EXAMINATION 3 VERSION B
"Wage Structure, Mobility, and Discrimination"
April 19, 2018

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, computers, wireless devices and mobile phones are NOT permitted. Point values for each question are noted in brackets. Maximum total points are 100.

I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 17 pts total]

(1) Because the wage distribution is positively skewed,
a. most workers earn a wage less than the average wage.
b. exactly half of workers earn a wage less than the average wage, and half of workers earn a wage greater than the average.
c. most workers earn a wage greater than the average wage.

(2) Perfect inequality implies a Gini coefficient of
a. negative one.
b. zero.
c. one-half.
d. one.
e. infinity.

(3) Technological change has likely increased the
a. relative demand for unskilled workers in the U.S.
b. relative demand for skilled workers in the U.S.
c. relative supply of unskilled workers in the U.S.
d. relative supply of skilled workers in the U.S.

(4) Since 1980, the fraction of workers in the U.S. who are covered by union collective-bargaining agreements has
a. first increased sharply and then decreased gradually.
b. first decreased and then rebounded sharply.
c. remained roughly constant.
d. increased.
e. decreased.

(5) Since 1980, the real minimum wage in the United States (that is, the legal minimum wage adjusted for inflation) has
a. remained roughly constant.
b. been repealed.
c. increased.
d. decreased.

(6) The "superstar phenomenon" is most likely to characterize the earnings of
a. violinists.
b. accountants.
c. teachers.
d. carpenters.

(7) The net gain to migration depends positively on
a. moving costs.
b. wages in the source region.
c. wages in the destination region.
d. All of the above.

(8) A "tied stayer" is a married worker who
a. prefers to move but instead stays because staying maximizes family income.
b. prefers to stay but instead moves because moving maximizes family income.
c. prefers to stay and does so jointly with their spouse to maximize family income.
d. is exactly indifferent between moving and staying, but stays anyway to maximize family income.

(9) Until the 1960s, most immigrants into the United States came from
a. Europe.
b. Canada.
c. Latin America.
d. Asia.

(10) Why do recent immigrants from Germany earn substantially more than native-born workers in the U.S.?
a.   The ability to speak German is highly rewarded in the U.S. labor market.
b.   Workers in Germany are, on average, more skilled than workers in the U.S.
c.   Immigrants from Germany are here only temporarily, so they work longer hours.
d.   Immigrants from Germany are not a random sample of the German population.

(11) According to the Roy model, if the return to skills is lower in Country X than in the U.S., then immigrants from Country X will be characterized by
a.   positive selection.
b.   negative selection.
c.   random selection.
d.   Cannot be determined from information given.

(12) On average, immigrants who arrived in the U.S. recently
a.   enjoyed higher earnings than native workers as soon as they arrived.
b.   are on track to overtake native workers in earnings.
c.   are likely to remain well below native workers in earnings throughout their careers.

(13) Most workers who are laid off from a job
a.   take another job immediately at a higher wage.
b.   are unemployed for a while, then take another job at a higher wage.
c.   take another job immediately at a lower wage.
d.   are unemployed for a while, then take another job at a lower wage.

(14) Oaxaca's decomposition is primarily intended to separate gaps in earnings due to discrimination from gaps in earnings due to differences in
a.   employer monopsony power.
b.   labor demand.
c.   risk of injury on the job.
d.   human capital.
e.   all of the above.

(15) Studies of the price of baseball trading cards provide evidence of
a.   employer discrimination against black players.
b.   employee discrimination against black players.
c.   customer discrimination against black players.
d.   None of the above.

(16) According to estimates of the Oaxaca decomposition, differences in schooling and region of residence account for
a.   almost none of the female-male wage differential.
b.   roughly half of the female-male wage differential.
c.   most of the female-male wage differential.

(17) Suppose red workers have less elastic labor supply to an employer than yellow workers. If the employer is a discriminating monopsonist, which group will get the higher wage?
a.   The red workers.
b.   The yellow workers.
c.   Red and yellow workers will get the same wage, assuming they are equally productive.
d.   Cannot be determined from the information given.

