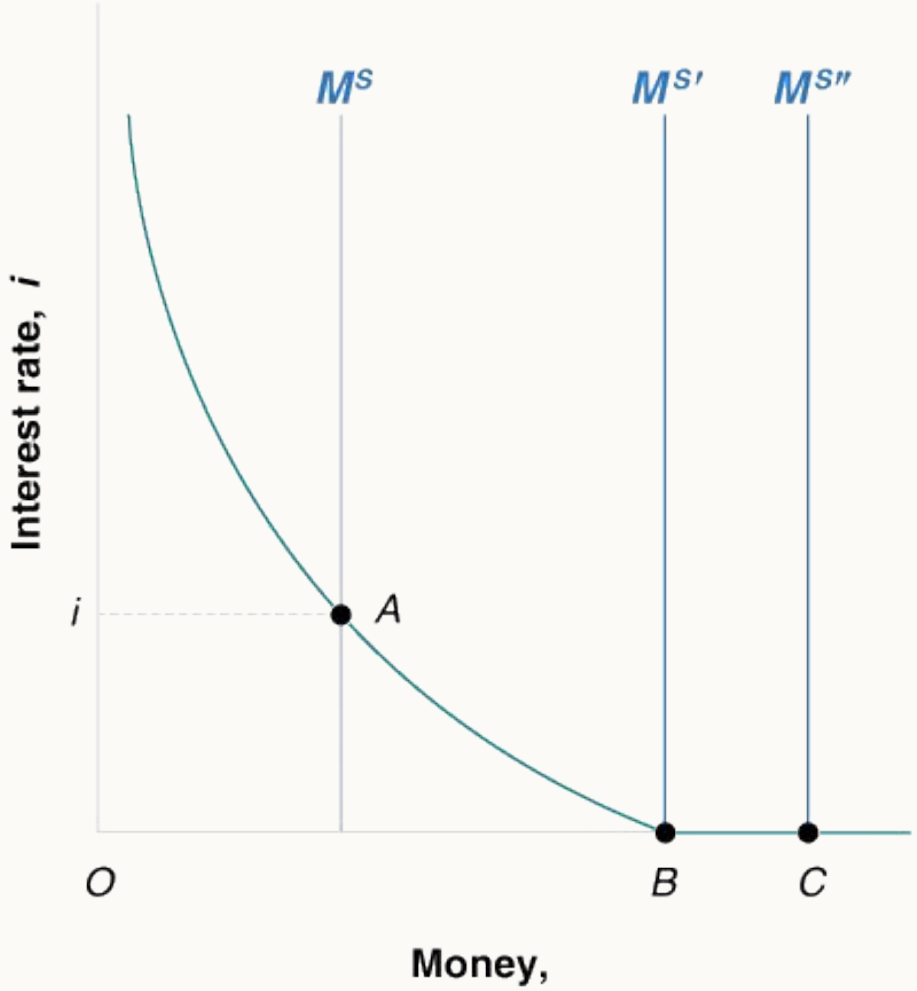


The Liquidity Trap

Figure 22 – 3

Money Demand, Money Supply, and the Liquidity Trap

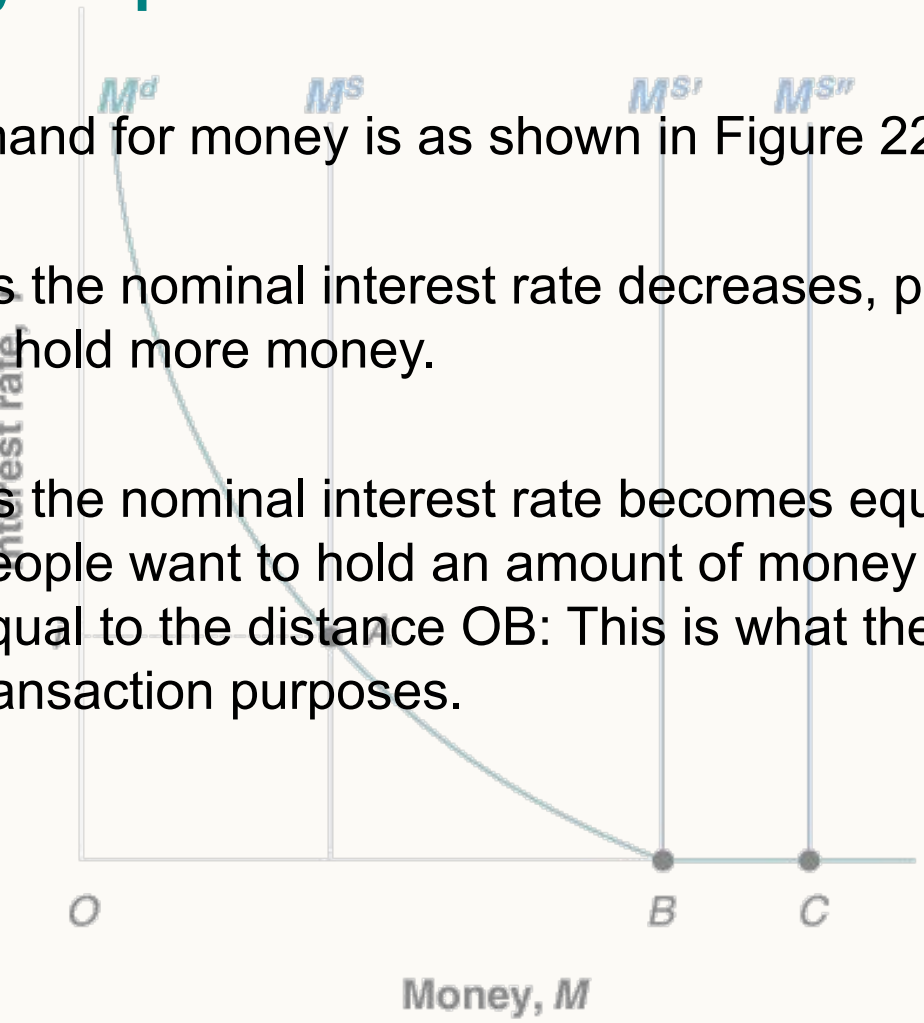
When the nominal interest rate is equal to zero, and once people have enough money for transaction purposes, they become indifferent between holding money and holding bonds. The demand for money becomes horizontal. This implies that, when the nominal interest rate is equal to zero, further increases in the money supply have no effect on the nominal interest rate.



