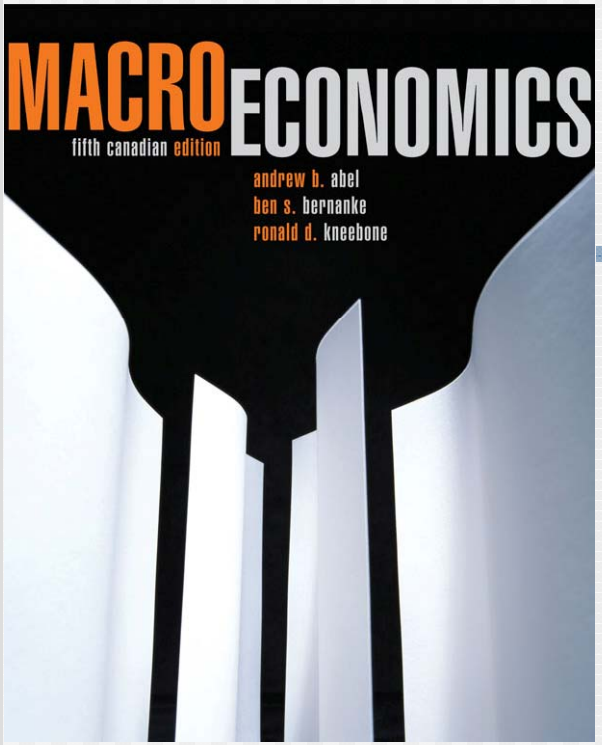


Chapter 8

Business Cycles

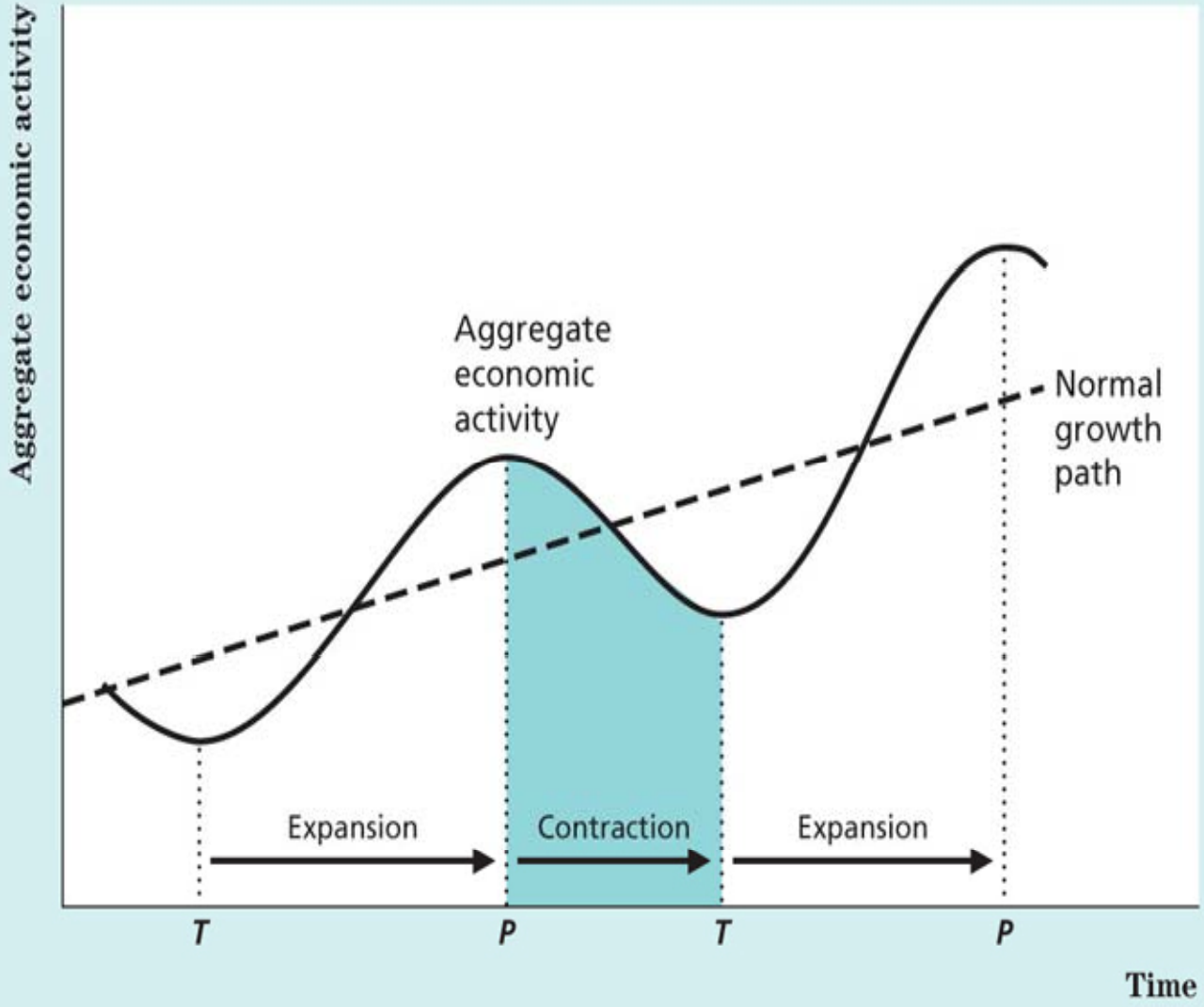
Business Cycles

- The business cycle is a central concern in macroeconomics, because business cycle fluctuations have such profound effects.
- Fluctuations around a normal growth path for the economy: it's a sequence of recessions and expansions
- Happens across industries
- Recurrent, not periodic
- Persistent

FIGURE 8.1

A BUSINESS CYCLE

The solid curve graphs the behaviour 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.



Business Cycles

- Why should we care about business cycles?
- Costs?
- Recessions can be very costly to those becoming unemployed.
- Potentially they could have permanent effects on overall living standards (compound growth).

Introduction to Business Cycles

- The two basic questions are:
  - What causes business cycles?
  - How policymakers should respond to cyclical fluctuations?
- The answer depends on one's view of how quickly the economy adjusts to shocks; i.e., a Classical or Keynesian view.

Introduction to Business Cycles (continued)

- Classical (and New Classical) economists view business cycles as representing the economy's best response to disturbances in production and spending.
- Keynesian (and New- and Post-Keynesian) economists argue that because wages and prices adjust slowly, disturbances in production and spending may drive the economy away from its most desirable level of output and employment for long periods of time.

Defining the Business Cycle

- Burns and Mitchell (1946) make 5 main points about the business cycle:

1. Fluctuation of "aggregate economic activity", not just a single economic variable
2. Expansions and contractions.
   - Contraction (recession or depression): time when aggregate economic activity is falling.
   - Trough: end of a contraction
   - Expansion (boom): time when aggregate economic activity is growing.
   - Peak: end of expansion

Defining the Business Cycle (continued)

3. Co-movement.
   - Prices, productivity, investment, and unemployment have regular patterns of behaviour.
4. Recurrent but not periodic.
   - It does not occur at regular, predictable intervals and does not last for fixed, predetermined length of time.
5. Persistence.
   - Once an expansion or contraction begins it tends to continue for a period of time.

The Canadian Business Cycle

- The pre-World War I period:
  - Recessions were common
- The Great Depression and WWII:
  - Great Depression: worst economic contraction
  - WWII: wartime production increases output
- Post-World War II:
  - Big recession in 1973: OPEC oil shock
  - Recessions in early 1980s & 1990s ; currency crises in Asia & Russia (1990s), liquidity trap in Japan (1990s)

Have Business Cycles Become Less Severe?

- Heart of the Keynesian-Classical debate – has policy been effective in limiting fluctuations?
- Real GDP growth and the unemployment rate are measured to be less volatile after 1945.
- The volatility may look lower due to poor quality of pre-1929 data.
- Further studies seem to confirm that cycles have been significantly moderated in the postwar period... although this is contradicted by 1990s crises and today's crisis
- Better macro policy may help to reduce fluctuations.

Are Business Cycles Made in Canada?

