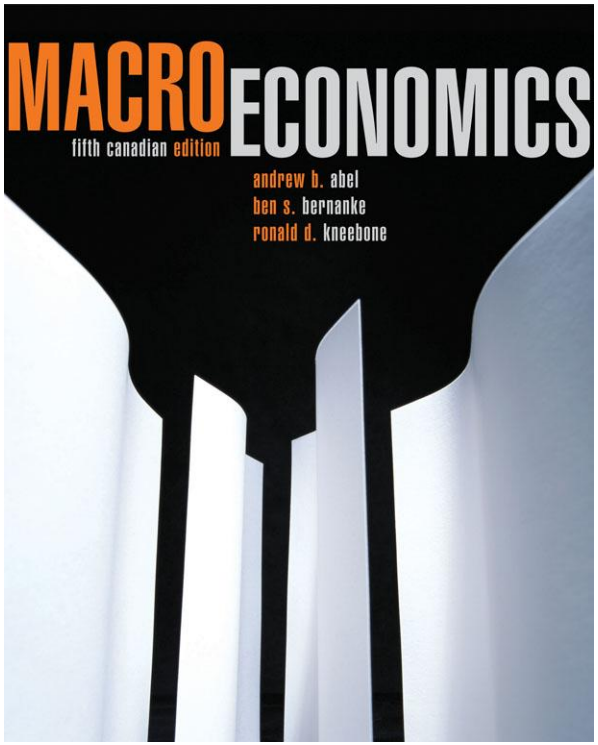


Chapter 3 (Continued)

Labour Market Equilibrium and Employment

Labour Market Equilibrium

- The classical model of the labour market assumes that the real wage adjusts *quickly* to equate labour supply and labour demand.
- In equilibrium supply and demand are equal.
- Both sides of the labour market (firms and individuals) are satisfied. If they were not, adjustment would occur.

Labour Market Equilibrium (continued)

- The equilibrium level of employment after the complete adjustment of wages and prices is full-employment level of employment ( ).
- The corresponding market clearing real wage is ( ).
- Both workers and employers are balancing off marginal costs with marginal benefits.

