

Econ 131
Spring 2021
Emmanuel Saez

Problem Set 1

DUE DATE: 11:59pm, Wednesday, February 24 on Gradescope

Student Name:

Student ID:

- Write or type your answers clearly and in dark ink (physical or electronic ink) so that your responses are legible
- Tag each of your answers on Gradescope so that it is clear what responses are to which questions
- **Although you may work in groups**, each student must submit individual sets of solutions. You must note the names other students that you worked with. Write their names here:

1. Essay

Take a look at the new dashboard on measuring poverty at the monthly level in almost real time during the COVID crisis. Using the most recent current report on the dashboard, write a short essay [*the essay has to fit in the page below*] explaining what is driving the poverty rate during the COVID crisis and which government policies have had the most impact.

Link to the dashboard <http://povertymeasurement.org/covid-19-poverty-dashboard/>

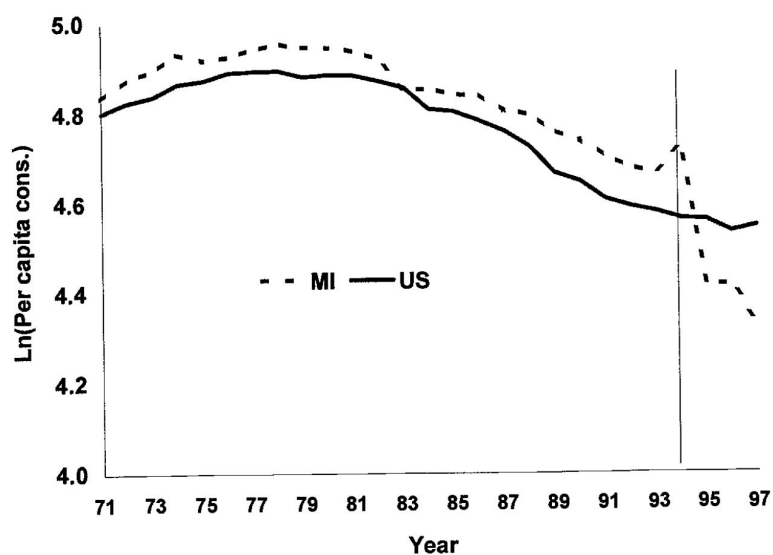
2. True/False Statements

Determine whether each statement is true, false, or uncertain and explain why. Answers with no explanation will receive no points.

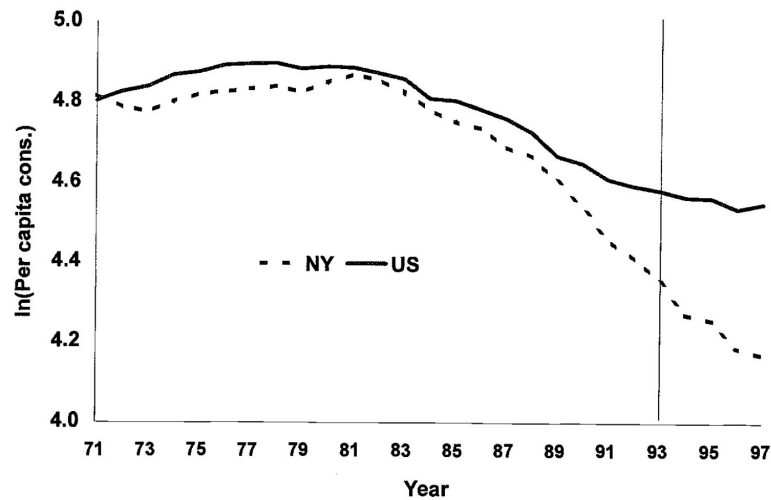
- (a) The number of people in extreme poverty is falling quickly around the world. This implies that the topic of poverty will become obsolete in economics.
- (b) The government should only intervene in the economy when there are market failures.
- (c) Repaying the large US debt accumulated during the Great recession and the covid crisis will be a heavy burden on future generations of Americans.