The Liquidity Trap

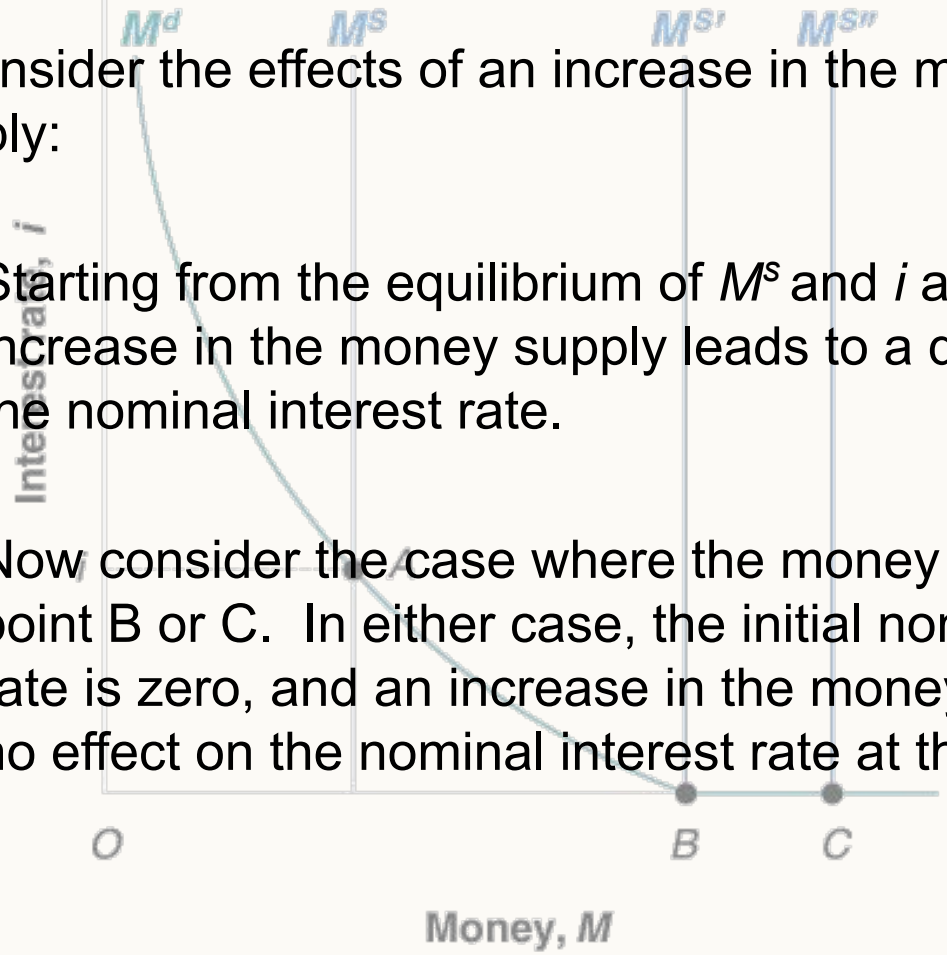
The demand for money is as shown in Figure 22-3.

- As the nominal interest rate decreases, people want to hold more money.
- As the nominal interest rate becomes equal to zero, people want to hold an amount of money at least equal to the distance OB: This is what they need for transaction purposes.



The Liquidity Trap

Now consider the effects of an increase in the money supply:



- Starting from the equilibrium of M^s and i at point A, an increase in the money supply leads to a decrease in the nominal interest rate.
- Now consider the case where the money supply is at point B or C. In either case, the initial nominal interest rate is zero, and an increase in the money supply has no effect on the nominal interest rate at this point.

The Liquidity Trap

The **liquidity trap** describes a situation in which expansionary monetary policy becomes powerless. The increase in money falls into a liquidity trap: People are willing to hold more money (*more liquidity*) at the same nominal interest rate.

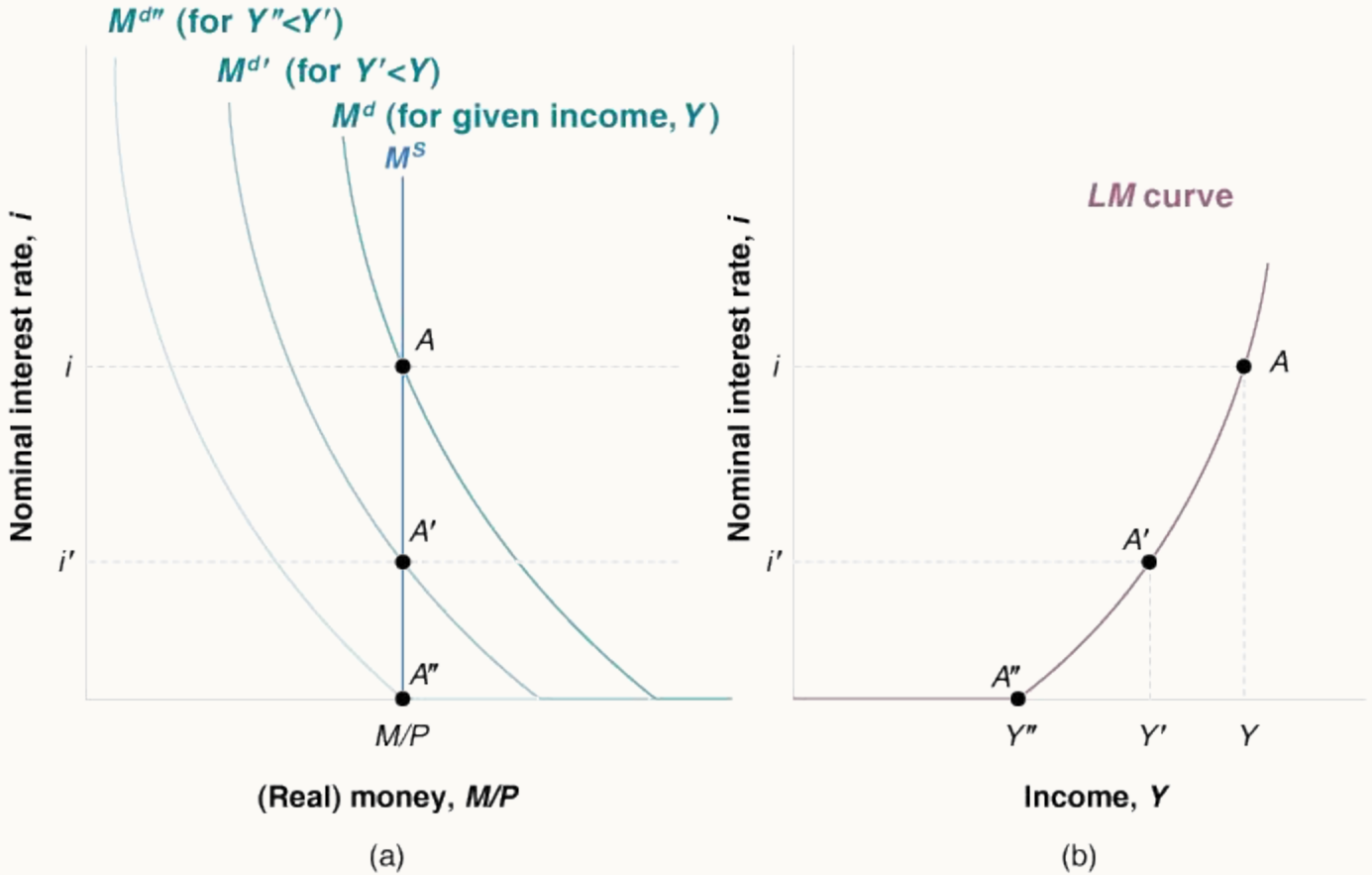
The central bank can increase "liquidity" but the additional money is willingly held by financial investors at an unchanged interest rate, namely, zero.

