

Figure 8.1

A business cycle

The solid curve graphs the behavior of aggregate economic activity over a typical business cycle. The dashed line shows the economy's normal growth path. During a contraction aggregate economic activity falls until it reaches a trough, *T*. The trough is followed by an expansion during which economic activity increases until it reaches a peak, *P*. A complete cycle is measured from peak to peak or trough to trough.

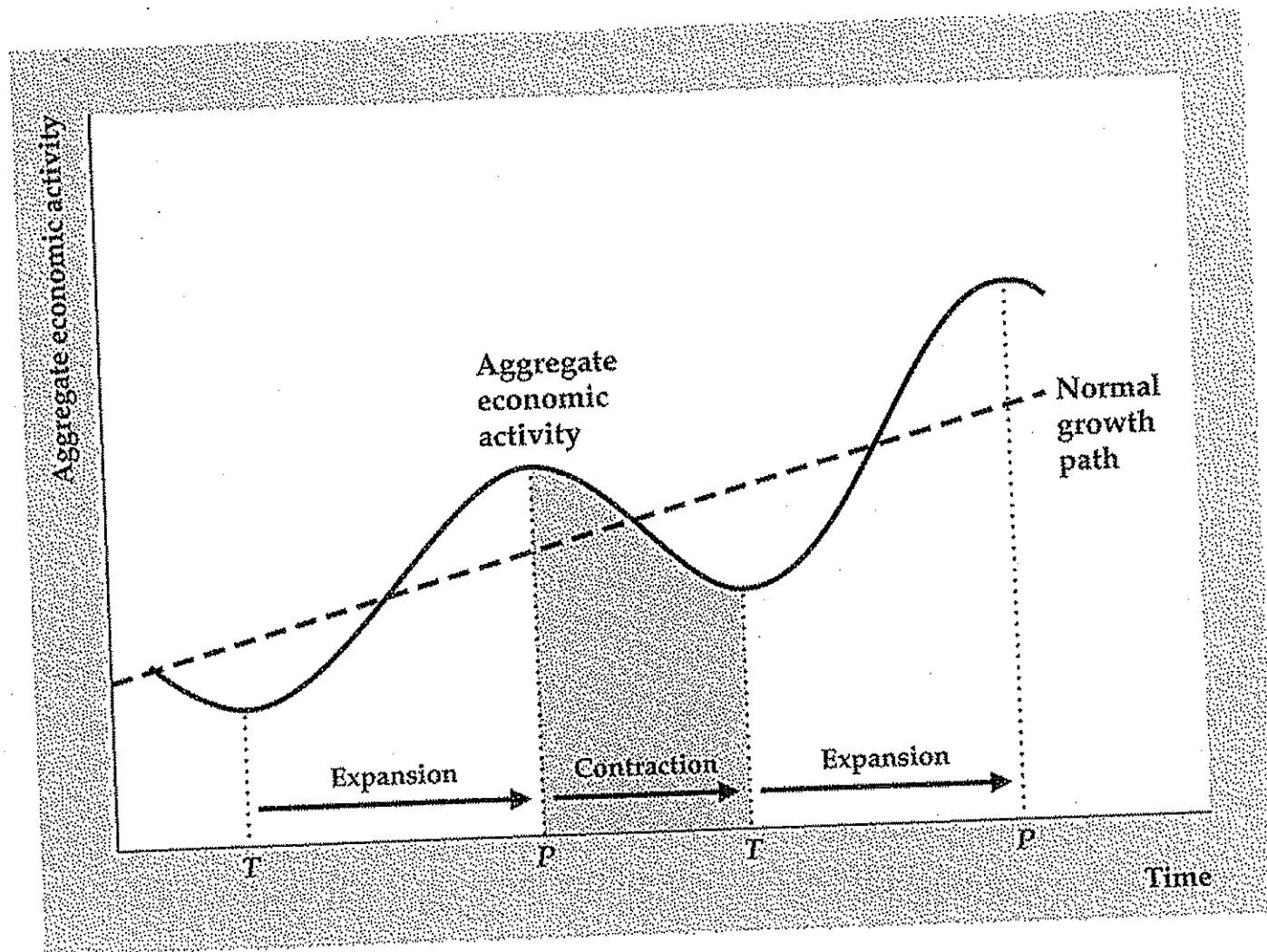


Table 8.1**NBER Business Cycle Turning Points and Durations of Post-1854 Business Cycles**

Trough	Expansion (months from trough to peak)	Peak	Contraction (months from peak to next trough)
Dec. 1854	30	June 1857	18
Dec. 1858	22	Oct. 1860	8
June 1861	46 (Civil War)	Apr. 1865	32
Dec. 1867	18	June 1869	18
Dec. 1870	34	Oct. 1873	65
Mar. 1879	36	Mar. 1882	38
May 1885	22	Mar. 1887	13
Apr. 1888	27	July 1890	10
May 1891	20	Jan. 1893	17
June 1894	18	Dec. 1895	18
June 1897	24	June 1899	18
Dec. 1900	21	Sept. 1902	23
Aug. 1904	33	May 1907	13
June 1908	19	Jan. 1910	24
Jan. 1912	12	Jan. 1913	23
Dec. 1914	44 (WWI)	Aug. 1918	7
Mar. 1919	10	Jan. 1920	18
July 1921	22	May 1923	14
July 1924	27	Oct. 1926	13
Nov. 1927	21	Aug. 1929	43 (Depression)
Mar. 1933	50	May 1937	13 (Depression)
June 1938	80 (WWII)	Feb. 1945	8
Oct. 1945	37	Nov. 1948	11
Oct. 1949	45 (Korean War)	July 1953	10
May 1954	39	Aug. 1957	8
Apr. 1958	24	Apr. 1960	10
Feb. 1961	106 (Vietnam War)	Dec. 1969	11
Nov. 1970	36	Nov. 1973	16
Mar. 1975	58	Jan. 1980	6
July 1980	12	July 1981	16
Nov. 1982	92	July 1990	8
Mar. 1991	120	Mar. 2001	8
Nov. 2001	73	Dec. 2007	

Source: NBER Web site, www.nber.org/cycles.html.

Figure 8.2

**GDP growth,
1960–2009**

The chart shows the annualized quarterly growth rate of seasonally adjusted GDP from the first quarter of 1960 to the second quarter of 2009. The growth rate is more volatile before 1984 than after 1984.

Source: Authors' calculations from data on real GDP from the Federal Reserve Bank of St. Louis FRED database, research.stlouisfed.org/fred2/GDPC1.

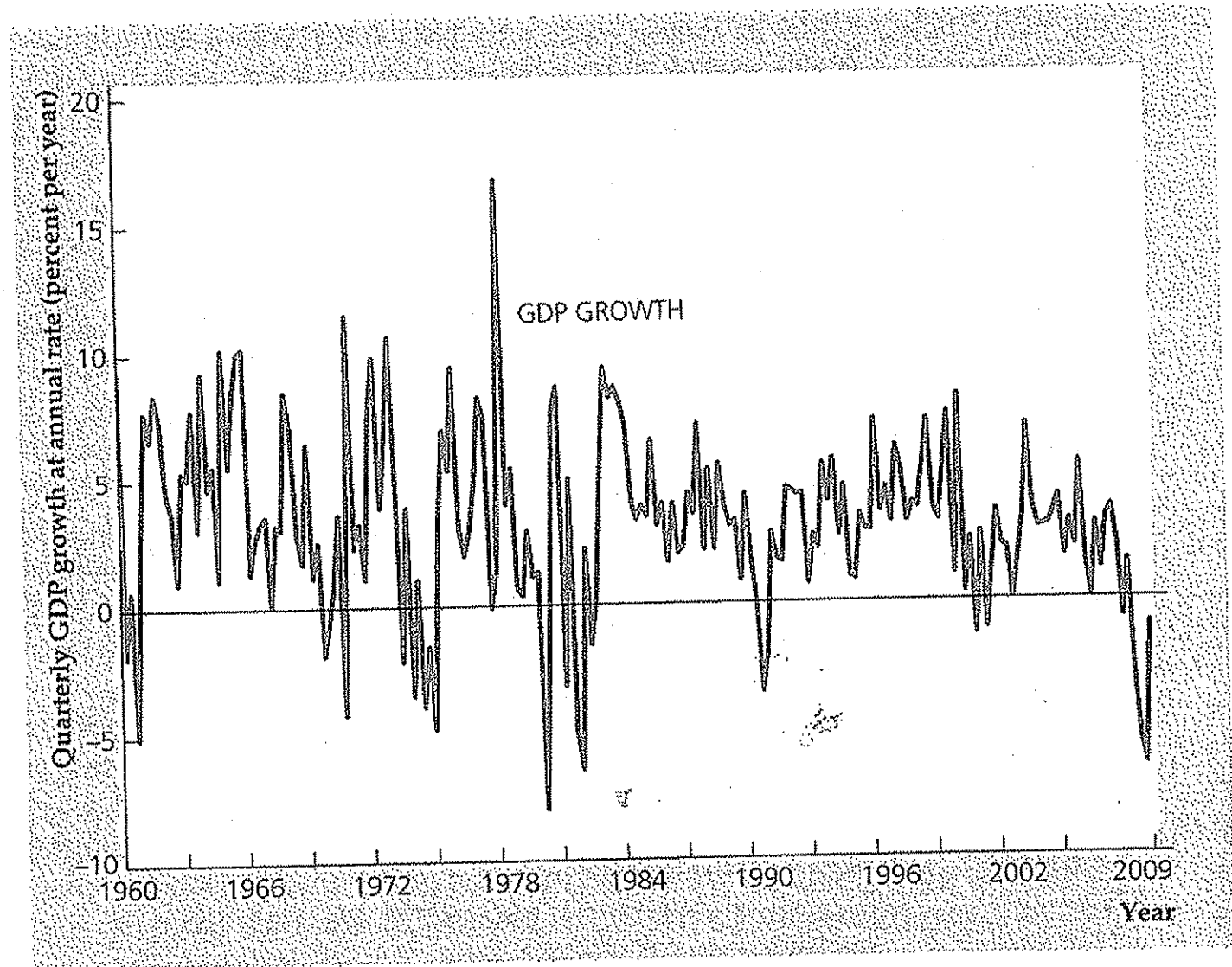


Figure 8.3

Standard deviation of GDP growth, 1960–2009

The chart shows the standard deviation of the annualized quarterly growth rate of GDP, over seven-year periods, from 1960 to 2009. The seven-year standard deviation fell sharply in about 1984, but rose during the recession that began in 2007.