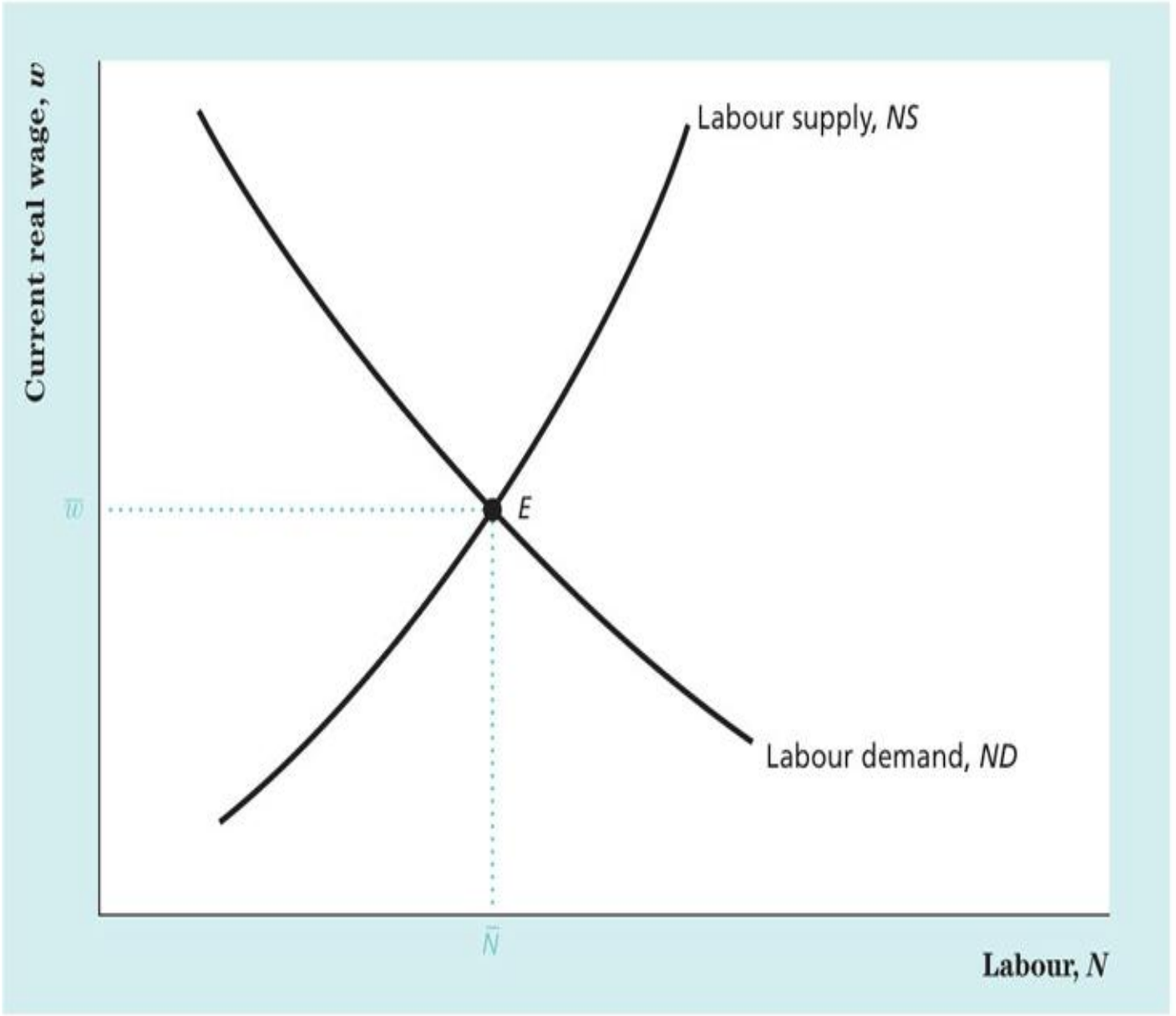
$\overline{N}$

$\overline{W}$

FIGURE 3.11

LABOUR MARKET EQUILIBRIUM

The quantity of labour demanded equals the quantity of labour supplied at point *E*. The equilibrium real