CHAPTER 12

WAGE DETERMINATION

Over 16 million Canadians go to work each day. We work at an amazing variety of jobs for thousands of different firms for considerable differences in pay. What determines our hourly wage or annual salary? Why is the salary for, say, a top major league baseball player $18 million a year, whereas the pay for a first-rate schoolteacher is $65,000? Why are starting salaries for university graduates who major in engineering and accounting so much higher than for graduates majoring in journalism and sociology?

Having explored the major factors that underlie labour demand, we now bring *labour supply* into our analysis to help answer these questions. Generally, labour supply and labour demand interact to determine the hourly wage rate or annual salary in each occupation. Collectively, those wages and salaries make up about 75 percent of the national income in Canada.

12.1   Productivity and the General Level of Wages

Economists use the term "labour" broadly to apply to (1) blue-collar and white-collar workers of all varieties; (2) professionals such as lawyers, physicians, dentists, and teachers; and (3) owners of small businesses, including barbers, plumbers, and a host of retailers who provide labour as they carry on their own business.

Wages are the price that employers pay for labour. Wages take the form not only of direct money payments such as hourly pay, annual salaries, bonuses, royalties, and commissions, but also fringe benefits, such as paid vacations and dental insurance. We will use the term "wages" to mean all such payments and benefits converted to an hourly basis. That will remind us that the **wage rate** is a price paid per unit of labour services, in this case, an hour of work. It will also let us distinguish between the wage rate and labour earnings, the latter being determined by multiplying the number of hours worked per week, per month, or per year by the hourly wage or wage rate.

We must also distinguish between nominal wages and real wages. A **nominal wage** is the amount of money received per hour, per day, and so on. A **real wage** is the quantity of goods and services a worker can obtain with nominal wages; real wages reveal the purchasing power of nominal wages.

Your real wage depends on your nominal wage and the prices of the goods and services you purchase. Suppose you receive a 5 percent increase in your nominal wage during a certain year, but in that same year the price level increases by 3 percent. Then your real wage has increased by 2 percent (= 5 percent *minus* 3 percent). Unless otherwise indicated, we will discuss only *real* wages.

Wages differ among nations, regions, occupations, and individuals. Wage rates are much higher in Canada than in China or India. Wages are slightly higher in central Canada and the west than in the east. Plumbers are paid less than NHL hockey players, and lawyer Adam may earn twice as much as lawyer Bharti for the same number of hours of work. Wage rates also differ by gender, race, and ethnic background.

The general level of wages includes a wide range of different wage rates. It includes the wages of bakers, barbers, brick masons, and brain surgeons. By averaging such wages, we can more easily compare wages among regions and among nations.

As Global Perspective 12.1 suggests, the general level of real wages in Canada, especially in the skilled trades, is relatively high—although not the highest in the world.

The explanation for the high real wages in Canada and other industrially advanced economies (referred to hereafter as advanced economies) is that the demand for labour in these nations is relatively large compared to the supply of labour.

wage rate
A price paid per unit of labour services.

nominal wage
The amount of money received by a worker per unit of time (hour, day, etc.).

real wage
The amount of goods and services a worker can purchase with a nominal wage.

Wages are the price that employers pay for labour.

The Role of Productivity

We know from the previous chapter that the demand for labour, or for any other factor, depends on its productivity. Generally, the greater the productivity of labour, the greater the demand for it. If the total supply of labour is fixed, then the stronger the demand for labour, and the higher the average level of real wages. The demand for labour in Canada and the other major advanced economies is large because labour in these countries is highly productive. There are several reasons for that high productivity:
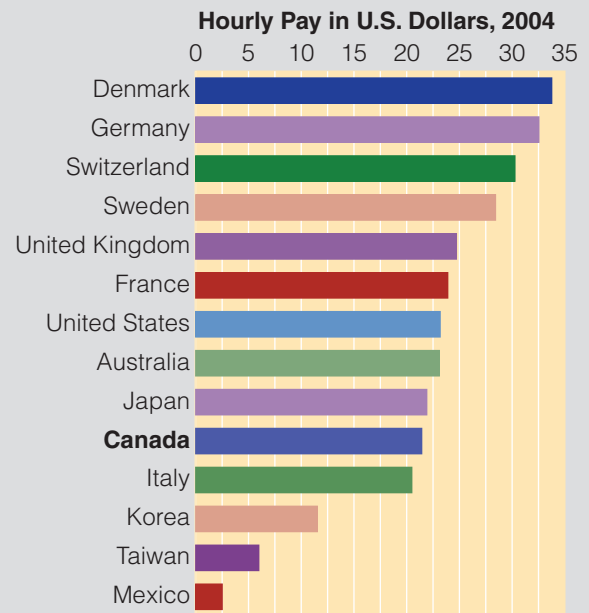
- *Plentiful Capital*   Workers in the advanced economies have access to large amounts of physical capital equipment (machinery and buildings). The total physical capital per worker in Canada is one of the highest in the world.

GLOBAL PERSPECTIVE 12.1

Hourly wages of production workers, selected nations

Worldwide wage differences are pronounced. The data shown here indicate that hourly compensation in Canada is not as high as in some European nations. It is important to note, however, that the prices of goods and services vary greatly among nations, and the process of converting foreign wages into dollars may not accurately reflect such variations.

Hourly Pay in U.S. Dollars, 2004

Nation	
Denmark	
Germany	
Switzerland	
Sweden	
United Kingdom	
France	
United States	
Australia	
Japan	
Canada	
Italy	
Korea	
Taiwan	
Mexico	

Source: U.S. Bureau of Labor Statistics, <www.bls.gov>, 2006

- *Access to Abundant Natural Resources*   In advanced economies, natural resources are abundant in relation to the size of the labour force. Some of those resources are available domestically and others are imported from abroad. Canada, for example, is richly endowed with arable land, mineral resources, and sources of energy for industry.

- *Advanced Technology*   The level of technological progress is generally high in advanced economies. Not only do workers in these economies have more capital equipment to work with but that equipment is also technologically superior to the equipment available to the vast majority of workers worldwide. Work methods in the advanced economies are also steadily being improved through scientific study and research.

- *Labour Quality*   The health, education, and training of workers in advanced economies are generally superior to those of workers in developing nations. Thus, even with the same quantity and quality of natural and capital resources, workers in advanced economies tend to be more productive than many of their counterparts.

- *Other Factors*   Less obvious factors also underlie the high productivity in some of the advanced economies. In Canada, for example, such factors include (1) the efficiency and flexibility of management; (2) business, social, and political environments that emphasize production and productivity; (3) access to a large market, which enables firms to engage in mass production; and (4) increased specialization of production made possible by free trade agreements with other nations.

Real Wages and Productivity

Figure 12-1 shows the close long-run relationship between output per hour of work and real hourly earnings in Canada. Because real income and real output are two ways of viewing the same thing,

FIGURE 12-1

Output per Hour and Real Hourly Earnings in Canada

Over the years a close relationship exists between output per hour of work and real hourly earnings.
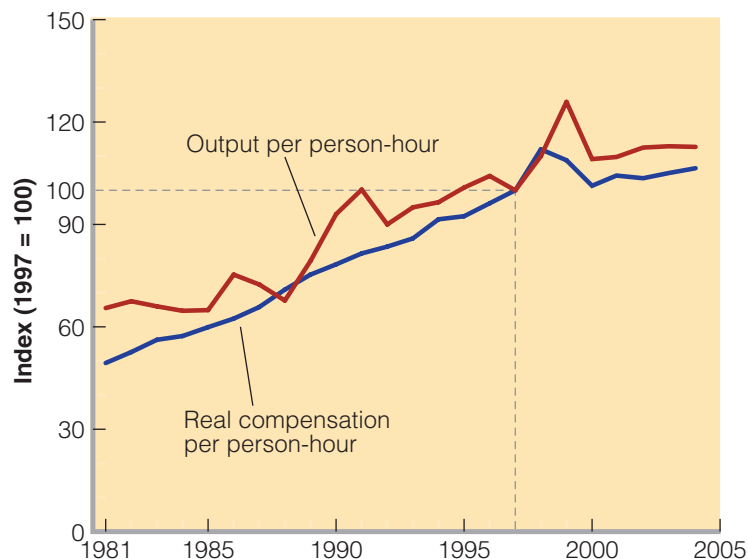
Source: Statistics Canada, CANSIM, table 383-0008.

real income (earnings) per worker can increase only at about the same rate as output per worker. When workers produce more real output per hour, more real income is available to distribute to them for each hour worked.

However, suppliers of land, capital, and entrepreneurial talent also share in the income from production. Real wages, therefore, do not always rise in lockstep with gains in productivity over short spans of time. But over long periods, productivity and real wages tend to rise together.

Growth of Real Wages

Basic supply and demand analysis helps explain the long-term trend of real-wage growth in Canada. The nation's labour force has grown significantly over the decades, but, as a result of the productivity-increasing factors we have mentioned, labour demand has increased more rapidly than labour supply. Figure 12-2 shows several such increases in labour supply and labour demand. The result has been a long-run increase in wage rates and employment.

12.2   Wages in a Perfectly Competitive Labour Market

Choosing a Little More or Less

perfectly competitive labour market
A factor market in which a large number of firms demand a particular type of labour supplied by a large number of nonunion workers.

We now turn from the average level of wages to specific wage rates. What determines the wage rate paid for some specific type of labour? Demand and supply analysis is again revealing. Let's begin by examining labour demand and labour supply in a **perfectly competitive labour market**. In this type of market

• Numerous firms compete with one another in hiring a specific type of labour.

