

Econ 131
Spring 2020
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Final Exam

May 15

Exam Instructions are printed on the Answer Booklets.

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1. True/False/Uncertain (questions 1a-j) (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) Labor supply theory and changes in incentives do a pretty good job at explaining the labor force participation of single mothers in the US over the last four decades.

Solution:

Uncertain: it is true that the surge in labor force participation of single mothers in the US in the 1990s coincided with welfare reform and the expansion of the Earned Income Tax Credit. The old literature believed that the EITC was the key element but recent work by Kleven (2019) has cast doubt on this: other EITC expansions did not increase LFP of single mothers. Hence, it is likely that a combination of EITC, welfare reform, and changes in social norms explain the surge in the LFP of single mothers.

- (b) Series on pre-tax income shares are affected by tax evasion and avoidance so it is impossible to say much about the evolution of inequality.

Solution:

False: True that series based on reported income on tax returns (the Piketty-Saez 2003 series) are affected by tax evasion and avoidance. For example, top incomes excluding capital gains show a big jump from 1986 to 1988 due to the shift of corporate income to individual income (as C-corporations shifted to partnership and S-corporation form). However, additional evidence shows that the rise of top incomes is real: series adding capital gains also show a dramatic increase since 1980 (and capital gains have always been tax favored and were the main tax channel to shelter income before the 1980s); charitable giving by top earners increased dramatically (relative to average income). More generally, it is possible in principle to construct series that reflect the true economic incomes. This is what the Distributional National Accounts of Piketty-Saez-Zucman 2018 attempt to do.

- (c) The Earned Income Tax Credit program in the United States is likely to discourage labor supply on average because most of the recipients are in the plateau or phasing out range of the program.

Solution:

False: It is true that along the intensive margin, the EITC discourages labor supply in the plateau and phase-out but the EITC unambiguously encourages work along the extensive margin of labor supply.

- (d) After Obamacare, any family or person who wants health insurance can get it at affordable price. Therefore, it is fair to say that the US has universal Health Insurance for all who want it.

Solution:

False: that was the principle of Obamacare: free health care for the poor through Medicaid expansion below 138% of poverty and then affordable health care on the exchanges subsidized based on family income. In practice, a number of states (14 today including FL and TX) refused the Medicaid expansion so that very low income families cannot get affordable health care. Undocumented immigrants (a large group of 10m) are also excluded from Medicaid and subsidies. Obamacare exchanges health insurance is perceived as expensive as it often has high deductibles (e.g. first \$5K of annual expenses are not covered by insurance).

- (e) Denmark has a very progressive tax system but can still attract top talent from abroad by offering tax discounts on highly skilled immigrants. Therefore, mobility of top talent does not threaten tax progressivity.

Solution:

True that Denmark has a very progressive tax system but can still attract top talent from abroad by offering tax discounts on highly skilled immigrants (Landais et al. 2014 study). So it does not hinder overall tax progressivity in Denmark (as the number of foreign immigrants at the top is very small relative to the domestic population). However, from a multi-country perspective, such schemes do threaten tax progressivity in every country if they proliferate. E.g., high income Danes might move abroad if Sweden/Germany offer such schemes as well forcing Denmark to reduce its own tax progressivity. This is “tax competition”. In principle, countries could fight such competition by taxing ex-pats as the US does (but the US is exceptional and no European country does this).

- (f) In contrast to social insurance, private insurance can provide perfect insurance because customers pay the full cost of expected insurance claims through the premiums.

Solution:

False: private insurance is also subject to moral hazard (actions taken by the person insured that increase the likelihood of insurance payment). Therefore, private insurance typically offers only partial insurance (e.g., auto insurance premiums go up after you have an accident).

- (g) If social security did not exist, individuals would save on their own because nobody wants to starve in retirement. Therefore, social security just crowds out private individual sav-

ings.