Source: Authors' calculations from data on real GDP from the Federal Reserve Bank of St. Louis FRED database, research.stlouisfed.org/fred2/GDPC1.

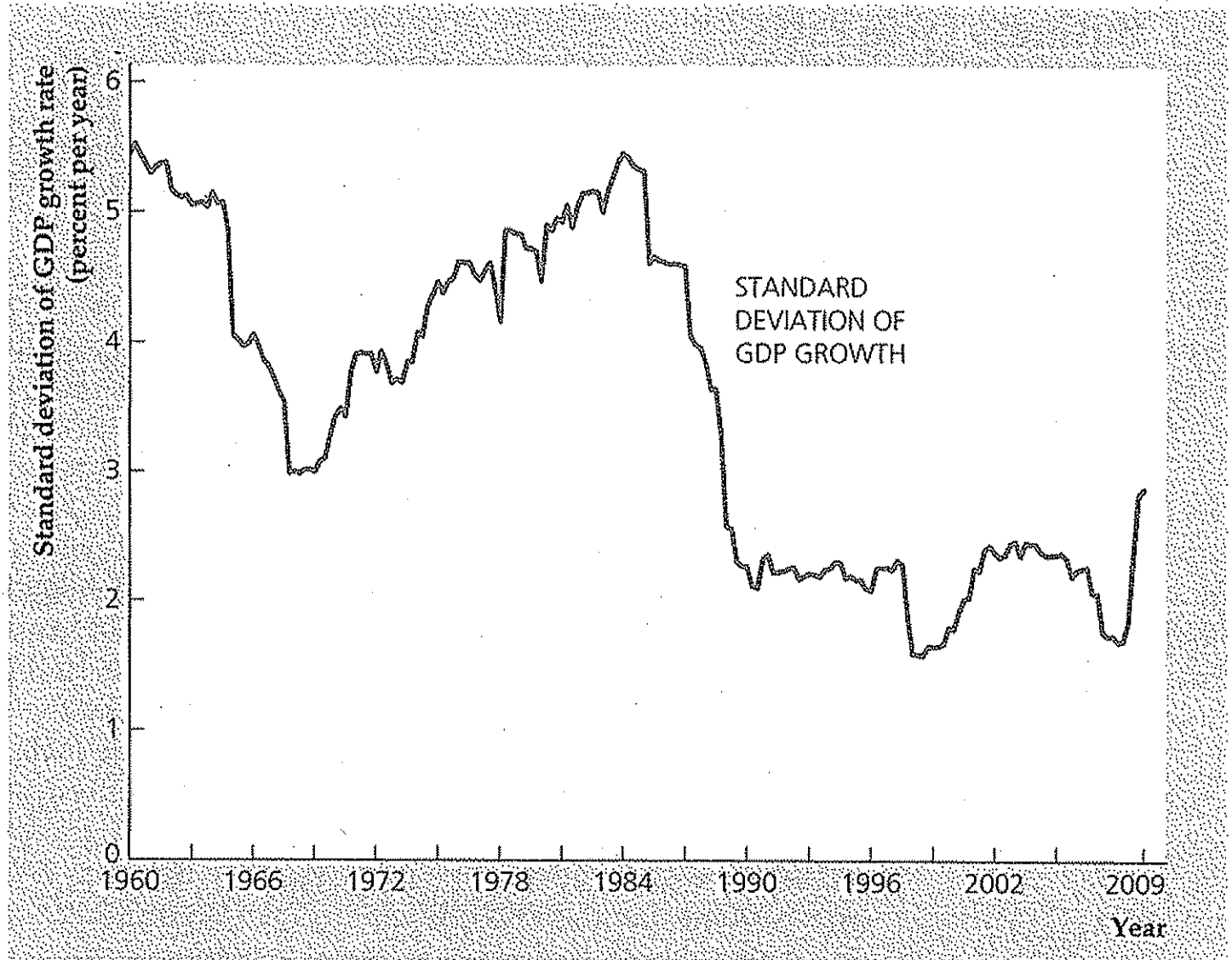
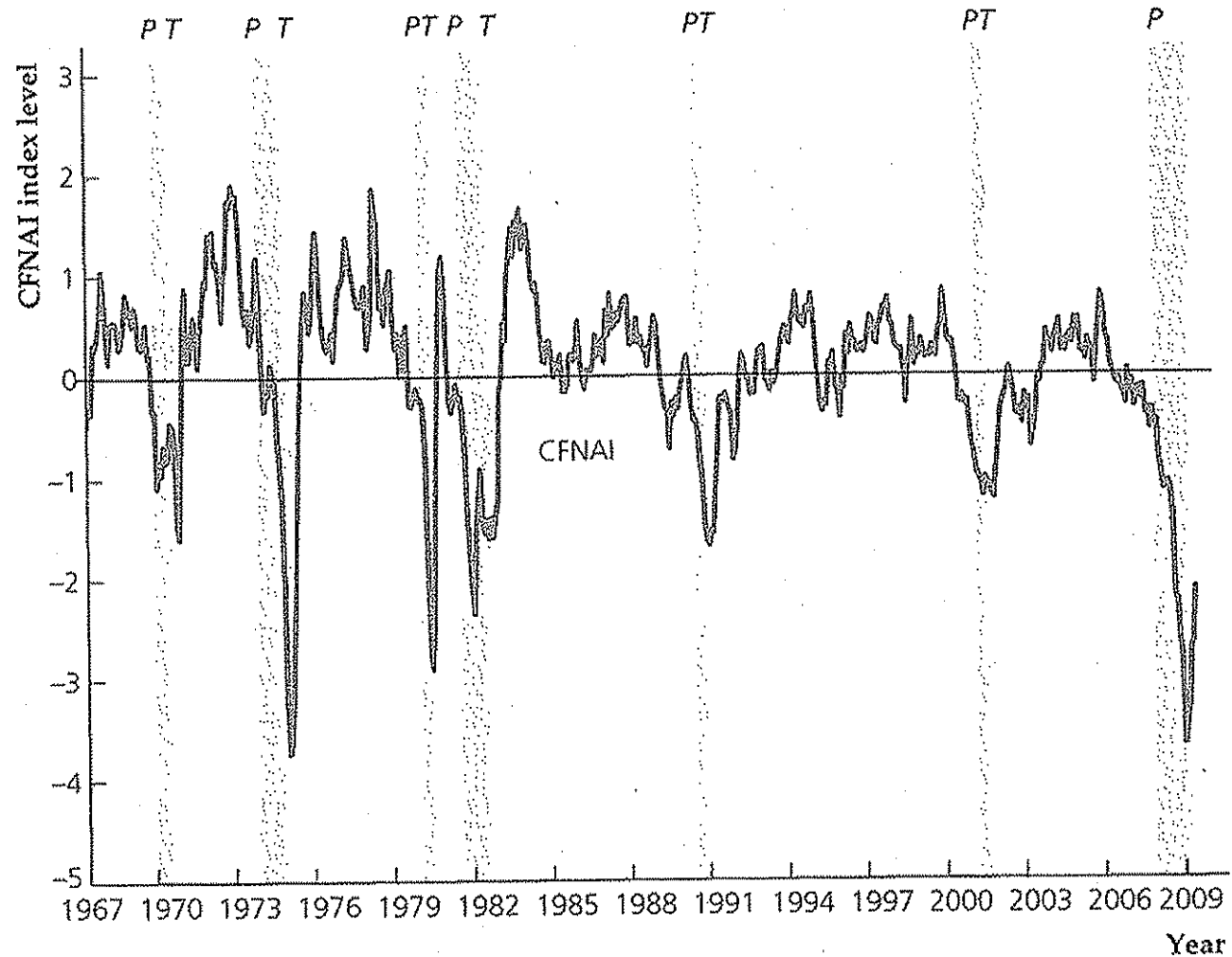


Figure 8.4

Chicago Fed National Activity Index, 1967–2009

The chart shows monthly data on the Chicago Fed National Activity Index (CFNAI), averaged over the current and preceding two months. The peaks and troughs of the business cycle are shown by the vertical lines. P and T. The shaded areas represent recessions. The index tracks recessions closely, falling more in severe recessions than in mild recessions.

Source: Federal Reserve Bank of Chicago Web site, www.chicagofed.org/economic_research_and_data/cfnai.cfm.