• Many qualified workers with identical skills supply that type of labour.

• Individual firms and individual workers are wage-takers, since neither can exert any control over the market wage rate.

www.mcgrawhill.ca/olc/mcconnell

FIGURE 12-2

The Long-Run Trend of Real Wages in Canada

The productivity of Canadian labour has increased substantially over the long run, causing the demand for labour, *D*, to shift rightward more rapidly than increases in the supply of labour, *S*. The result has been increases in real wages.
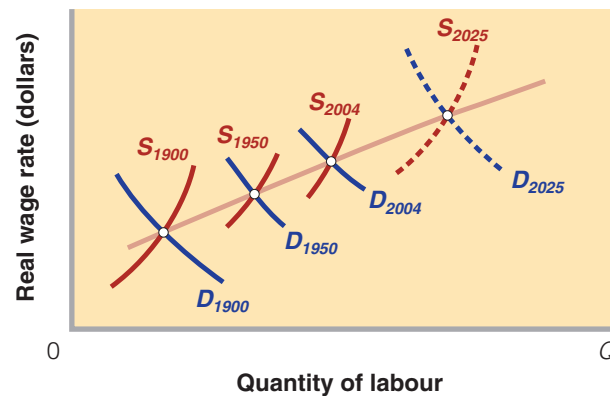
Market Demand for Labour

Suppose 200 firms demand a particular type of labour, say, carpenters. These firms need not be in the same industry. Thus, firms producing wood-framed furniture, wood windows and doors, houses and apartment buildings, and wood cabinets will demand carpenters. To find the total, or market, labour demand curve for a particular labour service, we sum horizontally the labour demand curves (the marginal revenue product curves) of the individual firms, as indicated in **Figure 12-3 (Key Graph)**. The horizontal summing of the 200 labour demand curves like *d* in Figure 12-3b yields the market labour demand curve *D* in Figure 12-3a.

Market Supply of Labour

On the supply side of a perfectly competitive labour market, we assume that no union exists and that workers individually compete for available jobs. The supply curve for each type of labour slopes upward, indicating that employers must bid workers away from other industries, occupations, and localities. Within limits, workers have alternative job opportunities: for example, they may work in other industries in the same locality, or they may work in their present occupations in different cities or provinces, or they may work in other occupations.

Firms that want to hire these workers (here, carpenters) must pay higher wage rates to attract them away from the alternative job opportunities available to them. They must also pay higher wages to induce people who are not currently in the labour force—perhaps doing household activities or enjoying leisure—to seek employment. In short, assuming that wages are constant in other labour markets, higher wages in a particular labour market entice more workers to offer their labour services in that market—a fact confirmed by the upward-sloping market supply of labour curve *S* in Figure 12-3a.
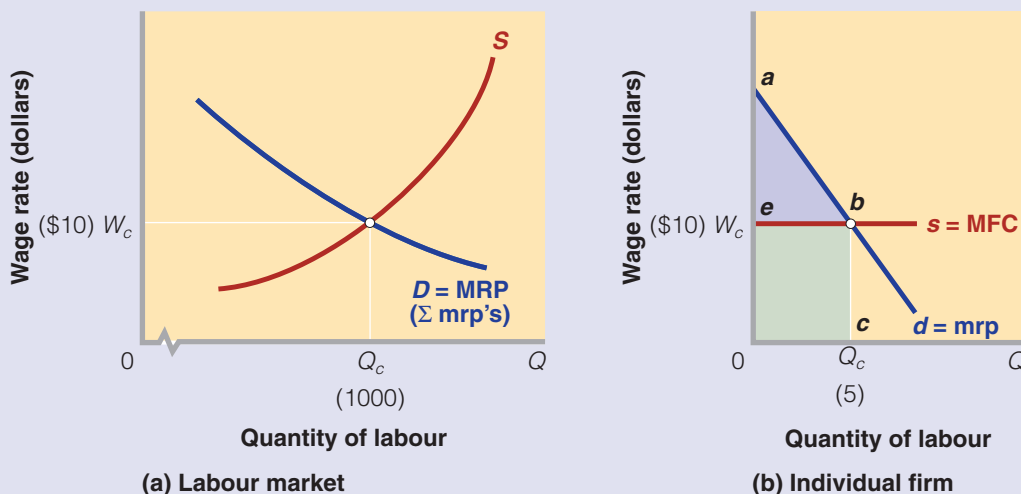
Labour Market Equilibrium

The intersection of the market labour demand curve and the market supply curve determines the equilibrium wage rate and level of employment in purely competitive labour markets. In Figure 12-3a the equilibrium wage rate is W_c ($10), and the number of workers hired is Q_c (1000). To the individual firm the market wage rate W_c is given. Each of the many firms employs such a small fraction of the total available supply of this type of labour that none of them can influence the wage rate. The supply of this labour is perfectly elastic to the individual firm, as shown by horizontal line *s* in Figure 12-3b.

KEY GRAPH

FIGURE 12-3   **Labour Supply and Labour Demand in (Panel a) a Perfectly Competitive Labour Market and (Panel b) a Single Competitive Firm**

(a) Labour market

(b) Individual firm

In a perfectly competitive labour market (panel a), the equilibrium wage rate, W_c, and the number of workers, Q_c, are determined by labour supply S and labour demand D. Because this market wage rate is given to the individual firm (panel b) hiring in this market, its labour supply curve s = MFC is perfectly elastic. Its labour demand curve is its MRP curve (here labelled mrp). The firm maximizes its profit by hiring workers up to where MRP = MFC. Area $0abc$ represents both the firm's total revenue and its total cost. The green area is its total wage cost; the lavender area is its nonlabour costs, including a normal profit—that is, the firm's payments to the suppliers of land, capital, and entrepreneurship.

Quick Quiz

1. **The supply of labour curve *S* slopes upward in graph (a) because**
a. the law of diminishing marginal utility applies.
b. the law of diminishing returns applies.
c. workers can afford to buy more leisure when their wage rates rise.
d. higher wages are needed to attract workers away from other labour markets, household activities, and leisure.

2. **This firm's labour demand curve *d* in graph (b) slopes downward because**
a. the law of diminishing marginal utility applies.
b. the law of diminishing returns applies.
c. the firm must lower its price to sell additional units of its product.
d. the firm is a competitive employer, not a monopsonist.

3. **In employing five workers, the firm represented in graph (b)**
a. has a total wage cost of $6000.
b. is adhering to the general principle of undertaking all actions for which the marginal benefit exceeds the marginal cost.
c. uses less labour than would be ideal from society's perspective.
d. experiences increasing marginal returns.

4. **A rightward shift of the labour supply curve in graph (a) would shift curve**
a. d = mrp leftward in graph (b).
b. d = mrp rightward in graph (b).
c. s = MFC upward in graph (b).
d. s = MFC downward in graph (b).

ANSWERS: 1. d; 2. b; 3. b; 4. d

TABLE 12-1

The Supply of Labour: Perfect Competition in the Hire of Labour			
(1) Units of labour	(2) Wage rate	(3) Total labour cost (wage bill)	(4) Marginal factor (labour) cost
0	$10	$ 0	
1	10	10	$10
2	10	20	10
3	10	30	10
4	10	40	10
5	10	50	10
6	10	60	10

Each individual firm will find it profitable to hire this type of labour up to the point at which marginal revenue product is equal to marginal factor cost. This is merely an application of the MRP = MFC rule we developed in Chapter 11.

As Table 12-1 indicates, when the price of a factor is given to the individual competitive firm, the marginal cost of that resource (MFC) is constant and is equal to the resource price. Here, MFC is constant and is equal to the wage rate. Each additional worker hired adds precisely his or her own wage rate ($10 in this case) to the firm's total resource cost. So the firm in a perfectly competitive labour market maximizes its profit by hiring workers to the point at which its wage rate equals MRP. In Figure 12-3b this firm will hire Q_c (five) workers, paying each of them the market wage rate, W_c ($10). The other 199 firms (not shown) that are hiring workers in this labour market will do the same.

To determine a firm's total revenue from employing a particular number of labour units, we sum the MRPs of those units. For example, if a firm employs three labour units with marginal revenue products of $14, $13, and $12, respectively, then the firm's total revenue is $39 (= $14 + $13 + $12). In Figure 12-3b, where we are not restricted to whole units of labour, total revenue is represented by area 0*abc* under the MRP curve to the left of Q_c. What area represents the firm's total cost, including a normal profit? For Q_c units, the same area—0*abc*. The green rectangle represents the firm's total wage cost ($0Q_c \times 0W_c$). The lavender triangle (total revenue minus total wage cost) represents the firm's nonlabour costs—its explicit and implicit payments to land, capital, and entrepreneurship. Thus, in this case, total cost (wages plus other income payments) equals total revenue. This firm and others like it are earning only a normal profit. Figure 12-3b represents a long-run equilibrium for a firm that is selling its product in a perfectly competitive product market and buying its labour in a perfectly competitive labour market. *(Key Questions 3 and 4)*

12.3 Monopsony Model

monopsony
A market structure in which there is only a single buyer.

In the perfectly competitive labour market described in the preceding section, each employer hires too small an amount of labour to influence the wage rate. The situation is quite different in **monopsony**, a market in which a single employer of labour has substantial buying (hiring) power. Labour market monopsony has the following characteristics:

- Only a single buyer of a particular type of labour exists.

- This type of labour is relatively immobile, either geographically or because workers would have to acquire new skills.

- The firm is a wage-maker, because the wage rate it must pay varies directly with the number of workers it employs.