The Liquidity Trap

Figure 22 – 4

The Derivation of the* LM *Curve in the Presence of a Liquidity Trap

For low levels of output, the *LM* curve is a flat segment, with a nominal interest rate equal to zero. For higher levels of output, it is upward sloping: An increase in income leads to an increase in the nominal interest rate.



The Liquidity Trap

To derive the *LM* curve, Figure 22-4(a) looks at equilibrium in the financial markets for a given value of the real money stock and draws three money demand curves, each corresponding to a different level of income:

- The combination of income, *Y*, and nominal interest rate, *i*, gives us the first point on the *LM* curve, point *A* in Figure 22-4(b).
- Lower income means fewer transactions, and, therefore, a lower demand for money at any interest rate. This combination of income, *Y'*, and nominal interest rate, *i'*, gives us the second point on the *LM* curve, point *A'* in Figure 22-4(b).

The Liquidity Trap

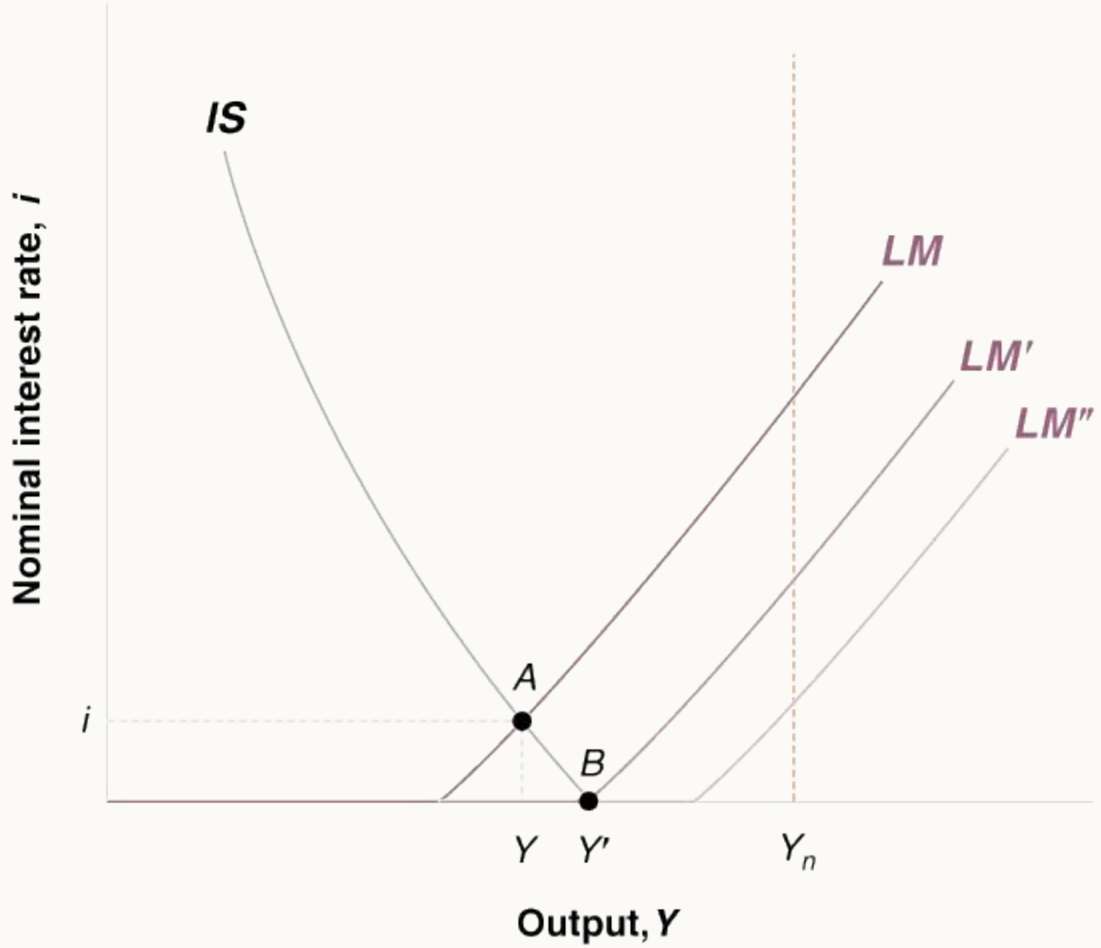
- The equilibrium is given by point *A"* in Figure 22-4(a), with nominal interest rate equal to zero. Point *A"* in Figure 22-4(b) corresponds to *A"* in Figure 22-4(a).
- The intersection between the money supply curve and the money demand curve takes place on the horizontal portion of the money demand curve. The equilibrium remains at *A"*, and the nominal interest rate remains equal to zero.

The Liquidity Trap

Figure 22 – 5

The* IS–LM *Model and the Liquidity Trap

In the presence of a liquidity trap, there is a limit to how much monetary policy can increase output. Monetary policy may not be able to increase output back to its natural level.