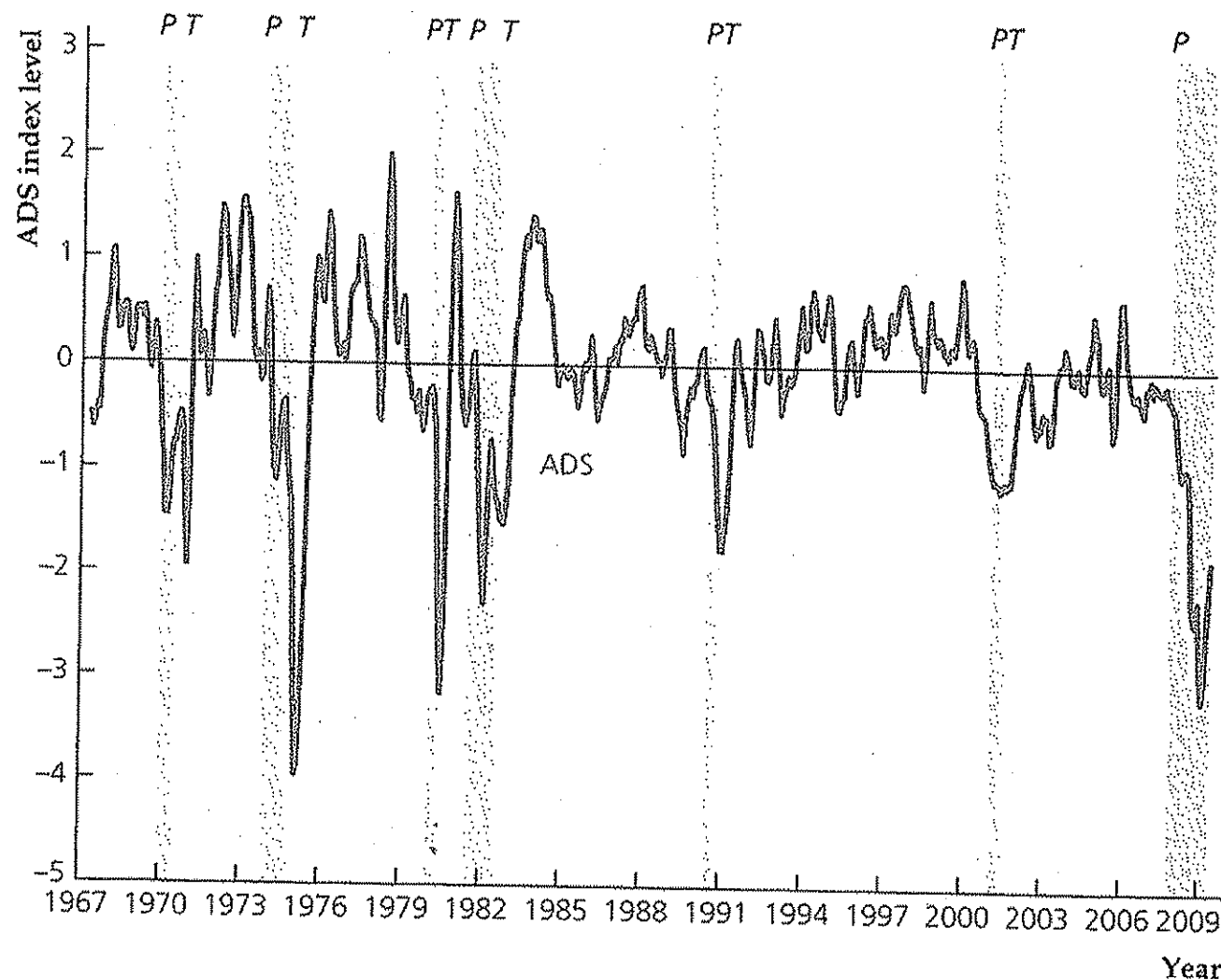
**For more details about the CFNAI, see the article by Charles L. Evans, Chin Te Liu, and Genevieve Pham-Kanter, "The 2001 Recession and the Chicago Fed National Activity Index: Identifying Business Cycle Turning Points," Federal Reserve Bank of Chicago *Economic Perspectives*, Third Quarter 2002, pp. 26–43; or read the discussion on the Chicago Fed's Web site at www.chicagofed.org/economic_research_and_data/cfnai.cfm.

Figure 8.5

ADS Business Conditions Index, 1967–2009

The chart shows monthly data on the ADS Business Conditions Index, averaged over the current and preceding two months. Like the CFNAI, the index tracks recessions closely, falling more in severe recessions than in mild recessions.

Source: Authors' calculations from data on Federal Reserve Bank of Philadelphia Web site, www.philadelphiafed.org/research-and-data/real-time-center/business-conditions-index.



***For more on the ADS index, see S. Boragan Aruoba, Francis X. Diebold, and Chiara Scotti, "Real-Time Measurement of Business Conditions," *Journal of Business and Economic Statistics*, October 2009, pp. 417–427; the ADS index data are available at the Philadelphia Fed's Web site at www.philadelphiafed.org/research-and-data/real-time-center/business-conditions-index.

(continued)

Production

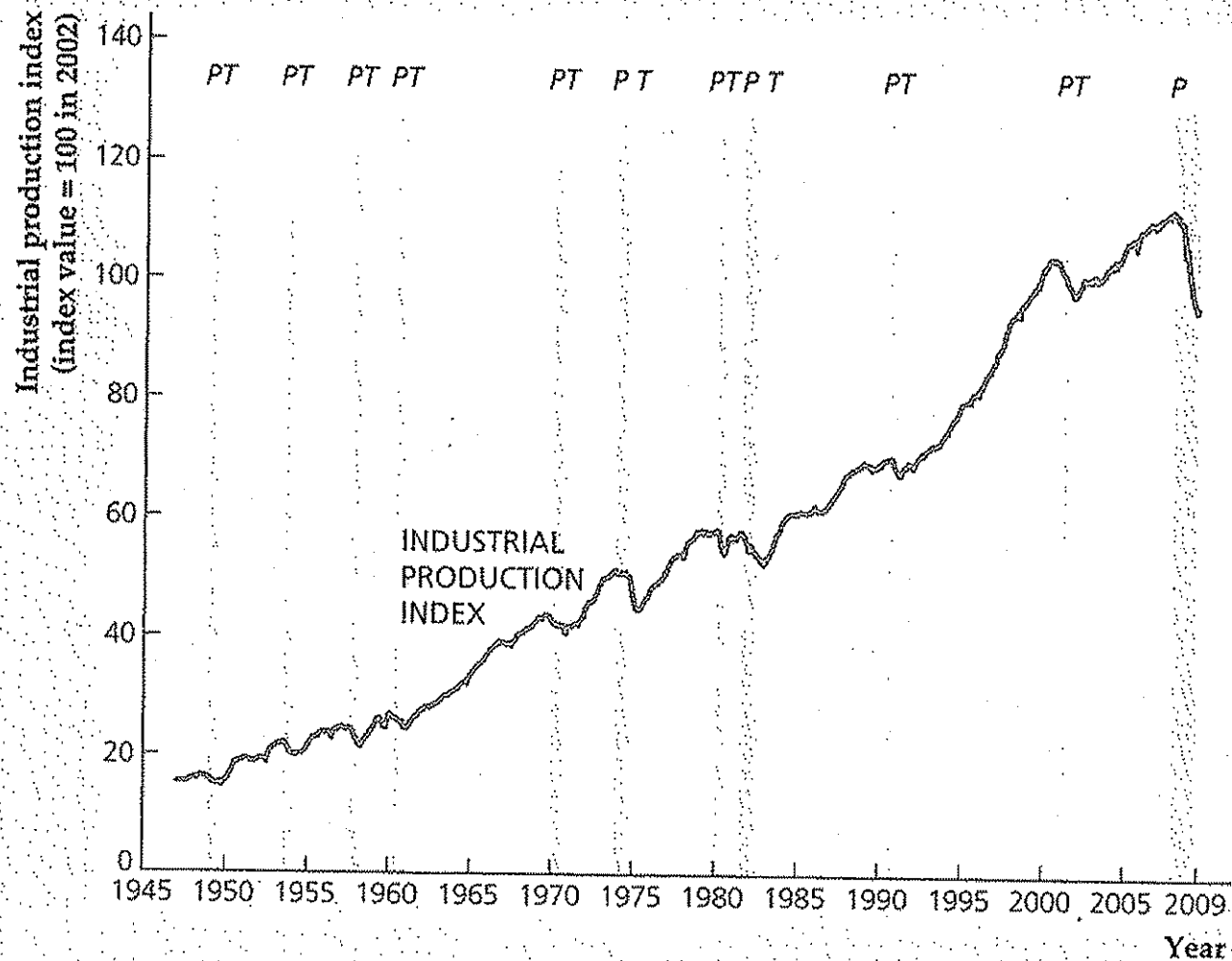
Because the level of production is a basic indicator of aggregate economic activity, peaks and troughs in production tend to occur at about the same time as peaks and troughs in aggregate economic activity. Thus production is a coincident and procyclical variable. Figure 8.6 shows the behavior of the industrial production index

Figure 8.6

Cyclical behavior of the index of industrial production, 1947-2009

The index of industrial production, a broad measure of production in manufacturing, mining, and utilities, is procyclical and coincident.

Source: Federal Reserve Bank of St. Louis FRED database at research.stlouisfed.org/fred2/series/INDPRO.



SUMMARY 10

The Cyclical Behavior of Key Macroeconomic Variables (The Business Cycle Facts)

Variable	Direction	Timing
Production		
Industrial production	Procyclical	Coincident
<i>Durable goods industries are more volatile than nondurable goods and services</i>		
Expenditure		
Consumption	Procyclical	Coincident
Business fixed investment	Procyclical	Coincident
Residential investment	Procyclical	Leading
Inventory investment	Procyclical	Leading
Government purchases	Procyclical	— ^a
<i>Investment is more volatile than consumption</i>		
Labor Market Variables		
Employment	Procyclical	Coincident
Unemployment	Countercyclical	Unclassified ^b
Average labor productivity	Procyclical	Leading ^a
Real wage	Procyclical	— ^a
Money Supply and Inflation		
Money supply	Procyclical	Leading
Inflation	Procyclical	Lagging
Financial Variables		
Stock prices	Procyclical	Leading
Nominal interest rates	Procyclical	Lagging
Real interest rates	Acyclical	— ^a

^aTiming is not designated by The Conference Board.