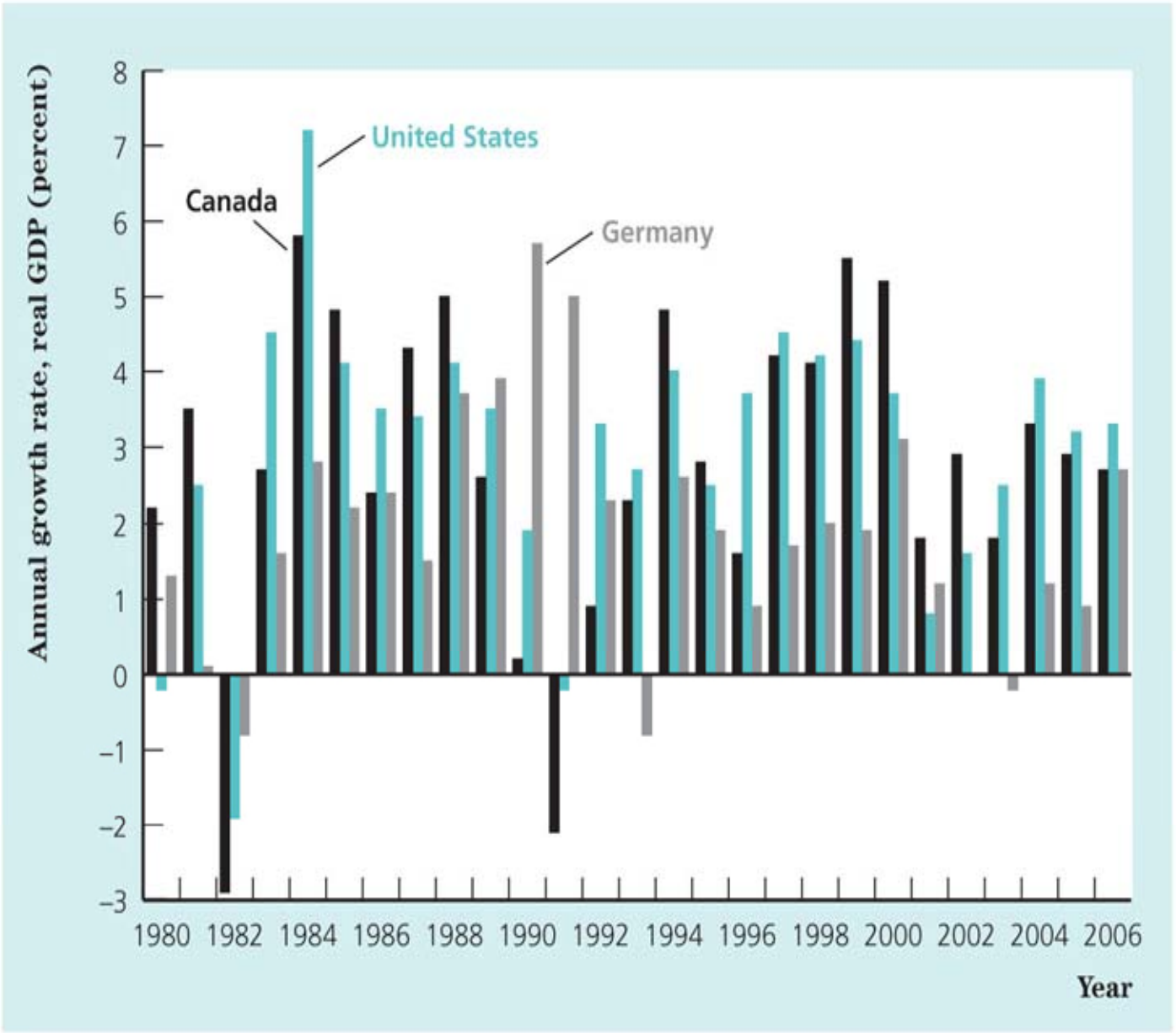
- Another important question, especially for macroeconomic policy.
- The historical data show a strong coincidence between cycle turning points in Canada and the US.
- A study of business cycles in six major countries shows that a significant component of the business cycle does seem to be made in Canada.

FIGURE 8.2

REAL GDP GROWTH RATES IN CANADA, GERMANY, AND THE US

The figure shows annual growth rates in real GDP for Canada, Germany, and the United States from 1980 to 2006. The three countries have over this period experienced growth rates that are similar during some periods but significantly different in others. This suggests that a significant component of the business cycle is unique to each country.

Source: International Monetary Fund, World Economic Outlook Database, April 2007.



The Business Cycle Facts

- Knowing facts about business cycles is useful for interpreting economic data and evaluating the state of the economy.
- Two important characteristics of the cyclical behaviour:
  - the direction in which a macroeconomic variable moves relative to the direction of aggregate economic activity;
  - the timing of the variable's turning points relative to the turning points of the business cycle.

The Business Cycle Facts (continued)

Direction:

- A procyclical variable moves in the same direction as aggregate economic activity.
- A countercyclical variable moves in the opposite direction to aggregate economic activity.
- An acyclical variable does not display a clear pattern over the business cycle.

The Business Cycle Facts (continued)

Timing:

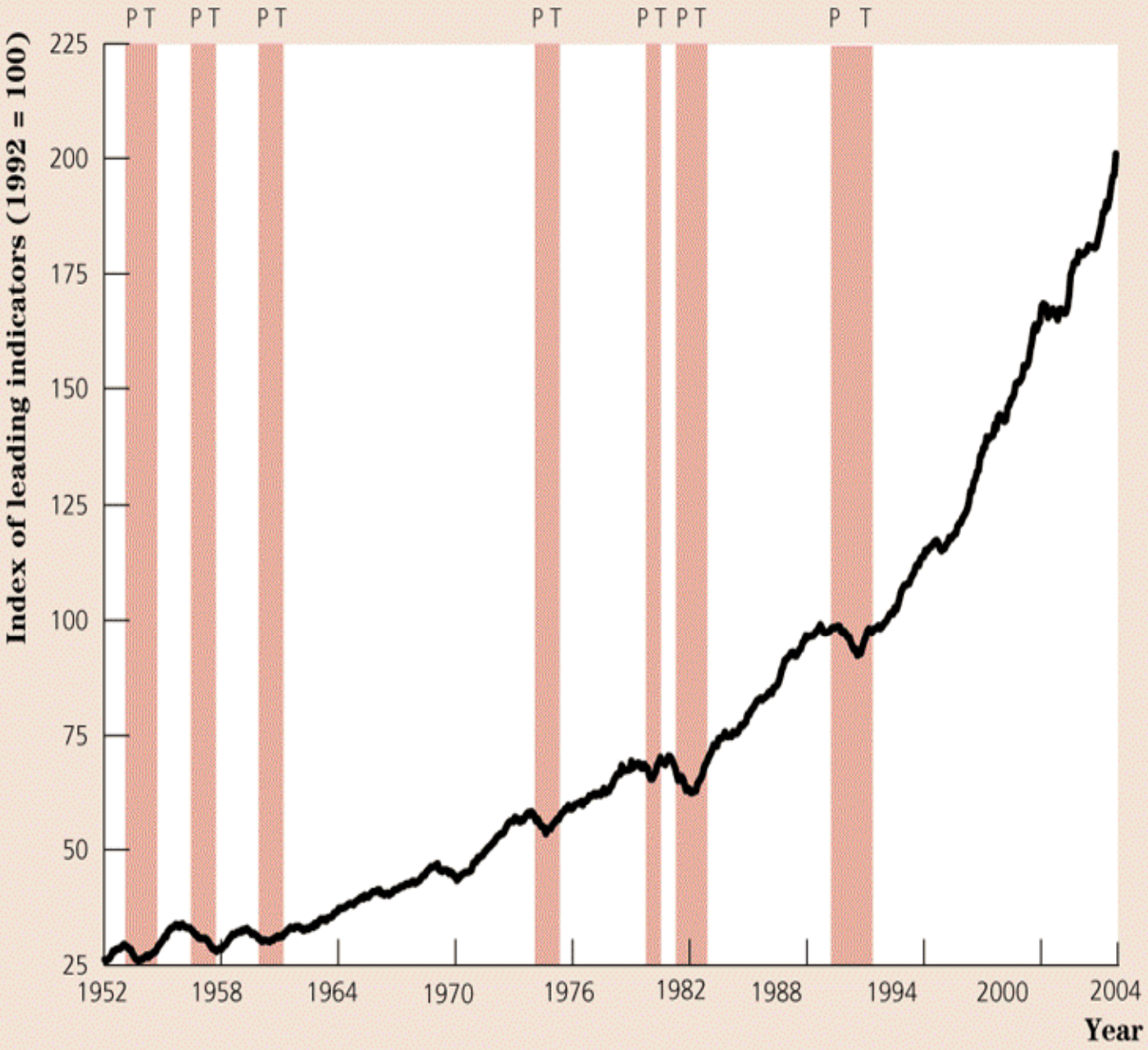
- A leading variable's turning points occur before those of the business cycle.
- A coincident variable's turning points occur around the same time as those of the business cycle.
- A lagging variable's turning points occur later than those of the business cycle.