As is true of monopoly power, there are various degrees of monopsony power. In a perfect monopsony such power is at its maximum, because only a single employer exists in the labour market. The best real-world examples are probably the labour markets in some towns that depend almost entirely on one major firm. For example, a copper-mining concern may be almost the only source of employment in a remote British Columbia town. A textile mill in Quebec's Eastern Townships, a Gatineau papermill, or a Newfoundland fish processor may provide most of the employment in its locale. Inco (the largest nickel producer in the world) is a dominant employer in the Sudbury, Ontario, area.
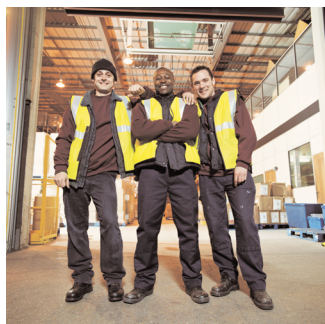
296

When a firm hires most of the available supply of a particular type of labour, its decision to hire more or fewer workers affects the wage rate it pays to those workers.

Math 12.1

A Monopsonist's MFC Exceeds the Wage Rate

In other cases three or four firms may each hire a large portion of the supply of labour in a certain market and, therefore, have some monopsony power. If they tacitly or openly act in concert in hiring labour, they greatly enhance their monopsony power.

Upward-Sloping Labour Supply to a Firm

When a firm hires most of the available supply of a particular type of labour, its decision to employ more or fewer workers affects the wage rate it pays to those workers. If a firm is large in relation to the size of the labour market, it will have to pay a higher wage rate to obtain more labour. Suppose only one employer of a particular type of labour exists in a certain geographic area. In that case, the labour supply curve for that firm and the total supply curve for the labour market are identical. This supply curve is upward sloping, indicating that the firm must pay a higher wage rate to attract more workers. The supply curve, S in Figure 12-4, is also the average-cost-of-labour curve for the firm; each point on it indicates the wage rate (cost) per worker that must be paid to attract the corresponding number of workers.

MFC Higher than the Wage Rate

When a monopsonist pays a higher wage to attract an additional worker, it must pay that higher wage to all the workers it is currently employing at a lower wage. If not, labour morale will deteriorate, and the employer will be plagued with labour unrest because of wage-rate differences for the same job. Paying a uniform wage to all workers means that the cost of an extra worker—the marginal factor (labour) cost (MFC)—is the sum of that worker's wage rate and the amount necessary to bring the wage rate of all current workers up to the new wage level.

Table 12-2 illustrates this point. One worker can be hired at a wage rate of $6, but hiring a second worker forces the firm to pay a higher wage rate of $7. The marginal factor (labour) cost of the second worker is $8—the $7 paid to the second worker plus a $1 raise for the first worker. From another viewpoint, total labour cost is now $14 (= 2 × $7), up from $6. So the MFC of the second worker is $8 (= $14 − $6), not just the $7 wage rate paid to that worker. Similarly, the marginal labour cost of the third worker is $10—the $8 that must be paid to attract this worker from alternative employment, plus $1 raises, from $7 to $8, for the first two workers.

FIGURE 12-4

In a monopsonistic labour market, the employer's marginal factor (labour) cost curve (MFC) lies above the labour supply curve, S. Equating MFC with MRP at point b, the monopsonist hires Q_m workers (compared with Q_c under competition). As indicated by point c on S, it pays only wage rate W_m (compared with the competitive wage W_c).
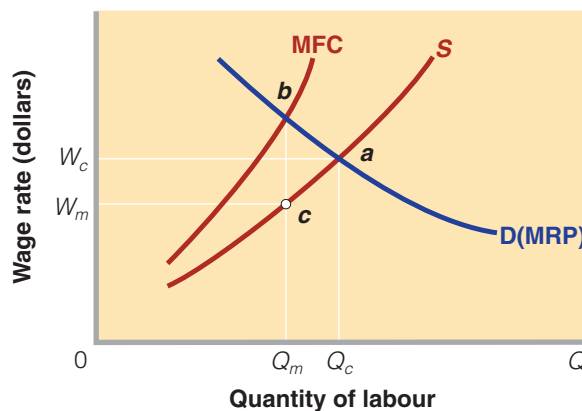

The Wage Rate and Level of Employment in a Monopsonistic Labour Market

TABLE 12-2

	The Supply of Labour: Monopsony in the Hire of Labour		
(1) Units of labour	(2) Wage rate	(3) Total labour cost (wage bill)	(4) Marginal factor (labour) cost
0	$ 5	$ 0	
1	6	6	$ 6
2	7	14	8
3	8	24	10
4	9	36	12
5	10	50	14
6	11	66	16

The important point is that to the monopsonist, marginal factor (labour) cost exceeds the wage rate. Graphically, the MFC curve lies above the average-cost-of-labour curve, or labour supply curve S, as is clearly shown in Figure 12-4.

Equilibrium Wage and Employment

How many units of labour will the monopsonist hire and what wage rate will it pay? To maximize profit, the monopsonist will employ the quantity of labour Q_m in Figure 12-4, because at that quantity MFC and MRP are equal (point b).[1] The monopsonist next determines how much it must pay to attract these Q_m workers. From the supply curve S, specifically point c, it sees that it must pay wage rate W_m. Clearly, it need not pay a wage equal to MRP; it can attract exactly the number of workers it wants (Q_m) with wage rate W_m. And that rate is what it will pay.

Contrast these results with those that would prevail in a competitive labour market. With competition in the hiring of labour, the level of employment would be greater (at Q_c) and the wage rate would be higher (at W_c). Other things equal, the monopsonist maximizes its profit by hiring a smaller number of workers and thereby paying a less-than-competitive wage rate. Society gets a smaller output, and workers get a wage rate that is less by bc than their marginal revenue product. Just as a monopolist finds it profitable to restrict product output to realize an above-competitive price for its goods, the monopsonist finds it profitable to restrict employment to depress wage rates and therefore costs—that is, to realize wage rates below those that would occur under competitive conditions.

Worked Problem 12.1
Labour Markets:
Competition and
Monopsony

Examples of Monopsony Power

Monopsonistic labour markets are not common in the Canadian economy, since more typically, many employers compete for workers, particularly for workers who are occupationally and geographically mobile. Also, in a potential monopsony in a local labour market, unions spring up to counteract that power by forcing firms to negotiate wages. Nevertheless, there is evidence of monopsony power in such diverse labour markets as the markets for nurses, professional athletes, public-school teachers, newspaper employees, and some building trades workers. *(Key Question 6)*

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[1]The fact that MFC exceeds factor price when factors are hired or purchased under imperfectly competitive (monopsonistic) conditions calls for adjustments in Chapter 11's least-cost and profit-maximizing rules for hiring factors. (See equations (1) and (2) in the "Optimal Combination of Factors" section of Chapter 11.) Specifically, we must substitute MFC for resource price in the denominators of our two equations. That is, with imperfect competition in the hiring of both labour and capital, equation (1) becomes

$$\frac{MP_L}{MFC_L} = \frac{MP_C}{MFC_C} \tag{1$'$}$$

and equation (2) is restated as

$$\frac{MRP_L}{MFC_L} = \frac{MRP_C}{MFC_C} = 1 \tag{2$'$}$$

In fact, equations (1) and (2) can be regarded as special cases of (1$'$) and (2$'$) in which firms happen to be hiring under perfectly competitive conditions and factor price is, therefore, equal to, and can be substituted for, marginal factor cost.

12.4   Unions and the Labour Market: Three Models

We have assumed so far that workers compete with one another in selling their labour services. In some labour markets, however, workers sell their labour services collectively through unions. When a union is formed in an otherwise competitive labour market, it bargains with a relatively large number of employers. The union has many goals, the most important of which is to raise wage rates, and it can pursue that objective in several ways.

Demand-Enhancement Model

From the union's viewpoint, the most desirable technique for raising wage rates is to increase the demand for labour. As Figure 12-5 shows, an increase in labour demand will create both higher wage rates and more jobs. How great those increases will be depends on the elasticity of labour supply. The less elastic the labour supply, the greater will be the wage increase; the more elastic the labour supply, the greater will be the employment increase.

To increase labour demand the union might try to influence one or more of the determinants of demand. For example, a union can attempt to increase the demand for the product or service its members are producing, enhance the productivity of labour, or alter the prices of other inputs.

FIGURE 12-5

Unions and Demand Enhancement

When unions can increase the demand for labour (say, from D_1 to D_2), they can realize higher wage rates (W_c to W_u) and more jobs (Q_c to Q_u).
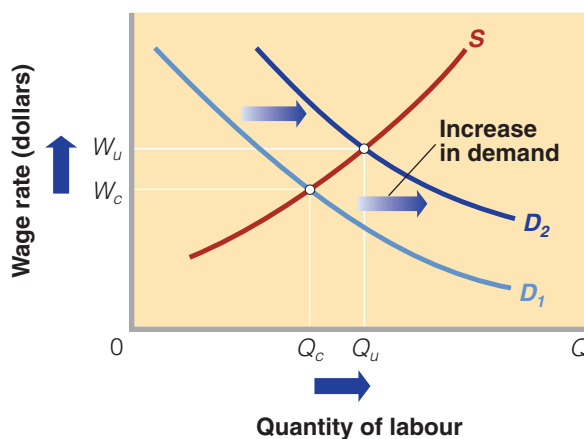
INCREASE PRODUCT DEMAND

Unions can increase the demand for the products their members help produce—and thus raise the derived demand for labour services—through advertising and political lobbying.