Solution:

False: This is true in the economists' view: in the rational economic model of intertemporal decisions, individuals save to smooth consumption. In that case, social security crowds out private savings (as we saw in class). But a lot of evidence shows that individuals are not able to save rationally for retirement. Before social security, most people were relying on family for support in old age. Even today, there is a substantial drop in consumption at retirement.

- (h) The replacement rate provided by Unemployment Insurance should never exceed 100%. Therefore, the CARES act that provides an extra \$600/week in unemployment benefit is sub-optimal policy.

Solution:

Uncertain: In the standard model trading off consumption smoothing and moral hazard, it is optimal to have a replacement rate less than 100%. A replacement rate of more than 100% would kill incentives for people to get back to work. The extra \$600/week from the CARES act does create replacement rates above 100% for low wage earners. However, the extra UI is limited till end of July and the unemployment rate is going to be very high (too many laid off workers, too few jobs) so that reducing search incentives might not be bad. The extra \$600/week was the only form of extra payment they could enact and implement very quickly through the decentralized and antiquated state systems.

- (i) Individuals benefit from higher education in the form of higher career earnings. Therefore, individuals should pay for their higher education themselves and the most the government should do is make loans available to students.

Solution:

False: This is true in the narrow economic model where individuals make rational decisions on acquiring higher education based on costs and benefits. Loans in principle allow students with no resources to attend school. In practice though, individuals' education decision do not follow the standard rational model: help through good mentoring/tutoring is important to be able to attend (Dartmouth study), mass higher education is always government funded historically, for-profit sector does not have a good record of providing quality education, student debt creates undue burden in many cases (people struggling to repay the loans).

- (j) Tax competition is particularly severe between sub-national governments. Therefore it is impossible for local governments to tax corporate profits.

Solution:

False: True that tax competition is generally more severe at the sub-national level. However the US case shows that it's possible for states to tax corporate profits, by using apportionment formulas. The US experience suggests that with adequate base protection measures, sub-national corporate income taxation is feasible.

2. Community college funding

A major component in post-secondary education in the United States is the community college sector. These institutions provide vocational training as well as lower-division academic coursework for those intending to transfer to 4-year institutions. The following questions apply a variety of public economics tools to the topic of community college funding.

- (a) Provide two economic motives justifying government involvement in education. Explain each.

Solution:

Possible motives include: externalities (spillovers), family failures, borrowing constraints, and individual failures. Must explain relevance for full credit.

- (b) Provide at least one economic motive justifying government NON-involvement in education. Explain.

Solution:

Possible reasons: much of the return for education is private; education is an excludable good.

Let's focus on the market for 2-year college education in Oakland. Assume the local demand for community college degrees is described by the inverse demand function $P = 8,000 - 3Q_d$, while the inverse supply function is given by $P = 4Q_s$, where P is the price of attending community college. The additional marginal benefit to the community for each degree is \$2,000.

- (c) Determine the private market equilibrium price and quantity.

Solution:

Private market equilibrium: $Q = 1,143$, $P = 4,571.42$.

- (d) What is the socially optimal demand function?

Solution:

We must add the $MB = \$2,000$ from PMB so that:

$$\begin{aligned}SMB &= PMB + MB \\ &= 8,000 - 3Q + 2,000 \\ &= 10,000 - 3Q\end{aligned}$$

- (e) Find the socially optimal equilibrium price and quantity.

Solution:

$$SMB = SMC$$

$$10,000 - 3Q = 4Q$$

Socially Optimal Equilibrium: $Q = 1,429$, $P = 5,714.29$.

- (f) Find the DWL associated with the private market equilibrium.