FIGURE 8.4

THE INDEX OF LEADING INDICATORS

Used for forecasting, the index of leading indicators is a weighted average of 10 economic variables that typically lead the business cycle. The index turns down in advance of business cycle peaks, signalling the onset of recession. Shaded areas represent recessions.

Source: Adapted from the Statistics Canda CANSIM database, <http://cansim2.statcan.ca>, Series v7687, or *Canadian Economic Observer, Statistical Summary*, Table 5 (unsmoothed).



Production and the Business Cycle

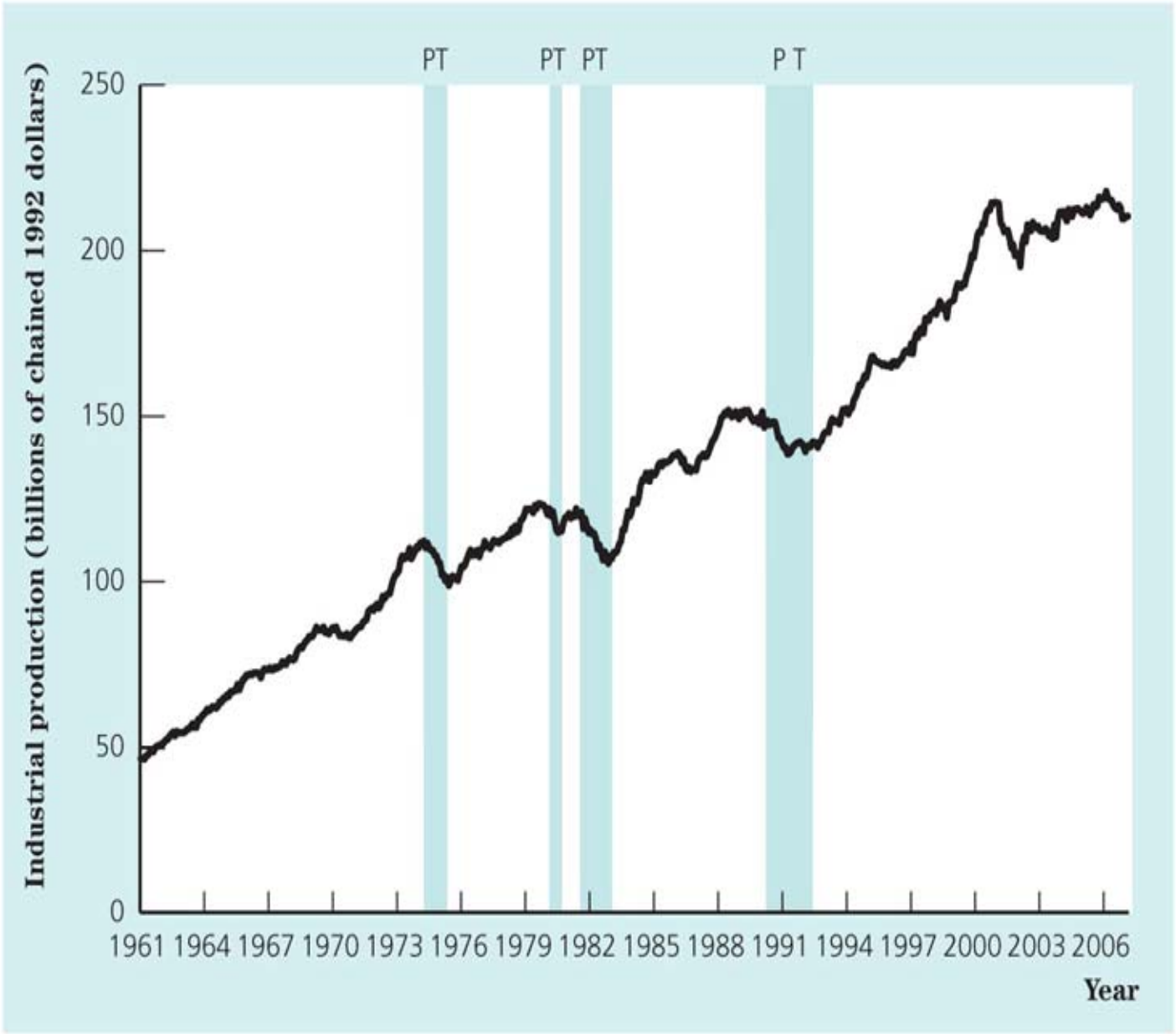
- Production is a coincident and procyclical variable.
- Industries that produce more durable, long-lasting goods (e.g. houses, cars) or capital goods (e.g. factories) are more sensitive to the business cycle than the industries producing nondurable goods (e.g. food)or services (e.g. education).

FIGURE 8.4

CYCLICAL BEHAVIOUR OF INDUSTRIAL PRODUCTION

Industrial production, an aggregate of production in all industries, is procyclical and coincident with the business cycle. The peaks and troughs of the business cycle are shown by the vertical lines *P* and *T*. The shaded areas represent recessions.

Source: Monthly industrial production, seasonally adjusted: Adapted from Statistics Canada CANSIM II series v329828 and v2044343.



Expenditure over the Business Cycle

- Consumption and fixed investment expenditures are pro-cyclical and coincident.
- Inventory investment is pro-cyclical, leading, and strongly volatile.
- Consumption of durable goods, fixed investment, and residential investment are strongly pro-cyclical.
- The trade balance is pro-cyclical and leading. It usually falls sharply before recessions. Business cycles are often *propagated across countries* through the trade balance.

FIGURE 8.5

CYCLICAL BEHAVIOUR OF CONSUMPTION AND INVESTMENT

Both consumption and investment are procyclical. I lowever, 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.

Source: Consumption and business fixed investment, real, quarterly, and seasonally adjusted: Adapted from Statistics Canada CANSIM II series v1992057 and v1992052.