Occasionally, unions advertise union-produced goods or services. The long-running campaign urging consumers to "look for the union label" is an example. Less often, unions join with their employers to finance advertising campaigns designed to bolster product demand. Unions in Canada, such as the Canadian Auto Workers (CAW), have helped to finance "Buy Union" campaigns to convince consumers to purchase products made by their members.

On the political front, construction unions have lobbied for new highway, mass transit, and stadium projects. Teachers' unions and associations have pushed for increased public spending on education, and the steelworkers' union has at times supported employers in seeking protective tariffs designed to exclude competing foreign steel. The steelworkers recognize that an increase in the price of imported steel through tariffs or international agreements will increase the demand for domestically made steel, boosting the derived demand for Canadian steelworkers.

INCREASE PRODUCTIVITY

Many decisions affecting labour productivity—for example, decisions concerning the quantity and quality of real capital used by workers—are made unilaterally by management. There is a growing tendency, however, to set up joint labour–management committees designed to increase labour productivity.

ALTER THE PRICE OF OTHER INPUTS

Unions sometimes have tried to strengthen the demand for their labour by working to increase the price of substitute factors. For example, although union members are generally paid significantly more than the minimum wage, unions have strongly supported increases in the minimum wage. The purpose may be to raise the price of low-wage, nonunion labour, which in some cases is substitutable for union labour. A higher minimum wage for nonunion workers will discourage employers from substituting such workers for union workers and thereby increase the demand for union members.

Similarly, unions have sometimes sought to increase the demand for their labour by supporting public actions that reduce the price of a complementary factor of production. For example, unions in industries that use large amounts of imported factors of production might urge reductions in tariffs on those imports. Where labour and energy are complementary, a price decrease for the other factors will increase the demand for labour through Chapter 11's output effect.

Unions recognize that their ability to influence the demand for labour is very limited. Consequently they are more likely to try to prevent declines in labour demand than they are to promote increases. So, it is not surprising that union efforts to raise wage rates have concentrated on the supply side of the labour market.

Exclusive or Craft Union Model

One way in which unions can raise wage rates is to reduce the supply of labour, and over the years organized labour has favoured policies to do just that. The Canadian Labour Congress, an umbrella organization representing 2.3 million workers, has supported legislation that has (1) restricted immigration, (2) reduced child labour, (3) encouraged compulsory retirement, and (4) enforced a shorter workweek.

Moreover, certain types of workers have adopted techniques designed to restrict the number of workers who can join their union. This is especially true of *craft unions,* whose members possess a particular skill, such as carpenters or brick masons or plumbers. Craft unions have frequently forced employers to agree to hire only union members, thereby gaining virtually complete control of the labour supply. Then, by following restrictive membership policies—for example, long apprenticeships, very high initiation fees, and limits on the number of new members admitted—they artifi-

300

exclusive unionism
The practice of a labour union of restricting the supply of skilled union labour to increase the wages received by union members.

occupational licensing
The laws of provincial or municipal governments that require a worker to satisfy certain specified requirements and obtain a licence from a licensing board before engaging in a particular occupation.

cially restrict labour supply. As indicated in Figure 12-6, such practices result in higher wage rates and constitute what is called **exclusive unionism**. By excluding workers from unions and therefore from the labour supply, craft unions succeed in elevating wage rates.

Occupational licensing is another means of restricting the supply of specific kinds of labour. Here a group of workers in a given occupation pressure provincial or municipal governments to pass a law that says that some occupational group (for example, barbers, physicians, plumbers, car mechanics, or pest controllers) can practise their trade only if they meet certain requirements. Those requirements might include level of education, amount of work experience, the passing of an examination, and personal characteristics ("the practitioner must be of good moral character"). Members of the licensed occupation typically dominate the licensing board that administers such laws. The result is self-regulation, which often leads to policies that serve only to restrict entry to the occupation and reduce the labour supply.

The purpose of licensing is supposedly to protect consumers from incompetent practitioners—surely a worthy goal. But such licensing also results in above-competitive wages and earnings for those in the licensed occupation (Figure 12-6). Moreover, licensing requirements often include a residency requirement, which inhibits the interprovincial movement of qualified workers. Some 300 occupations are now licensed in Canada.

Inclusive or Industrial Union Model

Instead of trying to limit their membership, however, most unions seek to organize all available workers. This is especially true of the *industrial unions,* such as the Canadian Auto Workers and the United Steelworkers. Such unions seek as members all available unskilled, semiskilled, and skilled workers in an industry. A union can afford to be exclusive when its members are skilled craft persons for whom there are few substitutes. But for a union composed of unskilled and semiskilled workers, a policy of limited membership would make available to the employers numerous non-union workers who can easily be substituted for the union workers.

An industrial union that includes virtually all available workers in its membership can put firms under great pressure to agree to its wage demands. Because of its legal right to strike, such a union can threaten to deprive firms of their entire labour supply, and an actual strike can do just that.

inclusive unionism
The practice of a labour union of including as members all workers employed in an industry.

We illustrate such **inclusive unionism** in Figure 12-7. Initially, the competitive equilibrium wage rate is W_c and the level of employment is Q_c. Now suppose an industrial union is formed that

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FIGURE 12-6

Exclusive or Craft Unionism

By reducing the supply of labour (say, from S_1 to S_2) through the use of restrictive membership policies, exclusive unions achieve higher wage rates (W_c to W_u). However, restriction of the labour supply also reduces the number of workers employed (Q_c to Q_u).
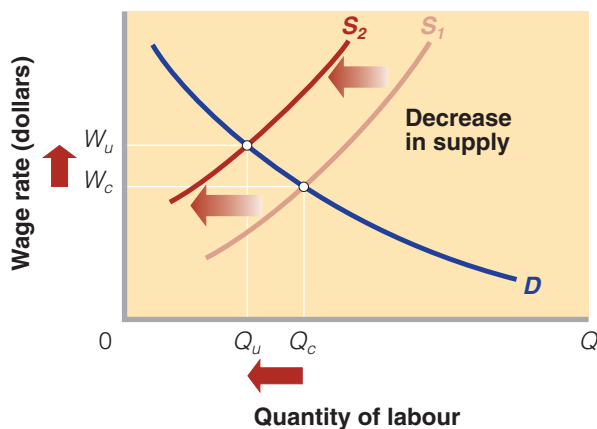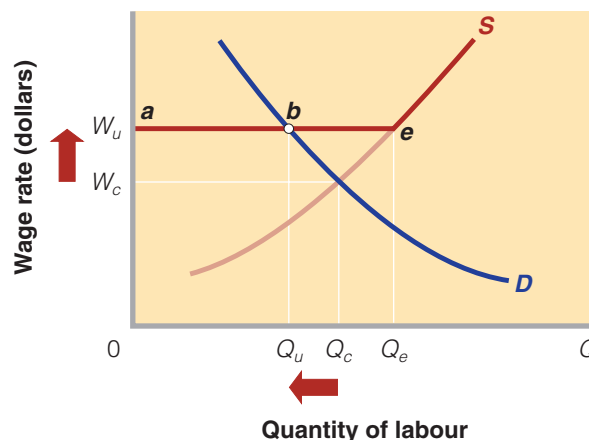
FIGURE 12-7

Inclusive or Industrial Unionism

By organizing virtually all available workers to control the supply of labour, inclusive industrial unions may impose a wage rate, such as W_u, which is above the competitive wage rate W_c. The effect is to change the labour supply curve from S to aeS. At wage rate W_u, employers will cut employment from Q_c to Q_u.

demands a higher, above-equilibrium wage rate of, say, W_u. That wage rate W_u would create a perfectly elastic labour supply over the range ae in Figure 12-7. If firms wanted to hire any workers in this range, they would have to pay the union-imposed wage rate. If they decide against meeting this wage demand, the union will supply no labour at all, and the firms will be faced with a strike. If firms decide it is better to pay the higher wage rate than to suffer a strike, they will cut back on employment from Q_c to Q_u.

By agreeing to the union's W_u wage demand, individual employers become wage-takers. Because labour supply is perfectly elastic over range ae, the marginal resource (labour) cost is equal to the wage rate W_u over this range. The Q_u level of employment is the result of employers' equating this MFC (now equal to the wage rate) with MRP, according to our profit-maximizing rule.

Note from point e on labour supply curve S that Q_e workers desire employment at wage W_u. But as indicated by point b on labour demand curve D, only Q_u workers are employed. The result is a surplus of labour of $Q_e - Q_u$ (also shown by distance eb). In a perfectly competitive labour market without the union, the effect of a surplus of unemployed workers would be lower wages. Specifically, the wage rate would fall to the equilibrium level, W_c, where the quantity of labour supplied equals the quantity of labour demanded (each Q_c).

Wage Increases and Unemployment

Have unions been successful in raising the wages of their members? Evidence suggests that union members on average achieve a 15 percent wage advantage over nonunion workers.

As Figures 12-6 and 12-7 show, the effect of wage-raising actions by both exclusive and inclusive unionism is to reduce employment. That result acts as a restraining influence on union wage demands. A union cannot expect to maintain solidarity within its ranks if it demands a wage rate so high that joblessness will result for, say, 20 or 30 percent of its members.

The unemployment effect created by union-induced wage increases may be reduced in two ways:

1. ***Growth*** The normal growth of the economy increases the demand for most kinds of labour over time. This continual rightward shift of the labour demand curves in Figures 12-6 and 12-7 might offset, or more than offset, the unemployment effects associated with the indicated wage increases. In that event, the increases in unemployment prompted by the unions would tend to *slow* the growth of job opportunities but would not reduce total employment by firms.