Putting Things Together: The Liquidity Trap and Deflation

The value of the real interest rate corresponding to a zero nominal interest rate depends on the rate of expected inflation. For example, if expected inflation is 10%, then:

- At a negative real interest rate of 10%, consumption and investment are likely to be very high. The liquidity trap is unlikely to be a problem when inflation is high.

$$r = i - \pi^e = 0\% - 10\% = -10\%$$

- If a country is in a recession, and the rate of inflation is negative, say 5%, then even if the nominal interest rate is zero, the real interest rate remains positive.

$$r = i - \pi^e = 0\% - (-5\%) = 5\%$$

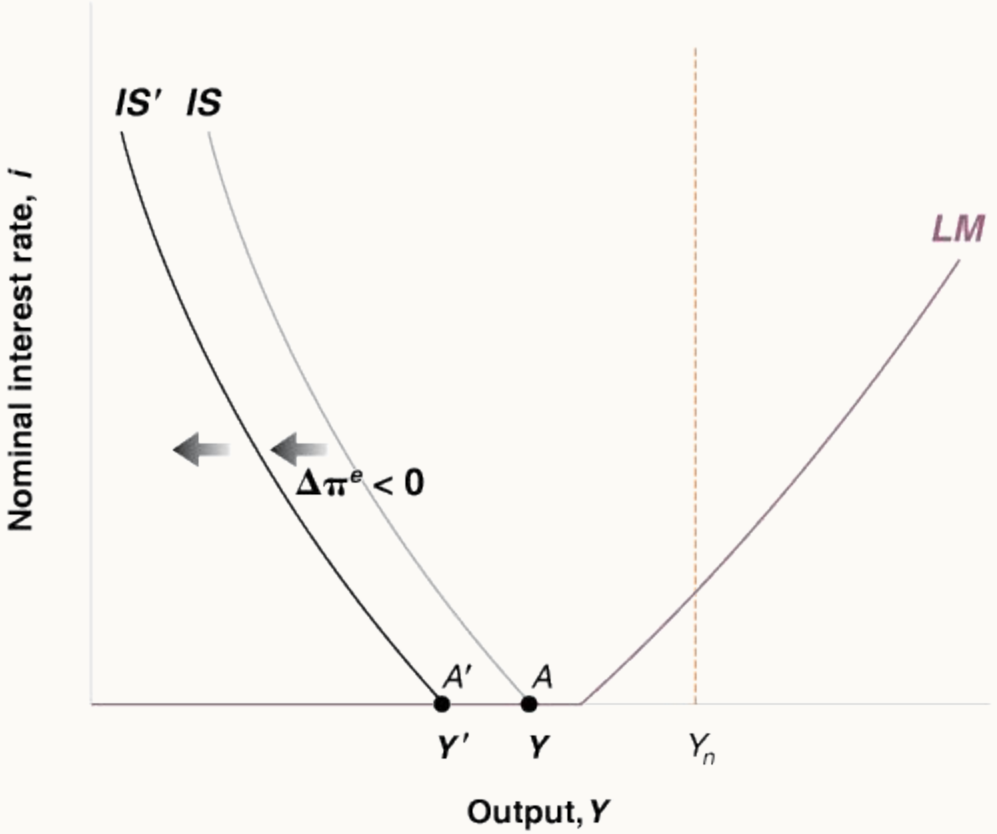
In this situation, there is nothing monetary policy can do to bring output above the natural level of output.

Putting Things Together: The Liquidity Trap and Deflation

Figure 22 – 6

The Liquidity Trap and Deflation

Suppose the economy is in a liquidity trap, and there is deflation. Output below the natural level of output leads to more deflation over time, which leads to a further increase in the real interest rate, and leads to a further shift of the IS curve to the left. This shift leads to a further decrease in output, which leads to more deflation, and so on.



In words: The economy caught in a vicious cycle: Low output leads to more deflation. More deflation leads to a higher real interest rate and even lower output, and there is nothing monetary policy can do about it.

Figure 22 – 7

The U.S. Unemployment Rate, 1920 to 1950

The Great Depression was characterized by a sharp increase in unemployment, followed by a slow decline.