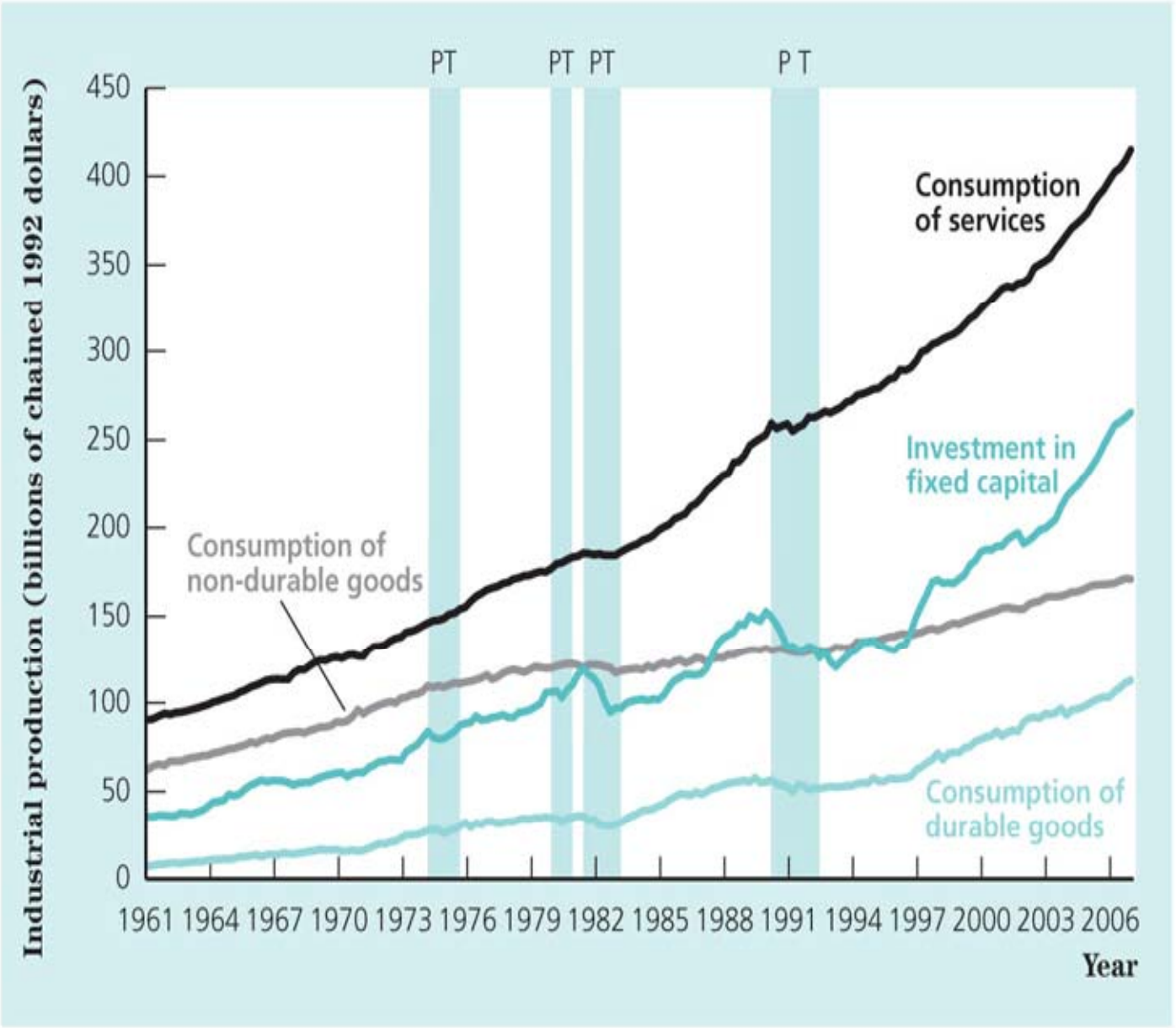
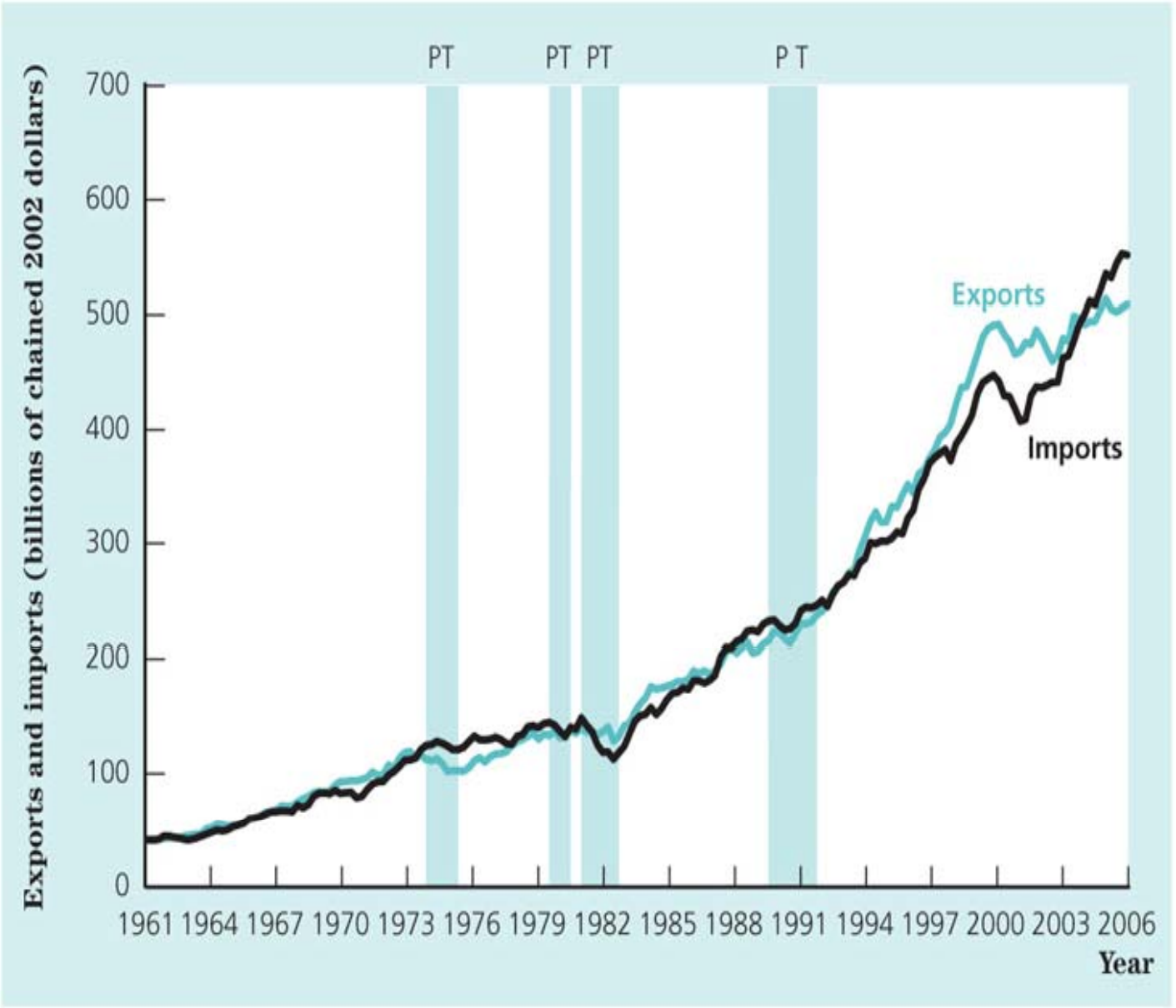


FIGURE 8.7

CYCLICAL BEHAVIOUR OF EXPORTS AND IMPORTS

Expenditures on imports tend to be coincident with the business cycle. Expenditures on exports are reflective of foreign rather than Canadian business cycles.

Source: Real quarterly exports and imports, seasonally adjusted: Adapted from Statistics Canada, CANSIM II series v1992060 and v1992063.



Employment, Unemployment and Labour Productivity

- Employment is strongly procyclical and coincident.
- The unemployment rate is strongly countercyclical and coincident.
- Average labour productivity tends to be procyclical and to lead the business cycle.
- The conclusions about cyclicality of real wage remain elusive.

FIGURE 8.8

CYCLICAL BEHAVIOUR OF EMPLOYMENT

Employment is procyclical and coincident with the business cycle.

Source: Total employment, monthly, seasonally adjusted. 1966–1975: *Canadian Economic Observer, Statistical Summary;* 1976–2006: Statistics Canada CANSIM II database, series v2062811.

