

Study Guide II Public Finance

1. Identify and/or Define the following:

a. pure public good	j. voting paradox
b. externality	k. rational ignorance
c. club good	l. fiscal illusion
d. free rider problem	m. Tiebout model
e. Pigovian tax	n. fiscal federalism
f. Lindalh tax	o. matchin grant
g. median voter	p. flat tax
h. majority rule cycle	q. value added tax (VAT)
i. median voter model	r. OASDI
2. Use diagrams to illustrate the normative problems associated with positive and negative **externalities**.
 - a. Label all important details.
 - b. Now, construct an example in which the free rider solution is Pareto optimal.
 - c. Is there any easy way to distinguish this case from the over or under supply cases in the real world? Explain.
 - d. Show how Pigovian taxes and or subsidies can be used to address the problems characterized in parts "a" and "b."
3. Use a two by two game matrix to illustrate the logic of the free rider problem. Suppose that the public good of interest provides benefits of \$5.00 to each "player" and costs a total of \$6.00 to produce. The cost is shared if both contribute, but must be paid entirely by one person if that person provides while the other free rides.
 - a. Label all payoffs, and explain the logic of the game.
 - b. Now suppose that provision of the good is subsidized. How much would the cost of the public good have to fall to eliminate the free rider problem?
 - c. How large would a "shirking tax" have to be to solve the problem?
4. Use a diagram (or two) to develop a three person public goods problem.
 - a. First, illustrate the "high demander provides" case, in which one person provides all of the public good.
 - b. Second, determine whether this output level is Pareto efficient, that is maximizes social net benefits.
 - c. Now consider the politics of public goods provision. Assume that the costs of this public good is shared equally and that the median voter determines the output level.
 - d. Determine whether the new result is Pareto efficient.
 - e. Would the median voter prefer the political solution or the initial free rider solution? Use your diagram(s) to explain why.
 - f. Is there another tax scheme (cost sharing arrangement) that will make the median voter prefer government supply to the initial free rider solution? Show this, and explain the logic of your diagram.
 - g. Would your voters prefer a Lindalh tax (and output) over the initial free rider (high demander) outcome? Illustrate and explain?
5. Illustrate and discuss the logic of the median voter theorem using the spatial voting model and a uniform distribution of voter preferences.
 - a. First, show a disequilibrium case in which two candidates (or parties) take positions to the left and right of the median voter.
 - b. Second, note incentives for one or both candidates to revise their strategies (campaign promises or platforms) in this case.
 - c. Third, show that after complete convergence takes place, neither candidate has an incentive to change his or her election strategy.
6. Voters have fairly weak incentives to be well informed about candidates or public policy issues.
 - a. Illustrate what happens to the service level of a government services if voters systematically underestimate their tax costs.
 - b. Illustrate what happens to the service level of a government services if voters systematically underestimate their service benefits.
 - c. Discuss the sense in which voters may be said to make mistakes in such cases.

7. Use a median voter model (with Marginal Benefit and Marginal Cost curves) to demonstrate how a "matching grant" from the central government can affect a local government's provision of local services.
 - a. Use the median voter's government budget set and indifference curves to show the effects of block grants and matching grants on a local government's output of services.
 - b. Show that a block grant can often improve the median voter's welfare relative to an equally costly matching grant.
 - (Hint, this looks like the difference between lump sum and marginal subsidies developed studied earlier in the course.)
 - c. Does your analysis suggest a "fly paper effect?" Why or why not?
 - d. In what case, if any, will a conditional lump sum grant have a larger effect on local government expenditures than a block grant?
8. The Niskanen Model of Bureaucracy.
 - a. Depict the largest budget that the budget maximizing bureaucrat could ever obtain.
 - b. If Niskanen's view of bureaucratic behavior is correct, would it make sense to have bureaucracies?
 - c. Suppose that bureaucrats do try to maximize their budgets but are unable to obtain Niskanen's extreme budget, how would this change your answer to b?
9. Suppose that interest groups provide benefits for individual's outside the group. For example, politically active farmers generate benefits for all farmers not just politically active farmers. What does this imply about:
 - a. the scale of special interest group lobbying,
 - b. the extent of rent-seeking losses,
 - c. the kinds of groups that are likely to be most effective?
10. To illustrate some of the effects of a Tiebout model, analyze decisions by two types of individuals to "join" one of two communities. Suppose that community A provides relatively high services and pays for them with an equal cost share plan, and that community B provides lower services, but also uses an equal cost share tax system.
 - a. Suppose that there are six consumer-citizens with different marginal benefit curves. Determine which persons go to which town.
 - b. In what sense, does your analysis suggest that sorting by fiscal demand occurs?
 - c. Now suppose that the community's hold elections and that the median voter in each community determines the service level. Illustrate the result and determine whether anyone would move as a consequence.
 - d. How would the existence of positive moving costs affect your answer to "c?"
 - e. Explain why politics is more important in this setting (with just two communities) than it would tend to be in setting with a large number of communities to choose from.
11. Discuss how cost-benefit analysis allows one to escape from the pork-barrel dilemma.
 - Explain why log rolling does not always generate gains to trade in the same manner that exchange in ordinary markets does.
12. Use supply and demand curves to analyze the distribution of the tax burden generated by the social security program.
 - a. Illustrate a case in which the burden falls entirely on firms (employers).
 - b. Illustrate a case in which the burden falls entirely on workers (employees).
 - c. Illustrate a case in which the burden is equally shared.
 - d. According to law, the tax used to pay for social security is paid half by employees and half by employers. Discuss the two meanings of "pay" for the tax implicit in this law and in your diagrams.