2. ***Elasticity***   The size of the unemployment effect resulting from a union-induced wage increase depends on the elasticity of demand for labour. The more inelastic that demand, the smaller the amount of unemployment that accompanies a given wage-rate increase. And if unions have sufficient bargaining strength, they may be able to win provisions in their collective bargaining agreements that reduce the elasticity of demand for union labour by reducing the substitutability of other inputs for that labour. For example, a union may force employers to accept rules slowing the introduction of new machinery and equipment. Or the union may bargain successfully for severance pay or layoff pay, which increases the cost to the firm of substituting capital for labour when wage rates are increased.

Bilateral Monopoly Model

bilateral monopoly
A market in which there is a single seller (monopoly) and a single buyer (monopsony).

Suppose a strong industrial union is formed in a labour market that is monopsonistic rather than competitive, creating a combination of the monopsony model and the inclusive unionism model. The result is called **bilateral monopoly** because there is a single seller and a single buyer. The union is a monopolistic "seller" of labour that controls labour supply and can influence wage rates, but it faces a monopsonistic "buyer" of labour that can also affect wages by altering its employment. This is not an uncommon case, particularly in less-pure forms in which a single union confronts two, three, or four large employers, such as steel, automobiles, construction equipment, and professional sports.

INDETERMINATE OUTCOME OF BILATERAL MONOPOLY

This situation is shown in Figure 12-8, where we superimpose Figure 12-7 onto Figure 12-4. The monopsonistic employer will seek the below-competitive-equilibrium wage rate W_m, and the union will press for some above-competitive-equilibrium wage rate such as W_u. Which will be the outcome? We cannot say with certainty because the bilateral monopoly model does not explain what will happen at the collective bargaining table. We can expect the wage outcome to lie somewhere between W_m and W_u. Beyond that, about all we can say is that the party with the greater bargaining power and the more effective negotiating strategy will probably get a wage closer to the one it seeks.

DESIRABILITY OF BILATERAL MONOPOLY

The wage and employment outcomes in this situation might be more socially desirable than the term "bilateral monopoly" implies. The monopoly on one side of the market might in effect cancel out the monopoly on the other side, yielding competitive or near-competitive results. ***(Key Question 7)***

FIGURE 12-8

A monopsonist seeks to hire Q_m workers (where MFC = MRP) and pay wage rate W_m corresponding to Q_m labour on labour supply curve S. The inclusive union it faces seeks the above-equilibrium wage rate W_u. The actual outcome cannot be predicted.

Bilateral Monopoly in the Labour Market
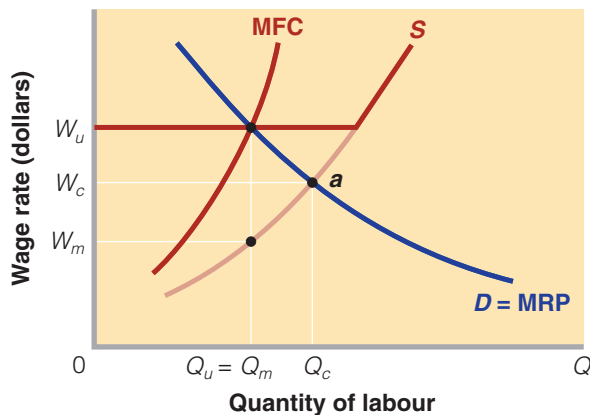
> **QUICK REVIEW**
>
> - In the demand-enhancement union model, a union increases the wage rate by increasing labour demand through actions that increase product demand, raise labour productivity, or alter the prices of related inputs.
>
> - In the exclusive (craft) union model, a union increases wage rates by artificially restricting labour supply, through, say, long apprenticeships or occupational licensing.
>
> - In the inclusive (industrial) union model, a union raises the wage rate by gaining control over a firm's labour supply and threatening to withhold labour via a strike unless a negotiated wage is obtained.
>
> - Bilateral monopoly occurs in a labour market where a monopsonist bargains with an inclusive, or industrial, union. Wage and employment outcomes are determined by collective bargaining in this situation.

12.5 The Minimum Wage

minimum wage
The lowest wage employers may legally pay for an hour of work.

In Canada both the federal and provincial governments have enacted **minimum wage** legislation, but it is the provincial laws that cover most workers. The provincial minimum wage ranges from $6.50 per hour in New Brunswick to $8.00 per hour in British Columbia. The purpose of the minimum wage is to provide a living wage for less-skilled workers to keep them and their families from poverty.

Case against the Minimum Wage

Critics, reasoning in terms of Figure 12-7, contend that an above-equilibrium minimum wage (say, W_u) will push employers back up their labour demand curves, causing them to hire fewer workers. The higher labour costs may even force some firms out of business. Then, some of the poor, low-wage workers whom the minimum wage was designed to help will find themselves out of work. Critics point out that a worker who is *unemployed* at a minimum wage of $5.00 per hour is clearly worse off than if *employed* at a market wage rate of, say, $4.50 per hour.

A second criticism of the minimum wage is that it does not reduce poverty. Critics point out that much of the benefit of the minimum wage accrues to teenage workers, most of whom receive only minimum wages for just a few years.

Case for the Minimum Wage

Advocates of the minimum wage say that critics analyze its impact in an unrealistic context. Figure 12-7, advocates claim, assumes a competitive, static market. But in a more realistic, low-pay labour market where there is some monopsony power (Figure 12-8), the minimum wage can increase wage rates without causing unemployment. Indeed, a higher minimum wage may even produce more jobs by eliminating the motive that monopsonistic firms have for restricting employment. For example, a minimum wage floor of W_c in Figure 12-8 would change the firm's labour supply curve to $W_c aS$ and prompt the firm to increase its employment from Q_m workers to Q_c workers.

A minimum wage may increase labour productivity, shifting the labour demand curve to the right and offsetting any reduced employment that the minimum wage might cause. For example, the higher wage rate might prompt firms to find more productive tasks for low-paid workers, thereby raising their productivity. Alternatively, the minimum wage may reduce *labour turnover* (the rate at which workers voluntarily quit). With fewer low-productive trainees, the *average* productivity of the firm's workers would rise. In either case, the higher labour productivity would justify paying the higher minimum wage. So, the alleged negative employment effects of the minimum wage might not occur.

304

Evidence and Conclusions

Which view is correct? Unfortunately, there is no clear answer. All economists agree there is some minimum wage so high, say, $20 an hour, that it would severely reduce employment. But no current consensus exists on the employment effects of the present level of the minimum wage. Evidence in the 1980s suggested that minimum wage hikes reduced employment of minimum wage workers, particularly teenagers (16- to 19-year-olds). The consensus then was that a 10 percent increase in the minimum wage would reduce teenage employment by about 1 to 3 percent. But recent evidence suggests that the minimum wage hikes in the 1990s produced even smaller, and perhaps zero, employment declines among teenagers.[2]

The overall effect of the minimum wage is thus uncertain. On the one hand, the employment and unemployment effects of the minimum wage do not appear to be a great as many critics fear. On the other hand, because a large part of its effect is dissipated on non-poverty families, the minimum wage is not as strong an anti-poverty tool as many supporters contend.

It is clear, however, that the minimum wage has strong political support. Perhaps this stems from two realities: (1) more workers are helped by the minimum wage than are hurt and (2) the minimum wage gives society some assurance that employers are not taking undue advantage of vulnerable, low-skilled workers.

12.6 | Wage Differentials

wage differentials
The difference between the wage received by one worker or group of workers and that received by another worker or group of workers.

Hourly wage rates and annual salaries differ greatly among occupations. In Table 12-3 we list average weekly wages for several industries to illustrate such occupational **wage differentials**. For example, observe that construction workers on average earn one-third more than those workers in the health and social service industry. Large wage differentials also exist within some of the occupations listed (not shown). For example, although average wages for retail salespersons are relatively low, some top salespersons selling on commission make several times the average wages for their occupation.

What explains wage differentials such as these? Once again, the forces of demand and supply are revealing. As we demonstrate in Figure 12-9 on page 306, wage differentials can arise on either the supply or demand side of labour markets. Figures 12-9a and b represent labour markets for two occupational groups that have identical *labour supply curves.* The labour market in panel (a) has a relatively high equilibrium wage (W_a) because labour demand is very strong. The labour market in panel (b) has an equilibrium wage that is relatively low (W_b) since labour demand is weak. Clearly, the wage differential between occupations (a) and (b) results solely from differences in the magnitude of labour demand.

Contrast that situation with Figure 12-9c and d, where the *labour demand curves* are identical. In the labour market in panel (c), the equilibrium wage is relatively high (W_c) because labour supply is highly restricted. In the labour market in panel (d) labour supply is highly abundant, so the equilibrium wage (W_d) is relatively low. The wage differential between (c) and (d) results solely from the differences in the magnitude of the labour supply.

Although Figure 12-9 provides a good starting point for understanding wage differentials, we need to know *why* demand and supply conditions differ in various labour markets.

Marginal Revenue Productivity

The strength of labour demand—how far rightward the labour demand curve is located—differs greatly among occupations because of differences in how much various occupational groups con-

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[2]Alan Krueger, "Teaching the Minimum Wage in Econ 101 in Light of the New Economics of the Minimum Wage," *Journal of Economic Education,* Summer, 2001.

