Review Questions

Choose the letter that represents the **BEST** response.

**Measuring Inequality**

1. The distribution of earnings refers to
   a. the number of people receiving each given level of earnings.
   b. the difference between the lowest and highest earnings level in a group.
   c. the overall level of earnings.
   d. the relative standing associated with any given level of earnings.

2. Which of the following characteristics of the earnings distribution are most closely associated with the degree of earnings inequality?
   a. The average level of earnings
   b. The dispersion of earnings
   c. The median level of earnings
   d. All of the above

3. Which of the following statistical measures best describes the absolute dispersion of earnings associated with a given earnings distribution?
   a. The mean
   b. The variance
   c. The coefficient of variation
   d. The ratio of earnings at the 80th percentile to earnings at the 20th percentile

4. Which of the following statistical measures associated with an earnings distribution would increase if everyone received an extra $1,000 in earnings?
   a. The median
   b. The standard deviation
   c. The variance
   d. The coefficient of variation

**Descriptive Data on Earnings Inequality**

5. As measured by the ratio of earnings at the 80th percentile to earnings at the 20th percentile, earnings inequality since 1980
   a. increased for both men and women.
   b. decreased for men and increased for women.
   c. decreased slightly for both men and women.
   d. increased for men and held constant for women.

6. The changes in earnings inequality that occurred during the 1980s took place within the context of
   a. generally falling real earnings for men and women in all percentiles.
   b. generally increasing real earnings for men and women in all percentiles.
   c. rising real earnings in the 20th percentile for women but not men, and rising real earnings in the 80th percentile for both men and women.
   d. rising real earnings in the 20th percentile for both men and women, but falling real earnings in the 80th percentile for both men and women.
7. Which of the following changes would be consistent with an overall increase in earnings inequality?
   a. The replacement of middle-income jobs by very low-or high-paying jobs
   b. An increase in the wage of high-paying jobs relative to low-paying jobs
   c. An increase in the hours worked by high-wage workers relative to the hours worked by low-wage workers
   d. All of the above

8. Consider the 80:50 and 50:20 ratios. Based on this measure, since the 1980s, income inequality has
   a. increased in only the upper range for both men and women.
   b. increased in only the lower range for both men and women.
   c. increased in the upper range but fell in the lower range for both men and women.
   d. not changed significantly in either range, for both men and women.

9. Which of the following is most responsible for the increases in the wages of high-paid workers relative to low-paid workers that took place since 1980?
   a. An increase in the returns to a college education
   b. An increase in the returns to a high school education
   c. An increase in the returns to a graduate education
   d. All of the above

10. Changes in the returns to a college education that occurred since 1980 took place within the context of
   a. slowly increasing real earnings for male college graduates.
   b. rapidly falling real earnings for male high school graduates.
   c. large increases in the real earnings of female college graduates.
   d. all of the above.

11. Which of the following is a correct statement about the returns to a college education?
   a. The relative return to a college education did not increase significantly from 1980–1990.
   b. The relative return to a college education did not increase significantly from 1990–2005.
   c. The relative return to a college education was comparatively greater over the 1990–2005 period because fewer college graduates entered the market.
   d. The relative return to a college education was comparatively less over the 1990–2005 period because more college graduates entered the market.

12. Since 1980, the earnings of workers with similar levels of education and experience tended to become more
   a. predictable.
   b. dispersed.
   c. similar.
   d. symmetric.
The Causes of Growing Inequality

13. Which of the following factors are capable, in theory, of widening the gap between the earnings of highly educated and less-educated workers?
   a. An increase in the supply of less-educated workers relative to the supply of highly educated workers
   b. An increase in the demand for highly educated workers relative to the demand for less-educated workers
   c. Institutional forces such as the decline of unionism
   d. All of the above

14. The widening gap between the wages of highly educated and less-educated workers that occurred over the past two decades is best explained by
   a. an increase in the supply of less-educated workers relative to the supply of highly-educated workers.
   b. an increase in the demand for highly educated workers relative to the demand for less-educated workers.
   c. institutional forces such as the decline of unionism.
   d. all of the above.

15. Which of the following factors are capable, in theory, of causing an increase in the demand for highly educated workers relative to less-educated workers?
   a. Shifts in product demand toward industries using a higher proportion of highly educated workers
   b. Substitution of highly educated workers for less-educated workers within industries
   c. Increases in the relative supply of less-educated workers
   d. Both a and b

16. Which of the following factors is most responsible for the increase in the demand for highly educated workers relative to less-educated workers that took place during the past two decades?
   a. Shifts in product demand toward industries using a higher proportion of highly educated workers
   b. Substitution of highly educated workers for less-educated workers within industries
   c. Increases in the price of capital
   d. Both a and b

17. Why would technological change be a plausible explanation for the demand-side increases in the returns to education that have taken place during the past two decades?
   a. Technological change is equivalent to a decrease in the price of capital.
   b. Capital and skilled labor tend to be gross complements.
   c. There were significant differences in the growth rate of earnings inequality across industrialized countries.
   d. Both a and b.