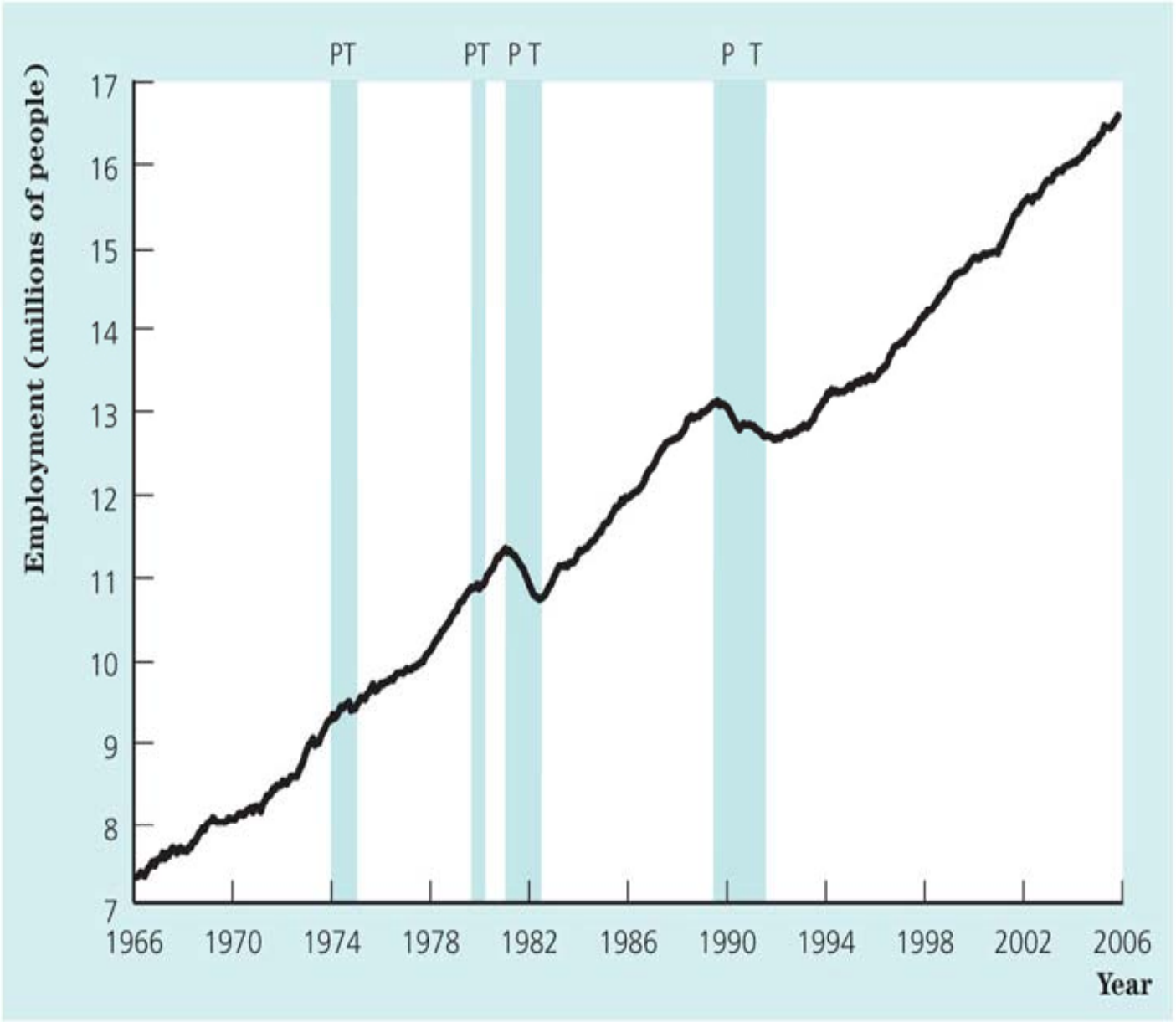


FIGURE 8.9

CYCLICAL BEHAVIOUR OF THE UNEMPLOYMENT RATE

The unemployment rate is countercyclical and very sensitive to the business cycle. It rises rapidly in contractions but falls more slowly in expansions.

Source: Monthly unemployment rate, seasonally adjusted. 1966–75: *Canadian Economic Observer, Statistical Summary*; 1976–2006: Statistics Canada CANSIM II database, series v2062815.

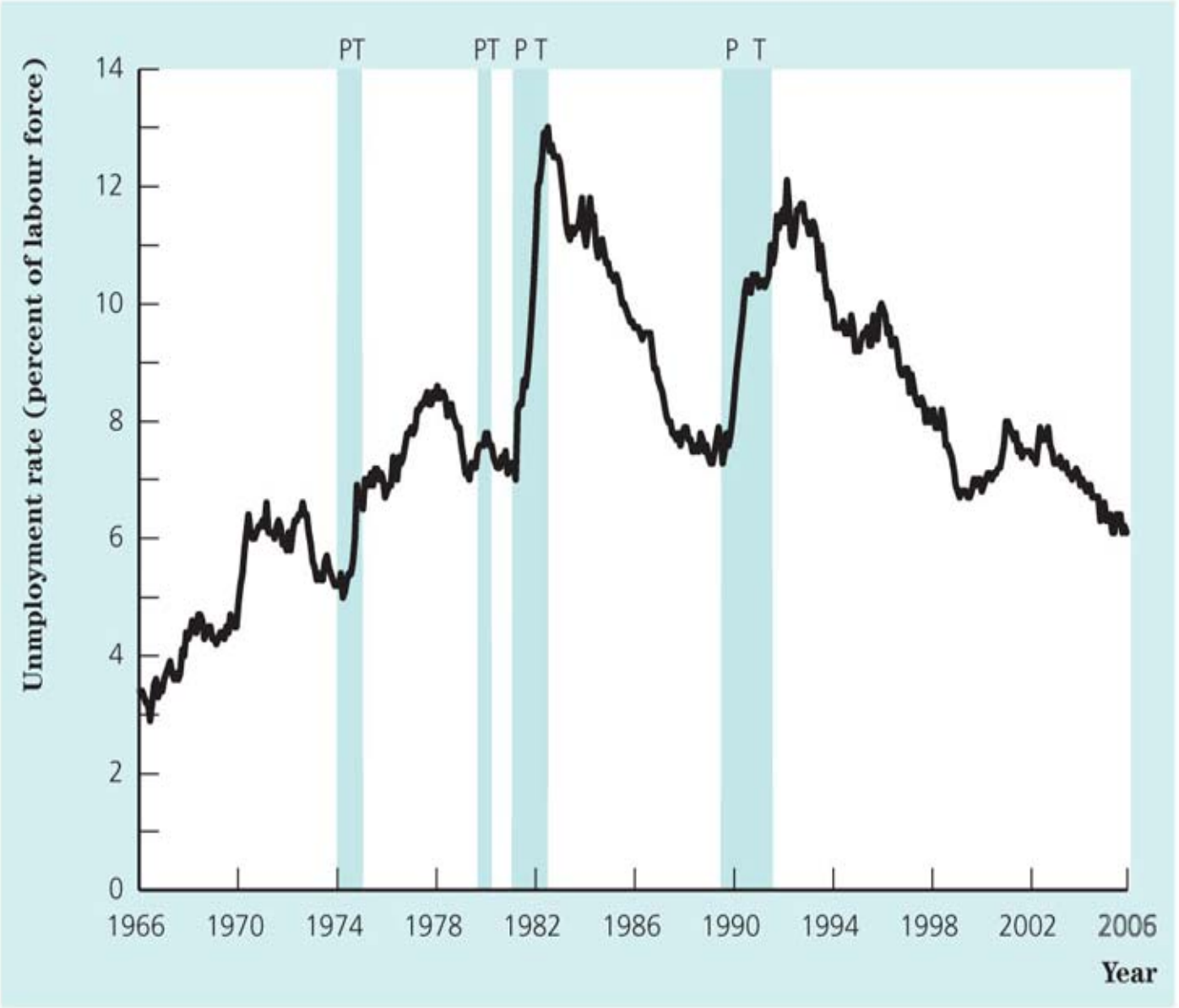
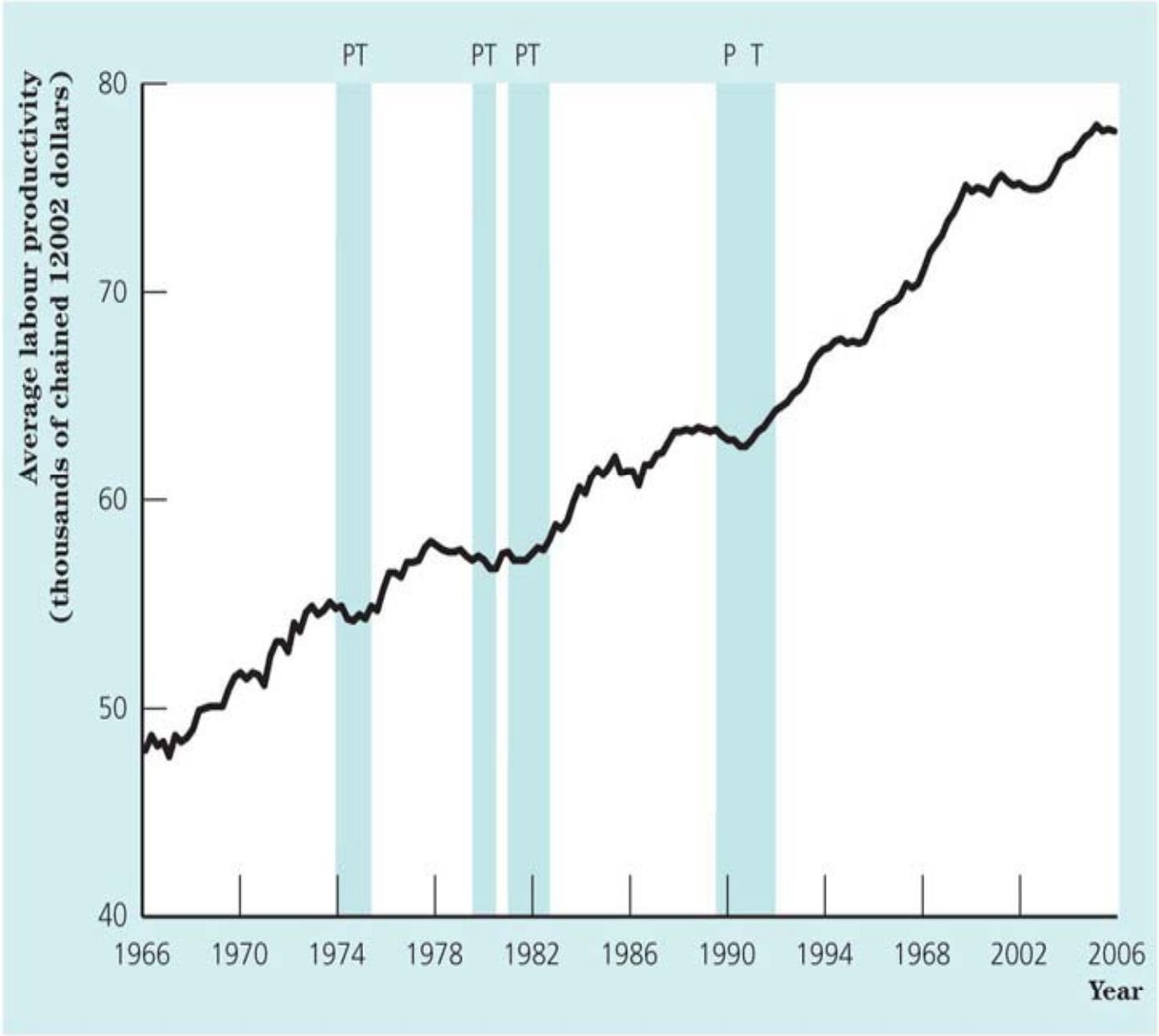