wage is $\overline{w}$, and the corresponding equilibrium level of employment is $\overline{N}$, the full-employment level of employment.



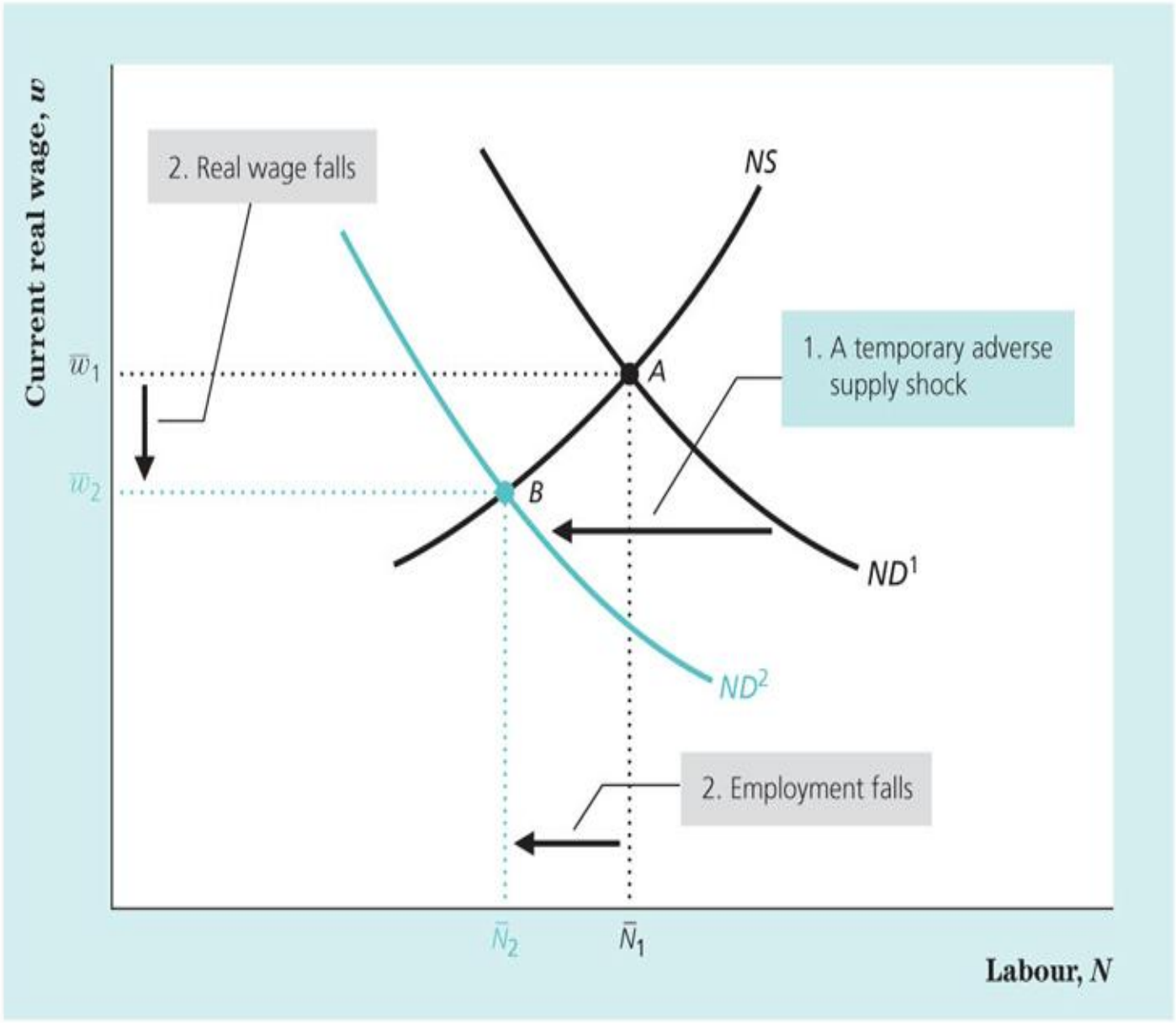
Labour Market Equilibrium (continued)

