Econ 131

Spring 2017

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Final

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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) Berkeley decides to purchase 500 bicycles to begin offering a bike share program that is free to the public. This is an example of a pure public good (Bike share programs offer bicycles that are parked in public spaces and can be used for transportation).

(b) A large study is conducted to evaluate the effects of income taxation on workers. Individuals are randomized into two groups and faced with different tax rates. The study finds that individuals in both groups work exactly the same number of hours per week on average. The study concludes that taxation clearly does not distort workers' behavior. Do you agree with this conclusion?

(c) In theory, the EITC encourages all low-income individuals to work more.

(d) You decide to create a start-up company that offers insurance against spilling liquid on laptops, and you believe that the probability that an individual spills liquid on their laptop in any given year is 1%. Taking this into account, you decide to set the premium at $10 per year for all your clients. You find out that among your clients, the probability of this incident occurring is actually 10%. This is an example of adverse selection.

(e) A reduction in the tax rate on interest income will increase overall savings.

(f) Educational degrees (at least Texas high school degrees) appear to be merely a screening device: a way for employers to distinguish among people who have better or worse intrinsic ability.

(g) It is rational for someone to want the government to tax everyone in order to fund a public good and then for that person to try to evade paying the tax herself.

(h) Flexibility in the timing of realizing capital gains (including exercising stock options) can make it hard to use basic difference-in-differences methods to estimate the long-run elasticity of high-earners' income with respect to their net-of-tax rate.

(i) When the government puts guardrails on roads (i.e. the sheets of metal sticking out of the ground that prevent cars from falling down mountains when the cars veer off the road), cars stop falling down mountains, but cars are more likely to get into minor accidents that don't affect others (e.g. cars skidding into trees) as people start to drive a little faster. This is an example of moral hazard and is a reason for the government to possibly not place guardrails on roads even if everyone prefers roads with guardrails and guardrails cost nothing.

(j) The optimal linear tax rate is never above the revenue maximizing tax rate.

2. Exercise - Externalities (12 points)

The 2016 United Nations Climate Change Conference met in Morocco in order to agree on policies to reduce climate-warming pollution like carbon dioxide. Suppose that the conference determined that the social marginal benefit from reducing each unit of carbon dioxide pollution equals $200 no matter how much pollution is occurring. Suppose that the world has lots of identical firms and each firm faces a marginal cost of reducing one unit of carbon dioxide pollution equal to $100 \times q$, where q is the number of units of pollution the firm reduces (i.e. the number of units of pollution the firm avoids emitting). There are no other costs to pollution reduction (so the firm's marginal cost equals the social marginal cost).

We have provided you with boxes to provide your answer to each part, but you must still show all of your work and derivations to receive full credit.

(a) [2 points] What is the socially optimal subsidy to pollution reduction (equivalent to the socially optimal tax on pollution) in terms of dollars per unit of pollution reduced? (Assume there is no quantity regulation.)

Your answer for part (a):

(b) [2 points] What is the socially optimal quantity regulation (the number of units of pollution reduction that every firm is required to do)? (Assume there is no subsidy/tax.)

Your answer for part (b):

Now the conference learns that $\$100 \times q$ was just the *expected* marginal cost that each firm will face to reducing a unit of pollution. In reality, either all firms will face a marginal cost equal to $100q - 50$ (because a cheap pollution-reducing technology gets invented, call this possible future "the good future"), or all firms will face a marginal cost equal to $100q + 50$ (because no cheap pollution-reducing technology gets invented, call this possible future "the bad future"). The good future and the bad future each have a 50% chance of happening.

(c) [2 points] Draw a graph of the social marginal benefit curve and the possible social marginal cost curves as a function of pollution reduction q. Label your axes and the socially optimal amounts of pollution reduction under each of the two scenarios.

(d) [2 points] Calculate expected DWL from the subsidy in part (a). The expected DWL is defined as [50% times the DWL in the good future] + [50% times the DWL in the bad future].

Your answer for part (d): [   ]

(e) [2 points] Calculate expected DWL from the quantity regulation in part (b).