FIGURE 8.10

CYCLICAL BEHAVIOUR OF AVERAGE LABOUR PRODUCTIVITY

Average labour productivity, measured as real output per person employed, is pro-cyclical and leading.

Source: Adapted from quarterly real GDP, seasonally adjusted, CANSIM II series v1992067. Employment, both sexes, 15 years and above: *Canadian Economic Observer, Statistical Summary* and Statistics Canada, CANSIM II series v2062811.



Money Growth and Inflation over the Business Cycle

- The rate of monetary growth is procyclical and leads the cycle as well as it leads the CPI inflation.
- Inflation is procyclical, but lags the business cycle: it typically builds up during the expansion and then falls after the cyclical peak.

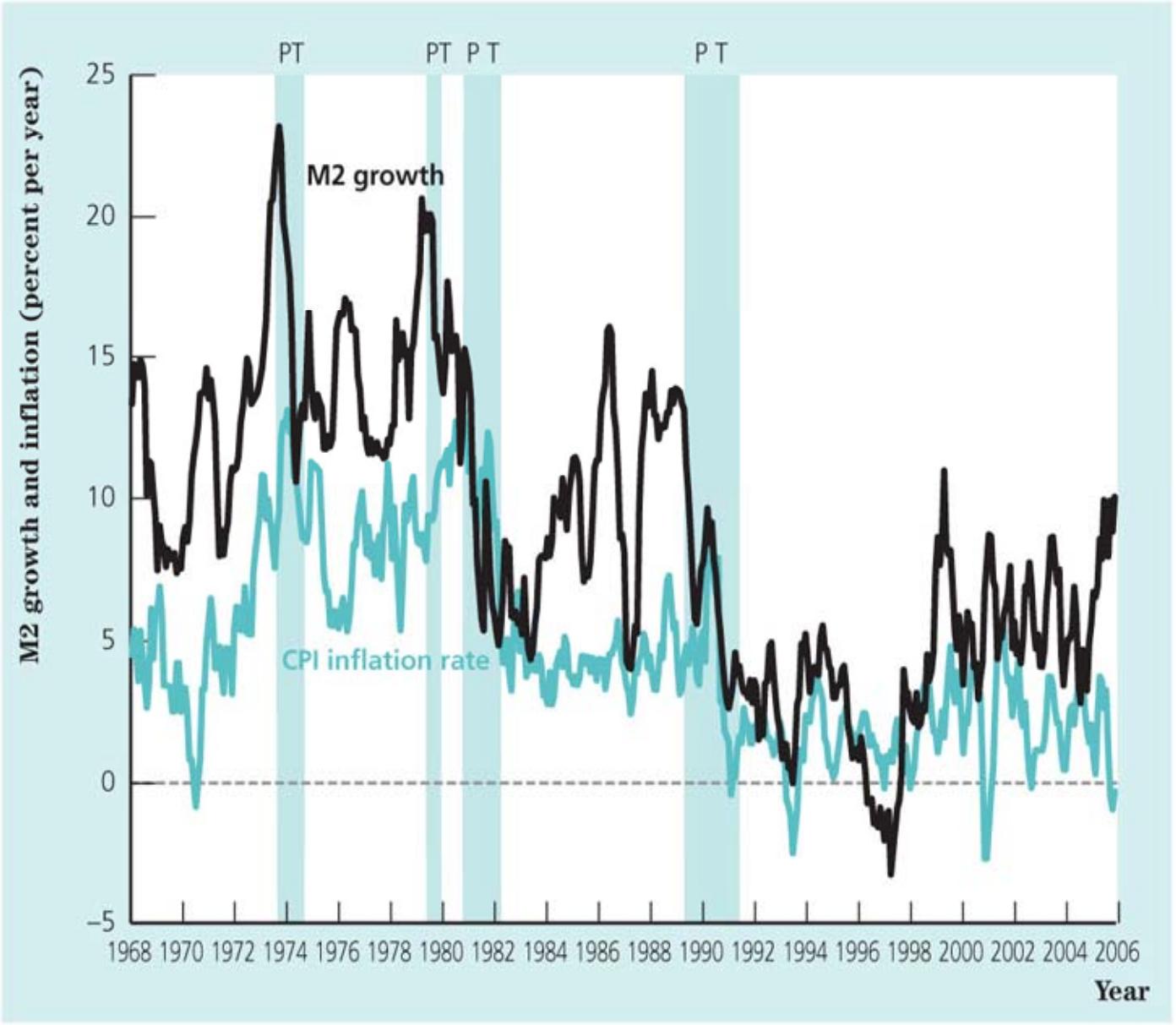
FIGURE 8.11

CYCLICAL BEHAVIOUR OF NOMINAL MONEY GROWTH AND INFLATION

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. 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. A typical pattern is for inflation to build up during the expansion and then to fall after the cyclical peak.

