

**Econ 131**  
**Spring 2019**  
**Emmanuel Saez**

**Final**

**May 17th**

Student Name:

Student ID:

GSI Name:

### **Exam Instructions**

- **Closed book/notes exam.** No computer, calculator, or any electronic device allowed.
- **No phones.** Turn them off and put them in your bag.
- **Explanation should be written using pens.** No pencils, except for graphs.
- **You must submit your solutions using the exam packet provided.** If you need more room to write your answers or need to re-draw a graph use the extra pages at the end. Make sure to note it clearly and accurately if your solutions continue on a different page.
- **Do not write your solutions on pages that say “Do not write on this page”.** Answers written on these pages will not be graded.
- **When time is called, STOP** writing, immediately **CLOSE** your exam packet and hold it up until it is collected by one of the GSIs.
- This exam contains a total of 50 points.

**Do NOT open this test until instructed to do so.**

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**1. True/False/Uncertain (questions 1a-j) (25 points, 2.5 points per question.)**

Explain your answer fully based on what was discussed in class, since all the credit is based on the explanation. Your grade depends entirely on the substance of your justification, not on whether you are correct in writing “True” or “False”. Note that it is possible to answer each question for full credit with three sentences or fewer, and answers longer than ten lines long will not be graded.

(a) It is desirable to concentrate taxes on goods whose demand is inelastic with the price.

(b) Empirical evidence shows that Medicare and Medicaid save lives.

(c) The elimination of the Obamacare individual mandate will lead to a death spiral on Obamacare exchanges.



(g) Disability insurance in the United States does not discourage labor supply because rejected applicants are very unlikely to work.

(h) Because US top 1% pre-tax income shares are strongly negatively correlated with top marginal tax rates, high top tax rates are not desirable.

(i) The corporate income tax is a progressive tax because profits from corporations accrue mostly to high income individuals.

- (j) For higher education, the role of the government should be limited to guaranteeing loans so that talented but poor students can borrow against their future earnings to fund their education.

## 1. Public Goods

San Francisco is preparing for the Golden State Warriors' move by building a new basketball arena. Assume the city has two residents: Curry and Durant. SF will fund the new arena solely from the individual contributions of these residents. Each of the two residents has a utility function over private goods ( $x_i$ ) and total arena size ( $S$ ), of the form:

$$U_i(x_i, S) = \ln(x_i - 3) + \ln(S - 6)$$

The total size of the arena is determined by the total number of seats built,  $S$ , and is the sum of the number of seats paid for by Curry and Durant:  $S = s_c + s_d$ . Curry has an income of \$36 and Durant has an income of \$24. Both the private good and an arena seat have a price of \$1. *Note: For any fraction or decimal answers, you may choose to round off or keep as is.*

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

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

(c) Suppose the city of San Francisco is not happy with the private equilibrium and decides to provide 6 seats in addition to what Curry and Durant choose to provide on their own. Durant and Curry each pay a \$3 lump-sum tax to pay for the 6 seats. What is the new total number of seats? How does your answer compare to (a)? Did San Francisco achieve the social optimum with this plan? Why or why not?

(d) Suppose instead, starting from the situation in part (a), an anonymous fan pays for 6 seats. What is the new total number of seats? How many are provided by Curry? By Durant? How does this compare to the level of provision in (c)? If there are any similarities or differences, explain why.

(e) Propose a mechanism the government could use to achieve the social optimum.

(f) Does a basketball arena fit the characteristics of a pure public good? Why or why not?

## 2. Insurance

Assume that everybody earns a wage of \$400. Individuals face a probability  $q$  of getting disabled. If they are disabled their wage becomes \$0. Individuals can purchase insurance from private firms. It provides them with \$400 if they get disabled. The price of insurance is  $p$  and is paid regardless of whether the person becomes disabled or not. In this problem (and in contrast to the model seen in class), we assume that individuals either buy no insurance at all or buy full insurance. Assume that there are three types of people that can differ in the probability of getting disabled,  $q$ , and/or their utility function over consumption  $c$ :

- Type 1:  $q_1 = 40\%$  and  $U(c) = \sqrt{c}$
- Type 2:  $q_2 = 10\%$  and  $U(c) = \sqrt{c}$
- Type 3:  $q_3 = 5\%$  and  $U(c) = c$

There are 10 people of each type.

- (a) Explain why only type I and type II would benefit from insurance.

**Assume in the remaining questions that the market for insurance is perfectly competitive. Assume in questions (b), (c) and (d) ONLY that firms know the type of each consumer and charge each type of consumer a different price  $(p_1, p_2, p_3)$**

- (b) Write down the profit function of firms for each type of individual:

- (c) Explain why in equilibrium, insurance providers earn zero profits.

(d) Calculate the prices  $(p_1, p_2, p_3)$  that firms will charge each type.

**Assume for the rest of the problem that firms cannot observe types.**

(e) Calculate how much each type is willing to pay for insurance. Willingness to pay is defined as the price of insurance that makes the individual indifferent between getting full insurance at this price and not being insured at all.

(f) What is the long term equilibrium price of insurance? Who gets insured in equilibrium?

(g) Give a reason for why the government should intervene in this market.

(h) Should the government be worried about moral hazard in this scenario?

**Assume now that type 1 and 2 have different utility functions but their probabilities of getting disabled are the same as before:**

- Type 1:  $q_1 = 40\%$  and  $U(c) = \sqrt{c}$
- Type 2:  $q_2 = 10\%$  and  $U(c) = c^{\frac{1}{4}}$
- Type 3:  $q_3 = 5\%$  and  $U(c) = c$

(i) Calculate the new equilibrium price. Who gets insurance now?

(j) Explain the intuition for this result.

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