Answers To Chapter 14

**Review Questions**

1. **Answer a.**

   \[ u = \frac{U}{U + E} = \frac{15}{15 + 135} = 0.10. \]

2. **Answer a.** The degree of economic hardship is clearly influenced by the percentage of the population that is employed, and yet the unemployment rate does not provide a reliable guide to how the employment rate is changing. If the labor force participation rate is growing fast enough, the employment rate will rise even if the unemployment rate is rising.

3. **Answer c.** The proportions can also be viewed as transition probabilities—in this case, the probability of moving from unemployment to employment during the month.

4. **Answer a.** As people flow from \( e \) to \( n \), the numerator of the unemployment rate stays constant, but the denominator decreases, raising the entire fraction.

5. **Answer d.** Labor markets are inherently dynamic, resulting in continual flows between the various labor market states. Because information is imperfect, it may take workers and firms some time to match up.

6. **Answer b.** An increase in the replacement rate should increase unemployment benefits and lower the marginal cost associated with job search.

7. **Answer b.** A higher reservation wage means that more low-wage offers are ruled out, thus raising the expected wage.

8. **Answer d.** Structural unemployment results in a mismatch of workers and jobs in different occupations and geographic areas.

9. **Answer a.** Advance notice of a plant closing gives the workers time to consider geographic changes or human capital investments that will allow them to be employed in other sectors of the labor market.

10. **Answer c.** The unemployment associated with efficiency wages is similar to the phenomenon of wait unemployment discussed in Chapter 13.

11. **Answer b.** The supply and demand model suggests that unemployment (a surplus of labor) occurs when wages are too high, but the wage curve highlights the fact that high unemployment is associated with low wages.
12. **Answer c.** When unemployment is high, workers are less likely to shirk, and so firms need not pay a high efficiency wage premium.

13. **Answer d.** A change in required skills is more likely to result in structural unemployment.

14. **Answer a.** By collectively not undercutting the prevailing wage, workers may end up with a higher present value of earnings stream.

15. **Answer c.** An imperfect experience rating system increases the benefits to firms of laying off workers.

16. **Answer a.** No experience rating means that the tax rate paid by firms would be independent of the number of workers laid off.

17. **Answer b.** Note that a and c are also true for demand deficient unemployment and yet that does not make such unemployment voluntary.

18. **Answer b.** New entrants are only one part of the unemployed “pool” every month.

19. **Answer d.** Teenagers and blacks traditionally have above-average unemployment rates. Therefore, if their proportions in the labor force fall, the unemployment rate should fall. An increase in women does not counteract this trend because the unemployment rate for women now tends to be closer to that for men.

20. **Answer a.** This relationship was originally known as Okun’s law.

### Problems

21a. \( u = \frac{20}{250} = 0.08 \).

21b. \( \text{lfp} = \frac{250}{400} = 0.625 \).

21c. \( e = \frac{230}{400} = 0.575 \).

21d. Substituting \( u = 0.1 \) and \( e = 0.575 \) into

\[
e = \text{lfp}(1 - u) \Rightarrow 0.575 = \text{lfp}(0.9) \Rightarrow \text{lfp} = 0.639.
\]

Therefore, given that the unemployment rate rose to 0.1, the labor force participation rate must rise to 0.639 (an increase of 1.4 percentage points) if the employment rate is to remain constant.

22a. Sector A: \( 20 - W = W \Rightarrow W_A^* = 10 \Rightarrow L_A^* = 10 \).

Sector B: \( 40 - 2W = 2W \Rightarrow W_B^* = 10 \Rightarrow L_B^* = 20 \).

22b. Because of the time needed to make job matches, there will still be some positive rate of unemployment even when markets are in equilibrium. This is the idea behind frictional unemployment.
22c. Substituting $W = 10$ into the supply and demand equations
\[ L_a^D = 15 - 10 = 5 \text{ and } L_a^S = 10. \]
Therefore, there are 5 workers unemployed in sector A.

Solving for the new equilibrium in sector B
\[ \text{Sector B: } 45 - 2W = 2W \Rightarrow W_B^* = 11.25 \Rightarrow L_B^* = 22.5. \]

22d. If the 5 unemployed workers were subtracted from the supply in A and added to the supply in B, a new equilibrium would occur where
\[ \text{Sector A: } 15 - W = W - 5 \Rightarrow W_A^* = 10 \Rightarrow L_A^* = 5. \]
\[ \text{Sector B: } 45 - 2W = 2W + 5 \Rightarrow W_B^* = 11 \Rightarrow L_B^* = 25. \]

22e. The costs of occupational and geographic mobility restrict these adjustments.

22f. If the adjustments could not be made, the unemployment could be classified as structural.

23a. The area of the distribution to the left of 50 is $(50 - 10)(0.02) = 0.8$. Therefore, if any offer in that range is acceptable, the person has an 80% chance of receiving a job offer.