TABLE 12-3

Average Weekly Wages in Selected Industries, 2005

Industry	Average weekly earnings (including overtime)
All industries	**$ 776.66**
Mining, and oil and gas extraction	1,299.34
Finance, insurance, and real estate	911.76
Logging and forestry	890.61
Manufacturing	871.84
Construction	867.28
Transportation, storage, communications, and other utilities	767.30
Educational and related services	798.46
Real estate services	642.03
Health and social services	638.47

Source: Statistics Canada, CANSIM table 281-0034.
Visit www.mcgrawhill.ca/olc/mcconnell for data updates.

Σ-STAT

marginal revenue productivity
How much workers contribute to their employers' revenue.

noncompeting groups
Collections of workers in the economy who do not compete with each other for employment because the skills and training of the workers in one group are substantially different from those in other groups.

Origin 12.2
Human Capital

human capital
Any expenditure to improve the education, skills, health, or mobility of workers, with an expectation of greater productivity and thus a positive return on the investment.

tribute to their employers' revenue. This revenue contribution, in turn, depends on the workers' productivity and the strength of the demand for the products they are helping to produce. Where labour is highly productive and product demand is strong, labour demand also is strong and, other things equal, pay is high. Top professional athletes, for example, are highly productive at sports entertainment, for which millions of people are willing to pay billions of dollars over the course of a season. So the **marginal revenue productivity** of these top players is exceptionally high, as are their salaries, represented in Figure 12-9a. In contrast, in most occupations workers generate much more modest revenue for their employers, so their pay is lower, as in Figure 12-9b.

Noncompeting Groups

On the supply side of the labour market, workers are not homogeneous; they differ in their mental and physical capabilities and in their education and training. At any given time the labour force is made up of many **noncompeting groups** of workers, each representing several occupations for which the members of a particular group qualify. In some groups qualified workers are relatively few, whereas in others they are highly abundant. Workers in one group do not qualify for the occupations of other groups.

ABILITY

Only a few workers have the ability or physical attributes to be brain surgeons, concert violinists, top fashion models, research scientists, or professional athletes. Because the supply of these particular types of labour is very small in relation to labour demand, their wages are high, as in Figure 12-9c. The members of these and similar groups do not compete with one another or with other skilled or semiskilled workers. The violinist does not compete with the surgeon, nor does the surgeon compete with the violinist or the fashion model.

The concept of noncompeting groups can be applied to various subgroups and even to specific individuals in a particular group. An especially skilled violinist can command a higher salary than colleagues who play the same instrument. A handful of top corporate executives earn 10 to 20 times as much as the average chief executive officer. In each of these cases, the supply of top talent is highly limited, since less talented colleagues are only imperfect substitutes.

EDUCATION AND TRAINING

Another source of wage differentials is differing amounts of **human capital**, which is the personal stock of knowledge, know-how, and skills that enables a person to be productive and thus to earn income. Such stocks result from investments in human capital. Like expenditures on machinery and equipment, productivity-enhancing expenditures on education or training are investments. In both cases, people incur *present costs* with the intention that those expenditures will lead to a greater flow of *future earnings*.

Although education yields higher incomes, it carries substantial costs. A college or university education involves not only direct costs (tuition, fees, books) but also indirect or opportunity costs (forgone earnings) as well. Does the higher pay received by better-educated workers compensate for these costs? The answer is yes. Rates of return are estimated to be 10 to 13 percent for investments in secondary education and 8 to 12 percent for investments in college and university education. One generally accepted estimate is that each year of schooling raises a worker's wage by about 8 percent. The 2001 census showed that an employee in Canada with less than high school graduation cer-

FIGURE 12-9

Labour Demand, Labour Supply, and Wage Differentials

(a) Strong labour demand

(b) Weak labour demand

(c) Restricted labour supply

(d) Abundant labour supply
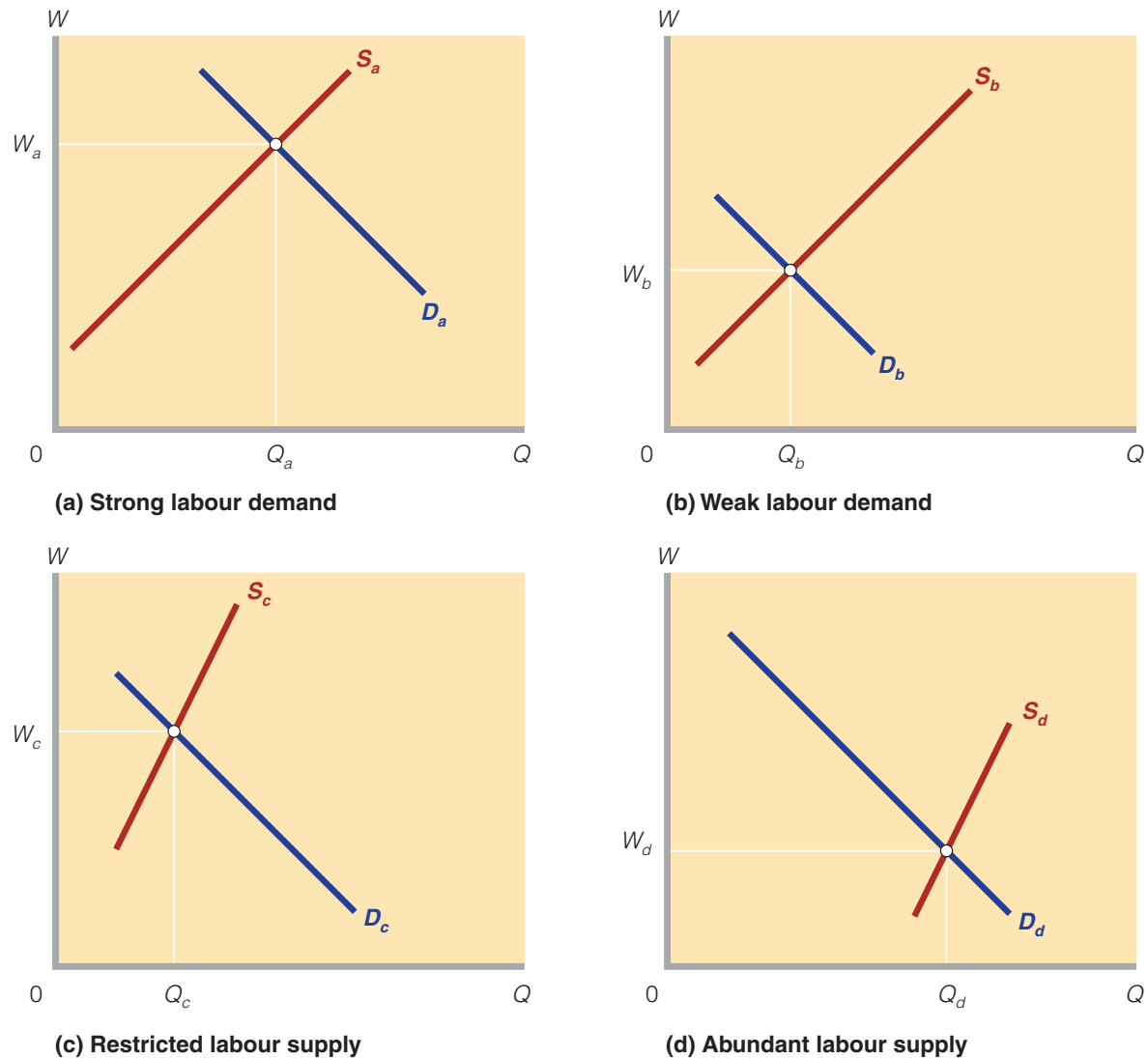
The wage differential between labour markets (a) and (b) results solely from differences in labour demand. In labour markets (c) and (d), differences in labour supply cause the wage differential.

tificate earned on average $21,230 per year, while an employee with a university certificate, diploma or degree averaged $48,648.

Compensating Differences

If the workers in a particular noncompeting group are equally capable of performing several different jobs, you might expect the wage rates to be identical for all these jobs. Not so. A group of

CONSIDER THIS

My Entire Life

Human capital is the accumulation of outcomes of prior investments in education, training, and other factors that increase productivity and earnings. It is the stock of knowledge, know-how, and skills that enables individuals to be productive and thus earn income. A valuable stock of human capital, together with a strong demand for one's services, can add up to a large capacity to earn income. For some people, high earnings have little to do with actual hours of work and much to do with their tremendous skill, which reflects their accumulated stock of human capital.

The point is demonstrated in the following story: It is said that a tourist once spotted the famous Spanish artist Pablo Picasso (1881–1973) in a Paris café. The tourist asked Picasso if he would do a sketch of his wife for pay. Picasso sketched the wife in a matter of minutes and said, "That will be 10,000 francs [roughly $2000]." Hearing the high price, the tourist became irritated, saying, "But that took you only a few minutes."

"No," replied Picasso, "it took me my entire life!"

QUESTION: A one hour visit to a dental specialist, for example an orthodontist, can cost hundreds of dollars. Explain why.

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compensating differences
Differences in the wages received by workers in different jobs to compensate for non-monetary differences in the jobs.

high-school graduates may be equally capable of becoming sales clerks or construction workers, but these jobs pay different wages. In virtually all locales, construction labourers receive much higher wages than sales clerks. These wage differentials are called **compensating differences**, because they must be paid to compensate for nonmonetary differences in various jobs.

The construction job involves dirty working conditions, the hazard of accidents, and irregular employment. The retail sales job means clean clothing, pleasant air-conditioned surroundings, and less fear of injury or layoff. Other things equal, it is easy to see why some workers would rather pick up a credit card than a shovel. So labour supply is less for construction firms, as in Figure 12-9c, than for retail shops, as in Figure 12-9d. Construction firms must pay higher wages than retailers to compensate for the unattractive aspects of construction jobs.