- Factors that shift aggregate labour demand or supply curve affect:
  - the equilibrium real wage;
  - the full-employment level of unemployment.
- A temporary adverse productivity shock shifts the demand curve (by changing the "A" in the production function);
- but, because it is temporary, there is no shift in labour supply – longer-run income is unaffected, so supply remains unchanged.

FIGURE 3.12

EFFECTS OF A TEMPORARY ADVERSE SUPPLY SHOCK ON THE LABOUR MARKET

An adverse supply shock that lowers the marginal product of labour (see Figure 3.4, p. 63) reduces the quantity of labour demanded at any real wage level. Thus, the labour demand curve shifts left, from ND^1 to ND^2, and the labour market equilibrium moves from point A to point B. The adverse supply shock causes the real wage to fall from $\overline{w}_1$ to $\overline{w}_2$ and reduces the full-employment level of employment from $\bar{N}_1$ to $\bar{N}_2$.

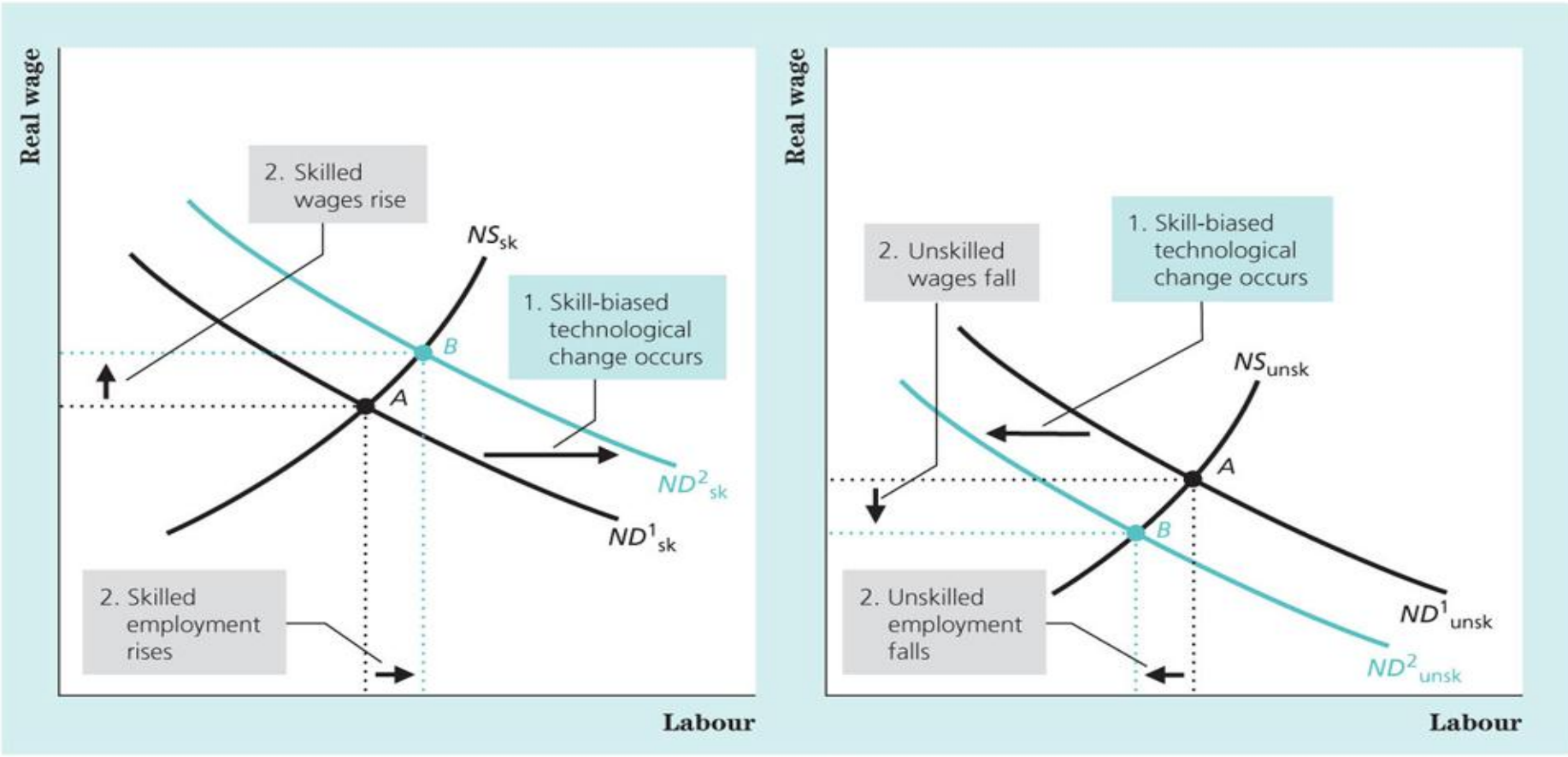


Labour Market Equilibrium (continued)

- The advantage of the model is that it can say something about how shocks can affect employment and wages.
- It also has some micro underpinnings, which was always a criticism of the simple Keynesian model.
- It is considered a good description of long-run equilibrium.

Labour Market Equilibrium (continued)

- The model, with some modifications, can be used to answer questions about income distribution.
  - Part of the reason for adverse income distribution can be attributed to skill differentials.
  - The data show that the proportion of skilled workers in the labour force is rising – a characteristic of technical change is that it has been "skill-biased".
- A complication not shown, supply curves could shift as well.



(a) Skilled workers **(b) Unskilled workers**

FIGURE 3.14

THE EFFECTS OF SKILL-BIASED TECHNOLOGICAL CHANGE ON WAGE INEQUALITY

The supply and demand for skilled labour is shown in (a), and the supply and demand for unskilled labour is shown in (b). The initial equilibrium is shown as point *A* in both parts. Because skilled workers have a higher *MPN* than unskilled workers, their real wage is higher. A skill-biased technical change increases the *MPN* of skilled workers relative to the *MPN* of unskilled workers. A rise in the *MPN* of skilled workers raises the demand, from ND^1_{sk} to ND^2_{sk} in (a). If the *MPN* of unskilled workers actually falls, demand for unskilled labour falls, from ND^1_{unsk} to ND^2_{unsk} in (b). At the new equilibrium, point *B* in both parts, the wages of skilled workers have risen relative to those of unskilled workers.

Labour Market Equilibrium (continued)

- Full-employment output (often called potential output), $\overline{Y}$, is the level of output that firms in the economy supply when wages and prices are fully adjusted.
- We can calculate it by substituting full employment labour $\overline{N}$ into the production function.

$$\overline{Y} = AF(K,\overline{N})$$

Labour Market Equilibrium (continued)

- Effects of an adverse supply shock now hit output as well:
  - The output is reduced directly by reduction in the productivity measure *A*.
  - The *MPN* falls, employment falls, full employment output falls. $\overline{N}$ $\overline{Y}$

Unemployment

- An important drawback of the model is that it implies that there is zero unemployment, which we know is not realistic.
- Possible explanations of unemployment:
  - the real wage could be slow to adjust.
  - matching people to jobs can be a time consuming process.