18. Technological change may have led to an increase in the returns to experience among high school graduates because
   a. technological change is equivalent to a decrease in the price of capital.
   b. capital and unskilled labor tend to be gross substitutes.
   c. seniority rules assure that the brunt of any decline in the demand for unskilled workers is borne by younger workers.
   d. both a and b.
Lorenz Curves and Gini Coefficients (Appendix 15A)

19. Which of the following is a valid statement if two Lorenz curves cross?
   a. The two earnings distributions have the same degree of inequality.
   b. The Gini coefficient associated with each curve will be the same.
   c. The Gini coefficient associated with each curve may be the same.
   d. Both a and b.

20. If over time the Lorenz curve moves closer to the line of perfect earnings equality, one can infer that
   a. earnings inequality must have been reduced.
   b. the Gini coefficient will be smaller.
   c. earnings have increased by some constant percentage.
   d. both a and b.

Problems

Measures of Earnings Dispersion

21. Consider the data from Table 15-1 in the Summary section Example problem. Note that the variance was originally computed as 2,400, the coefficient of variation as 0.61, and the 80:20 ratio as 5.

21a. Suppose $20 is redistributed from worker 5 to worker 1. Compute the new variance and coefficient of variation.

21b. Suppose $20 is redistributed from worker 5 to worker 4. Compute the new variance and the coefficient of variation.

21c. Intuitively, which redistribution brings about more income equality? Which measure of dispersion changes in a way that corresponds to your intuition?

21d. For the two redistributions described above, what happens to the 80:20 ratio? For each case, does the change in the ratio correspond with your intuition about what constitutes more income equality?

22. One of the key pieces of descriptive data presented in this chapter is that earnings within narrowly defined human capital groups also became more dispersed since 1980. The point of this exercise is to show how this increased dispersion affects the overall dispersion of earnings. The questions that follow pertain to Table 15-3 which shows the individual earnings associated with members of two distinct human capital groups. Group A is assumed to be the high human capital group while group B denotes the low human capital group.

Table 15-3

<table>
<thead>
<tr>
<th>Person</th>
<th>Group A</th>
<th>Person</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$70</td>
<td>1</td>
<td>$10</td>
</tr>
<tr>
<td>2</td>
<td>$80</td>
<td>2</td>
<td>$20</td>
</tr>
<tr>
<td>3</td>
<td>$90</td>
<td>3</td>
<td>$30</td>
</tr>
</tbody>
</table>
22a. Compute the mean earnings in each group. Compute the variance and coefficient of variation for each group.

22b. Compute the variance and coefficient of variation for the entire population.

22c. Suppose that the earnings distribution changes. In group A, the earnings are now $65, $80, and $95, while in group B, the earnings are $5, $20, and $35. Compute the mean earnings in each group. Compute the variance and coefficient of variation for each group.

22d. Compute the variance and coefficient of variation for the entire population. How has the change in the within-group dispersion affected the dispersion of the entire population?

### Changes in the Relative Demand for Educated Workers

23. The change in employment between periods $i$ and $j$ for a particular category of labor (C) in a certain industry can be found using the equation

$$\Delta C = E_j \Delta k + k_i \Delta E,$$

where $E$ refers to the total employment in the industry, $k$ refers to the proportion of total employment in the industry comprised by category C workers, and $\Delta$ refers to any change that occurs between period $i$ and period $j$. This equation was derived in a footnote of the text to make the point that even small increases in the proportion of college-educated workers employed by particular industries could have a large effect on the demand for college-educated workers.

23a. Suppose that over the last decade, the proportion of group C workers in a particular industry increased 50% from 0.2 to 0.3. Assuming total industry employment remained constant at 1,500, what is the change in the employment of group C?

23b. Suppose that over the last decade, the proportion of group C workers in a particular industry remained constant at 0.2. Assuming that total industry employment increased 50% from 1,000 to 1,500, what is the change in the employment of group C?

23c. Suppose that over the last decade, the proportion of group C workers in a particular industry rose from 0.2 to 0.3. At the same time, total industry employment fell from 1,000 to 800. What is the change in the employment of group C?