II. Problems: Please insert your answer to each question in the box provided. You may use margins and graphs for scratch work. Only the answers in the boxes will be graded.

(1) [Measuring inequality: 15 pts] Suppose the lowest third of workers all have an annual wage of $20 thousand, the middle third all have an annual wage of $80 thousand, and the highest third all have an annual wage of $100 thousand.

Third	Annual wage	Share of earnings	Cumulative share
Lowest	$20 thousand	%	%
Middle	$80 thousand	%	%
Highest	$100 thousand	%	%

   a. [5 pts] Compute the shares and cumulative shares. Check your work carefully.
   b. [2 pts] **Using a straightedge,** plot the Lorenz curve for wages in the graph below.
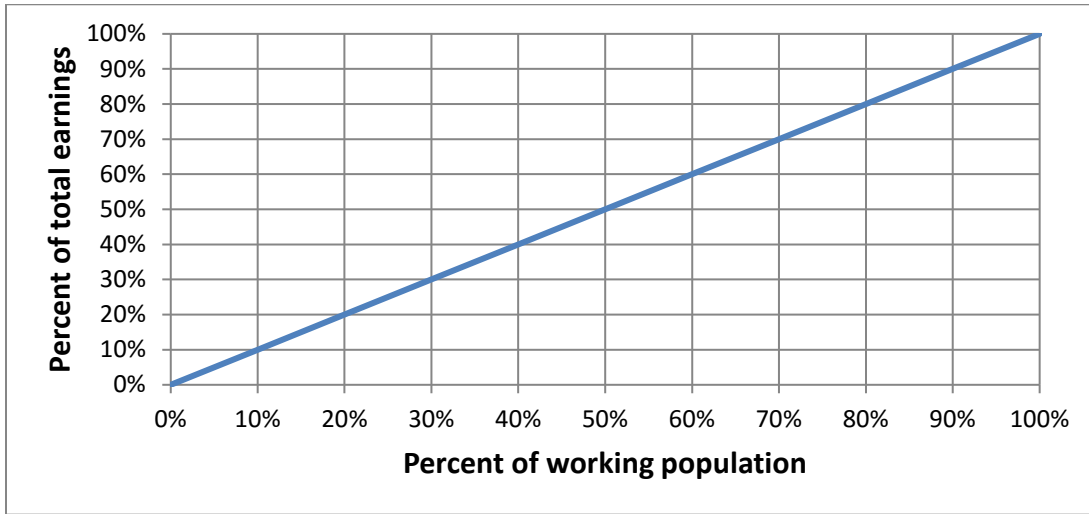
   c. [2 pts] Compute the Gini coefficient to three decimal places.

   d. [2 pts] Compute the 90-10 wage gap.

   e. [2 pts] Compute the 90-50 wage gap.

   f. [2 pts] Compute the 50-10 wage gap.

	%
	%
	%

(2) [Migration decision: 8 pts] Suppose a worker with a discount rate of 10 percent currently lives in Des Moines, but is considering a move to Denver. There are three work periods left in her career. If the worker remains in Des Moines, she will earn $50,000 per year in each of the three periods. If the worker moves to Denver, she will earn $65,000 per year in each of the three periods. (Assume the worker is paid at the beginning of each period.)

  a. If the worker's moving cost is $40,000, will she move to Denver? Why or why not?

  b. What is the worker's highest cost of moving that she will incur and still move to Denver?

(3) [Roy model: 6 pts] Suppose Country X and Country Y each have workers whose skill (S) ranges from 0 to 100. The relationship between wages and skill in Country X is given by $W_X = 80 + S$. The relationship in Country Y is given by $W_Y = 10 + 2S$. Assume that moving costs are **$10**.

  a. [4 pts] For what range of values of S will workers in Country X want to migrate to Country Y? Show your work and circle your final answer.

  b. [2 pts] Is this immigrant flow positively or negatively selected? Justify your answer.