Unemployment (continued)

- First some measurement/definitions issues:
  - an employed person (E) is someone who worked full-time or part-time during the past week.
  - an unemployed person (U) is someone who did not work during the past week, *but* who had actively sought work in the previous four weeks, and was available for work.

Unemployment (continued)

- Someone not in the labour force is a person who did not work during the past week and did not look for work during the past four weeks – they are not participating.
- The rest are in the labour force (LF), which is defined as all employed and unemployed workers (E + U).
- The working age, or adult population (P) is the sum of those in and not in the labour force.

Unemployment (continued)

- The unemployment rate is the fraction of the labour force that is unemployed [U/(E+U) = U/LF].
- The participation rate is the fraction of the labour force in the working-age population (LF/P).
- The employment ratio is the fraction of the employed in the working-age population (E/P).

Important definitions: A Summary

- Labor Force = $U + E$ = 17.9 (million)
- Unemployment rate = U/LF = 6.1%
- Participation rate = LF/P = 67.5%
- Employment ratio = E/P = 63.4%
- The fraction of those not in the labour force = (1 – Participation rate) = 32.5%

Changes in Employment Status

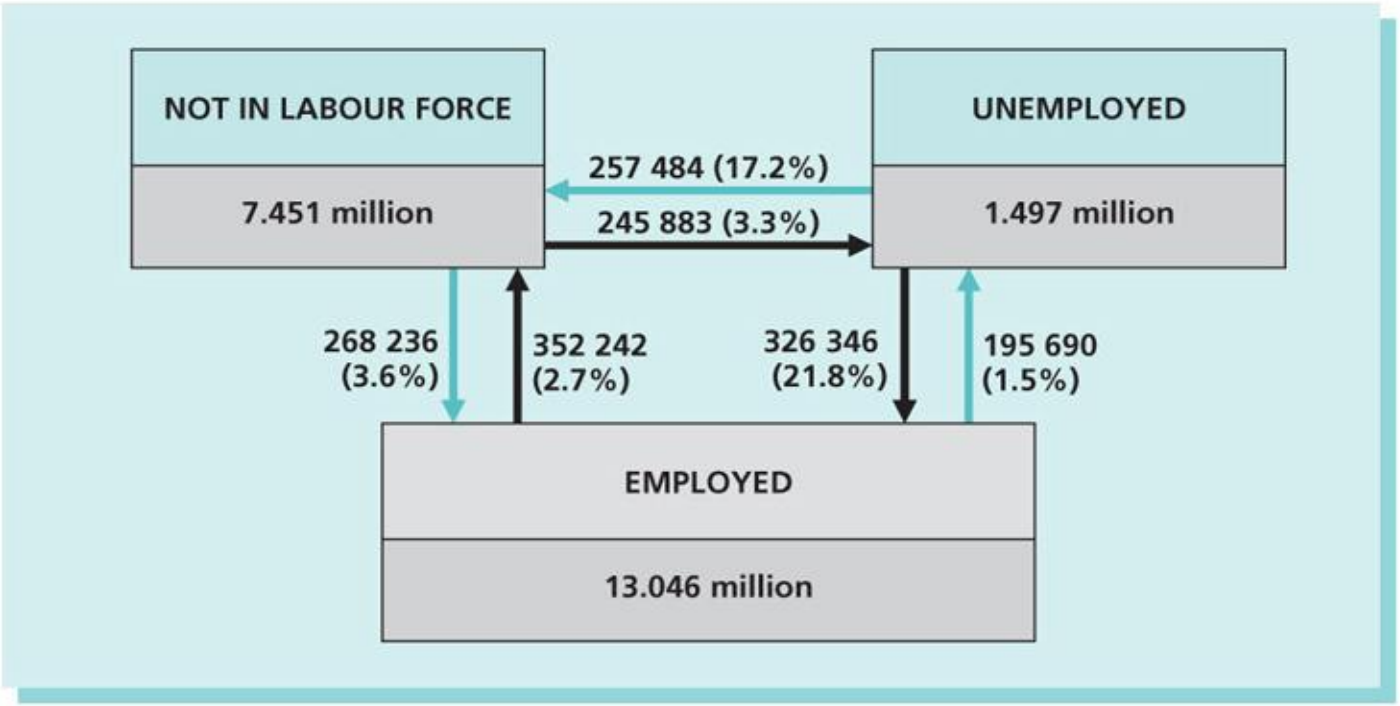
- The labour market is in a constant state of flux – it is very dynamic. The net numbers reported mask a lot of action.
- Workers lose and find jobs continuously.
  - 21.8% of unemployed find find work in the next month.
  - 17.2% will exit the labour force.
  - The rest 61% of unemployed stay unemployed the following month.
- Some workers will become discouraged and stop searching.