23b. Note that if $W_R$ were set at $10$, the probability of getting a better offer is 80%. On the other hand, if the reservation wage were set at $50$, the probability of getting a better offer is zero (given the skill level of this individual). Hence, for reservation wages between $10$ and $50$ the probability ($P$) of getting a better offer can be written as
\[ P = \frac{50 - W_R}{50}. \]

23c. Since the average wage in the interval between $W_R$ and $50$ can be written as $(W_R + 50)/2$, this wage would represent a gain ($G$) over $W_R$ of
\[ G = \frac{W_R + 50}{2} - W_R \Rightarrow G = \frac{W_R + 20 - 2W_R}{2} \Rightarrow G = \frac{50 - W_R}{2}. \]

23d. Multiplying $G$ by $P$ yields the expected gain from additional job search ($EG$)
\[ EG = (P)(G) = \frac{50 - W_R}{50} \cdot \frac{50 - W_R}{2} \Rightarrow EG = \frac{(50 - W_R)^2}{100}. \]

23e. Assuming for simplicity that the marginal cost of an additional period of job search is constant at $1$, the optimal value for the reservation wage occurs where
\[ \frac{(50 - W_R)^2}{100} = 1 \Rightarrow W_R = 50 - \sqrt{100} = 40. \]
23f. Note that by setting a reservation wage of $40, the individual deliberately reduces his or her chances of a job offer from 0.8 to \((50 - 40)(0.02) = 0.2\) (from 80% to 20%). The dramatic reduction occurs because of the low marginal cost associated with additional periods of job search.

23g. A reservation wage strategy is a deliberate and purposeful restriction of the probability of flowing from unemployment to employment. If everyone does this, it lowers \(P_{ue}\) in the stock-flow model and so raises the unemployment rate.

### Applications

24a. Since the person now has the highest skill level, he or she has a 100% chance of receiving a job offer.

24b. Note that if \(W_R\) were set at $10, the probability of getting a better offer is 100%. On the other hand, if the reservation wage were set at $30, the probability of getting a better offer is zero (given the skill level of this individual). Hence, for reservation wages between $10 and $30 the probability \((P)\) of getting a better offer can be written as

\[
P = \frac{30 - W_R}{20}.
\]

24c. Since the average wage in the interval between \(W_R\) and $30 can be written as \((W_R + 30)/2\), this wage would represent a gain \((G)\) over \(W_R\) of

\[
G = \frac{W_R + 30}{2} - W_R \Rightarrow G = \frac{W_R + 30 - 2W_R}{2} \Rightarrow G = \frac{30 - W_R}{2}.
\]

24d. Multiplying \(G\) by \(P\) yields the expected gain from additional job search \((EG)\)

\[
EG = (P)(G) = \frac{30 - W_R}{20} \cdot \frac{30 - W_R}{2} \Rightarrow EG = \frac{(30 - W_R)^2}{40}.
\]

24e. Assuming for simplicity that the marginal cost of an additional period of job search is constant at $2, the optimal value for the reservation wage occurs where

\[
\frac{(30 - W_R)^2}{40} = 2 \Rightarrow W_R = 30 - \sqrt{80} = $21.06.
\]

24f. Note that by setting a reservation wage of $21.06, the individual deliberately reduces his or her chances of a job offer from 1.0 to \((30 - 21.06)(0.05) = 0.447\) (from 100% to about 45%).

24g. Note that the increase in skill level has raised the reservation wage substantially, from $11.06 in the Summary section Example problem to $21.06 here. However, note that the probability of a job offer has remained at 0.447. Thus the proportion of people flowing from unemployment to employment should be unchanged.

25a. This firm would face the minimum unemployment insurance (UI) tax rate. Its tax payment for each worker is computed by multiplying the tax rate by the worker’s earnings if the earnings are less than the specified taxable wage base (e.g., $10,000). If earnings exceed the base, the tax payment for the worker is the tax rate times the wage base.
25b. The firm would have contributed less because of the imperfect experience rating of the UI tax rate. This refers to the tendency of the UI tax rate to rise with layoff experience at a lower rate than is necessary to make the employer’s marginal cost of layoff equal to the marginal UI benefits paid out to laid-off workers. Note that the tax rate also has a ceiling so that at some point additional layoffs have no effect on the UI tax rate. The rest of the money paid out to unemployed workers comes from the firms that conducted no layoffs but still paid their UI taxes.

25c. Since low-layoff firms are essentially subsidizing high-layoff firms, the high-layoff firms are more likely to survive and grow, thus increasing the incentive to use layoffs. More widespread use of layoffs increases the proportion of people flowing from employment to unemployment.

26a. Earnings = $400, taxes paid = 0.255(400) = $102, after tax earnings = $298 ($7.45 per hour).

26b. UI benefits = $220, taxes paid = 0.18(220) = $39.6, after tax benefits = $180.4 ($4.51 per hour).

26c. The marginal cost of being unemployed is only $117.6 per week ($2.94 per hour). If UI benefits were subject to Social Security and Medicare taxes, the marginal cost of unemployment would be higher, raising the cost of job search, and lowering the duration of job search unemployment.

27a. 
\[ PV_{Cut} = 9.9 + \frac{5}{1.06} + \frac{5}{1.06^2} = 19.07. \]

27b. Expected wage = 0.4(5) + 0.6(10) = 8.

27c. 
\[ PV_{Wait} = 5 + \frac{8}{1.06} + \frac{8}{1.06^2} = 19.67. \]

27d. On average, the person is better off holding out for the prevailing wage even if it means a spell of unemployment.