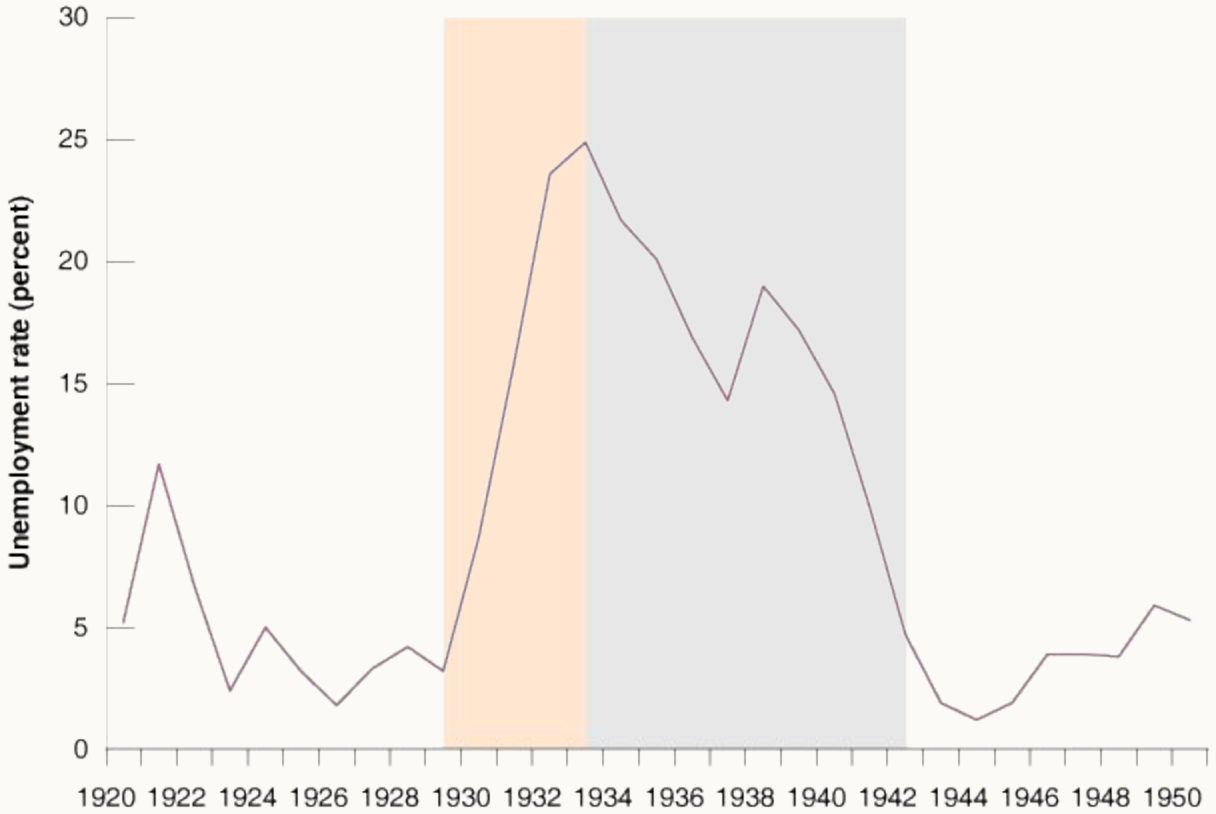


Table 22-1 U.S. Unemployment, Output Growth, Prices, and Money, 1929 to 1942

Year	Unemployment Rate (%)	Output Growth Rate (%)	Price Level	Nominal Money Stock
1929	3.2	−9.8	100.0	26.6
1930	8.7	−7.6	97.4	25.7
1931	15.9	−14.7	88.8	24.1
1932	23.6	−1.8	79.7	21.1
1933	24.9	9.1	75.6	19.9
1934	21.7	9.9	78.1	21.9
1935	20.1	13.9	80.1	25.9
1936	16.9	5.3	80.9	29.5
1937	14.3	−5.0	83.8	30.9
1938	19.0	8.6	82.2	30.5
1939	17.2	8.5	81.0	34.1
1940	14.6	16.1	81.8	39.6
1941	9.9	12.9	85.9	46.5
1942	4.7	13.2	95.1	55.3

Focusing only on unemployment and output for the moment, two facts emerge from the table:

- How sharply and how much output declined at the start of the depression.
- How long it then took for unemployment to recover.

The Initial Fall in Spending

A recession had actually started before the stock market crash of October, 1929. The crash, however, was important.

The stock market crash not only decreased consumers' wealth, it also increased their uncertainty about the future.

The Initial Fall in Spending

Figure 22 – 8

The S&P Composite Index, 1920 to 1950

From September 1929 to June 1932, the stock market index fell from 313 to 47 before it slowly recovered.

The Contraction in Nominal Money

The impact of the stock market crash was compounded by a major policy mistake, namely, a large decrease in the nominal money stock.

The relation between the money stock, *M*1, and the monetary base, *H*, is given by:

$$M1 = H \times \text{money multiplier}$$

The Contraction in Nominal Money

Table 22-2 Money, Nominal and Real, 1929 to 1933

Year	Nominal Money Stock, *M1*	Monetary Base, *H*	Money Multiplier, *M1/H*	Real Money Stock, *M1/P*
1929	26.6	7.1	3.7	26.4
1930	25.7	6.9	3.7	26.0
1931	24.1	7.3	3.3	26.5
1932	21.1	7.8	2.7	25.8
1933	19.4	8.2	2.4	25.6

During the Great Depression, the decrease in the money supply came from a decrease in the money multiplier (*M1*/*H*), as people shifted their money from checkable deposits to currency.

The decrease in the money supply was roughly proportional to the decrease in the price level. Consequently, the *LM* curve remained roughly unchanged.

The Adverse Effects of Deflation

The result of low output was strong deflation and a sharp increase in the real interest rate.

Table 22-3 The Nominal Interest Rate, Inflation, and the Real Interest Rate, 1929 to 1933

Year	One-Year Nominal Interest Rate (%), i	Inflation Rate (%), π	One-Year Real Interest Rate (%), r
1929	5.3	−0.0	5.3
1930	4.4	−2.5	6.9
1931	3.1	−9.2	12.3
1932	4.0	−10.8	14.8
1933	2.6	−5.2	7.8

The Recovery

Monetary policy played an important role in the recovery. From 1933 to 1941, the nominal money stock increased by 140% and the real money stock by 100%. These increases were due to increases in the monetary base, not the money multiplier.

Other factors that played an important role were:

The **New Deal**—a set of programs implemented by the Roosevelt administration.

The creation of the *Federal Deposit Insurance Corporation* (FDIC).

Other programs administered by the **National Recovery Administration (NRA).**

The Recovery

The puzzle is *why* deflation ended in 1933.

- One proximate cause may be the set of measures taken by the Roosevelt administration such as establishing the **National Industrial Recovery Act (NIRA)** of 1933.
- Another factor may be that while unemployment was still high, output growth was high as well.
- Another factor may be the perception of a "regime change" associated with the election of Roosevelt.

22-3 The Japanese Slump

The robust growth that Japan had experienced since the end of World War II came to an end in the early 1990s.

Since 1992, the economy has suffered from a long period of low growth—what is called the *Japanese slump*.

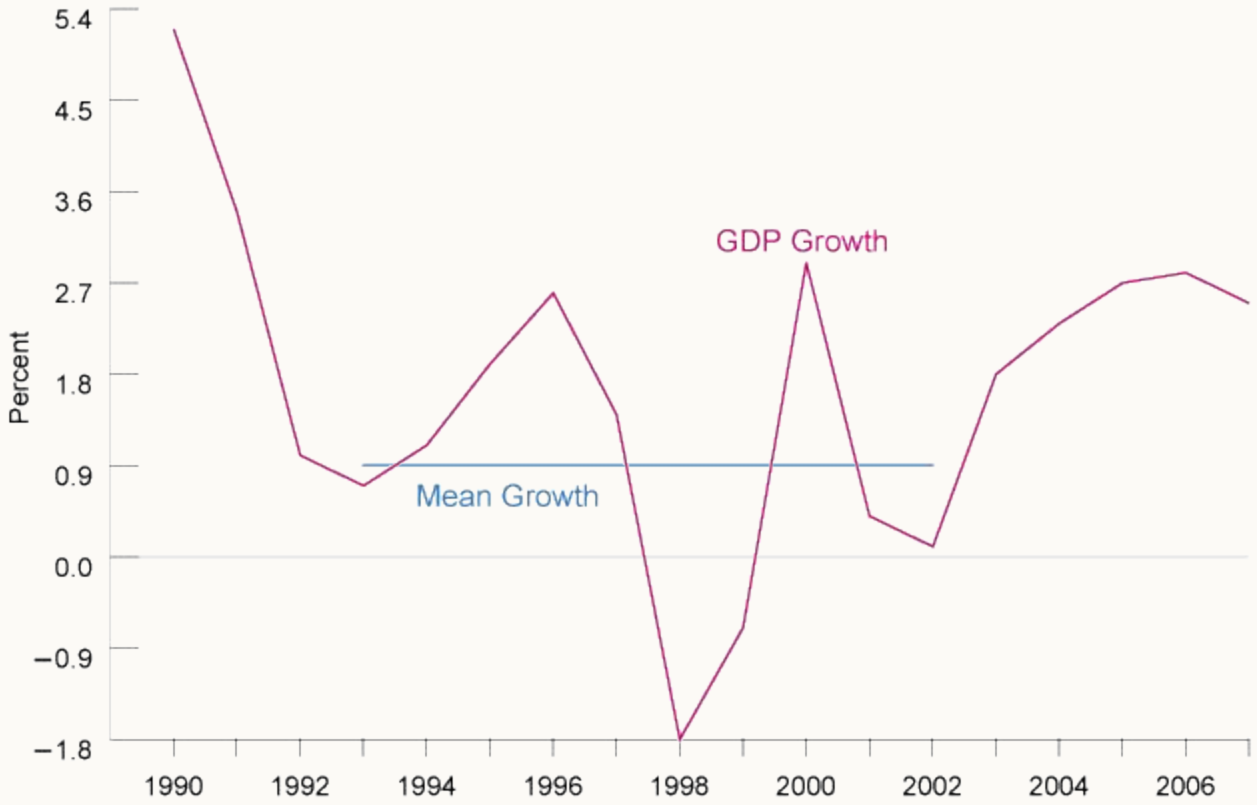
Low growth has led to a steady increase in unemployment, and a steady decrease in the inflation rate over time.