^bDesignated as "unclassified" by The Conference Board.

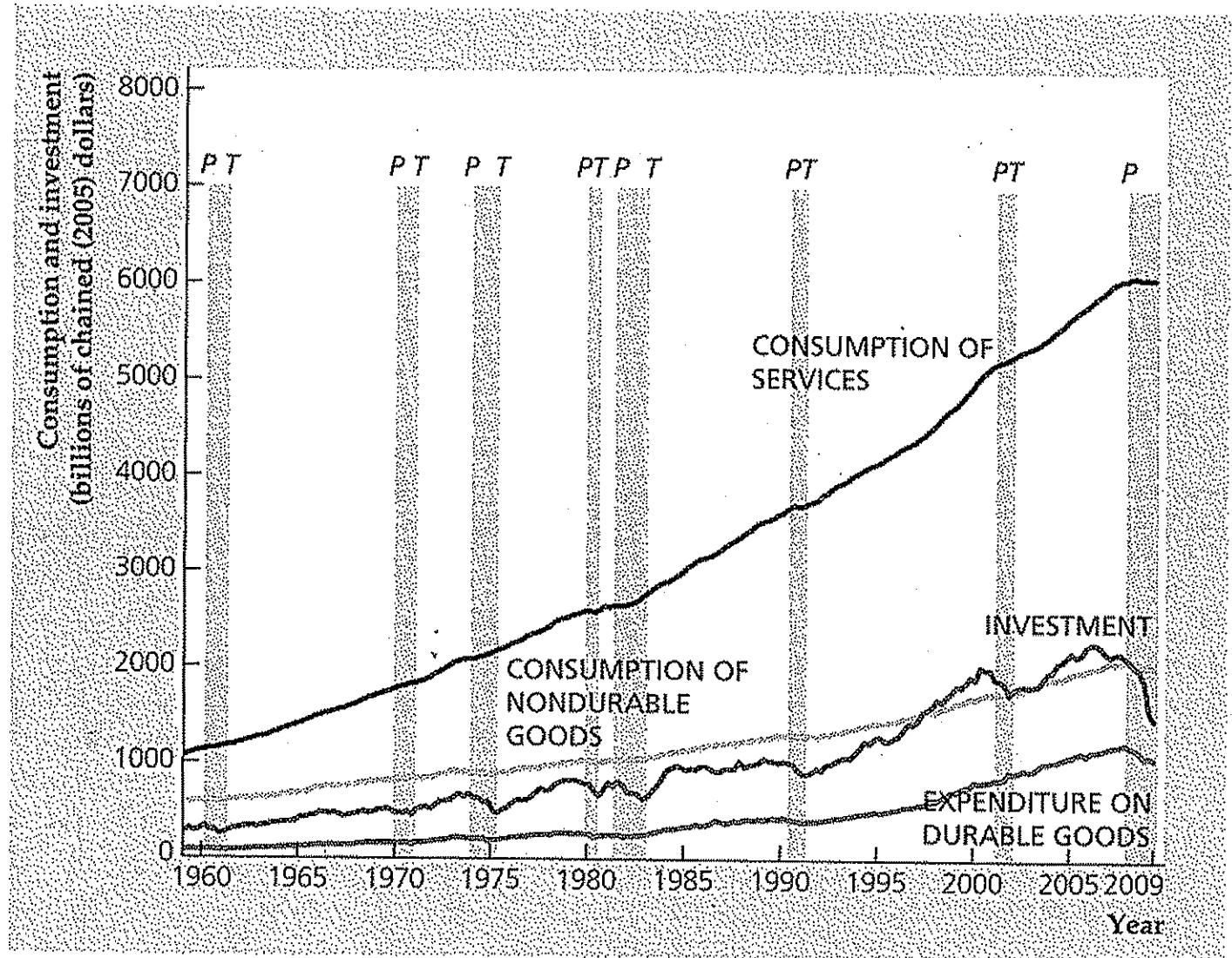
Source: *Business Cycle Indicators*, September 2008. Industrial production: series 47 (industrial production); consumption: series 57 (manufacturing and trade sales, constant dollars); business fixed investment: series 86 (gross private nonresidential fixed investment); residential investment: series 28 (new private housing units started); inventory investment: series 30 (change in business inventories, constant dollars); employment: series 41 (employees on nonagricultural payrolls); unemployment: series 43 (civilian unemployment rate); money supply: series 106 (money supply M2, constant dollars); inflation: series 120 (CPI for services, change over six-month span); stock prices: series 19 (index of stock prices, 500 common stocks); nominal interest rates: series 119 (Federal funds rate), series 114 (discount rate on new 91-day Treasury bills), series 109 (average prime rate charged by banks).

Figure 8.7

Cyclical behavior of consumption and investment, 1959-2009

Both consumption and investment are procyclical. However, investment is more sensitive than consumption to the business cycle, reflecting the fact that durable goods are a larger part of investment spending than they are of consumption spending. Similarly, expenditures on consumer durables are more sensitive to the business cycle than is consumption of nondurable goods or services.

Source: Federal Reserve Bank of St. Louis FRED database at research.stlouisfed.org/fred2 seriesPCDGCC96 (durable goods), PCNDGC96 (nondurable goods), PCESVC96 (services), and GPDIC1 (investment).



¹¹Summary table 10 shows that residential investment leads the cycle.

Figure 8.8

**Cyclical behavior of
civilian employment,
1955-2009**

Civilian employment is
procyclical and coinci-
dent with the business
cycle.

Source: Federal Reserve Bank of
St. Louis FRED database at
research.stlouisfed.org/fred2/series/CE16OV.

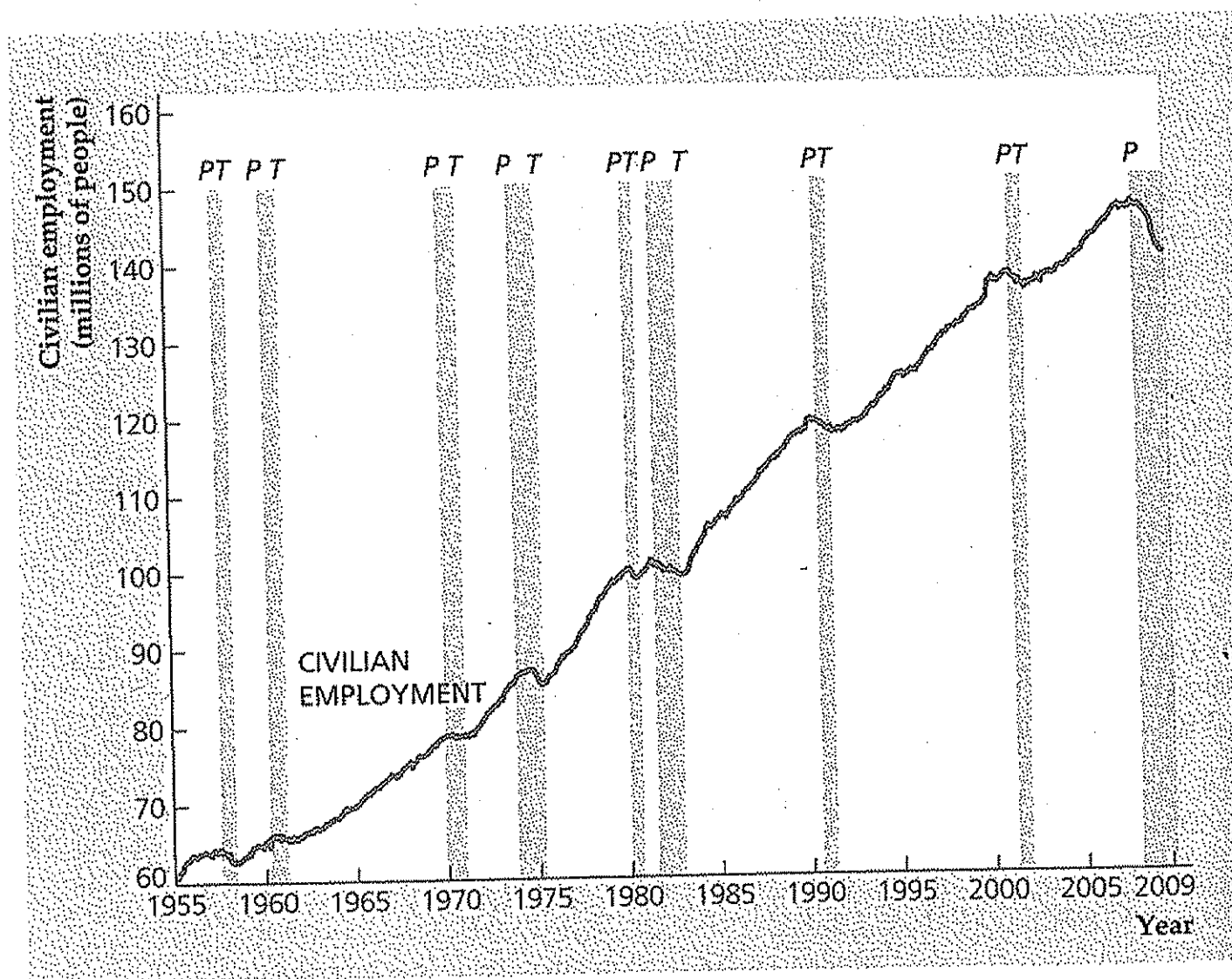


Figure 8.9

**Cyclical behavior of
the unemployment
rate, 1959-2009**

The unemployment rate is countercyclical and very sensitive to the business cycle. Its timing pattern relative to the cycle is unclassified, meaning that it has no definite tendency to lead, be coincident, or lag.

