

Final Exam Solution

Short Answers: (5 points each) Please indicate whether the following statements are True, False, or Uncertain. Credit will be given based on the explanation. Please use bullet points and cite academic work where possible.

1. Disability insurance in the United States discourages labor supply because applicants assigned to stringent DI examiners are more likely to work subsequently than applicants assigned to lenient DI examiners.

True: This is the analysis by Maestas-Mullen-Strand AER13 discussed in classes that uses natural variation in DI examiners stringency and large SSA admin data linking DI applicants and examiners. They obtain causal effect of DI on LFP using and find relatively small but significant effects (see class notes).

2. The strong correlation between the drop in top tax rates and the increase in top 1% pre-tax income shares in OECD countries since 1960 implies that low to moderate top tax rates are desirable.

True/False: Piketty-Saez-Stantcheva AEJ 13 show strong correlation between the drop in top tax rates and the increase in top 1% pre-tax income shares in OECD countries since 1960. Note that correlation may not necessarily imply causation. Even if it's causation, the policy implications depend on the mechanism (supply side, tax avoidance/evasion, rent-seeking). Only in supply side scenario, low top tax rates are desirable (see Piketty-Saez-Stantcheva AEJ13 and lecture notes for details).

3. In the basic labor supply theory model we used in class, increasing the linear tax rate on earnings reduces labor supply.

Uncertain: increasing the linear tax rate creates both substitution and income effects. Substitution effects discourage labor supply. Income effects encourage labor supply. The net effect depends on the sign of the uncompensated elasticity.

4. The government observes that health insurance companies charge much higher premiums to those who have previously suffered a stroke. Explain what would happen if the government decided that this is unfair and bans this form of price discrimination.

Insurance companies would be forced to charge the same price to all customers. Low risk individuals would subsidize high risk individuals. Therefore, low risk individuals likely to drop out of the market, exacerbating adverse selection.

5. There is compelling evidence that unemployment insurance creates moral hazard effects.

True: see class notes on the study by Card-Chetty-Weber using variation in duration of benefits in Austria and a compelling regression discontinuity design.

6. Empirical evidence shows that Medicare Part D prescription drug benefits creates moral hazard effects.

True: Medicare Part D creates a nonlinear budget set for drug spending with brackets with different refund rates. Einav, Finkelstein, Schrimpf use drug spending data for Medicare beneficiaries and show that there is bunching at the threshold where the refund rate drops from 75% down to 25% (the Medicare doughnut hole). This is evidence of moral hazard. See class notes.

7. The efficiency costs of the EITC are increasing overtime as more and more individuals figure out how to game the EITC.

True: Chetty-Friedman-Saez AER13 show that cheating of the EITC using self-employment income to maximizing the EITC refund has grown overtime. In turn, wage responses have also significant in places with a lot of cheating. This suggests that the efficiency costs of the EITC (due to behavioral responses) increase overtime as information about the structure of the EITC diffuses.

8. The US social security retirement program discourages work of the elderly.

True: there is a spike in retirement at the 62 early retirement age implying that the availability of US social security benefits induces some workers to retire at 62, as soon as benefits are available (see class notes).

9. The preferred outcome of the median voter wins in majority voting against any other alternative.

True if the choice is unidimensional (like level of defense spending) and preferences are single peaked. This is the median voter theorem. Explain the proof for full credit (see class notes).

10. There is compelling empirical evidence that access to guaranteed loans increases college enrollment.

True: See the paper by Solis (2013) discussed in class in the case of Chile. Chile's government offers guaranteed loans to students with SAT score above some threshold. Using a regression discontinuity strategy, Solis shows convincingly that guaranteed loans increase college enrollment.

Problems

1. Community college funding (25 points)

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) [2 points] Provide two economic motives justifying government involvement in education. Explain each.

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

(b) [1 point] Provide at least one economic motive justifying government NON-involvement in education. Explain.

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 demand function $Q_d = 10,000 - P$, while the supply is given by $Q_s = P$, where P is the price of attending community college. The additional marginal benefit to the community for each degree is \$2,000.

(c) [3 points] Graph the market for community college degrees. Clearly label all points and axes. Determine the private market equilibrium price and quantity.

Private market equilibrium: $Q = 5,000$, $P = 5,000$. Supply curve is a 45-degree line going through the origin; demand curve is downward sloping with intercepts (Q,P) at $(Q=0, P=10,000)$ and $(Q=10,000, P=0)$.

