Economics 2 Professor Emmanuel Saez
Fall 2024

PROBLEM SET 3

DUE ON GRADESCOPE BY 11:59PM ON MONDAY, NOVEMBER 4

Student name:

Student ID:

You may work together on the problems, but your answers must be ***in your own words*** and ***handwritten***. You also must ***list the other students with whom you worked*** here:

For all questions be sure to explain your answers and to use graphs whenever asked to. Write your answers in the spaces below.

1. (1 pt) Consider the markets for low-skilled and high-skilled labor in the United States. Describe how each of the following developments is likely to affect the wages of workers with a college degree relative to workers without a college degree.

a. There is increased demand for installing solar panels, which is work done by non-college graduates.

b. A larger fraction of people go to college so that there are more college graduate workers (and fewer non-college graduates).

2. **1.5 pts.** Here is the most recent distribution of income in the United States from income tax data from IRS tax statistics. This is annual income that each taxpayer reports (can be a single person or a married couple with their dependent children)

Individual Income Statistics for Year 2022

Income bracket	Number of taxpayers	Amount of income (in $million)
Under $15,000	29,392,477	71,612
$15,000 to $30,000	24,863,933	552,405
$30,000 to $50,000	28,847,954	1,138,003
$50,000 to $100,000	39,111,531	2,790,459
$100,000 to $200,000	25,982,949	3,583,241
$200,000 to $250,000	4,164,641	926,175
$250,000 or more	8,364,645	6,080,868
Total	**160,728,129**	**15,142,763**

a. Use this table to compute the fraction of taxpayers with income below $15K, below $30K, below $50K, below $100K, below $200K, below $250K and the fraction of total income that each of these groups earn. Then plot the corresponding points of the Lorenz curve in the standard Gini type diagram. Complete the Lorenz curve assuming straight lines to connect the dots.

b. From your Lorenz curve above, deduce the approximate shares of total income earned by the bottom 50%, the next 40%, and the top 10%. What is the approximate Gini coefficient? [can do this with excel/computer help or just by hand if your graph above is neatly done]

c. In reality, the Lorenz curve is not a straight line between the points. Would the true Lorenz curve display a higher or lower Gini coefficient than the one you've drawn with straight lines. Why?

3. (.5 pts) Consider a worker who is planning to retire 10 years from now and is thinking about not working for the next year and instead completing a one-year Master's program. If they do not complete the program, they will earn $A one year from now, $A two years from now, and so on through 10 years from now. If they complete the program, they will pay $B one year from now and then earn $C each of the subsequent 9 years. Assume the worker's only concern is their financial well-being. Explain whether the worker should do the Master's program or not based on the values of A, B, C as well as the interest rate r.

4. (2 pts) In class, we considered the labor market model for industrial workers in a transition from an economy with only subsistence workers to an economy with industry. The labor supply curve for industrial workers is flat at wage W equal subsistence wage W_s when $L<=L_T$ (total number of workers available) and then becomes vertical when $L=L_T$. The demand curve is downward sloping and shifts out as industry develops.

a. Let us consider the case where there is monopsony power for employers in industry. How does this affect W and L and deadweight loss in the early phase of industrialization (when $L<L_T$ in the competitive case)? Explain why graphically.

b. How does this affect W and L and deadweight loss in the late phase of industrialization (when $L=L_T$ in the competitive case)? Explain why graphically.

c. Let us now consider the case where there is a union for industrial workers that decides how many workers L to supply while employers are competitive. How does this affect W and L and deadweight loss in the early phase of industrialization (when $L<L_T$ in the competitive case)? Explain why graphically.

d. How does this affect W and L and deadweight loss in the late phase of industrialization (when $L=L_T$ in the competitive case)? Explain why graphically.