Source: Federal Reserve Bank of St. Louis FRED database at research.stlouisfed.org/fred2/series/UNRATE.

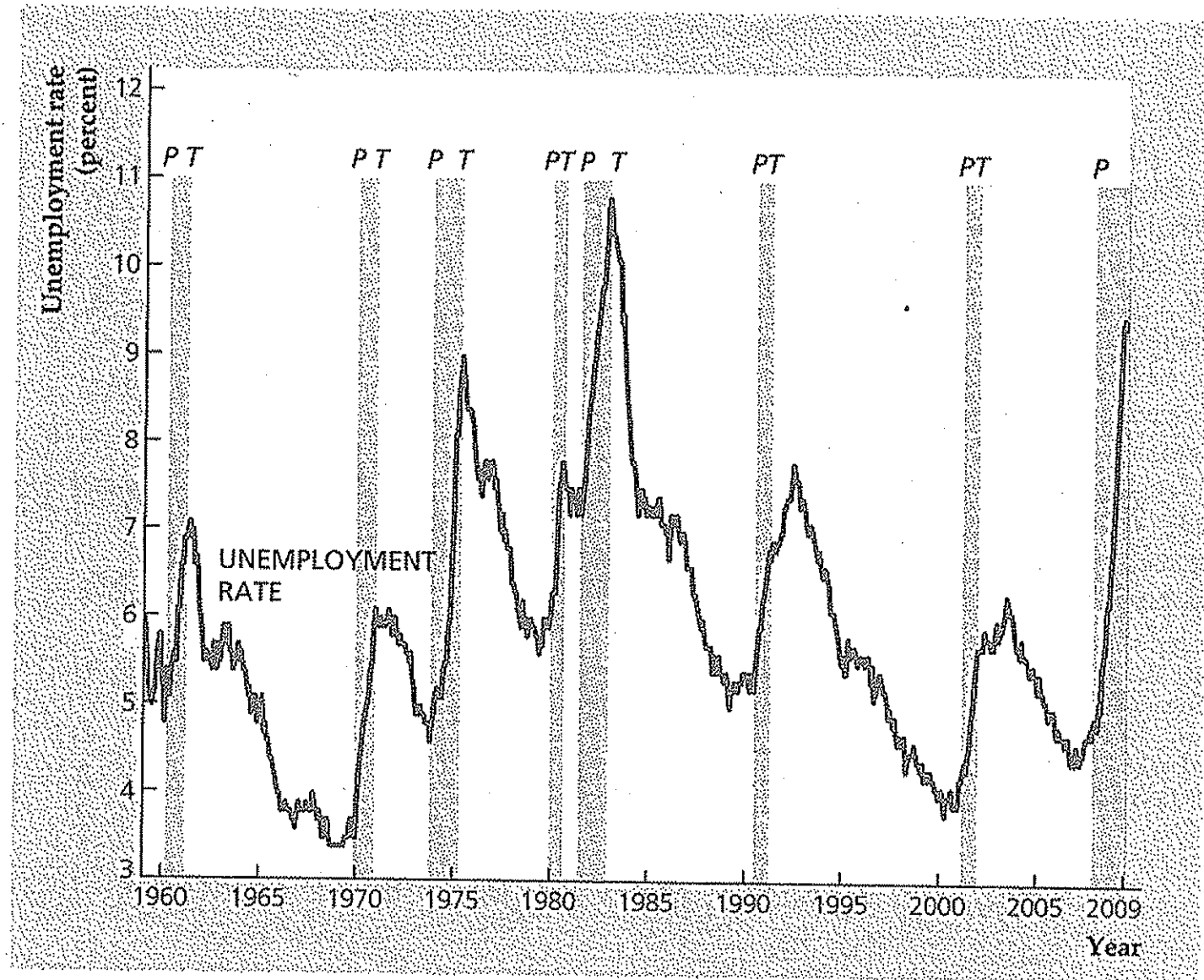


Figure 8.10

The job finding rate, 1976–2009

The chart shows monthly data from January 1976 to June 2009 on the rate at which people who are unemployed find new jobs each month, that is, those who report being unemployed one month and employed the next month. The job finding rate rises in expansions and falls in recessions.

Source: Shigeru Fujita and Garey Ramey, "The Cyclical-ity of Separation and Job Finding Rates," *International Economic Review*, May 2009, pp. 415–430; data updated by Shigeru Fujita.

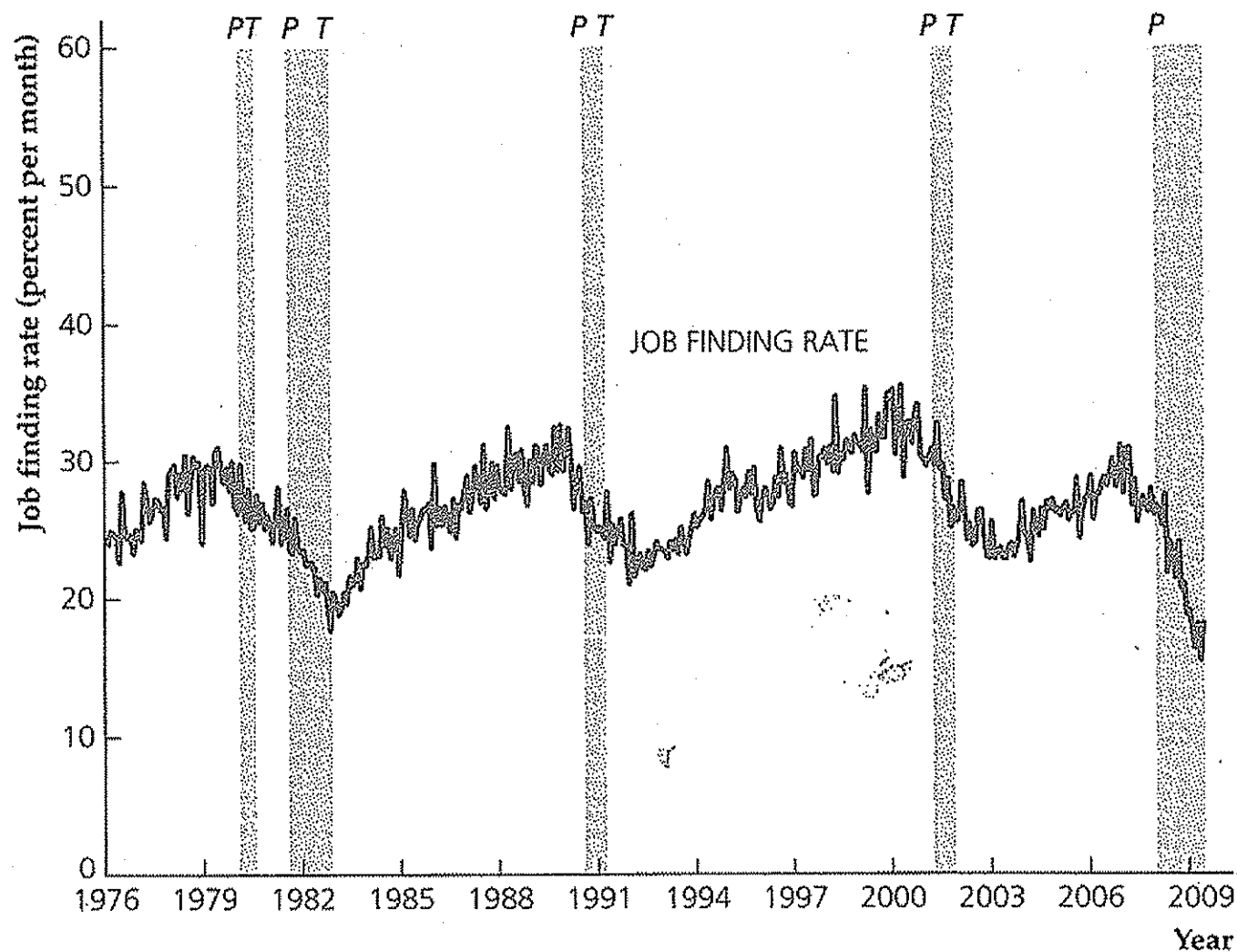


Figure 8.11

**The job loss rate,
1976–2009**

The chart shows monthly data from January 1976 to June 2009 on the rate at which people who are employed lose their jobs each month, that is, those who report being employed one month and unemployed the next month. The job loss rate declines in expansions and rises in recessions.

Source: Shigeru Fujita and Garey Ramey, "The Cyclical-ity of Separation and Job Finding Rates," *International Economic Review*, May 2009, pp. 415–430; data updated by Shigeru Fujita.

