CHAPTER 15 THE LABOR MARKET: WORKERS,

WAGES, AND UNEMPLOYMENT

**Answers to Review Questions**

1. The five trends include the following:
   1. the long-term increase in real wages in industrialized countries;
   2. the slowdown in real-wage growth since the 1970s;
   3. increasing inequality in U.S. real wages;
   4. rapid employment growth in the United States in recent decades;
   5. high rates of unemployment in Europe.

The link between labor productivity and labor demand underlies the first three trends. That is, strong labor productivity growth caused labor demand to grow faster than labor supply before 1973, causing real wages to grow rapidly during that period. Similarly, the slowdown in productivity growth since the 1970s is the primary reason for the slowdown in real wage growth since the 1970s, as labor demand grew at about the same rate as labor supply. By increasing real wages, higher labor productivity improves living standards in the long term. Increased productivity (which raises labor demand) has also contributed to rising U.S. employment, which improves living standards by giving more people a chance to earn a paycheck.

The other two trends show, however, increases in average labor productivity by themselves do not necessarily guarantee improved living standards for everyone. In the U.S., some workers have not shared in the general gains in real wages giving rise to increased wage inequality while in Western Europe potential workers have been sidelined by persistently high rates of unemployment

Learning Objective: 15-01

AACSB: Analytic

Bloom’s: Analyze

1. Acme should determine the value of the extra output Jane will produce for the firm. For example, if Jane is a lawyer, the firm would calculate the extra revenue her billings would bring in (less costs such as the cost of her secretary and her computer). If the value of Jane’s marginal product is greater than or equal to $40,000, Acme will find it profitable to hire her.

Learning Objective: 15-02

AACSB: Analytic

Bloom’s: Analzye

1. Strong productivity growth over the past century steadily increased the demand for labor demand at a faster rate than the growth of labor supply. Since the early 1970s, a slowdown in productivity growth has slowed the rate of increase in the demand for labor, while the supply of labor has grown more quickly, due to factors such as increased female participation in the labor market. Slower demand growth combined with more rapid supply growth has depressed real wages (though permitted strong employment growth) since the 1970s. In the past few years real wage growth has picked up again, reflecting a stronger pace of productivity growth, largely caused by innovations in information and communication technologies (ICT).

Learning Objective: 15-03

AACSB: Reflective Thinking

Bloom’s: Understand

1. Two factors contributing to wage inequality are globalization and skill-biased technological change. Globalization – which includes increased international trade – increases the demand for workers in export industries and lowers the demand for workers in industries that compete with imports. Wages therefore rise in export industries and fall in import competing industries, thereby increasing wage inequality. Skill-biased technical change has increased the productivity of more skilled workers relative to that of unskilled wages. The relative increase in demand for skilled workers increases the difference in wages between the skilled and unskilled.

One type of policy response is to try to block the underlying processes generating increased wage inequality by, for example, reducing globalization and international trade, or by refusing to adopt new technologies. Neither of these strategies are good public policies, since they will reduce the rate of economic growth and make the amount of economic surplus available to everyone smaller than it otherwise would be. A better set of policies is to promote the abilities of workers to change jobs; for example, by creating programs that help workers acquire the skills they need to move from low-paying to high-paying jobs (while providing income assistance to those unable to retrain).

Learning Objective: 15-03

AACSB: Analytic

Bloom’s: Analyze

1. Three types of unemployment are:
   1. *Frictional unemployment:* the short-term unemployment associated with the process of matching workers with jobs in a dynamic, heterogeneous labor market.
   2. *Structural unemployment*: the long-term and chronic unemployment that exists even when the economy is producing at a normal rate. Structural unemployment results from factors such as language barriers, discrimination, structural features of the labor market, lack of skills, or long-term mismatches between the skills workers have and the available jobs.
   3. *Cyclical unemployment*: the extra unemployment that occurs during periods of recession.

Frictional unemployment is the least costly type of unemployment since it is usually of short duration and often economically beneficial, being part of the process by which productive matches of workers and jobs are formed.

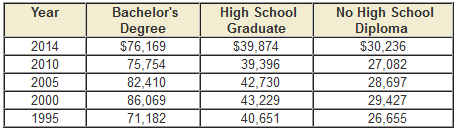
Learning Objective: 15-04

AACSB: Reflective Thinking

Bloom’s: Understand

**Answers to Problems**

1. Answers will vary. If using the following data, a sample answer could be:



While workers with a bachelor's degree saw the largest increase dollar increase in their real wage ($4,987), the largest percent increase was seen by those workers who have no high school degree. Their average real income increased by $3,581 between 1995 and 2014, which is 17.4% (3,581/24,267).  Note that the average real income for workers with a high school degree actually declined between 1995 and 2014, but that it still remains $9,638 or 32% higher than the average real income for workers without a high school degree.

