

I. True, False and Uncertain

(30 minutes, 5 minutes each; 95% of credit is based on your explanation)

1. The Department of Health and Human Services is considering giving state level grants to promote programs which provide free medical vaccinations for children. Health and Human Services has had its budget reduced by Congress and wishes to target its limited resources as efficiently as possible. A matching grant (which matches state spending dollar for dollar) is preferable to a closed-end matching grant (which matches state spending dollar for dollar up to a specified amount, at which point there is no more subsidy).
2. The 1996 welfare reform devolved responsibility for welfare to the states. The theory of optimal fiscal federalism suggests this was the optimal policy.
3. The State of Massachusetts expands its provision of health care for children from 200% of the poverty line to 250% of the poverty line. The expansion results in a large increase in the number of publicly insured children. The program is clearly efficient in expanding the health care coverage of children in Massachusetts.
4. Prescription drugs and CDs are both taxed at a rate of 10%. The Ramsey rule suggests that this is the optimal commodity tax.
5. The State of Florida wishes to encourage the preservation of wetlands. Currently there are several private charity groups engaged in wetlands preservation. The State Treasury department has determined that both the price elasticity and the elasticity with respect to government spending of wetlands charitable giving are quite small. The price elasticity is approximately -0.1 and the elasticity with respect to government spending is 0.05 . These estimates suggest that tax expenditures are more efficient than direct government spending.
6. President Bush has proposed replacing the income tax with a consumption tax. This is a good policy change on both efficiency and equity grounds.

II. Short ESSAY

(20 minutes, 10 minutes each; write a short essay - one to two blue book pages)

1. School vouchers, by providing choice, would increase the amount and efficiency of the provision of education.
2. What are the advantages and problems associated with reforming Social Security by moving to individual, annuitized accounts?

III. Welfare and Labor Supply

(40 minutes)

A low income single mother has the following utility function:

$$U = 2/3 \ln C + 1/3 \ln L$$

Where C is consumption and L is leisure. The mother can work up to 160 hrs. per month. Any of the 160 hours that are not worked are consumed as leisure. She has a wage of \$6 per hour (assume she pays no taxes) and the price of consumption is \$1. In order to work, she must pay \$3 in child care costs for every hour worked. [Note : All graphs must include the slope of the budget line and must numerically label the points where the budget line intersects the vertical and horizontal axis.]

- a) Assume that there is no welfare. Solve for the number of hours worked and the level of consumption, C. Draw the graph illustrating the mother's budget set in C, L space, with C on the vertical axis and L on the horizontal axis.
- b) The government introduces a NIT (negative income tax). The NIT guarantees an income of \$210 per month. The benefit is reduced \$1 for every \$1 of labor earnings. Draw the graph illustrating the new budget set. Determine the number of hours worked and consumption, C. Has the NIT succeeded in raising the income of the single mother? Why or why not?
- c) Now assume that the income guarantee level is \$100. Determine the number of hours worked and consumption, C (you do not need to draw a graph for this portion of the question). Explain differences in results from part (b).
- d) Now consider the NIT in part b) with an income guarantee of \$210 per month. In addition, the government institutes a welfare program which pays for all child care for single mothers regardless of income. Draw the graph illustrating the new budget set. Determine the number of hours worked and consumption, C. Calculate the total government cost. Calculate as well the total government cost in part (b). Define efficiency as the ratio of single mother's income to government expenditure. Which program is more efficient (part (b) or this part)? Why?
- e) The government decides to replace the NIT with a food stamp program. Individuals are guaranteed \$210 worth of food stamps per month and the benefit is reduced by \$1 for every \$1 of labor earnings. The government cost of the food stamp program ends up being much lower than the NIT. Why would you expect this reduction in cost after the switch to in-kind welfare? Can this switch to in-kind welfare increase the efficiency of the welfare program? Why?

IV. Social Insurance Mandates and DWL

(40 minutes; graphs should have wage on the vertical axis and labor on the horizontal axis)

Consider the following linear labor demand and supply curves:

Labor Demand; $L_d = 30 - w - c$

Labor Supply; $L_s = (w+a*c)/2$

Where w is the wage, c is a per-unit of labor tax paid by the employer and a is the valuation workers place on a social insurance mandate funded by the tax ($a \geq 0$; a fully valued program has $a=1$).

- a) What is the equilibrium wage in the absence of a tax wedge (i.e. $c = 0$)?
- b) The government institutes a per-unit of labor tax of $3/2$ (i.e. $c = 3/2$). The tax goes to general government revenue, so $a = 0$. What is the wage? Calculate and display graphically the DWL resulting from the tax .
- c) Now assume that Social Security has been abolished. The $3/2$ per-unit of labor tax is used to fund mandated individual annuities. Let $a = 1$, which indicates that the workers value the annuities at their cost to the employer. What is the wage? Calculate and graphically display the deadweight loss. How does the DWL compare to part b? What explains the difference?
- d) Now consider the case where $a = .5$. What is the wage? Calculate and graphically display the deadweight loss. How does the DWL compare to part b? What explains the difference?
- e) Even if workers value annuities at their full value, $a = 1$, employers may not offer them it in the absence of a government mandate. Why would this occur?
- f) Could an annuity mandate ever increase the overall level of employment? Under what circumstance would this occur? Give both a technical answer in terms of the above model and the intuition.

V. Insurance

(50 minutes)

Consider a society of identical workers that each earns a wage W when they work. Each worker faces a probability of sustaining an injury of α ; if they sustain an injury, they have no earnings ($W=0$). In any case, however, they always have some outside income of 5. Workers have utility of the form: $U = \frac{1}{2} \log(C)$, where C = consumption = total income in the period (they do no savings). Assume that there is no moral hazard.

a) What is the expression for the expected utility of each worker?

Now, suppose that the government introduces a worker's compensation program. Under this system, individuals pay some fraction of their wage when they are employed (i.e. their wage is taxed at a certain rate), and get a benefit while they are injured. The system must break even at a point in time; that is, the benefits paid to injured workers must be equal to the taxes collected from employed workers.

b) What is the optimal worker compensation system? That is, what is the system that, subject to the constraint of breaking even, maximizes worker utility? Present both the tax rate and the benefit level for this system.

c) Are there welfare gains or losses from introducing the Worker's Comp system (you don't actually have to measure the gains/losses, just sign them)? Why?

d) Would your answer to (c) change if utility was of the form: $U = \frac{1}{2} C$?

Now, suppose that when workers get injured their spouses go to work. Each worker injured gets an amount kW from their spouse, where k is some constant and $k < (1-\alpha)$.

e) What is the expected utility now if there is no Worker's Comp program?

f) Now, reintroduce Worker's Comp, which once again must break even. What is the optimal Worker's Comp system now (both tax rate and benefit level)? How does this compare to your answer to (b)? Why?

g) Are there welfare gains or losses now from introducing the system (once again, no measurement is necessary)? Intuitively (and not mathematically), are these gains or losses greater than in (c)? Why?