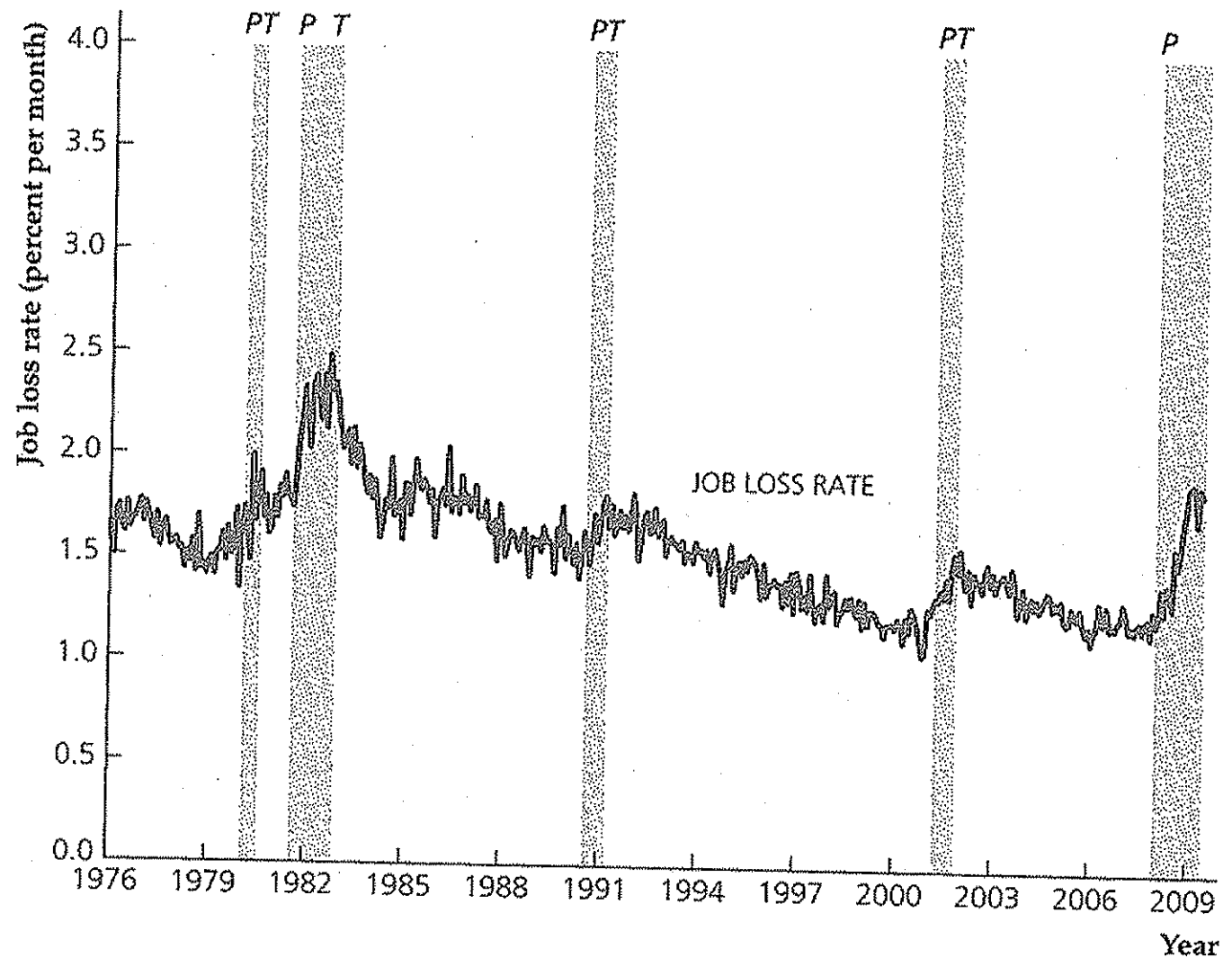


Figure 8.12

Cyclical behavior of average labor productivity and the real wage, 1959–2009

Average labor productivity, measured as real output per employee hour in the nonfarm business sector, is procyclical and leading. The economywide average real wage is mildly procyclical.

Source: Federal Reserve Bank of St. Louis FRED database at research.stlouisfed.org/fred2 series OPHNFB (productivity) and COMPRNFB (real wage).

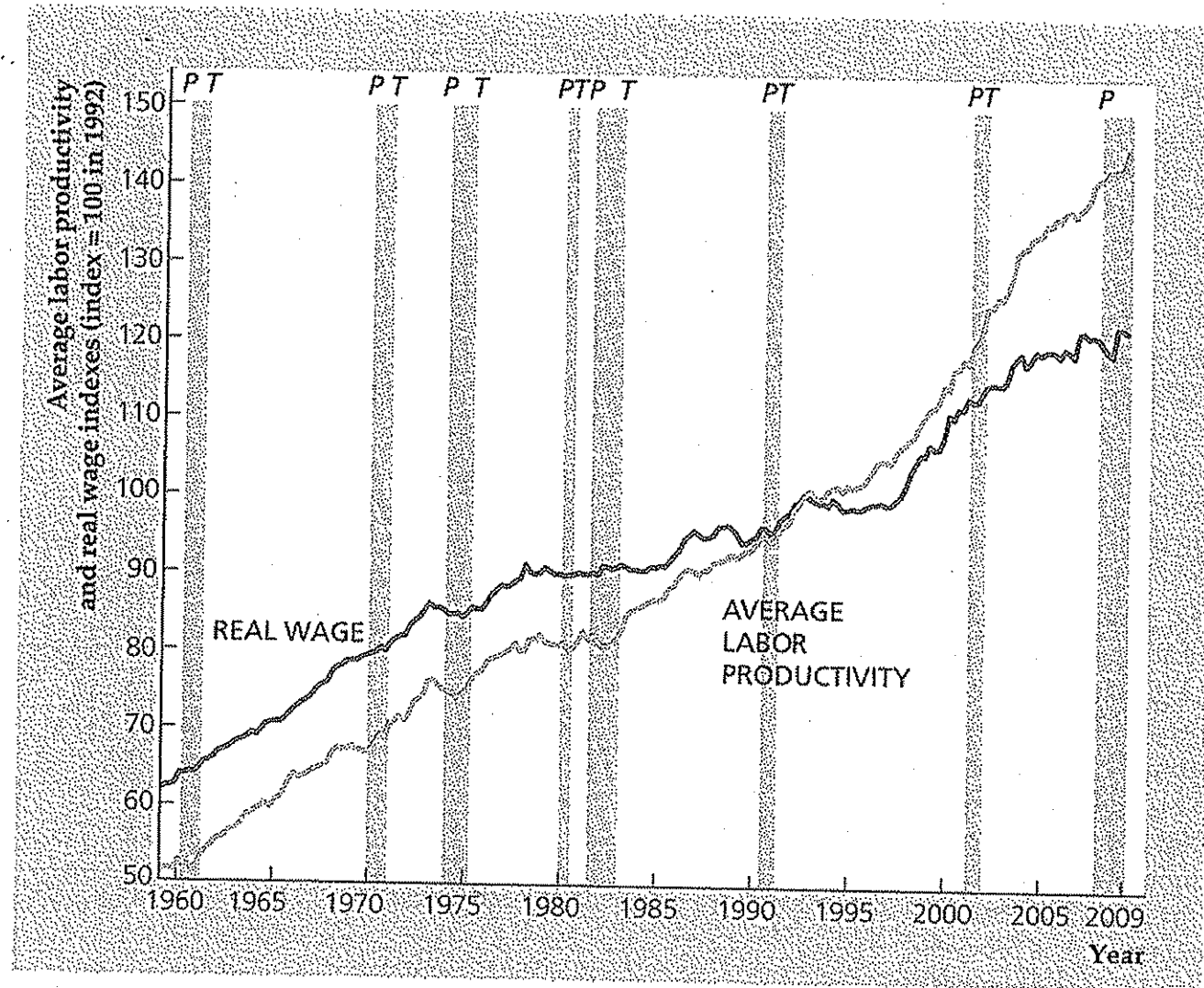


Figure 8.13

Cyclical behavior of nominal money growth and inflation, 1959–2009

Nominal money growth, here measured as the six-month moving average of monthly growth rates in M2 (expressed in annual rates), is volatile. However, the figure shows that money growth often falls at or just before a cyclical peak. Statistical and historical studies suggest that, generally, money growth is procyclical and leading. Inflation, here measured as the six-month moving average of monthly growth rates of the CPI (expressed in annual rates), is procyclical and lags the business cycle.

