Econ 131
Spring 2021
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Final Exam

May 14

Exam Instructions:

- **Explanation should be written using pens (we recommend black or blue ink, as these often scan the best).** No pencils, except for graphs.

- **Show your work**. Credit will only be awarded on the basis of what is written on the exam.

- **Sign the academic honesty pledge**. Cheating will be dealt with harshly.

Student Name:

Student ID Number:

Affirm the academic honesty pledge below. For those writing on a non-printed copy, please just write "Academic Honesty Pledge as on exam", and sign your name.
If you do not affirm this pledge, your exam will be marked invalid.

0. ACADEMIC HONESTY PLEDGE

I confirm that I have abided by all academic honesty rules for UC Berkeley and Economics 131. I confirm that I did not see this exam before my official exam start time. I confirm that I have not shared and will not share this exam with anyone else. I confirm that I haven't copied from anybody else's exam.

Signature: _____

1. True/False/Uncertain (20 points, 2 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) Taxes cannot have a very large impact on labor supply of prime age workers because France has much higher taxes than the US and yet about the same work rate among prime age workers.

(b) The efficiency costs of the EITC is increasing overtime as more and more individuals figure out how to game the EITC.

(c) In the standard life cycle economic model, there is no need for a public retirement program like social security.

(d) In the US, the elderly used to work more when there was no social security program. Therefore, the premise that people cannot work in old age and need retirement benefits is wrong.

(e) The Biden administration wants to cut CO2 emissions in the US in half by 2030 without imposing any extra tax on carbon emissions. It would be much more efficient to impose instead a carbon tax.

(f) In the US, people working at large firms pay for health insurance through reduced wages. As a result, the ordinary worker end up paying as much as the highly paid manager for health care.

(g) It would be foolish for the United States to introduce a wealth tax on the rich because the European experience has shown that such taxes are easy to avoid or evade.

(h) The evidence from Chile showing that government student loans for high SAT scoring students increase college enrollment of high SAT students is not compelling because even absent government loans, we expect that high scoring students would be more likely to attend college anyway.

(i) In the US, the poor get government subsidies for health care while the middle and the rich pay full cost for their health insurance (and also fund the subsidies to the poor). That is much more redistributive than the European way of providing universal health insurance paid for by taxes on everybody.

(j) It is very difficult to fake a work disability. Therefore, we can conclude that Disability Insurance recipients would not be able to work absent the program.

2. Public Goods (20 points)

Global warming is the main challenge for the 21st century. To fight global warming it is necessary worldwide effort. For simplicity assume that there are only two countries in the world, countries A and B. The two countries have identical preferences: $U(x,C)=4 \log X + \log C$, where log denotes the natural logarithm (base e), x is each country private consumption, and C is the sum of global contributions to the climate agenda. Countries A and B contribute C_a and C_b, hence $C = C_a + C_b$. Assume that $p_x = p_c = 1$ and that each country has a $900 budget for both goods.

(a) What are the two characteristics of a pure public good? *(2 point)*

(b) Determine the private equilibrium level of contributions for each country, C_a and C_b. *(3 point)*

(c) Determine the socially optimal contribution to the climate agenda, C. *(3 point)*

(d) Why does the socially optimal quantity of contributions to the climate agenda in (c) differ from the level in (b)? *(3 point)*

(e) To assist on the global environmental issue, United Nations offers a matching grant of 25% for any contributions made by country A (C_a), or country B (C_b). Determine the private contribution levels C_a and C_b for each country under this program. *(3 point)*

(f) Does the matching grant described in (e) affects the private equilibrium level of contributions for each country, C_a and C_b? *(3 point)*

(g) Does the matching grant described in (e) is enough to bring the private equilibrium level of contributions for each country, C_a and C_b to the socially optimal levels in (c)? *(3 point)*

3. Disability Insurance (20 points)

Let's suppose that each individual in the economy earns \$200. There is no public provision of disability insurance, so they receive \$0 when sick. Let's start out assuming that there are four types of people, each with a different utility function and lifestyle-based disability probability q_i (where i indexes the different riskiness groups l, m, h, o):

- Type L: $q_l = 0.2$, $u(c) = \sqrt{c}$

- Type M: $q_m = 0.75$, $u(c) = \sqrt{c}$

- Type H: $q_h = 0.6$, $u(c) = c$

- Type O: $q_o = 0.3$, $u(c) = c^2$

Let's suppose each individual can purchase disability insurance from private firms at premium price p, providing a lump-sum benefit b if they end up disabled. For (a) and (b), we'll assume that that there is no asymmetric information; i.e. insurance companies know each consumer's type, and can offer specialized plan options to each type. There are 100 people of each type in the economy.

(a) Briefly state **and justify** whether each type would benefit from, be indifferent to, or worse off from receiving insurance at actuarially fair premiums (compared to receiving no insurance). *(2 points)*

For the rest of the problem, assume that types H and O have migrated out of the economy, so only types L and M remain. **Recall that there are 100 people of type L and 100 people of type M.**

(b) Maintaining our assumption of no asymmetric information, let's assume that private providers only offer actuarially fair plan policies with full insurance. Calculate the benefit b and price p offered to each type (note again that types H and O have migrated out of the economy, so only types L and M remain). *(2 points)*

For the rest of the problem, let's relax the "no asymmetric information" assumption: instead, suppose that insurance providers cannot observe worker types.

(c) Assume that there is only one insurance company (so it may earn a profit) and it offers only one insurance plan. It offers a plan with a benefit of $b = 200$ for a price of $p = 150$. Call this insurance plan Plan #1. Which types will choose to buy it? *Hint: calculating utilities rather than maximum-prices-willing-to-pay will help you save time later. (4 points)*

(d) Will the insurance company still be able to offer Plan #1 in a perfectly competitive equilibrium? *(1 point)*

(e) Suppose now that a single insurance firm offers Plan #2. Plan #2 has benefit b = 20. Show that the actuarially fair price for Plan #2 is 9.5 if the firm expects both types to buy it. At this price of 9.5, would both types buy this insurance or would they prefer to go without any insurance? *(2 point)*

(f) Suppose now that one insurance firm offers plan #1 at price 150 and another one offers plan #2 at price 9.5 (as in the questions above). Which types will buy Plan #2, if any? Which types will buy Plan #1, if any? *(4 points)*

(g) Entrepreneurs learn that the insurance company offering plan #2 was making a profit. Those entrepreneurs start lots of new firms so that any firm offering a plan with benefit $b = 20$ has to set the premium equal to actual average costs. As a result, Plan #2 disappears, but there is a new plan called Plan #3 with $b = 20$ and premium p equal to the plan's actual average costs. Assume that the types who used to buy Plan #2 (computed in the previous problem) buy Plan #3 and are the only ones who buy it. What premium will Plan #3 have? *(2 point)*

(h) Suppose that only Plan #1 and Plan #3 are offered in the economy. Which types (if any) will buy Plan #1? Which types (if any) will buy Plan #3? Which types (if any) will buy no plan? *(3 points)*