22-3 The Japanese Slump

Figure 22 – 9

The Japanese Slump: Output Growth since 1990 (percent)

From 1992 to 2002, average GDP growth in Japan was less than 1%.

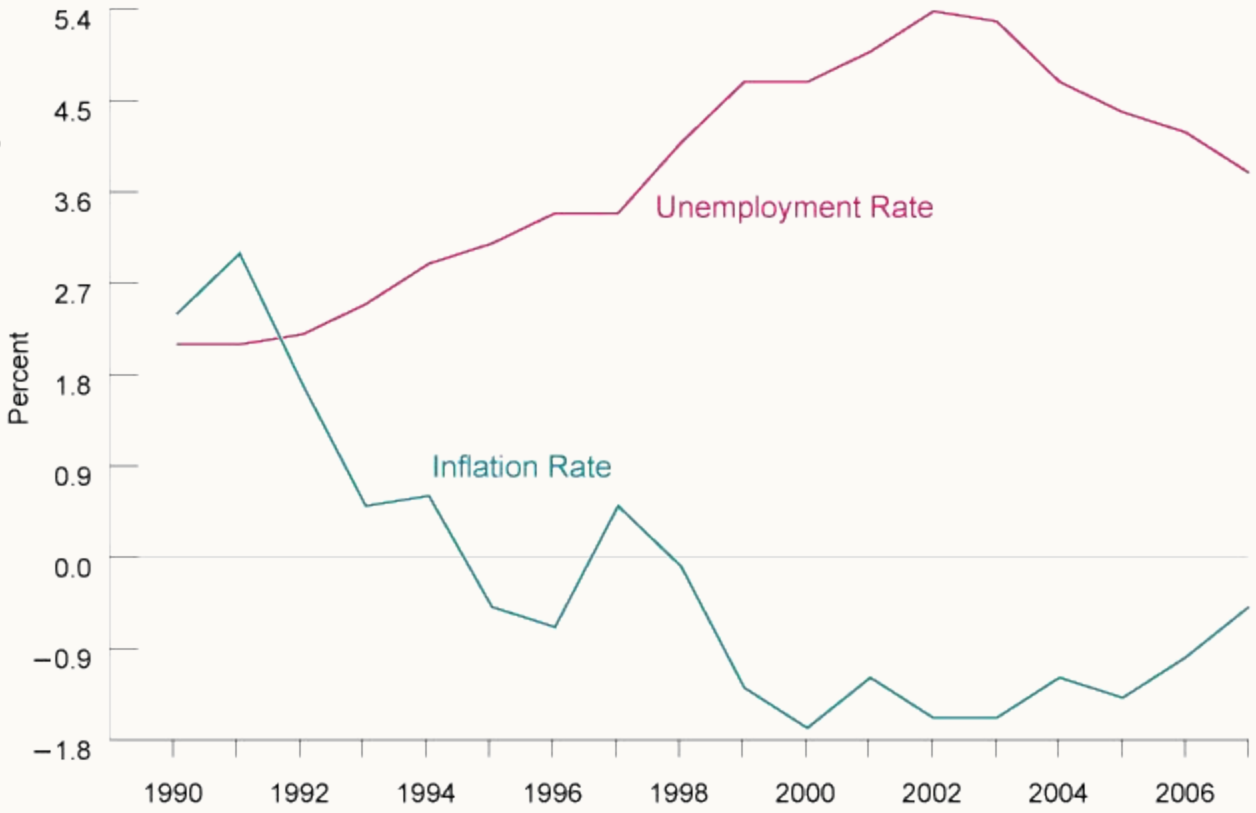


22-3 The Japanese Slump

Figure 22 – 10

Unemployment and Inflation in Japan since 1990 (percent)

Low growth in output has led to an increase in unemployment. Inflation has turned into deflation.



22-3 The Japanese Slump

Table 22-4 GDP, Consumption, and Investment Growth, Japan, 1988-1993

Year	GDP (%)	Consumption (%)	Investment (%)
1988	6.5	5.1	15.5
1989	5.3	4.7	15.0
1990	5.2	4.6	10.1
1991	3.4	2.9	4.3
1992	1.0	2.6	−7.1
1993	0.2	1.4	−10.3

The numbers in Table 22-4 raise an obvious set of questions:

What triggered Japan's slump? Why did it last so long? Were monetary and fiscal policies misused, or did they fail? What are the factors behind the current recovery?

The Rise and Fall of the Nikkei

There are two reasons for the increase in a stock price:

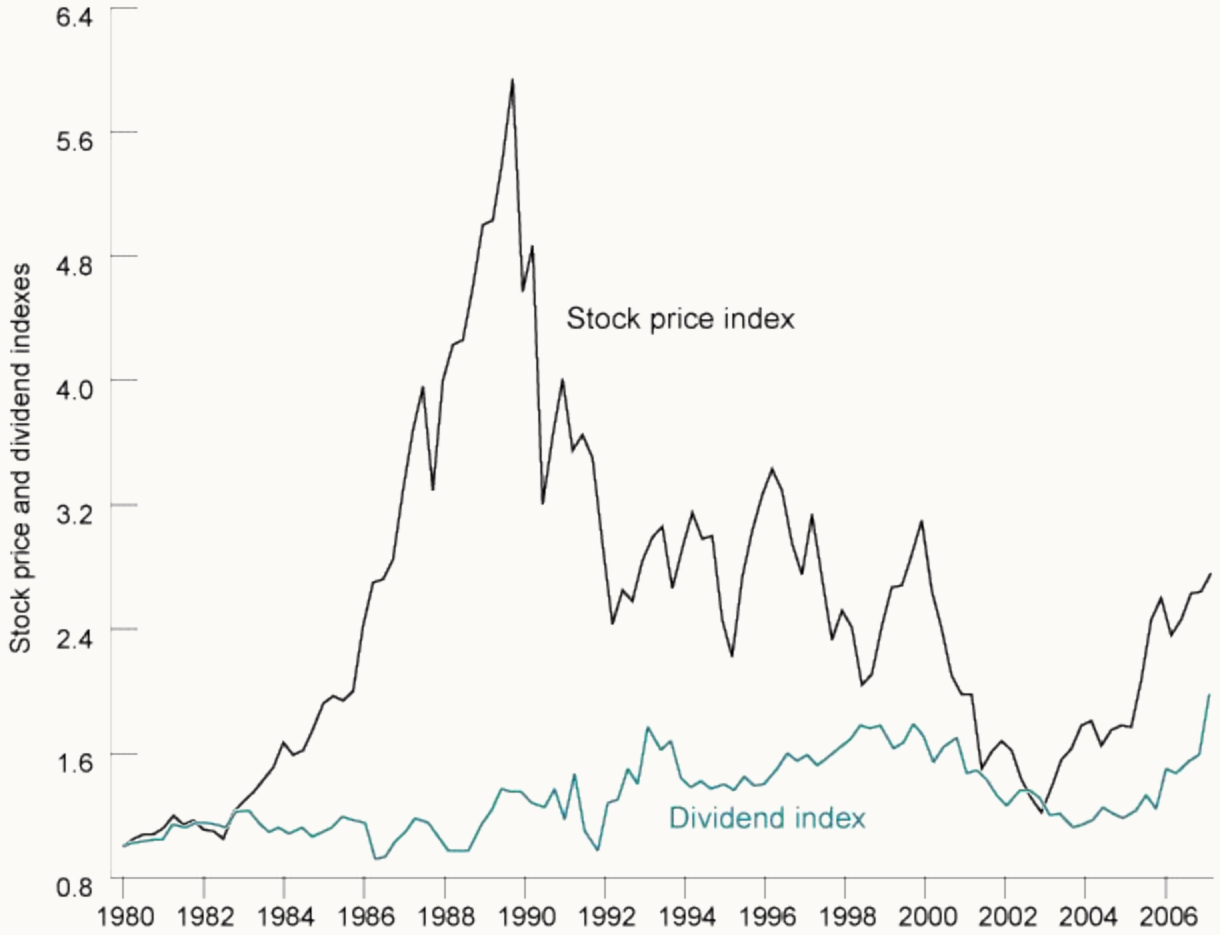
- A change in the fundamental value of the stock price, which depends on the expected present value of future dividends.
- A speculative bubble: Investors buy at a higher price simply because they expect the price to go even higher in the future.

The Rise and Fall of the Nikkei

Figure 22 – 11

Stock Prices and Dividends in Japan since 1980

The increase in stock prices in the 1980s and the subsequent decrease were not associated with a parallel movement in dividends.



The Rise and Fall of the Nikkei

The fact that dividends remained flat while stock prices increased strongly suggests that a large bubble existed in the Nikkei.

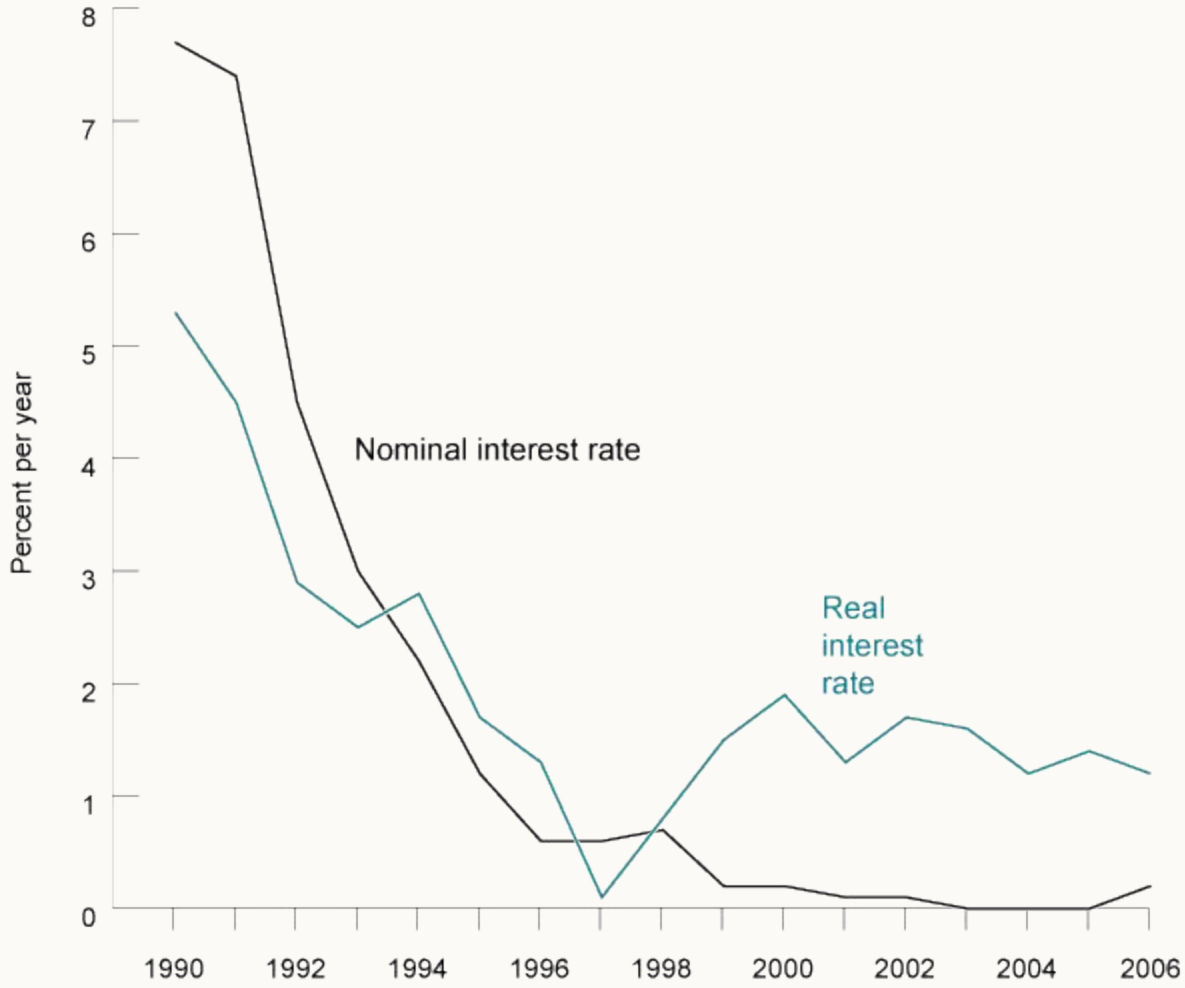
The rapid fall in stock prices had a major impact on spending—consumption was less affected, but investment collapsed.

