

Econ 131
Spring 2017
Emmanuel Saez

Problem Set 3

DUE DATE: April 5

Student Name:

Student ID:

GSI Name:

- **You must submit your solutions using this template.**
- **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

A group of “conservative statesmen” issued in mid February a climate action proposal with a short summary in the NYTimes:

<https://www.nytimes.com/2017/02/08/opinion/a-conservative-case-for-climate-action.html>

Read this article and their full proposal at

<https://www.clcouncil.org/wp-content/uploads/2017/02/TheConservativeCaseforCarbonDividends.pdf>

Based on what you learned from the lecture on externalities, explain whether this proposal is a sound economic idea or not. In particular, would there be losers if such a proposal would be enacted? If there are losers, would it be possible to modify the proposal to compensate them for their losses? Answer this question by distinguishing theory from practice. Based on your reading of the news since February, has this proposal had any traction with the Trump administration and the Republican Congress?

(d) Suppose that candidates X and Z run for president. Candidate X is elected president after winning 51% of the vote. Then once in office, he appoints more conservative members to the Supreme Court than candidate Z would have. This means that a majority of American voters preferred more conservative Supreme Court members. (Assume that everyone is fully informed about the candidates plans and the President does not need Senate approval to appoint Supreme Court members.)

(e) Parks are an example of a pure public good.

3. Public Goods

San Francisco is considering building a new concert venue. Assume the city has two residents: Lakisha and Jamal. San Francisco will fund the concert venue solely from the individual contributions of these residents. Each of the two residents has a utility function over private goods (x_i) and total venue size (S), of the form:

$$U_i(x_i, S) = \frac{1}{2} \ln(x_i) + \frac{1}{2} \ln(S)$$

The total size of the venue is determined by the total number of seats built, S , and is the sum of the number of seats paid for by Lakisha and Jamal: $S = s_L + s_J$. Lakisha has an income of \$200 and Jamal has an income of \$100. Both the private good and a venue seat have a price of \$1.

- a) How many seats will be built if the government does not intervene? How many are paid for by Lakisha? By Jamal?

- b) What is the socially optimal number of seats? If your answer differs from (a), explain why.

Now, imagine that starting from a price on seats of \$1, the price changes to $\$p_S$. The price on X is still \$1. As the price changes, Lakisha's and Jamal's incomes are increased in the following way: as the price changes from 1 to p_S , the terms $C_L \equiv (p_S - 1)s_L$, and $C_J \equiv (p_S - 1)s_J$, are added to the incomes of Lakisha's and Jamal's usual budget constraint, respectively. The resulting budget constraint is called the *compensated budget constraint*.

- c) Write up expressions for Lakisha's and Jamal's compensated budget constraints. Why do you think the budget constraints are called "compensated"?

d) Find the social optimum through vertical summation of demand curves:

i) Derive the inverse *compensated* demand curve for S in the following way:

- Maximize Lakisha's and Jamal's utility functions subject to their compensated budget constraints. Be careful not to plug in C_L and C_J , respectively, until *after* you've taken derivatives.
- Solve for p_S as a function of s_L and s_J for both Lakisha and Jamal. (*See Gruber 4th edition, ch. 2 (Theoretical Tools of Public Finance), p. 44 for intuition, though this reference is not necessary to solve the problem*)

ii) Using your result in i) derive the social demand curve.

iii) Return to a setup with $p_S = 1, p_X = 1$. Find the social equilibrium by equalizing the social demand curve with the supply curve for venue seats (i.e. the marginal cost of venue seats). Does this differ from what you found in (b)?

*Note: Lakisha's demand curve depends on Jamal's choice, and vice versa. This implies that we can't draw the demand curves in the usual way, as we simultaneously need to determine s_L, s_J and p_S , i.e. we have a 3-dimensional problem instead of our usual 2-dimensional problem (determining Q and p). For illustration (**not for credit**), draw Lakisha's demand curve by fixing some value of s_J and Jamal's demand curve by fixing some value of s_L , and from that draw the social demand curve. However, you won't be able to graphically get the social optimum, only analytically as we did above.*

Write your solution for (i) here:

Write your solution for (ii) here:

Write your solution for (iii) here:

e) Suppose, an anonymous fan pays for 60 seats. What is the new total number of seats? How many are provided by Lakisha? By Jamal? How does this compare to the level of provision in (d)?

f) Propose a mechanism the government could use to achieve the socially optimal amount of seat provision.