Source: M2 monthly, seasonally adjusted: Statistics Canada, CANSIM II series v37128; monthy CPI, all items: Statistics Canada, CANSIM II series v735319.



Financial Variables over the Business Cycle

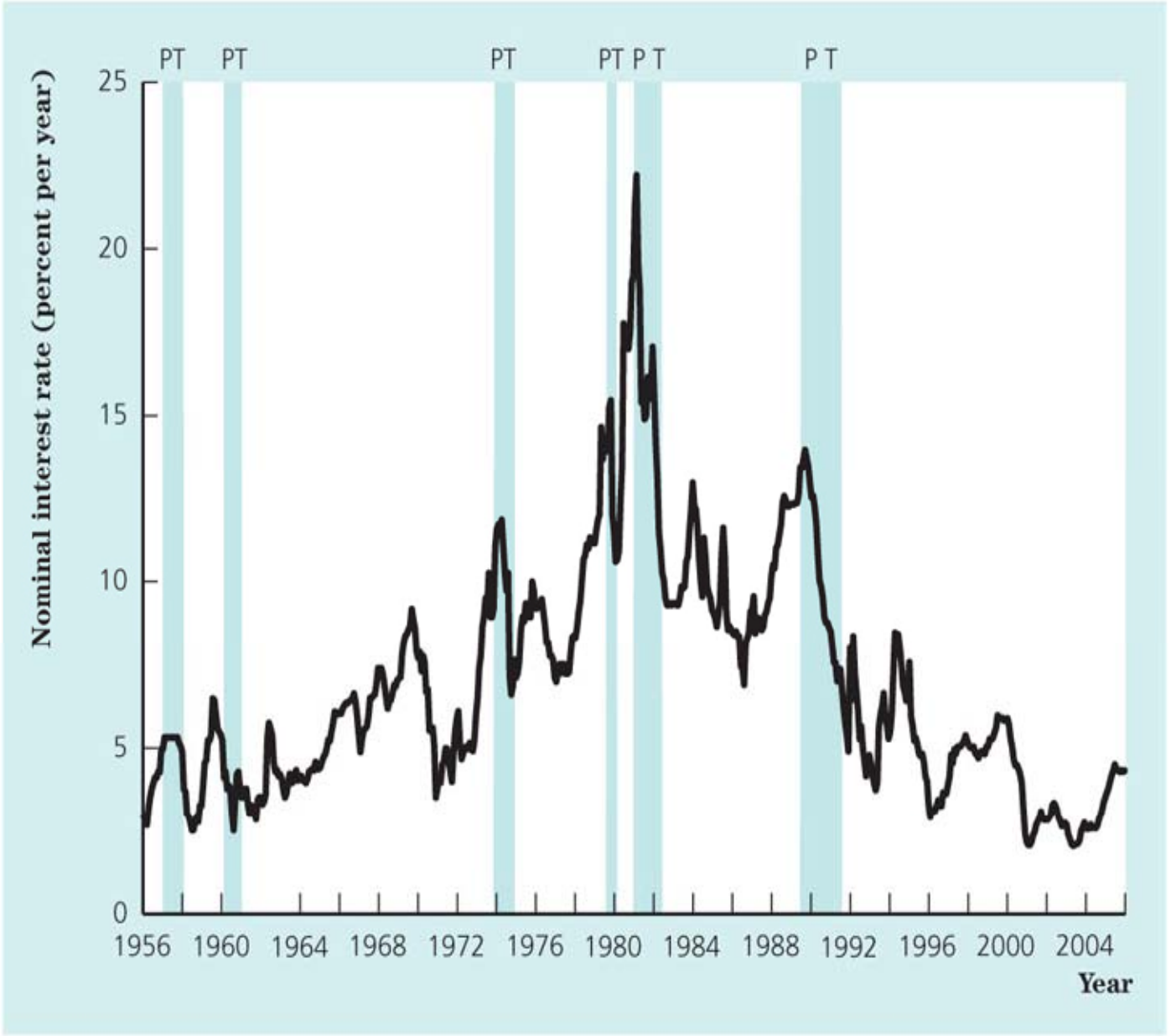
- Stock prices are generally procyclical and leading the cycle.
- Nominal interest rates are procyclical and lagging (have a similar cyclical pattern as inflation)
- The real interest rate is acyclical. It may reflect the fact that individual business cycles have different sources of cycles.

FIGURE 8.12

CYCLICAL BEHAVIOUR OF THE NOMINAL INTEREST RATE

The nominal interest rate, measured here as the interest rate on 90-day corporate paper, is procyclical and recently has lagged the business cycle.

Source: Monthly average, 90-day corporate paper rate: Adapted from Statistics Canada, CANSIM II series v122491.



Business Cycle Theories

- Now we go a step further and try to understand what explains the patterns we have been looking at.
- Theories of B-C have two components:
  1) Description of shocks hitting economy
  2) Model of how economy responds
- Theories answer two major questions:
  1) What causes business cycles?
  2) How should policy-makers respond?

Aggregate Demand and Aggregate Supply Model

- Both the Classical and Keynesian theories can be presented within a single aggregate demand – aggregate supply (AD-AS) model.
- Components of the AD-AS model are:
  - the aggregate demand curve
  - the short-run aggregate supply curve
  - the long-run aggregate supply curve
- Each curve represents a relationship between P and Y

The AD Curve

- The AD curve slopes downward.
- When the price level is higher, people demand less goods (Ch 9 will explain why)
- The AD shifts when, for a specific price level, non-price factors change the aggregate demand for goods.
- These could include:
  - A rise in the stock market;
  - An increase in desired investment; or
  - A change in government spending.

The SRAS Curve

- The SRAS is a horizontal line.
- It captures the idea that in the short run, the price level is fixed and firms are willing to supply any amount of output at that price.
- Demand varies from day to day, but a firm is not going to change price each day that demand is different (menu costs).