- (d) Pre-tax income inequality has increased in the United States since 1980 but government taxes and transfers have offset this increase.

- (e) In 1994, Michigan raised taxes on cigarettes sold in Michigan. The graph below shows the evolution of log per capita consumption in Michigan (dashed line) and in the US overall (solid line). Based on what you know about the difference-in-difference methodology learned in class, do you find that this graph provides compelling evidence of an effect of cigarette taxation on consumption? (graph from Evans, Ringel, Stech “Tobacco Taxes and Public Policy to Discourage Smoking” *Tax Policy and the Economy*, volume 13)



- (f) In 1993, New York substantially raised taxes on cigarettes sold to consumers in New York. The graph below shows the evolution of log per capita consumption in New York (dashed line) and in the US overall (solid line). Based on what you know about the difference-in-difference methodology learned in class, do you find that this graph provides compelling evidence of an effect of cigarette taxation on consumption? (graph from Evans, Ringel, Stech “Tobacco Taxes and Public Policy to Discourage Smoking” *Tax Policy and the Economy*, volume 13)



3. Optimization (12 points)

Fatima is taking a new job, and must decide how many hours she would like to work. Assume that Fatima gets enjoyment from two things: consumption goods c and hours of leisure ℓ . Her utility is given by

$$U(c, \ell) = \frac{1}{2} \ln(c - 40) + \frac{1}{2} \ln(\ell)$$

.

The price of consumption goods is given by $p_c = 1$. Fatima's wage in the new job is 20 per hour worked. Assume that Fatima has only 80 available hours each week that she can either spend working or on leisure.

- (a) What is Fatima's budget constraint? (*1 point*)

- (b) What is Fatima's optimal choice of consumption goods c and hours of leisure ℓ ? (*4 points*)

(c) Now assume that Fatima receives a raise so that she is paid 40 an hour. What is her new optimal choice of c and ℓ ? (2 points)

(d) What is the sign (direction) of the substitution effect and the income effect, caused by the raise she received, on Fatima's choice of c and ℓ ? If the effect is motivating Fatima to increase c or ℓ , fill in the cell with the (\uparrow) symbol, if decreasing (\downarrow), if no effect (0) and if the effect is ambiguous (?). (4 points)

	c	ℓ
Substitution Effect		
Income Effect		

(e) Which effect (income or substitution) has a larger impact on Fatima's choice of ℓ , or are they the same size? In one sentence, how can you tell? (1 point)

4. Tax Incidence (13 points)

Let's consider the market for toilet paper. Suppose that, on March 19, 2020, aggregate demand for toilet paper in Berkeley is given by $Q^D = 120 - 30P$, where P represents the price of toilet paper roll and Q represents the quantity of rolls in a given day. Suppose aggregate supply is given by $Q^S = 10P$.

- (a) What are the equilibrium price and quantity in the Berkeley toilet paper market? (*1 point*)
- (b) Calculate the price elasticity of supply and the price elasticity of demand at the equilibrium. Compare the values and explain which side you would expect to face a higher incidence if a tax is levied on toilet paper? (*4 points*)
- (c) Now suppose a tax of $t = \$0.40$ is imposed on toilet paper sales. More specifically, at the time of any transaction, for each roll purchased, the consumer is taxed \$0.40 above the sticker price. Who bears the statutory incidence of the tax? (*1 point*)

- (d) Compute the new equilibrium with the tax. What are the new equilibrium price and quantity? How many fewer rolls of toilet paper are sold as a result of the tax? (*2 points*)
- (e) How is the incidence of the \$0.40 tax split between producers and consumers? (*2 points*)
- (f) How much revenue does Berkeley collect from this tax? (*2 points*)
- (g) Suppose that on March 20, 2020, all of California (including Berkeley) went under lockdown. Because of uncertainty, the demand for toilet paper shoots up to become $Q_D = 1200 - 30P$. Under this new demand function, would the tax incidence on consumers increase, decrease or stay the same? Explain briefly. (*1 point*)