Solution:

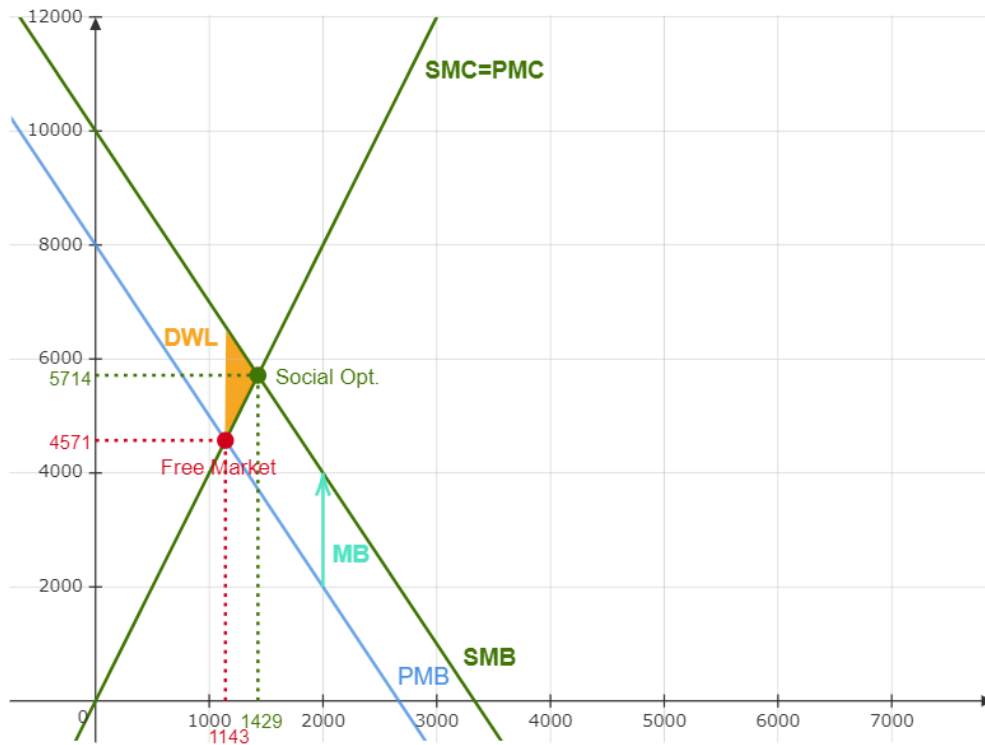
$$DWL = (\Delta Q * MB)/2$$

$$= (285.71 * 2,000)/2$$

$$= \$258,714$$

- (g) Graph the market for community college in Oakland. Be sure to label 8 things: PMC, SMC, PMB, SMB curves, the Marginal Benefit, the DWL, the private market equilibrium and the socially optimal equilibrium.

Solution:



(h) What would be the Pigouvian solution to the externality problem introduced above.

Solution:

The social optimum could be achieved through an education subsidy equal to the $MB = \$2,000$.

At the California state legislature in Sacramento, lawmakers are debating policy proposals to increase per-student expenditures for community colleges. The three proposals are as follows:

- No change in funding;
- a \$1,000 increase in funding per student; and
- a \$2,000 increase in funding per student.

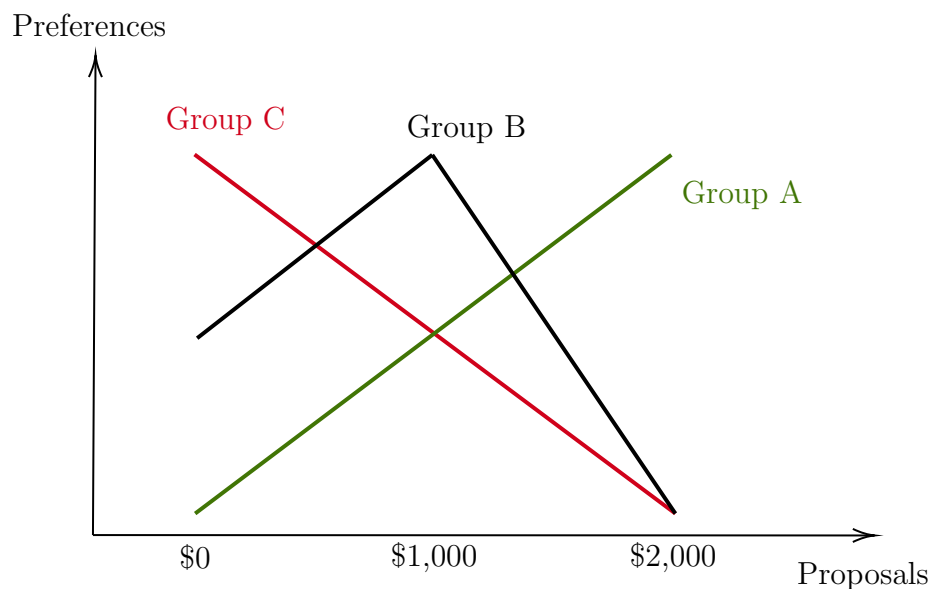
In addition, there are three voting blocs:

- Group A: Prefers more community college funding to less.
- Group B: The \$1,000 increase in funding is the most preferred option, followed by no change in funding, with the \$2,000 increase as the least preferred option.
- Group C: No change in funding is the most preferred option, followed by the \$1,000 increase, with the \$2,000 increase as the least preferred option.

(i) Which groups' preferences are single-peaked? Explain or demonstrate why. You may use a graph.

Solution:

All of them are single-peaked: Group A support is monotonically increasing in funding, Group B peaks at \$1,000, fall in support for less or more funding and Group C support is monotonically decreasing in funding.



- (j) Assuming equal proportions of voters in each group, will majority voting generate consistent outcomes? Explain why or why not.

Solution:

Yes, We see that a \$1,000 increase is preferred to a \$2,000 increase and to no increase, and a \$2,000 increase is preferred to no increase. The ranking is therefore 1st: \$1,000 increase, 2nd: \$2,000 increase and 3rd: No increase.

- (k) If 2 of the 3 proposals are selected to compete in an election, would the median voter most preferred alternative win?, Explain.

Solution:

Yes, Since the preferences are single-peaked, the voting is single-dimensional and there are 2 proposals, as long as the full-information and the No-money assumptions hold, the predictions of the Median Voter Theorem would hold.

3. Workers Compensation

Consider an economy of identical individuals who earn a wage of 200 while working and nothing when they don't. With probability q , the individuals get injured and cannot work. When injured, the individuals get a worker's compensation benefit of b from the government. When working, individuals pay a tax of $(200 * \tau)$ to finance the workers compensation system. Assume that the agents have no other source of consumption in either state. Let $u(c) = c^{1/3}$ denote the individual's utility from consuming c in a given state.

- (a) Write the individual's expected utility as a function of b , q and τ .

Solution:

Expected utility is the weighted average of the utility in each state - injured/not injured.

$$EU = (1 - q)(200(1 - \tau))^{1/3} + q(b^{1/3})$$

- (b) Write the government's budget constraint for an actuarially fair insurance program and find the balanced budget tax τ in terms of q and b

Solution:

The government must have a balanced budget - expected payments for worker's compensation should equal expected tax revenue.

$$(1 - q)\tau * 200 = qb$$

From which we can get the balanced budget τ :

$$\tau = \frac{qb}{200(1 - q)}$$

- (c) Assuming a balanced budget government, find the value of the benefit b that maximizes individuals expected utility.

Solution:

Plugging the τ found in (b) into the EU we get:

$$\begin{aligned} EU &= (1 - q) \left(200 \left(1 - \frac{qb}{200(1 - q)} \right) \right)^{1/3} + q(b^{1/3}) \\ &= (1 - q) \left(200 - \frac{qb}{(1 - q)} \right)^{1/3} + q(b^{1/3}) \end{aligned}$$