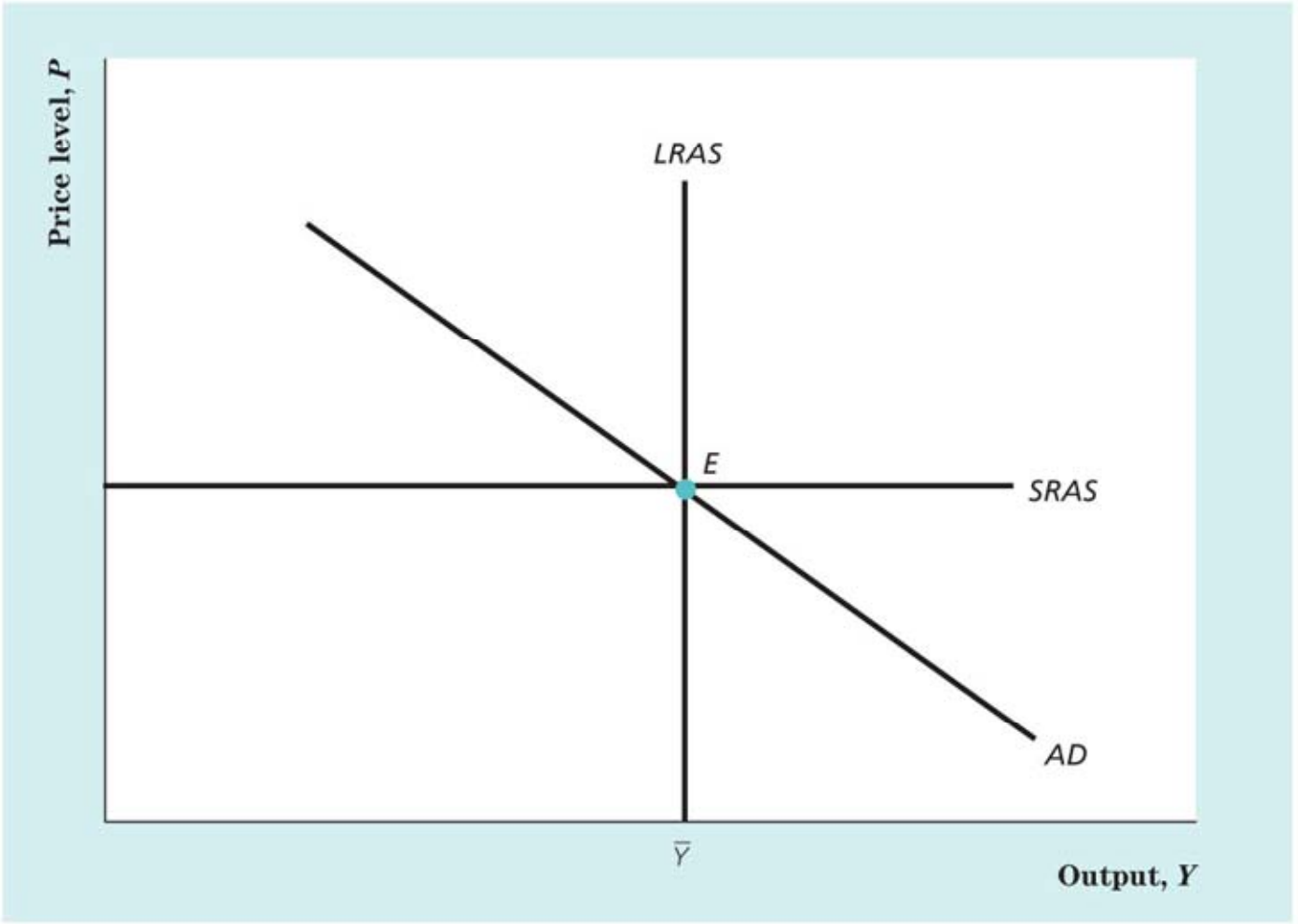
The LRAS Curve

- The LRAS is a vertical line.
- In the long run all firms will adjust their prices so that they can produce at their normal level of output.
- For the economy as a whole it will be a the full-employment level of output, $\overline{Y}$

FIGURE 8.13

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*) curve is vertical at the full-employment level of output, $\overline{Y}$. The economy's short-run equilibrium is at the point where the *AD* and *SRAS* curves intersect, and its long-run equilibrium is where the *AD* and *LRAS* curves intersect. In this example, the economy is in both short-run and long-run equilibrium at point *E*.



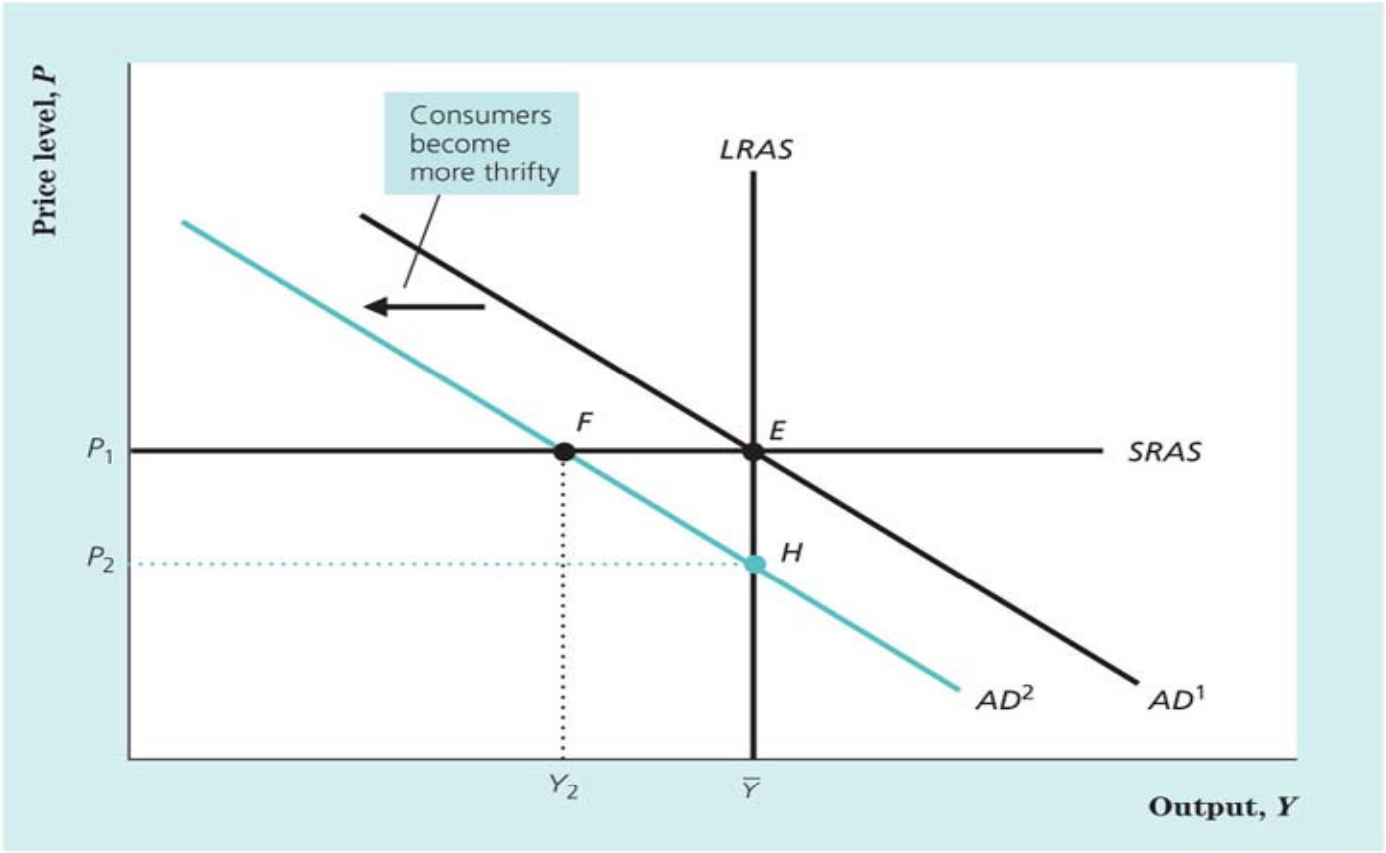
Aggregate Demand Shocks

- Any theory that wants to explain the business cycle must have a story of how shocks affect activity.
- An aggregate demand shock is an unpredictable change in the economy that shifts the AD curve.
- An adverse AD shock shifting the AD curve down will cause output to fall in the SR, but not in the LR...

FIGURE 8.14

AN ADVERSE AGGREGATE DEMAND SHOCK

An adverse aggregate demand shock reduces the aggregate quantity of goods and services demanded at a given price level; for example, 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 long-run equilibrium at point *H*, where output returns to its full-employment level, $\overline{Y}$, and the price level falls to P_2. In the strict classical view, the economy moves almost immediately to point *H*, so the adverse aggregate demand shock essentially has no effect on output in both the short run and the long run. Keynesians argue that the adjustment process takes longer so that the adverse aggregate demand shock may lead to a sustained decline in output.



Aggregate Demand Shocks (continued)

- The key question is: how long will it take the economy to reach the long run?
  - Classical economists think that the LR equilibrium will be restored quickly. Little is gained by the government trying to fight recession – in fact the situation could be made worse by government action.
  - Keynesians argue that prices do not adjust quickly, so that recessions may be prolonged, and the government can help to fight it: increase AD and restore full employment.

Aggregate Supply Shocks

- Classical economists view aggregate supply shocks as the major force behind changes in output and employment – AD shocks do not matter as the economy is self-correcting.
- An adverse AS shock shifts the LRAS curve to the left thus reducing long-run output and increasing long-run price level.
- Keynesians agree with the long-run effects that supply shocks can have, but view the adjustment process to the new equilibrium differently.

FIGURE 8.15

AN ADVERSE AGGREGATE SUPPLY SHOCK

An adverse aggregate supply shock, such as a drought, reduces the full-employment level of output from $\overline{Y}_1$ to $\overline{Y}_2$. Equivalently, the shock shifts the long-run aggregate supply curve from 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 $\overline{Y}_1$ to $\overline{Y}_2$ and the price level has increased from P_1 to P_2.