The Failure of Monetary and Fiscal Policy

Figure 22 – 12

The Nominal Interest Rate and the Real Interest Rate in Japan since 1990

Japan has been in a liquidity trap since the mid-1990s: The nominal interest rate has been close to zero, and the inflation rate has been negative. Even at a zero nominal interest rate, the real interest rate has been positive.



The Failure of Monetary and Fiscal Policy

Monetary policy was used, but it was used too late, and when it was used, if faced the twin problems of the liquidity trap and deflation.

The Bank of Japan (*BoJ*) cut the nominal interest rate, but it did so slowly, and the cumulative effect of low growth was such that inflation had turned to deflation. As a result, the real interest rate was higher than the nominal interest rate.

The Failure of Monetary and Fiscal Policy

Fiscal policy was used as well. Taxes decreased at the start of the slump, and there was a steady increase in government spending throughout the decade.

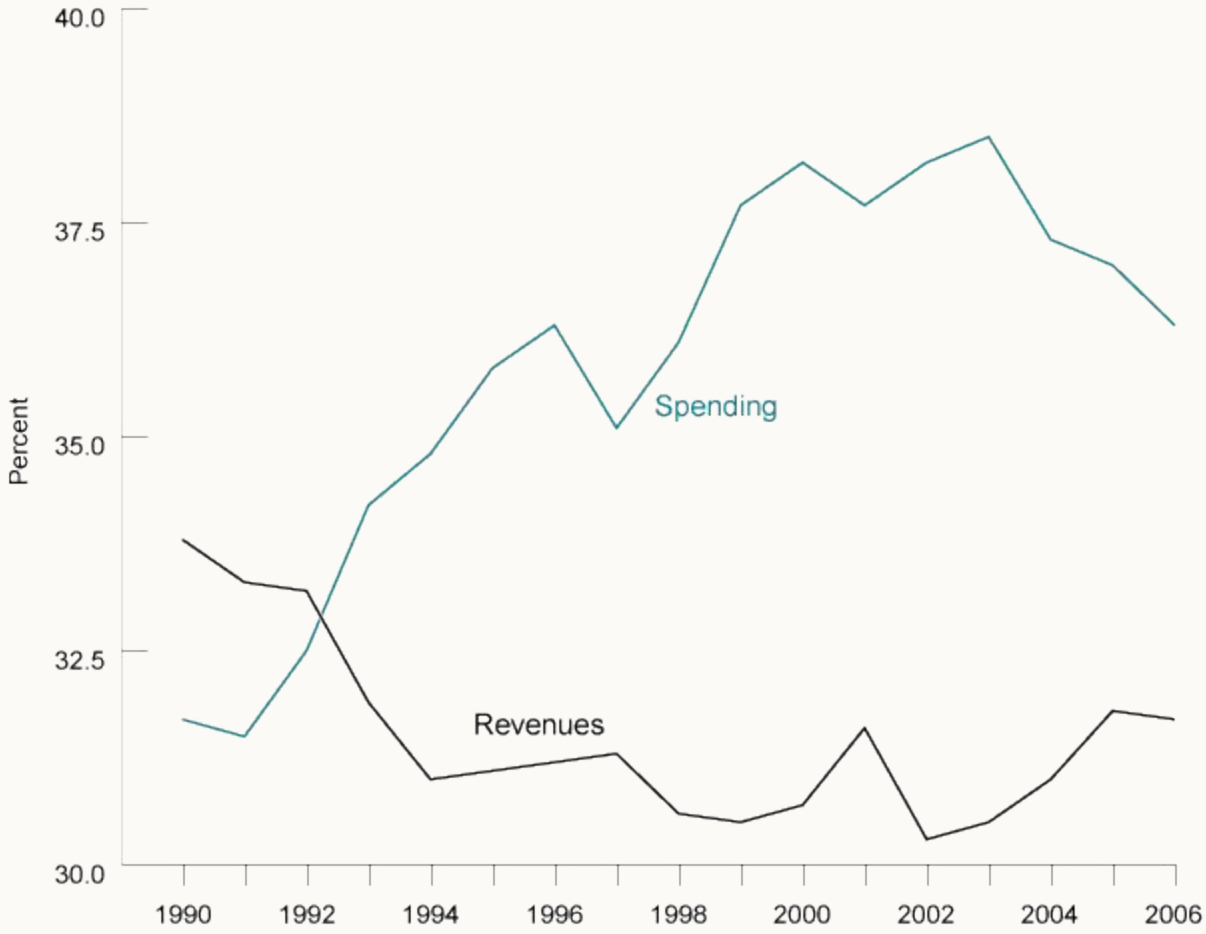
Fiscal policy helped, but it was not enough to increase spending and output.

The Failure of Monetary and Fiscal Policy

Figure 22 – 13

Government Spending and Revenues (as a percentage of GDP) in Japan since 1990

Government spending increased and government revenues decreased steadily throughout the 1990s, leading to steadily larger deficits.



The Japanese Recovery

Output growth has been higher since 2003, and most economists cautiously predict that the recovery will continue. This raises the last set of questions. What are the factors behind the current recovery?

There appear to be two main factors.

The Japanese Recovery

A Regime Change in Monetary Policy

It is suggested that even if the nominal interest rate is already equal to zero and thus cannot be reduced further, the central bank might still be able to lower the real interest rate by affecting inflation expectations.

The Cleanup of the Banking System

It became clear in the 1990s that the banking system in Japan was in trouble. Since 2002, the government has put increasing pressure on banks to reduce *bad loans*, and banks, in turn, have put increasing pressure on bad firms to restructure or close.

The Japanese Banking Problem

FOCUS

Like the Great Depression in the U.S., the sharp decrease in output growth in Japan in the early 1990s left many firms unable to repay their bank loans.

Assets	Liabilities
Loan: $100	Deposits: $50 Net worth: $50

Figure 1 ***The Bank's Balance Sheet***

Key Terms

- depression
- slump
- liquidity trap
- New Deal
- National Recovery Administration (NRA)
- National Industrial Recovery Act (NIRA)