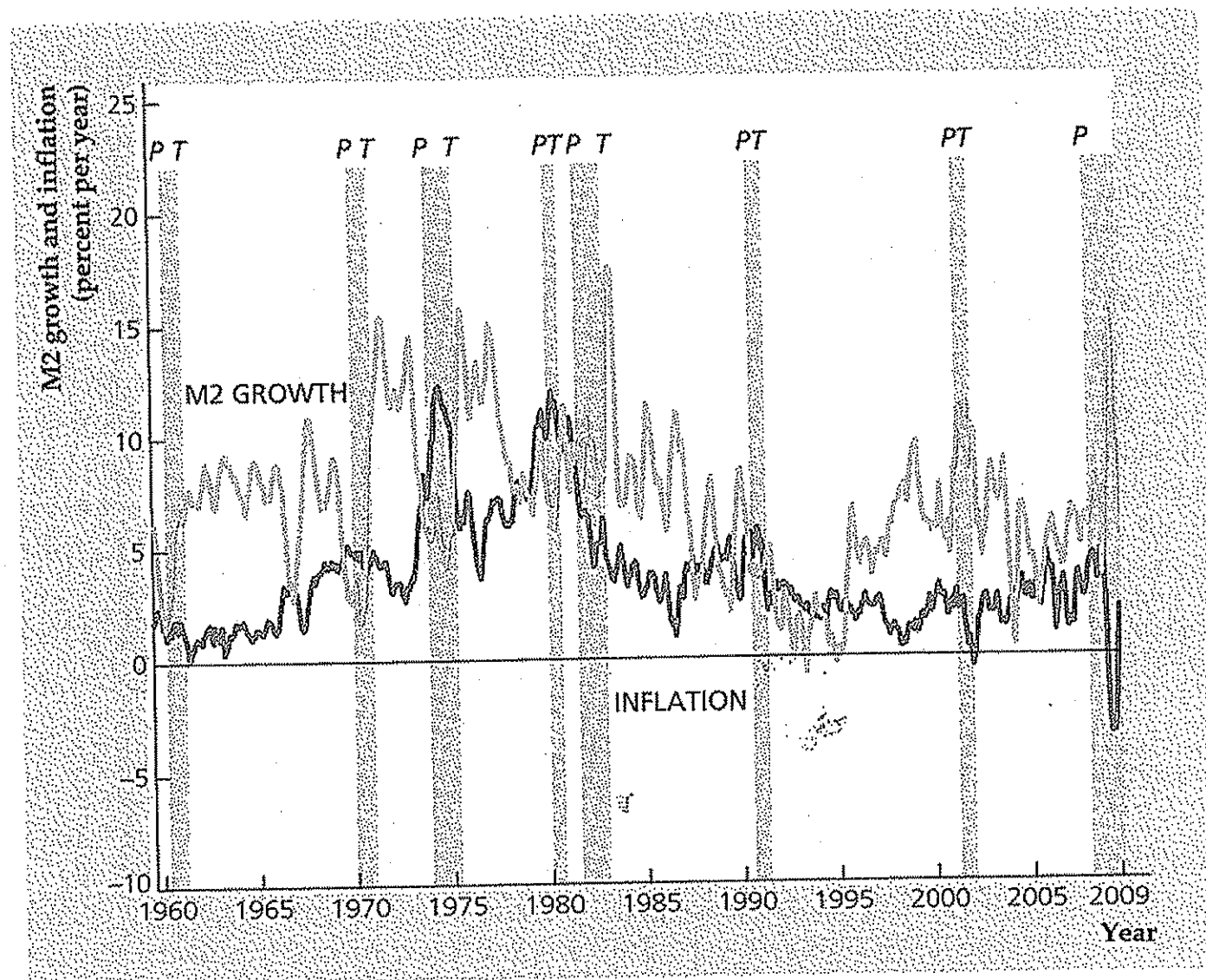


Figure 8.13 Note that (nominal) money growth fluctuates a great deal

Figure 8.14**Cyclical behavior of the nominal interest rate, 1947–2009**

The nominal interest rate, measured here as the interest rate on three-month Treasury bills, is procyclical and lagging.

Source: Federal Reserve Bank of St. Louis FRED database at research.stlouisfed.org/fred2/series/TB3MS.

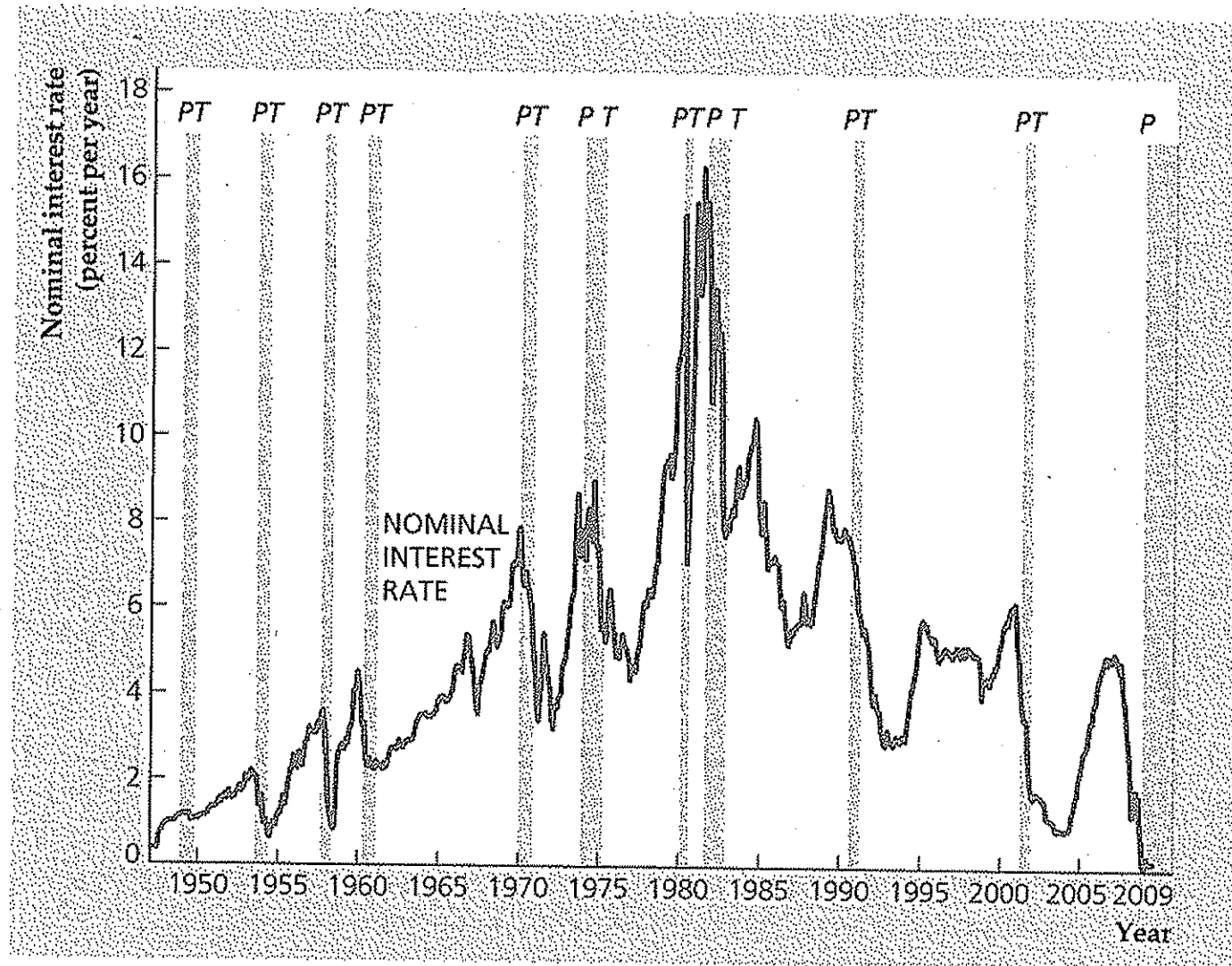


Figure 8.15

Industrial production indexes in six major countries, 1960–2009

The worldwide effect of business cycles is reflected in the similarity of the behavior of industrial production in each of the six countries shown. But individual countries also have fluctuations not shared with other countries.

Source: International Financial Statistics, August 2009, from International Monetary Fund (with scales adjusted for clarity).
Note: The scales for the industrial production indexes differ by country; for example, the figure does not imply that the United Kingdom's total industrial production is higher than that of Japan.

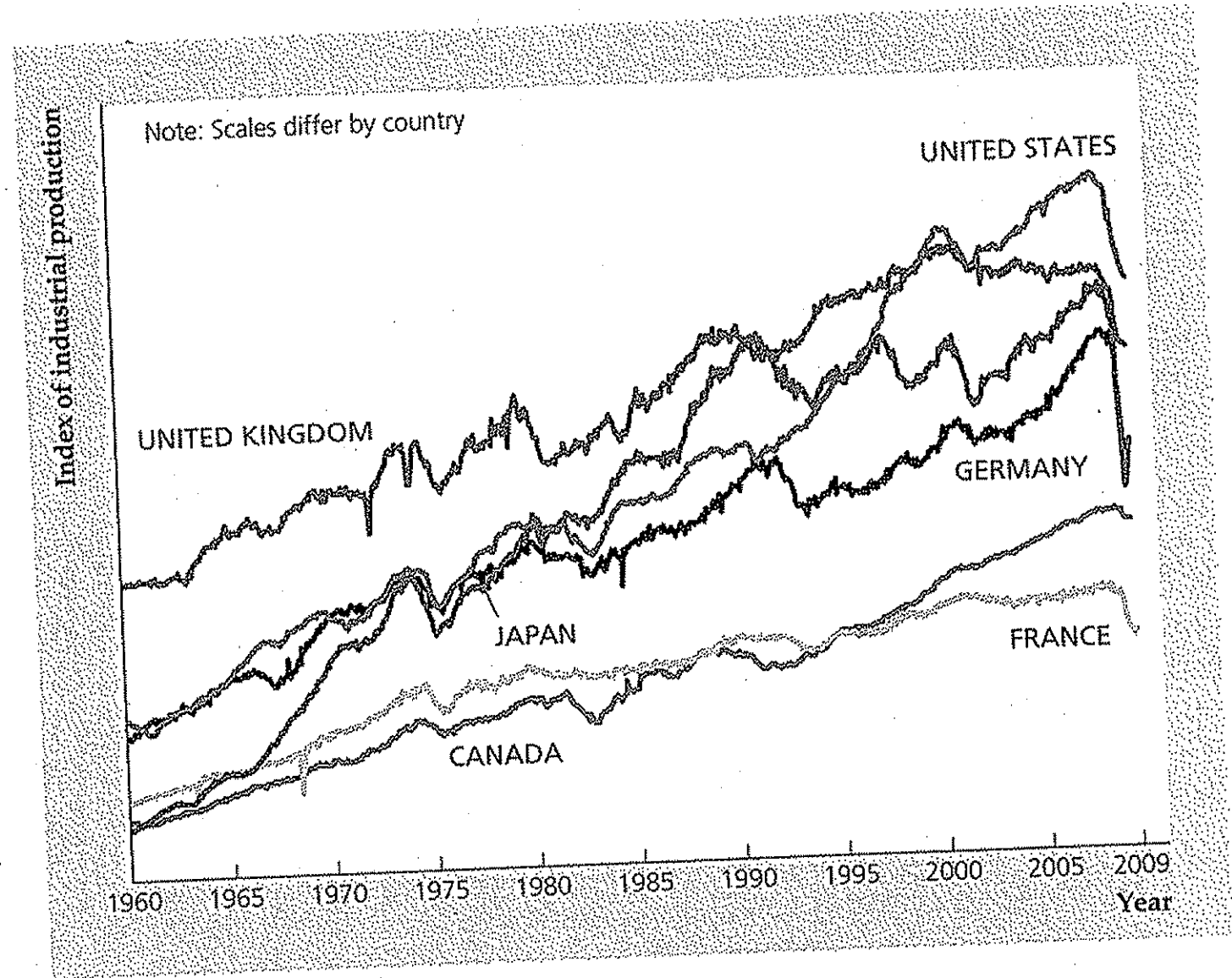


Figure 8.16

The aggregate demand–aggregate supply model

The aggregate demand (AD) curve slopes downward, reflecting the fact that the aggregate quantity of goods and services demanded, Y , falls when the price level, P , rises. The short-run aggregate supply (SRAS) curve is horizontal, reflecting the assumption that, in the short run, prices are fixed and firms simply produce whatever quantity is demanded. In the long run, firms produce their normal levels of output, so the long-run aggregate supply (LRAS)