(d) [4 points] Determine the socially optimal equilibrium price and quantity. On the graph, indicate the change(s) to the curves and mark the new price and quantity. Explain how the social optimum can be met in the market.

Social equilibrium: $Q = 6,000$, $P = 4,000$. This can be found by combining the added marginal benefit to the supply curve; it shifts the supply curve down by 2,000. The added marginal benefit is a positive externality, which can be met through subsidies in education. The same quantity could also occur if students were given tuition subsidies (raising demand), which would also result in higher market prices.

Now assume Oakland's city government must choose between community college degrees (C) and all other goods (X). Its preferences between both goods is given by $U(C, X) = (1/3) \cdot \log(C) + (2/3) \cdot \log(X)$. For simplicity, let the price for C and X both equal \$1, and let the city budget equal \$9,000.

(e) [3 points] Under these conditions, graph the budget constraint for the city, and determine Oakland's optimal provision of C and X .

$C = 3,000$ and $X = 6,000$; this can be found from utility maximization, but also by Cobb-Douglas preferences—1/3rd of the total budget is spent on college degrees, while 2/3rds is spent on other goods. The budget constraint will be a line connecting $(0,9000)$ and $(9000,0)$, assuming C on the horizontal axis and X on the vertical axis.

(f) [4 points] If the city is given a \$6,000 conditional block grant to be used for community college degrees, what is Oakland's optimal provision of C ? Explain your result. Also, draw the new budget constraint.

$C=6,000$, $X=9,000$. The budget constraint connects the points $(0,9000)$, $(6000, 9000)$, and $(15000, 0)$. The city would prefer to let $C=5,000$ (and $X=10,000$) with the grant, but is mandated to use all of the grant funds for community college, so they have to choose the kink point bundle with $C=6,000$. The grant does not result in a pure increase in college degree production.

(g) [2 points] Economic theory predicts the result in (f). What does the empirical evidence tell us about how C will change with the conditional block grant? Is there a difference in the short-run versus the long-run?

The **flypaper effect**, where “money sticks where it lands,” predicts most of the spending to stay with the targeted program in the short-run, but crowd-out of spending in the long-run. We would expect C to be greater than 6,000 initially, but it would fall over time.

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: Prefers best the \$1,000 increase in funding, but then would prefer no new funding to the \$2,000 funding request.
- Group C: Prefers best no new funds, but would go with the largest funding proposal if any new spending occurs. (This is the “go big or go home” caucus.)

(h) [3 points] Which groups’ preferences are single-peaked? Explain or demonstrate why. You may use a graph.

Group A (since support is monotonically increasing in funding) and Group B (peak at \$1,000, fall in support for less or more funding). Group C’s preferences are multi-peaked, since they prefer no funding, followed by having a large funding increase. The middle option is least preferred.

(i) [2 points] Assuming equal proportions of voters in each group, will majority voting generate consistent outcomes? Explain why or why not.

No, because there will be a cycling outcome in policy preferences. We see that a \$2,000 increase is preferred to a \$1,000 increase, a \$1,000 increase is preferred to no increase, and no increase is preferred to a \$2,000 increase. It’s unclear what the aggregate ranking of choices would actually be.

2. Unemployment Insurance (25 points)

Individuals have utility function given by $U(C) = \sqrt{C}$.

Individuals earn a wage w when employed and have no earnings when unemployed.

The probability of being unemployed is p .

(a) [2 points] Write down the individuals' expected utility

$$EU = (1 - p)\sqrt{w} + p\sqrt{0} = (1 - p)\sqrt{w}$$

(b) [2 points] How much insurance at an actuarially fair price would individuals buy (No need for calculation)

Given the utility function $U(C) = \sqrt{C}$, individuals are risk averse. We therefore know that at an actuarially fair price they would purchase full insurance such that their consumption is equal in each state of the world.

(c) [2 points] Present the previous result graphically, making sure to label the axes and to show the risk premium.

Standard graph

(d) [3 points] When individuals have their own, unobservable to private insurers and to the government, probability of being unemployed p_i , the government might need to intervene in the insurance market. Explain why.