### The Skewness of Earnings

24. Another issue related to earnings inequality is the skewness of the distribution. An earnings distribution is said to be skewed when the dispersion of earnings is not symmetric. If earnings are distributed in such a way that individuals are bunched at the lower end of the distribution, while a few individuals have high earnings, the distribution is said to be skewed to the right. If most individuals are bunched at the high end of the distribution, while a few have low incomes, the distribution is said to be skewed to the left. Some statisticians measure skewness ($\gamma$) using the formula

$$\gamma = \frac{3(E - E_M)}{\sigma},$$

where $\overline{E}$ is the mean earnings, $E_M$ the median earnings, and $\sigma$ is the standard deviation. The median earnings is the earnings value that falls exactly in the middle of the list when earnings are ranked from lowest to highest. If $\gamma$ is positive, the distribution is skewed right. If $\gamma$ is negative, the distribution is skewed left. The greater the magnitude of $\gamma$, the greater the degree of skewness.
*24a. For the data in Table 15-1 in the \textbf{Summary} section \textbf{Example} problem, compute the skewness measure. Is the distribution skewed left or right?

*24b. Now suppose that $20 is transferred from person 3 to person 1. Has the variance increased or decreased? Has the skewness increased or decreased?

*24c. Does increased earnings equality necessarily mean less skewness?

*24d. Why might an earnings distribution that is skewed to the right be considered unfair?

\textbf{Lorenz Curves and Gini Coefficients (Appendix 15A)}

25. Consider the data from Table 15-1 in the \textbf{Summary} section \textbf{Example} problem.

25a. Draw the Lorenz curve consistent with the data. Be sure to indicate the line of perfect equality.

*25b. Compute the Gini coefficient associated with this earnings distribution.

25c. Now suppose the distribution of earnings changes so that the earnings levels are now $32, $48, $60, $80, and $180. Total earnings are still $400. Draw the new Lorenz curve.

25d. Is it clear from the Lorenz curves which distribution is more equal?

*25e. Compute the Gini coefficient associated with the new earnings distribution.

\section*{Applications}

\textbf{Popular Perspectives on Inequality}

26. A perspective shared by many Americans is that the economy is essentially a “zero-sum” game, i.e., when those at the upper end of the earnings distribution gain, the gain comes at the expense of those at the bottom. Some would go so far as to say that what the rich gain is taken from the poor.

26a. Did higher-earning men actually “gain” in an \textit{absolute} sense during the period 1975–1997? Did higher-earning women?

26b. Data suggest that higher wage earners of both genders did gain \textit{relative} to lower wage earners during the period 1975–1997. What was the major reason for this gain? Did this gain result from the rich exploiting the poor?

26c. Explain why shifts in the relative supply of less-educated workers could not have caused the decrease in relative wages experienced by those workers.

26d. Explain why changes in the relative quality of labor supplied by less-educated workers could not have caused the decrease in relative wages experienced by those workers.

26e. Explain why institutional changes like declining union membership could not have been a major factor in the rising return to education seen during the 1980s.
The Superstar Effect

27. Consider the situation of two lawyers with the same education, age, and experience. Lawyer A is just slightly more proficient under pressure than lawyer B. You are involved in a major lawsuit where the loser must pay the winner $1 million. The case is very close and sure to be decided in favor of the side with the better lawyer.

27a. How much would you be willing to pay lawyer A in this situation? How much would you be willing to pay lawyer B?

27b. What is the relationship between worker productivity and earnings in this example? What is it about the nature of the contest that makes for this relationship?

27c. What effect would such contests have on the dispersion of earnings within narrowly defined human capital groups? What effect does such dispersion have on the overall dispersion of earnings in the economy?

27d. Review the hypothesis about the effects of relative standing concerns discussed in Question 27d in Chapter 1. If this hypothesis is true, what effect would it have on the inequality of earnings?

Effects of Income Maintenance Policies on the Earnings Distribution

28. Review Example 2 from the Summary section of Chapter 6 on labor supply.

28a. For the person with preferences given by the utility function

\[ U = L^{1/4} Y^{3/2}, \]

find the total wage earnings before and after the development of the welfare program described in the example.

28b. For the person with preferences given by the utility function

\[ U = L^{1/4} Y^{3/2}, \]

find the total wage earnings before and after the development of the welfare program described in the example.

28c. What effect does the welfare program described in this example have on the dispersion of earnings?

Lorenz Curves and Gini Coefficients (Appendix 15A)

29. Consider the data from Table 15-1 in the Summary section Example problem. The Lorenz curve and Gini coefficient for this data were computed in Problem 25.

29a. How would the Lorenz curve change if all earnings levels were multiplied by 1,000?

*29b. Suppose each worker in the economy received an additional $20 in earnings. Draw the new Lorenz curve and compute the new Gini coefficient.

29c. Lorenz curves can be drawn to represent the distribution of earnings or income. In this example, since there is no nonlabor income or taxes, the two curves would be the same. In general, this would not be true. Would you expect the distribution of earnings to be more or less equal than the distribution of income?