13. For many years, social security has collected more in tax revenue than it has paid out in benefits. This surplus has been "borrowed" by the treasury for use in rest of the Federal budget. In exchange, the treasury issued IOUs to the trust fund.
- Explain why the government will have to raise taxes, borrow, or print money in order meet its future obligations to retired persons.
 - Explain why "a" is true regardless of whether the trust fund is accumulated as cash, government bonds, or treasury IOUs--and moreover would have been true even if no trust fund had been accumulated!
 - Explain why the Social Security Program will have a cash flow problem in the future if taxes and benefits are held constant.
14. Use the present value formula to calculate the net benefit that Al receives from the social security program.
- Assume first that Al will retire in 30 years and live another 25 years after retiring. Suppose that Al's tax is 10,000 per year and that his benefits are 15,000/year in real terms. Assume that the real interest rate is 3%/year.
 - Calculate the present value of Al's tax payments
 - Calculate the present value of Al's benefits. (Hint: don't forget that the benefits are not received until 30 years in the future.)
 - Is Al better or worse off under social security if his "opportunity cost rate of return" is 3%/year.
 - Now repeat a-d but assume that the real interest rate is 2%/year, 1%/year.
 - Suppose that Al were planning to retire in only 10 years. How would this affect the present value of his/her participation in the social security program? (Use numbers to support your analysis.)
 - Use a spreadsheet program or other computer program to find Al's rate of return in both a and c.
15. Use marginal benefit curves and marginal cost curves to illustrate how a progressive tax system can cause "rich" tax payers to prefer fewer government services, even if government services are a normal good.
- Use indifference curves and a budget constraint defined over current consumption and savings to illustrate how a value added tax might reduce consumption and increase savings for a typical tax payer.
 - Use indifference curves and a budget constraint defined over work (earned income or consumption) and leisure to show how a flat income tax may increase unemployment by changing relative prices. Now, show that a progressive tax tends to have a larger effect--other things being equal.
- Use labor supply curves of varying elasticities to show how the effects of the same tax schedule may have quite different effects on people with steeper and flatter individual labor supply curves.
 - Can there be a neutral income tax? a neutral tax? Explain.
 - Which of these tax systems will tend to generate the least fiscal illusion? Explain your reasoning.
16. Nominal social security benefits averaged \$43.45 per month in 1946, \$118 per month in 1970, \$567 per month in 1989, and approximately \$1150/month in 2007.
- What is the average annual percentage rate of growth of nominal social security benefits in each period and overall?
 - The CPI was 18.2 in 1946, 37.8 in 1970, 121.1 in 1989, and 202 in 2007; what was the real benefit at each date.
 - What was the rate of growth in (real-inflation adjusted) average social security benefits overall and in each sub period?
 - If the real growth rate found in part b continued until 2030, what would real social security benefits be?
 - If the nominal rate of growth found in part a continued until 2030, what would nominal benefits be?
17. Suppose that an environmental externality is known to impose external costs of 20 million dollars per year. A variety of clean up and/or regulatory methods are possible. Determine the present value of the cost and benefits of each of the following programs. Assume that the interest rate is 5% and that each program continues forever.
- Program one imposes fixed regulatory standard (as in auto emissions) which is expected to increase industry operating costs by 18 million per year and cost 1.5 million to administer.
 - Program two uses a Pigovian tax on pollution to induce companies to use cleaner technologies. It is expected to increase operating costs by 15 million dollars per year, but have administrative costs of 6 million dollars per year. There will also be an initial 10 million dollar cost to set up the program. The Pigovian tax will generate tax revenues of 5 million dollars per year.

c. Program three establishes a general target for this particular form of pollution and creates a tradable "effluent licenses" which entitle the owner to release effluents at some fixed rate (say K pounds per year). One expects low cost polluters to sell their licenses to high cost polluters. This program will increase operating costs by 14 million dollars per year, and have administrative costs of 7 million dollars per year. There will also be an initial 12 million dollar cost to set up the program. (Initially, pollution licenses are given away and so the program generates no revenues.)

18. The average nominal per capita (per person) income of individuals in the United States has increased substantially over the last hundred twenty years.

	1870	1890	1910	1930	1950	1970	1990
Income/pop	170	208	382	740	1,900	4,951	20,903
CPI (1967=100)	38	27	28	50	72.1	116.3	242.9

- Determine the nominal and real average annual growth rates during each 20 year sub period.
- Determine the average annual inflation rate for the each twenty year period.