This is due to adverse selection. When individuals looking for insurance have private information that is not observable to the insurer, in this case their own probability of being unemployed, the private insurance market can unravel such that no one (but the highest risk individual) is insured, even though everyone would want to purchase insurance. When this is the case government mandating everyone to buy insurance can be pareto improving.

Let's now assume that the government intervenes and provides unemployment insurance benefits b to the unemployed. This is financed by a payroll tax t paid by the employed.

(e) [3 points] Write down the government's constraint for a balanced budget and individuals expected utility as a function of p , w and b .

$$\text{Budget Constraint: } t = \frac{p}{1-p} * b$$

$$EU = (1 - p)\sqrt{w - \frac{p}{1-p} * b} + p\sqrt{b}$$

(f) [3 points] When the likelihood of being unemployed depends positively on the generosity of UI benefits b , should the government provide full or partial insurance? Explain.

This is a case of moral hazard: the probability of being unemployed is a function of the generosity of the benefits. Under moral hazard the government should only provide partial insurance.

Arkansas, California, and New York are considering reforms of their unemployment insurance programs and have invited you to give your expert opinion on the optimal policy. They have estimated

two parameters that they think will be useful in guiding your advice: The change in consumption while unemployed for a \$1 increase in the UI benefit rate ($\frac{\partial c}{\partial b}$) and the elasticity of unemployment durations with respect to the benefit rate ($\varepsilon_{dur,b}$). The estimates are as follows:

	Arkansas	California	New York
$\frac{\partial c}{\partial b}$	0.2	0.3	0.3
$\varepsilon_{dur,b}$	0.8	0.8	0.5

(g) [2 points] Explain why $\frac{\partial c}{\partial b}$ is relevant in determining the optimal UI benefit rate. Based on this parameter only, which state(s) should have higher UI benefits?

The change in consumption when unemployed for a \$1 increase in the UI benefit rate tells us about the need for income during unemployment. A low number implies a low need for consumption smoothing while a large one implies a large need for consumption smoothing. Therefore based only on this parameter California and New York should have higher UI benefits than Arkansas.

(h) [2 points] Explain why $\varepsilon_{dur,b}$ is relevant in determining the optimal UI benefit rate. Based on this parameter only, which state(s) should have higher UI benefits?

The elasticity of unemployment durations with respect to the benefit rate is a way to measure moral hazard. A small number implied that increasing UI benefits does not impact the probability of unemployment, while a large number implies that increasing UI benefits has a large impact on the probability of unemployment. Based only on this parameter New York should have higher UI benefits than Arkansas and California.

(i) [1 point] Assuming the states are identical in all other dimensions, which state would you recommend should have the highest UI benefit rate? Which should have the lowest?

Optimal insurance balances the benefits of consumption smoothing with the moral hazard costs of longer unemployment durations. The consumption smoothing benefits are highest in California and New York and the moral hazard costs are highest in Arkansas and California. Thus, New York should have the highest insurance benefit rate, then California, and then Arkansas.

(h) [3 points] How would you expect the parameters $\frac{\partial c}{\partial b}$ and $\varepsilon_{dur,b}$ to change during a recession? What does this imply for the optimal benefit level?

In times of recession it is likely that the value of consumption smoothing increases and $\frac{\partial c}{\partial b}$ goes up. This is because income substitution methods are reduced. For example, in a recession it might be harder for the partner of the unemployed to work more or for family and friends to provide assistance.

It is also likely that $\varepsilon_{dur,b}$ falls during a recession, since even workers who look hard for a job can't find one due to the few jobs available (left-wing view of rationned jobs in recession). There is a view that increasing UI benefits, increases the bargaining power of job seekers, leading to an increase in wages and therefore further reducing labor demand (right-wing view). This would imply $\varepsilon_{dur,b}$ increases during recession.

Overall it seems that increasing benefit amounts would be a reasonable policy (but there is a debate and the correct answer depends on what you stated above).

(i) [2 points] In the context of unemployment insurance, explain what experience rating is. Provide an argument for perfect experience rating.

Experience rating is the linkage of the number of layoffs of a firm to the taxes it pays to contribute to the UI pool. In the US there is partial experience rating, meaning firms pay some of the additional cost they impose from laying off workers. However this allows firms to game the system, by temporarily laying off workers, who obtain partially subsidized vacation from the state, and rehiring them again. If this is an important concern perfect insurance rating might be desirable: firms would pay in taxes exactly the cost they impose on the UI system