FIGURE 3.15

CHANGES IN EMPLOYMENT STATUS IN A TYPICAL MONTH

The arrow between two boxes represents a change from one employment status to another; the label on the arrow shows the number of people in one status who switched to the other status in a typical month, during the period 1990–1994. For example, the arrow from the unemployed box to the employed box shows that 326 346 unemployed workers (21.8% of the unemployed) became employed the following month. The arrow from the employed box to the unemployed box shows that 195 690 employed workers (1.5% of the employed) became unemployed during the following month.

Source: Adapted from Stephen R. G. Jones and W. Craig Riddell, "Gross Flows of Labour in Canada and the United States," *Canadian Public Policy*, February 1998, pp. 103–120.



How Long are People Unemployed?

- An unemployment spell is the length of time that an individual is constantly unemployed. Its length is called the duration of the unemployment spell.
- Most unemployment spells are of short duration, about two month or less.
- Most people who are unemployed *on a given date* are experiencing unemployment spells with long duration.
- How can both statements be true?

How Long are People Unemployed? (continued)

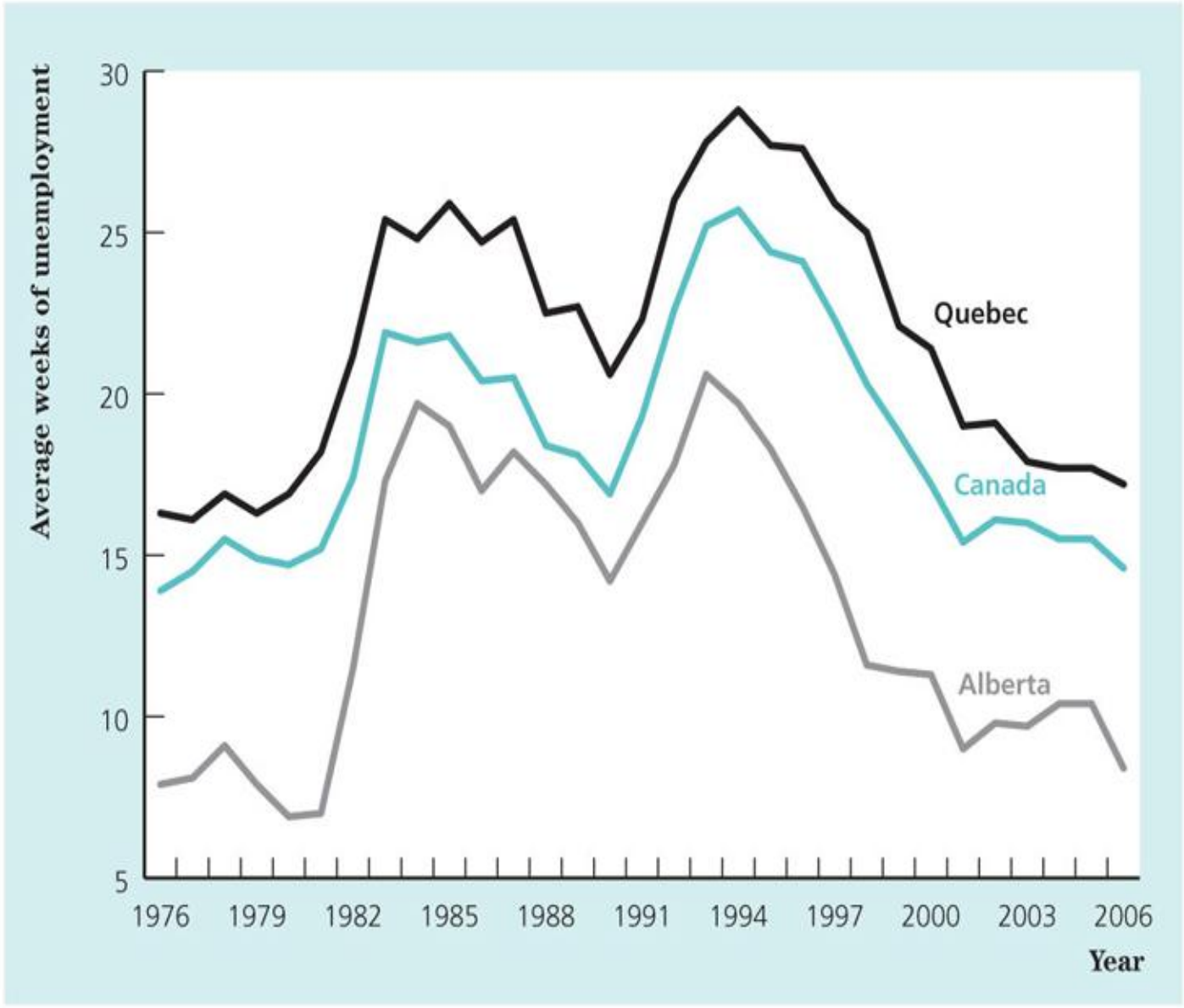
- Duration of unemployment varies across the country and over time.
- Duration of unemployment by 2006 was down to levels last seen in the 1970s.
- The business cycle has an effect.
- But other factors are at play as well (Chapter 13).