Evaluating the FOC and solving for b delivers:

$$\begin{aligned}
 (1-q)\frac{1}{3}\left(200 - \frac{qb}{(1-q)}\right)^{-2/3}\left(-\frac{q}{(1-q)}\right) + q\frac{1}{3}(b^{-2/3}) &= 0 \\
 \frac{1}{3}\left(200 - \frac{qb}{(1-q)}\right)^{-2/3}(q) &= q\frac{1}{3}(b^{-2/3}) \\
 \left(200 - \frac{qb}{(1-q)}\right)^{-2/3} &= b^{-2/3} \\
 200 - \frac{qb}{(1-q)} &= b \\
 b\left(1 + \frac{q}{(1-q)}\right) &= 200 \\
 b\frac{1}{(1-q)} &= 200 \\
 b &= 200(1-q)
 \end{aligned}$$

- (d) Find the tax rate τ that a government with balanced budget would have to charge workers to finance a benefit of the size found in (c), and discuss the intuition behind your result.

Solution:

$$\begin{aligned}
 \tau &= \frac{qb}{200(1-q)} \\
 &= \frac{q(200(1-q))}{200(1-q)} \\
 &= q
 \end{aligned}$$

A government that wants to offer full insurance to the workers and have a balanced budget needs a tax rate that is equal to the share of the time (q) that an average individual would spend injured and therefore receiving the WC benefit.

Assume now that the probability of injured is $q = 5\%$

- (e) Find the expected utility of an individual with no Workers Compensation system (Uninsured)

Solution:

$$EU = 0.95(200)^{1/3} + 0.05(0)^{1/3} = 5.56$$

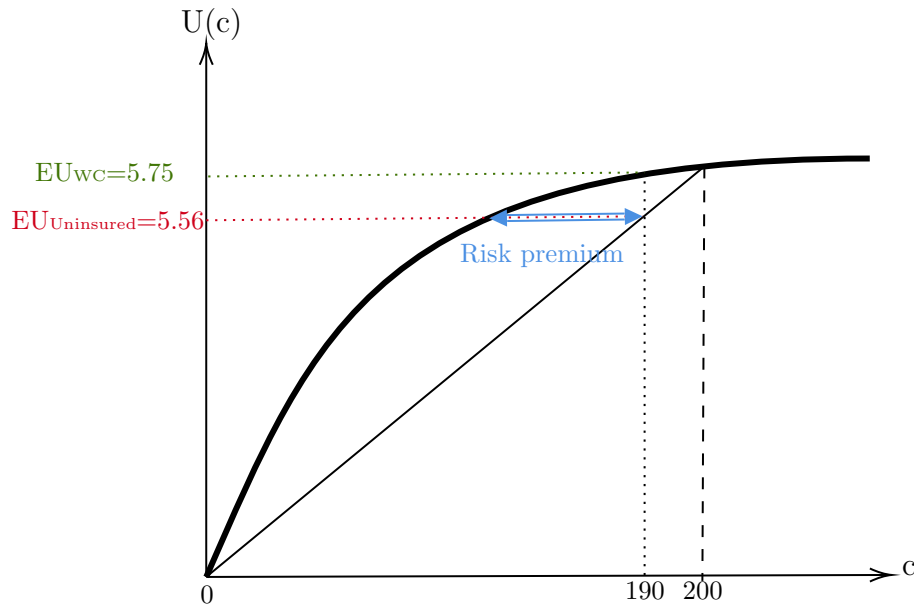
- (f) Find the expected utility of an individual under a Worker Compensation system with the full insurance benefit you found in (c) and a balanced budget tax rate τ .

Solution:

$$EU = (200 * 0.95)^{1/3} = 5.75$$

- (g) Present the previous results graphically, making sure to label (1) the axes, (2) the high and low consumption outcomes, (3) $EU^{uninsured}$, (4) EU under workers compensation, and (5) the risk premium.

Solution:



- (h) Now suppose that q is a function of b . Under the presence of moral hazard would you expect $\frac{dq}{db}$ to be positive/negative?, explain.

Solution:

We expect that $\frac{dq}{db} > 0$ since the greater the benefits that can be collected from workers' compensation the less likely employees are to be careful not to get injured and the more likely to fake an injury.