In 1995, a worker with a bachelor's degree earned on average 1.75 (71,182/40,651) times that of a worker with only a high school degree and 2.67 (71,182/26,655) times that of a worker with a high school diploma.

In 2014, a worker with a bachelor's degree earned on average 1.91 (76,169/39,874) times that of a worker with only a high school degree and 2.52 (76,169/30,236) times that of a worker with a high school diploma.

While all three groups saw their average real wages fall during the time period 2005 and 2010, the largest percent decline was for workers with a bachelor's degree. These workers saw their average real income fall by $6,656 or 8.08% during this time period. The other two groups saw their average real income fall by $3,334 (7.8%) and 1,615 (5.6%) respectively.

While the difference in average real wages between those workers who has a high school degree and those workers without are somewhat diminishing, though the workers with a diploma still earn 30% more, the difference between the average real wage of college graduates and high school graduates are increasing. Note again, how workers with a bachelor's degree earned on average 1.91 (76,169/39,874) times that of a worker with only a high school degree in 2014 compared to 1.75 times more in 1995.

Learning Objective: 15-01

AACSB: Analytic

Bloom’s: Apply

1. a. The table below shows marginal products and the value of marginal products for

each worker added. Since bikes sell for $130 and non-labor costs are $100 per bike, the value of a worker’s marginal product equals $30 ($130 - $100) times the number of additional bikes assembled.

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of workers** | **Output**  **(number of bikes)** | **Marginal product**  **(number of bikes)** | **Value of**  **marginal product**  **(dollars)** |
| 1 | 10 | 10 | $300 |
| 2 | 18 | 8 | 240 |
| 3 | 24 | 6 | 180 |
| 4 | 28 | 4 | 120 |
| 5 | 30 | 2 | 60 |

* 1. Bob’s demand for labor at each wage is the same as his value of marginal product at each level of employment, that is, his labor demand is given by the first and last columns of the table in part a:

|  |  |
| --- | --- |
| **Number of workers** | **Wage=**  **Value of marginal product**  **(dollars)** |
| 1 | $300 |
| 2 | 240 |
| 3 | 180 |
| 4 | 120 |
| 5 | 60 |

* 1. If bikes sell for $140 each, the value of each worker’s marginal product is $40 times his or her marginal product. The table in part b becomes:

|  |  |
| --- | --- |
| **Number of workers** | **Value of**  **marginal product = wage**  **(dollars)** |
| 1 | $400 |
| 2 | 320 |
| 3 | 240 |
| 4 | 160 |
| 5 | 80 |

* 1. When labor productivity increases by 50 percent, the marginal products and the values of the marginal products also rise, as shown in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Number of workers** | **Output**  **(number of bikes)** | **Marginal product**  **(number of bikes)** | **Value of**  **marginal product**  **(dollars)** |
| 1 | 15 | 15 | 450 |
| 2 | 27 | 12 | 360 |
| 3 | 36 | 9 | 270 |
| 4 | 42 | 6 | 180 |
| 5 | 45 | 3 | 90 |

Learning Objective: 15-02

AACSB: Analytic

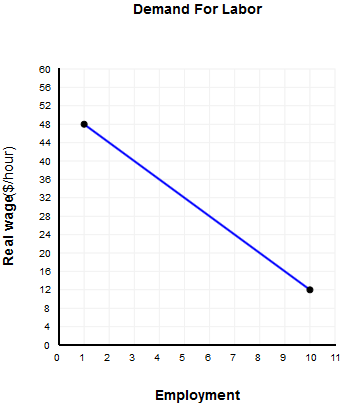
Bloom’s: Apply

1. The value of marginal products are obtained by multiplying the marginal product, which is the additional lightbulbs produced when hiring an additional worker, multiplied by the $2 value of each finished light bulb.

|  |  |  |
| --- | --- | --- |
| **Number of workers** | **Marginal product: Lightbulbs per hour** | **Value of marginal product** |
| 1 | 24 | $48 |
| 2 | 22 | 44 |
| 3 | 20 | 40 |
| 4 | 18 | 36 |
| 5 | 16 | 32 |
| 6 | 14 | 28 |
| 7 | 12 | 24 |
| 8 | 10 | 20 |
| 9 | 8 | 16 |
| 10 | 6 | 12 |

a. According to the table above, the value of the marginal product of the 7th worker is $24 (12 × $2). Since each worker costs $24 per hour, the factory manager should stop hiring additional workers at this point. Note that an 8th worker would only contribute an additional $20 per hour in sales while adding $24 per hour in labor cost. If the cost of labor is increased from $24 per hour to $36 per hour, the factory will only hire 4 workers, since the value of the marginal product of the 4th worker is exactly $36 per hour.