FIGURE 3.16

THE AVERAGE DURATION OF UNEMPLOYMENT, 1976–2006

The figure shows the average number of weeks someone suffering a spell of unemployment remained unemployed. These data are presented for two provinces (Quebec and Alberta) as well as for Canada as a whole. Note how unemployment duration rises during recessions (1981–1982, 1991–1992) but falls during expansions (1983–1990 and 1993–2006).

Source: Adapted from Statistics Canada CANSIM II Table 282-0048.



Why are There Always Unemployed People? Frictional Unemployment

- Frictional unemployment arises as workers search for suitable jobs and firms search for suitable workers.
  - The search and match process takes time.
  - During that time someone is unemployed.

Structural Unemployment

- Structural unemployment is the long-term and chronic unemployment that exists when the economy is not in a recession.
  - Unskilled or low skilled workers are unable to find long-term jobs.
  - Workers lose their skills.
  - Reallocation of labour from industries/regions in decline takes time.

The Natural Rate of Unemployment

- The natural rate of unemployment ($\overline{u}$) is the rate of unemployment that prevails when output and employment are at their full-employment levels.
- The natural rate of unemployment exist due to frictional and structural causes.

Cyclical Unemployment

- Cyclical unemployment is the difference between actual and natural unemployment rates

  $(u - \bar{u})$

- Cyclical unemployment is positive whenever the actual unemployment rate is above the natural rate (and *vice versa*).

Okun's Law

- Okun's law states that the gap between an economy's full-employment and actual levels of output increases by about 2 percentage points for every 1 percentage point increase in the unemployment rate.
- A rise in cyclical unemployment has a magnified effect on output – the number of people in the work force, hours worked and productivity also fall.

Okun's Law (continued)

$$\frac{\overline{Y} - Y}{\overline{Y}} = 2(u - \bar{u})$$

- Okun's law can also be expressed in growth terms as:

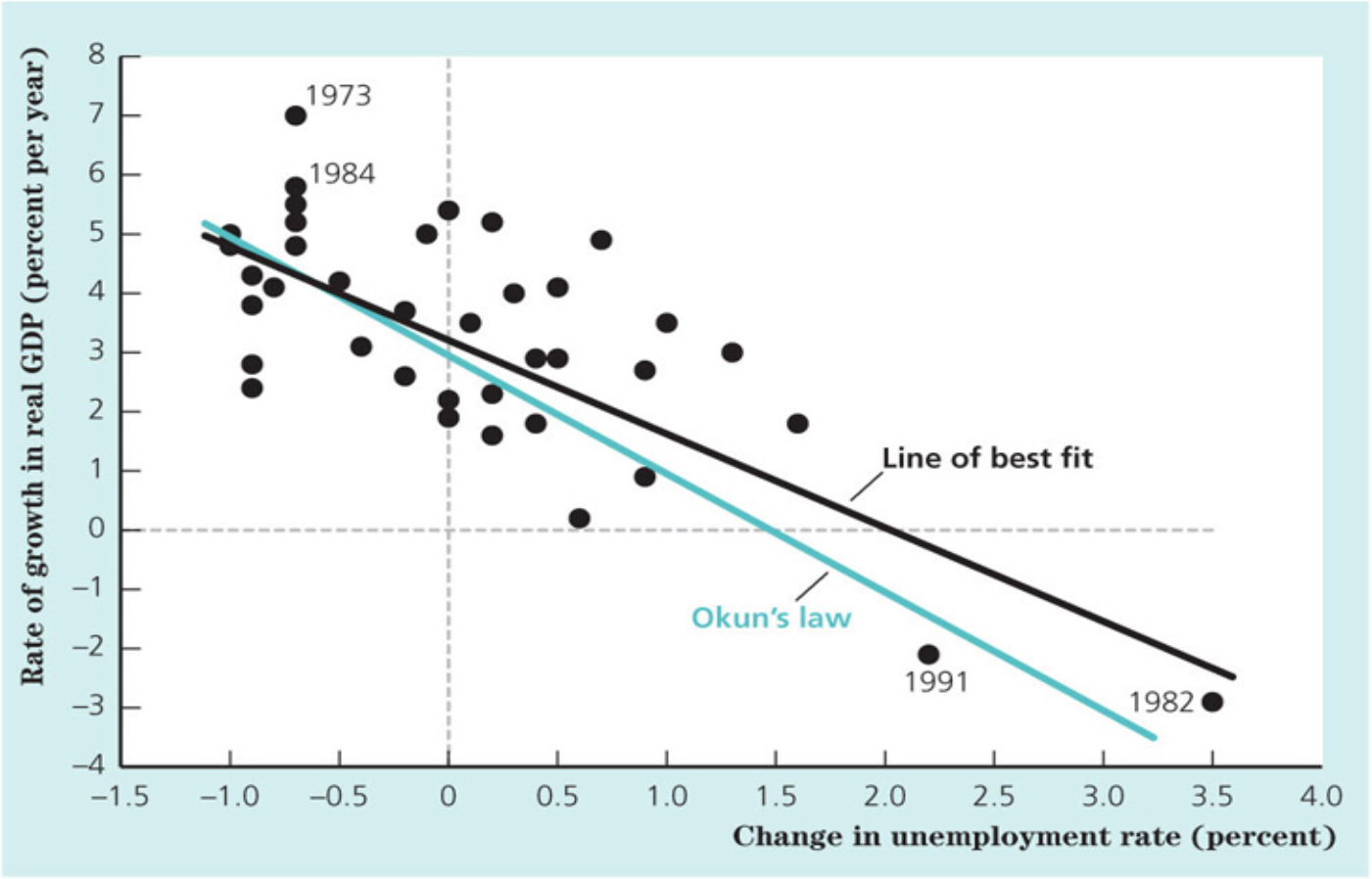
$$\frac{\Delta Y}{Y} = 3 - 2\Delta u$$

FIGURE 3.17

OKUN'S LAW IN CANADA, 1967–2006

This figure shows the relation between the growth rate of real GDP (vertical axis) and the change in the unemployment rate (horizontal axis). Each point represents one year and shows the change in the unemployment rate and the change in real output that was realized in that year. The black line is the line of best fit running through these points. The slope of this line is –1.5, indicating that a 1 percentage point change in the unemployment rate is typically associated with a change in the growth rate of output equal to 1.5 percentage points in the opposite direction. The teal line shows Okun's law. It has a slope of –2. The rule of thumb described by Okun's law does a reasonable job of describing the relation between the growth rate of output and the change in the unemployment rate in Canada.

Source: Adapted from Statistics Canada CANSIM II series v2062815 and v3860085.



A treat for the class: The production function and why product divides

- Let's start with the production:

  (1) $Y = AK^{\alpha}N^{(1-\alpha)}$

- The return to capital is its marginal product, (the slope of the production function, fig. 3.2):

  (2) $MPK = \Delta Y/\Delta K = \alpha AK^{(\alpha-1)}N^{(1-\alpha)} > 0$

- The return to labour is the real wage (fig. 3.3):

  (3) $MPN = \Delta Y/\Delta N = (1-\alpha)AK^{\alpha}N^{-\alpha} > 0$

  (4) Real income = returns to factors times number of them = $MPK \times K + MPN \times N$

The production function and why product divides (next steps)

(5) $MPK \times K = \alpha A K^{(\alpha-1)} N^{(1-\alpha)} \times K$

$= \alpha A K^{\alpha} N^{(1-\alpha)}$

$= \alpha Y$

- In a similar fashion it can be shown that:

  (6) $MPN \times N = (1-\alpha) Y$

- Thus:

  (7) $MPK \times K + MPN \times N = \alpha Y + (1-\alpha) Y = Y$

- Income = output – *is this cool or what!*