Compensating differences play an important role in allocating society's scarce labour resources. If very few workers want to be garbage collectors, then society must pay high wages to attract garbage collectors. If many more people want to be sales clerks than are needed, then society need not pay them as much as garbage collectors to get those services performed.

Compensating differences are more difficult to determine in Canada's publicly funded health care system. For example, many remote communities in Canada do not have enough physicians to serve the needs of the population. Many provincial governments offer bonuses to physicians who will move into remote communities. But it is not easy to determine an effective level for these government-determined bonuses, which are intended to compensate doctors for moving to what many of them believe to be less-desirable areas to live. Provincial bonuses to those physicians willing to relocate to remote areas have partially alleviated the chronic shortage of doctors in many parts of rural Canada.

Market Imperfections

Differences in marginal revenue productivity, amounts of human capital, and nonmonetary aspects of jobs explain most of the wage differentials in the economy. But other persistent differentials result from various market imperfections that impede workers moving from lower-paying jobs to higher-paying jobs.

LACK OF JOB INFORMATION

Workers may simply be unaware of job opportunities and wage rates in other geographic areas and in other jobs for which they qualify. Consequently, the flow of qualified labour from lower-paying to higher-paying jobs may not be sufficient to equalize wages within occupations.

GEOGRAPHIC IMMOBILITY

Many workers are reluctant to move to new places, to leave friends, relatives, and associates, to force their children to change schools, to sell their houses, or to incur the costs and inconveniences of adjusting to a new job and a new community. As Adam Smith noted more than two centuries ago, "A [person] is of all sorts of luggage the most difficult to be transported." The reluctance of workers to move creates persistent geographic wage differentials within the same occupation. Some economists point out that Canada's employment insurance program contributes to labour immobility.

UNIONS AND GOVERNMENT RESTRAINTS

Wage differentials may be reinforced by artificial restrictions on mobility imposed by unions and government. We have noted that craft unions keep their wages high by restricting membership. Thus, the low-paid nonunion carpenter of Edmonton, Alberta, may be willing to move to Vancouver in the pursuit of higher wages, but her chances of succeeding are slim. She may be unable to get a union card, and no card means no job. Similarly, an optometrist or lawyer qualified to practise in one province may not meet licensing requirements of other provinces, so his ability to move is limited. Other artificial barriers involve pension plans and seniority rights that might be jeopardized by moving from one job to another.

DISCRIMINATION

Despite legislation to the contrary, discrimination results in lower wages being paid to women and visible-minority workers than to white males doing virtually identical work. Also, women and minorities may be crowded into certain low-paying occupations, driving down wages there and raising them elsewhere. If discrimination keeps qualified women and minorities from taking the higher-paying jobs, then differences in pay will persist.

All four considerations—differences in marginal revenue productivity, noncompeting groups, nonmonetary differences, and market imperfections—come into play in explaining actual wage differentials. For example, the differential between the wages of a physician and those of a construction worker can be explained based on marginal revenue productivity and noncompeting groups. Physicians generate considerable revenue because of their high productivity and the strong willingness of consumers (via provincial governments) to pay for health care. Physicians also fall into a noncompeting group where, because of stringent training requirements, only a relatively few persons qualify. So the supply of labour is small in relation to demand.

12.7   Pay for Performance and the Principal–Agent Problem

The models of wage determination we have described in this chapter assume that worker pay is always a standard amount for each hour's work, for example, $15 per hour. But pay schemes are often more complex than that in both composition and purpose. For instance, many workers receive annual salaries rather than hourly pay. Many workers also receive fringe benefits: dental insurance, life insurance, paid vacations, paid sick-leave days, pension contributions, and so on. Finally, some pay plans are designed to elicit a desired level of performance from workers. This last aspect of pay plans requires further elaboration.

The Principal–Agent Problem Revisited

In Chapter 6 we first identified the *principal–agent problem* as it relates to possible differences in the interests of corporate stockholders (principals) and the executives (agents) they hire. This problem extends to all workers. Firms hire workers to help produce the goods and services the firms sell for a profit. Workers are the firms' agents; they are hired to advance the interest (profit) of the firms. The principals are the firms; they hire agents to advance their goals. Firms and workers have one interest in common: they both want the firm to survive and thrive. That will ensure profit for the firm and continued employment and wages for the workers.

But the interests of the firm and of the workers are not identical. A principal–agent problem arises when those interests diverge. Workers may seek to increase their utility by shirking on the job, that is, by providing less than the agreed-on effort or by taking unauthorized breaks. The night security guard in a warehouse may leave work early or spend time reading a novel rather than making the assigned rounds. A salaried manager may spend time away from the office visiting friends rather than attending to company business.

Firms (principals) have a profit incentive to reduce or eliminate shirking. One option is to monitor workers, but monitoring is difficult and costly. Hiring another worker to supervise or monitor the security guard might double the cost of maintaining a secure warehouse. Another way of resolving the principal–agent problem is through some sort of **incentive pay plan** that ties worker compensation more closely to output or performance. Such incentive pay schemes include piece rates, commissions and royalties, bonuses and profit sharing, and efficiency wages.

PIECE RATES

Piece rates are compensation paid according to the number of units of output a worker produces. If a principal pays fruit pickers by the bushel or typists by the page, it need not be concerned with shirking or with monitoring costs.

COMMISSIONS OR ROYALTIES

Unlike piece rates, commissions and royalties tie compensation to the value of sales. Employees who sell products or services—including real estate agents, insurance agents, stockbrokers, and retail salespersons—commonly receive *commissions* that are computed as a percentage of the monetary value of their sales. Recording artists and authors are paid *royalties,* computed as a certain percentage of sales revenues from their works. These types of compensation link the financial interests of the salespeople or artists and authors to the profit interest of the firms.

BONUSES, STOCK OPTIONS, AND PROFIT SHARING

Bonuses are payments in addition to one's annual salary that are based on some factor such as the performance of the individual worker, or of a group of workers, or of the firm itself. A professional baseball player may receive a bonus based on a high batting average, the number of home runs hit, or the number of runs batted in. A business manager may receive a bonus based on the profitability of her or his unit. *Stock options* allow workers to buy shares of their employer's stock at a fixed price. If the firm does well and its stock prices rise, the workers' stock holdings rise in value. Such options are part of the compensation packages of top corporate officials, as well as many workers in relatively new high-technology firms. *Profit-sharing plans* allocate a percentage of a firm's profit to its employees. Such plans have in recent years resulted in large annual payments to many Canadian workers.

THE PRINCIPAL–AGENT PROBLEM AND HEALTH CARE SUPPLIERS

A difficult-to-solve principal–agent problem may arise in the doctor–patient relationship. Clearly, the physician has much more medical expertise than the patient, which gives rise to possible "demand creation" by the physician. If a doctor advises a patient to come back for a visit in two

Origin 12.3
Principal–Agent Problem

incentive pay plan
A compensation structure, such as piece rates, bonuses, stock options, commissions, and profit sharing, that ties worker pay directly to performance.

weeks, the patient is hardly in a position to disagree, given the physician's superior medical knowledge. Such a situation can result in unnecessary trips to doctors' offices, which in a health care sector dominated by private markets would lead to wasteful consumer expenditures. In a government-funded health care sector, such as Canada's, it also leads to wasteful *public* expenditures.

In the Canadian health care system, in which patients do not pay out-of-pocket for a visit to the physician, the principal–agent problem between doctors and patients may be exacerbated. It probably contributes to the excess demand for physician services, which has resulted in longer waiting times to see a doctor. Unnecessary doctor visits have also contributed to rising health care expenditures for the federal and provincial governments.

Addendum: The Negative Side Effects of Pay for Performance

Although pay for performance may help to overcome the principal–agent problem and enhance worker productivity, such plans may have negative side effects and so require careful design. Here are a few examples:

- The rapid production pace that piece rates encourage may result in poor product quality and may compromise the safety of workers. Such outcomes can be costly to the firm over the long run.
- Commissions may cause some salespeople to engage in questionable or even fraudulent sales practices, such as making exaggerated claims about products or recommending unneeded repairs. Such practices may lead to private lawsuits or government legal action.
- Bonuses based on personal performance may disrupt the close cooperation needed for maximum team production. A professional hockey player who receives a bonus for goals scored may be reluctant to pass the puck to teammates.
- Since profit sharing is usually tied to the performance of the entire firm, less energetic workers can free-ride by obtaining their profit share based on the hard work of others.

QUICK REVIEW

- Proponents of the minimum wage argue that it is needed to assist the working poor and to counter monopsony where it might exist; critics say that it is poorly targeted to reduce poverty and that it reduces employment.

- Wage differentials are generally attributable to the forces of supply and demand, influenced by differences in workers' marginal revenue productivity, workers' education and skills, and nonmonetary differences in jobs. Several labour market imperfections also play a role.

- As it applies to labour, the principal–agent problem is one of workers pursuing their own interests to the detriment of the employer's profit objective.

- Pay-for-performance plans (piece rates, commissions, royalties, bonuses, and profit sharing) are designed to improve worker productivity by overcoming the principal–agent problem.

The LAST WORD

Are Top Executives in Canada Overpaid?

The multimillion-dollar pay of major corporate CEOs has drawn considerable criticism.

Top executives of Canadian corporations typically receive total annual pay (salary, bonuses, and stock options) in the millions of dollars. As shown in the table below, each of the five highest-paid Canadian executives earned more than $12 million in 2002. The highest paid CEO earned over $50 million!