* 1. The demand for labor at each wage is the same as the value of marginal product at each level of employment. Note that you can verify your answers to part a using this graph.



* 1. When the price or value of each lightbulb increases from $2 to $3, the value of marginal product increases too. For example, the value of the marginal product from the first worker is now $72 per hour (24 × $3). Visually, this can be seen as a rightward shift of the demand for labor. The two wage levels will now correspond to a higher number of workers demanded, as each worker contributes more value to the factory. In other words, the demand for labor has increased.
  2. If the supply of labor is fixed at 8 workers, then the equilibrium between the demand for labor and the supply of labor can be found in the two graphs by envisioning vertical supply curves at the quantity of 8 workers. In the first graph (when bulbs sell for $2) the equilibrium real wage would be $20, and in the second graph (when bulbs sell for $3) the equilibrium wage would be $30. Alternatively, knowing that the marginal product of the 8th worker is 10 bulbs, we can compute that the value of the marginal product for the 8th worker is either $20 (10 × $2) or $30 (10 × $3) depending on the price that the bulbs sell for. Therefore, the equilibrium real wage is $20 and $30 respectively.

Learning Objective: 15-02

AACSB: Analytic

Bloom’s: Apply

1. a. An increase in the age for Medicare eligibility means that more people will

continue working in order to obtain employer-paid health insurance or to earn more to be able to pay for their own health care costs. As a result, the supply of labor will increase.

1. An increase in productivity shifts the demand for labor up. The supply of labor is unaffected. The real wage and employment rise as the economy moves *along* the labor supply curve.
2. The draft removes people from the civilian labor force and thus reduces the supply of labor. (This effect may be offset if patriotism drives more civilians to enter the labor force, as appears to have been the case during World War II.)
3. In the short run, the withdrawal of parents and caregivers from the labor force reduces labor supply. In the long run, however, more children imply a larger population and thus more workers, all else equal.
4. The effect on labor supply depends on how the generosity of Social Security benefits affects people’s retirement decisions. Assuming that people are induced by better benefits to retire earlier, labor supply falls.

Learning Objective: 15-02

AACSB: Reflective Thinking

Bloom’s: Understand

5. a. An increase in demand for the type of car made by the plant raises the

car’s relative price, which raises the value of the marginal product (VMP) of the plant’s workers. The increase in the VMP raises the demand for plant workers and therefore should increase their real wage and employment.

1. The increase in gas prices lowers the demand for cars. The relative price of cars falls and therefore the value of the workers’ marginal product falls as well. Demand for workers therefore falls, causing a decline in their real wage and employment.
2. A decline in the supply of factory workers raises their real wage but reduces the number employed.

Learning Objective: 15-03

AACSB: Reflective Thinking

Bloom’s: Understand

1. a. The marginal product of skilled workers rises and that shifts the demand for labor

to the right (assuming no change in the price of output), which causes the real wage of skilled workers to rise and the number of skilled workers employed to rise. The real wage and employment level of unskilled workers remains unchanged. Thus, the effect of the new electronic equipment is to increase the wage of skilled workers relative to the wage of unskilled workers.

* 1. Unskilled workers will want to earn the higher wage earned by skilled workers, so they will acquire the skills needed to move from the unskilled labor market to the skilled labor market. This means that the supply of unskilled workers falls as unskilled workers move to the skilled labor market, causing the wage for unskilled workers to rise while employment in the unskilled sector falls. Similarly, the supply of skilled workers will rise, driving down the skilled wage and increasing the employment of skilled workers. The end result will be an equalization of wages between the two sectors at a rate somewhere between the levels in part (a) and the level of the wage before the electronic equipment was introduced.

Learning Objective: 15-03

AACSB: Analytic

Bloom’s: Apply

7. a. Structural. Ted’s skills are mismatched with existing employment opportunities.

1. Cyclical. Alice’s unemployment is temporary and associated with a recession.
2. Frictional. Gwen’s change of location forced her to look for a new “match” with an employer. After a short time searching she found a new job.

Learning Objective: 15-04

AACSB: Reflective Thinking

Bloom’s: Understand