is vertical at the

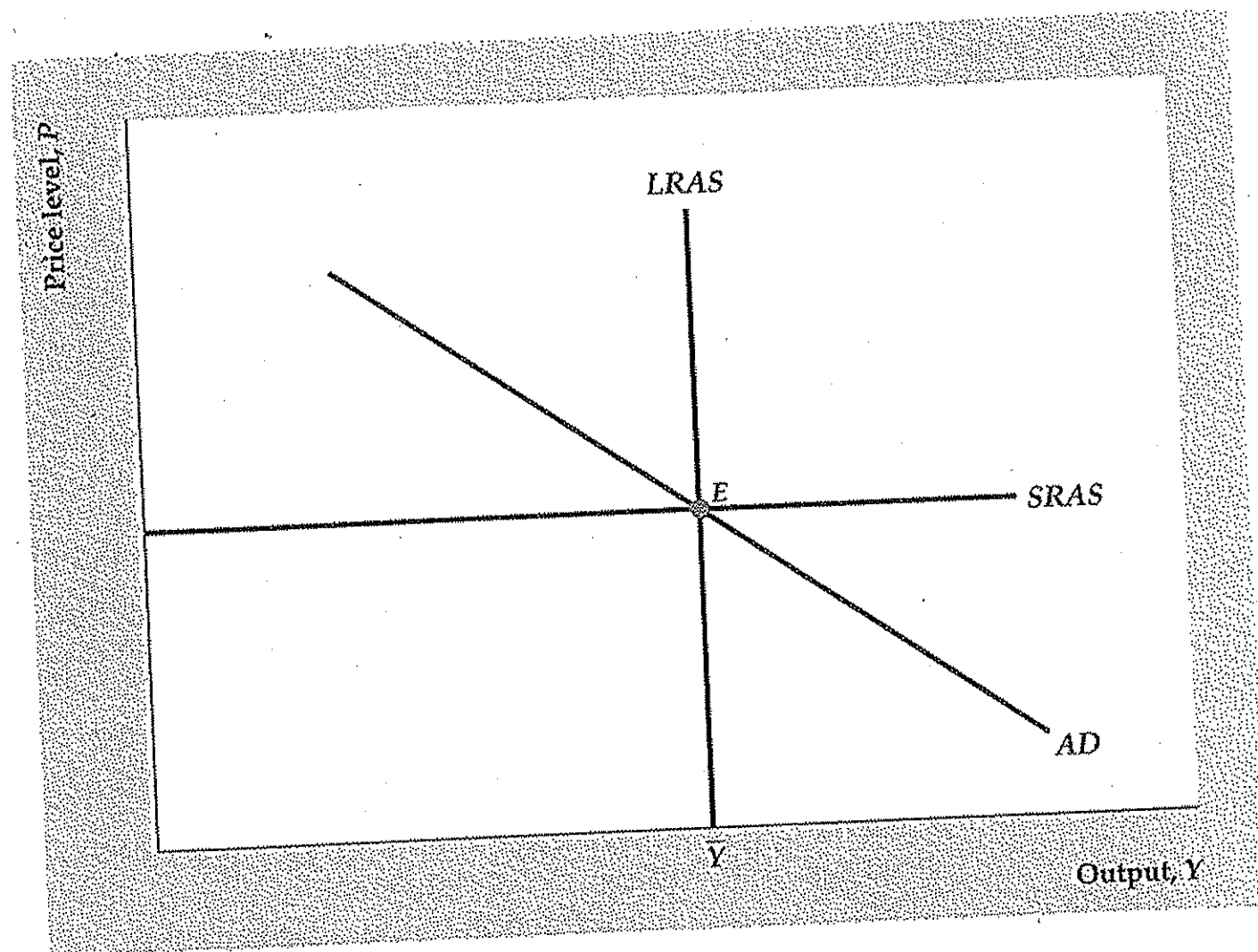


Figure 8.17

An adverse aggregate demand shock

An adverse aggregate demand shock reduces the aggregate quantity of goods and services demanded at a given price level; an example is that consumers become more pessimistic and thus reduce their spending. This shock is represented by a shift to the left of the aggregate demand curve from AD^1 to AD^2 . In the short run, the economy moves to point F . At this short-run equilibrium, output has fallen to Y_2 and the price level is unchanged.

Eventually, price adjustment causes the economy to move to the new

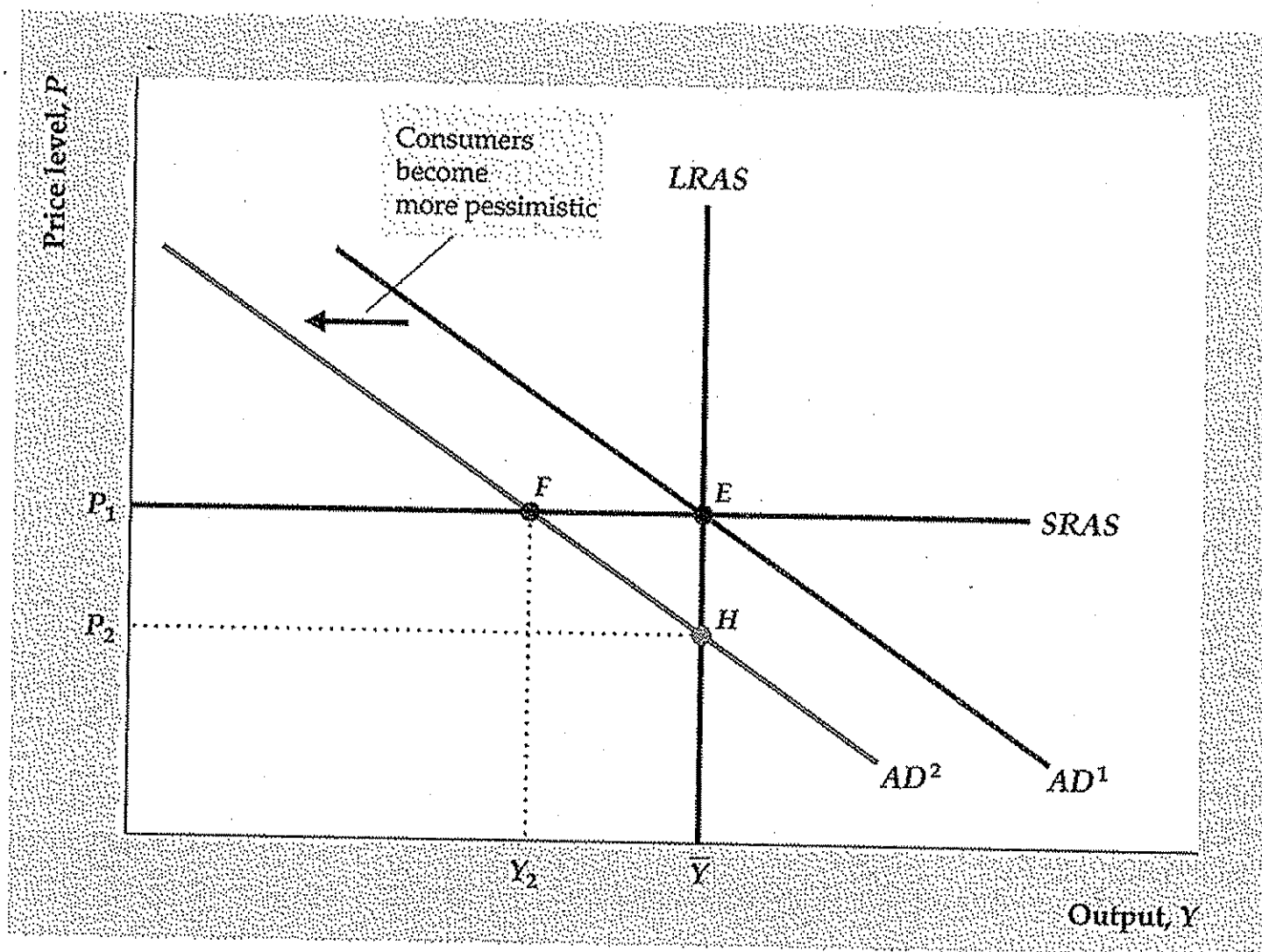


Figure 8.18

An adverse aggregate supply shock

An adverse aggregate supply shock, such as a drought, reduces the full-employment level of output from \bar{Y}_1 to \bar{Y}_2 . Equivalently, the shock shifts the long-run aggregate supply curve to the left, from $LRAS^1$ to $LRAS^2$. As a result of the adverse supply shock, the long-run equilibrium moves from point E to point F. In the new long-run equilibrium, output has fallen from \bar{Y}_1 to \bar{Y}_2 and the price level has increased from P_1 to P_2 .