(4) [Immigration cohorts: 8 pts] Suppose we have the following Census data on average earnings:

	2000 Census	2010 Census	2020
Native-born workers	$60,000	$60,000	
New immigrants	$40,000	$20,000	
Immigrants who have been in the U.S. for ten years	$50,000	$42,000	(b)

a. Compute the percent change in earnings experienced by an individual immigrant worker over ten years.

%

b. Using your answer to part (a), forecast the average earnings of immigrants who have been in the U.S. for ten years in 2020—that is, the element in the table above marked "(b)".

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(5) [Oaxaca decomposition: 6 pts] Suppose we have computed the following statistics using data on hourly wages (W) and schooling (S) for a large sample of green and blue workers:

	Regression equation	Average years of schooling
Green workers	$\ln(W_G) = 1.2 + 0.10\ S_G$	13
Blue workers	$\ln(W_B) = 1.0 + 0.08\ S_B$	10

a. Compute the raw log wage differential—that is, $\overline{\ln(W_G)} - \overline{\ln(W_B)}$.

b. Compute the log wage differential due to schooling.

c. Compute the log wage differential due to discrimination in the labor market, in Oaxaca's definition.

(6) [Employer preference discrimination: 18 pts] Suppose a firm's production function is given by
$q = 6\sqrt{E_G + E_B}$, where E_G is the number of green workers employed by the firm and E_B is the number of blue
workers employed by the firm. There are no other inputs besides labor. Clearly, green and blue workers are perfect
substitutes in production. It can be shown with calculus that the marginal product of labor (either type) is given by
$MP_E = 3/\sqrt{E_G + E_B}$. Suppose the market wage of green workers is **$18** and the market wage of blue workers is
$10. Also assume the price of the firm's output is **$30**.

   a. First, suppose the firm does not discriminate. How many workers will it hire of each type? How much output
      does it produce? How much profit does it enjoy?

Now suppose the firm discriminates against blue workers, with discrimination coefficient d. That is, the firm
perceives the cost of blue workers as being (1+d) times their actual wage.

   b. If d = 1.0, how many workers will it hire of each type? How much output does it produce? How much profit
     does it enjoy?

   c. If d = 0.5, how many workers will it hire of each type? How much output does it produce? How much profit
     does it enjoy?

(7) [Monopsony wage discrimination: 16 pts] A certain employer enjoys monopsony power over two groups of workers. Supply of green workers to this employer is given by $w_G = 5 + (E_G/20)$. Supply of blue workers to the same employer is given by $w_B = 3 + (E_B/10)$. The value of marginal product of all workers is constant and equal to **$15**.

   a. Recall that if labor supply is a straight line, then marginal labor cost is also a straight line, with the same intercept and twice the slope of labor supply. Give the equation for marginal labor cost for each group of workers.

$MLC_G =$ $MLC_B =$

   b. What level of employment (E_G and E_B) will the employer choose for each group?

   c. What wage (w_G and w_B) will the employer pay each group?

   d. Suppose the government imposes a minimum wage of $12 for all workers. Now what level of employment (E_G and E_B) will the employer choose for each group?

III. Critical thinking: Write a one-paragraph essay answering one question below (your choice). [6 pts]

(1) Suppose that you survey all the workers at a particular company. You collect data on their wages and their seniority (length of time at this employer). You find that workers with greater seniority tend to earn higher wages than workers with less seniority, holding everything else constant (schooling, labor-market experience, etc.).
a.   What is the "specific human capital" explanation for this relationship?
b.   What is the "matching" explanation for this relationship?
c.   How could you determine which explanation is correct? What additional data on these workers would you need?

(2) We have discussed a number of economic theories of discrimination.
a.   What theory that predicts that discriminating employers will have *lower* profits than nondiscriminating employers. Explain why they have lower profits.
b.   What theory that predicts that discriminating employers will have *higher* profits than nondiscriminating employers. Explain why they have higher profits.

Circle the question you are answering and write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.

[end of exam]