THE FIVE HIGHEST-PAID CANADIAN CEOS, 2002

Name	Company	Total Pay (in millions)
1. Frank Stronach	Magna International	$52.1
2. Travis Engen	Alcan Inc.	17.5
3. Don Wright	TD Bank	12.6
4. Belinda Stronach	Magna International	12.5
5. Paul Tellier	CNR Corp.	12.3

Source: http://dailynew.mcmaster.ca/story.cfm?id=3047

CEO pay in Canada is not only exceptionally high relative to the average pay of Canadian managers and workers, but is also the second highest CEO pay among industrialized countries.

Is high CEO pay simply the outcome of labour supply and labour demand, as is the pay for star athletes and entertainers? Does it reflect marginal revenue productivity—that is, the contributions by CEOs to their company's output and revenue?

Observers who answer affirmatively point out that decisions made by the CEOs of large corporations affect the productivity of every employee in the organization. Good decisions enhance productivity throughout the organization and increase revenue; bad decisions reduce productivity and revenue. Only executives who have consistently made good business decisions attain the top positions in large corporations. Because the supply of these people is highly limited and their marginal revenue productivity is enormous, top CEOs command huge salaries and performance bonuses.

Also, some economists note that CEO pay in Canada may be like the prizes professional golfers and tennis players receive for winning tournaments. These valuable prizes are designed to promote the productivity of all those who aspire to achieve them. In corporations the top prizes go to the winners of the "contests"

among managers to attain, at least eventually, the CEO positions. Thus high CEO pay does not derive solely from the CEO's direct productivity. Instead, it may exist because the high pay creates incentives that raise the productivity of scores of other corporate executives who seek to achieve the top position. In this view, high CEO pay is still based on high productivity.

Critics of existing CEO pay acknowledge that CEOs deserve substantially higher salaries than ordinary workers or typical managers, but they question pay packages that run into the millions of dollars. They reject the "tournament pay" idea on the grounds that corporations require cooperative team effort by managers and executives, not the type of high-stakes competition promoted by "winner-take-most" pay. They believe that corporations, although owned by their shareholders, are controlled by corporate boards and professional executives. Because many board members are present or past CEOs of other corporations, they often exaggerate CEO importance and, consequently, overpay their own CEOs. These overpayments are at the expense of the firm's stockholders.

In summary, defenders of CEO pay say that high pay is justified by the direct or indirect marginal revenue contribution of CEOs. Like it or not, CEO pay is market-determined pay. In contrast, critics say that multimillion-dollar CEO pay bears little relationship to marginal revenue productivity and is unfair to ordinary stockholders. It is clear from our discussion that these issues remain unsettled.

QUESTION: Do you think exceptionally high pay to CEOs is economically justified? Why or why not?

CHAPTER SUMMARY

12.1 PRODUCTIVITY AND THE GENERAL LEVEL OF WAGES

- The term "labour" encompasses all people who work for pay. The wage rate is the price paid per unit of time for labour. Labour earnings comprise total pay and are found by multiplying the number of hours worked by the hourly wage rate. The nominal wage rate is the amount of money received per unit of time; the real wage rate is the purchasing power of the nominal wage.

- The long-run growth of real hourly earnings—the average real wage—roughly matches that of productivity, with both increasing over the long run.

- Global comparisons suggest that real wages in Canada are relatively high, but not the highest, internationally. High real wages in the advanced industrial countries stem largely from high labour productivity.

12.2 WAGES IN A PERFECTLY COMPETITIVE LABOUR MARKET

- Specific wage rates depend on the structure of the particular labour market. In a competitive labour market, the equilibrium wage rate and level of employment are determined at the intersection of the labour supply curve and labour demand curve. For the individual firm, the market wage rate establishes a horizontal labour supply curve, meaning that the wage rate equals the firm's constant marginal resource cost. The firm hires workers to the point where its MRP equals this MFC.

12.3 MONOPSONY MODEL

- Under monopsony the marginal factor cost curve lies above the factor supply curve because the monopsonist must bid up the wage rate to hire extra workers and must pay that higher wage rate to all workers. The monopsonist hires fewer workers than are hired under competitive conditions, pays less-than-competitive wage rates (has lower labour costs), and thus obtains greater profit.

12.4 UNIONS AND THE LABOUR MARKET

- A union may raise competitive wage rates by (a) increasing the derived demand for labour, (b) restricting the supply of labour through exclusive unionism, or (c) directly enforcing an above-equilibrium wage rate through inclusive unionism.

- In many industries the labour market takes the form of bilateral monopoly, in which a strong union sells labour to a monopsonistic employer. The wage-rate outcome of this labour market model depends on union and employer bargaining power.

- On average, unionized workers realize wage rates 15 percent higher than those of comparable nonunion workers.

12.5 THE MINIMUM-WAGE CONTROVERSY

- Economists disagree about the desirability of the minimum wage as an antipoverty mechanism. While it causes unemployment for some low-income workers, it raises the incomes of those who retain their jobs.

12.6 WAGE DIFFERENTIALS

- Wage differentials are largely explainable in terms of (a) marginal revenue productivity of various groups of workers; (b) noncompeting groups arising from differences in the capacities and education of different groups of workers; (c) compensating wage differences, that is, wage differences that must be paid to offset nonmonetary differences in jobs; and (d) market imperfections in the form of lack of job information, geographical immobility, union and government restraints, and discrimination.

12.7 PAY FOR PERFORMANCE

- The principal–agent problem arises when workers provide less-than-expected effort. Firms may combat this by monitoring workers, by creating incentive pay schemes that link worker compensation to performance.

TERMS AND CONCEPTS

wage rate, p. 290
nominal wage, p. 290
real wage, p. 290
perfectly competitive labour market, p. 292
monopsony, p. 295

exclusive unionism, p. 300
occupational licensing, p. 300
inclusive unionism, p. 300
bilateral monopoly, p. 302
minimum wage, p. 303
wage differentials, p. 304

marginal revenue productivity, p. 305
noncompeting groups, p. 305
human capital, p. 305
compensating differences, p. 307
incentive pay plan, p. 309

STUDY QUESTIONS

1. Explain why the general level of wages is high in Canada and other industrially advanced countries. What is the single most important factor underlying the long-run increase in average real-wage rates in Canada?

2. Why is a firm in a perfectly competitive labour market a *wage-taker*? What would happen if that firm decided to pay less than the going market wage rate?

3. **KEY QUESTION** Describe wage determination in a labour market in which workers are unorganized and many firms actively compete for the services of labour. Show this situation graphically, using W_1 to indicate the equilibrium wage rate and Q_1 to show the number of workers hired by the firms as a group. Show the labour supply curve of the individual firm and compare it with that of the total market. Why are there differences? In the diagram representing the firm, identify total revenue, total wage cost, and revenue available for the payment of nonlabour resources.

4. **KEY QUESTION** Complete the following labour supply table for a firm hiring labour competitively:

Units of labour	Wage rate	Total labour cost (wage bill)	Marginal factor (labour) cost
0	$14	$_____	$_____
1	14	_____	_____
2	14	_____	_____
3	14	_____	_____
4	14	_____	_____
5	14	_____	_____
6	14	_____	

a. Show graphically the labour supply and marginal factor (labour) cost curves for this firm. Explain the relationship of these curves to one another.

b. Plot the labour demand data of question 2 in Chapter 11 on the graph used in *a* above. What are the equilibrium wage rate and level of employment? Explain.

5. Suppose the formerly competing firms in question 3 form an employers' association that hires labour as a

monopsonist would. Describe verbally the effect on wage rates and employment. Adjust the graph you drew for question 3, showing the monopsonistic wage rate and employment level as W_2 and Q_2, respectively. Using this monopsony model, explain why hospital administrators sometimes complain about a shortage of nurses. How might such a shortage be corrected?

6. **KEY QUESTION** Assume a firm is a monopsonist that can hire its first worker for $6 but must increase the wage rate by $3 to attract each successive worker. Draw the firm's labour supply and marginal labour cost curves and explain their relationships to one another. On the same graph, plot the labour demand data of question 2 in Chapter 11. What are the equilibrium wage rate and level of employment? Why do these differ from your answer to question 4?

7. **KEY QUESTION** Assume a monopsonistic employer is paying a wage rate of W_m and hiring Q_m workers, as indicated in Figure 12-8. Now suppose an industrial union is formed that forces the employer to accept a wage rate of W_c. Explain verbally and graphically why in this instance the higher wage rate will be accompanied by an increase in the number of workers hired.

8. Have you ever worked for the minimum wage? If so, for how long? Would you favour increasing the minimum wage by a dollar? by two dollars? by five dollars? Explain your reasoning.

9. "Many of the lowest-paid people in society—for example, short-order cooks—also have relatively poor working conditions. Hence, the notion of compensating wage differentials is disproved." Do you agree? Explain.

10. What is meant by investment in human capital? Use this concept to explain (a) wage differentials, and (b) the long-run rise of real wage rates in Canada.

11. What is the principal–agent problem? Have you ever worked in a setting where this problem arose? If so, do you think increased monitoring would have eliminated the problem? Why don't firms simply hire more supervisors to eliminate shirking?

INTERNET APPLICATION QUESTION

1. **Men's and Women's Earnings in Professional Golf—Why the Difference?** Go to the McConnell-Brue-Barbiero Web site (Chapter 12) to access earnings of professional golfers. What are the annual earnings to date of the top 10 male golfers on the PGA tour? What

are the earnings of the top 10 female golfers on the LPGA tour? What are the general differences in earnings between the male and female golfers? Can you explain them?