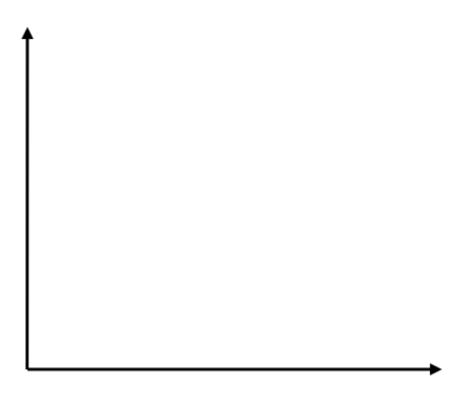Your answer for part (e): [   ]

(f) [2 points] By comparing the expected DWL calculated in parts (d) and (e), which of the two policies would you recommend to the conference leaders? Plot out **and** explain a change to the social marginal benefit curve that would make your recommendation different. [Note: There is no math required here, and you can answer this question if you understand the concepts but were unable to answer parts (d) and (e).]

3. Social Insurance (13 Points)

Pam is a single mother with two kids. If she applies for welfare and does not work at all, she receives **welfare benefits** of $5,000 a year and health insurance for her family through **Medicaid** that she values at $2,000 a year. If she works, she earns $10 per hour and can work up to 2000 hours per year. She loses $1 in welfare benefits for every $2 she earns. She loses her Medicaid coverage if she earns enough so that she is no longer eligible for welfare benefits (i.e. she loses Medicaid when welfare benefits = $0). Her job does not provide health insurance. Pam's income is low enough that she does not pay income taxes (also assume that she does not pay Social Security taxes).

(a) [4 points] Graph Pam's opportunity set in the space consumption-hours (carefully labeling the slope of the budget constraint, intercept points, and any discontinuities). Is there any hours range that she definitely won't choose? Why or why not?
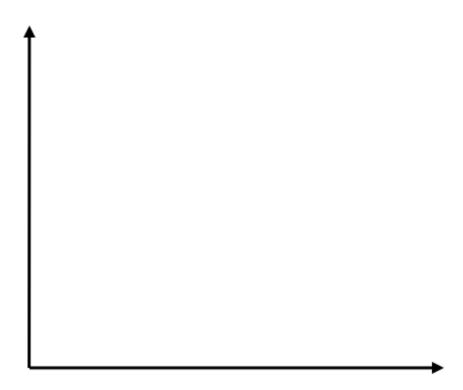
(b) [3 points] Suppose that there is a Medicaid expansion so that single mothers earning less than $25,000 per year and their children are now covered. How does this change Pam's opportunity set (draw a new graph). How might her new choice of hours of work compare to her choice in part (a)? Show graphically and explain.
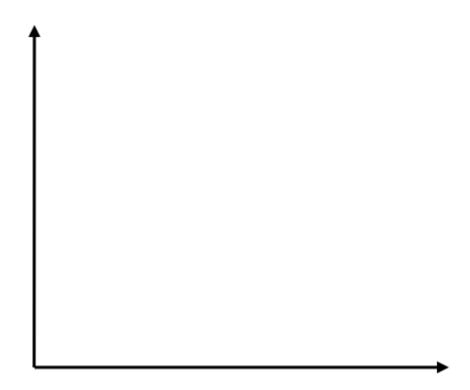
Assume the Medicaid expansion stays in place for the remainder of the problem (i.e. assume Pam is eligible for Medicaid if she earns less than $25,000)

(c) [3 points] Congress is concerned that there is too high a tax on work for welfare recipients and passes a new law. Under the new law, Pam loses $1 in benefits for every $3 she earns. How does this change Pam's opportunity set (draw a new graph)? How might her new choice of hours of work compare to her choice in part (b)? Show graphically and explain. How might this law affect the total number of people on welfare?

(d) [3 points] The law from part (c) is vetoed, so Pam once again loses $1 in benefits for every $2 she earns. Congress passes a new law that allows the IRS to take child support directly out of the wages of "deadbeat dads" and give it to the mothers. As a result of the new law, Pam receives $5,000 per year in child support. However, she loses $1 of welfare benefits for every $2 of child support she receives. How does this change Pam's opportunity set (draw a new graph)? How might her new choice of hours of work compare to her choice in part (b)? Show graphically and explain.

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