1.   Identify and/or Define the following:

a. pure public good   k. all or nothing offer

b. externality   l. Tiebout model

c. club good   m. fiscal federalism

d. free-rider problem   n. matching grant

e. Pigovian tax   o. conditional block grant

f. Lindahl tax   p. structural deficit

g. median voter   q. OASDI

h. rational ignorance   r. Medicare

i. fiscal illusion   s. Medicaid

j. rent seeking   t. Harberger triangle

2.   Matching: determine which ideas and people on the left best match with those on the right.

__ pure public good   a. A reduction in social net benefits

__ club good   b. Goods that are somewhat shareable

__ median voter   c. Old Age, Survivors, and Disability Insurance (social security)

__ rational ignorance   d. A tax that is supposed to be used to fund a particular program

__ fiscal illusion   c. The idea that taxes and deficits should be equivalent methods of finance from the point of view of voters.

                         d. Tax-financed health insurance program for retired persons.

__ William Niskanen   e. Goods that are perfectly shareable

__ Rent-seeking loss   f. Biased expectations about the marginal cost or benefits of a government program

__ deadweight loss

__ Charles Tiebout   g. More or less permanent deficits linked to taxes being below expenditures

__ fiscal federalism   h. Voter who's ideal point is in the middle of the distribution of voter ideal points

__ matching grant   i. Theorist who argued that bureaucrats generally attempt to maximize their budgets

__ block grant   j. Theorist who analyzed competition between governments for residents and tax bases

__ OASDI   k. studies the fiscal relationships between governments within decentralized governmental systems.

__ Medicare   l. Grants from a higher level of government that provide resources in proportion to the expenditures of a lower level of government.

__ ear-marked tax   m. lump-sum grants from one level of government to another

__ Structural deficit   n. idea the information is costly so it is often "rational" to remain ignorant of some facts and ideas.

__ Ricardian equivalence   o. value of resources used in contests to establish public policies that generate deadweight losses

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 the person providing it, if one person provides while the other free rides.

a. Calculate all the payoffs and enter them into a game matrix.

b. Label all payoffs, and explain the logic of the game.

c. Now suppose that provision of the good is subsidized. This increases the net benefits to the "provide" strategy in all three cells where someone provides the good. How much would the cost of the public good have to fall to eliminate the free rider problem?

d. The same problem can be addressed with a tax. How large would a "shirking tax" have to be to solve the problem?

4. Use the diagram below to analyze a typical public goods problem.
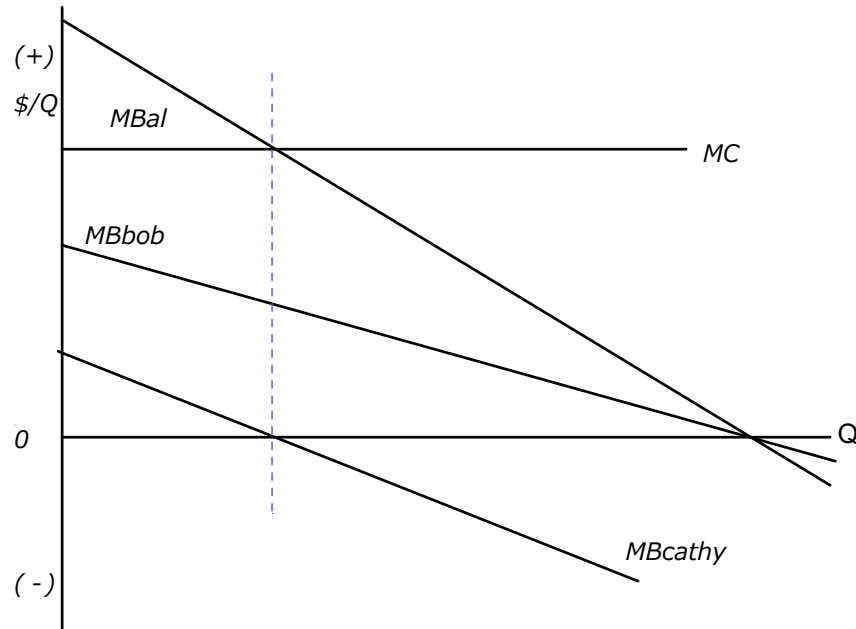
a. Determine the "high demander provides" outcome (one in which a single person provides all of the public good).

b. Determine whether this output level is Pareto efficient. Does it maximize social net benefits?

   Now assume that the costs of this public good is shared equally and that the median voter determines the output level.

c. Determine the median voter outcome and breifly explain why this is the median voter outcome.

d. Is the median voter outcome Pareto efficient?

e. Determine whether the median voter prefers the political cost-sharing solution or the initial free rider solution? Use your diagram to explain why.

f.

5. Use the following marginal benefit and marginal cost curves to analyze another pure public problem and possible solution:
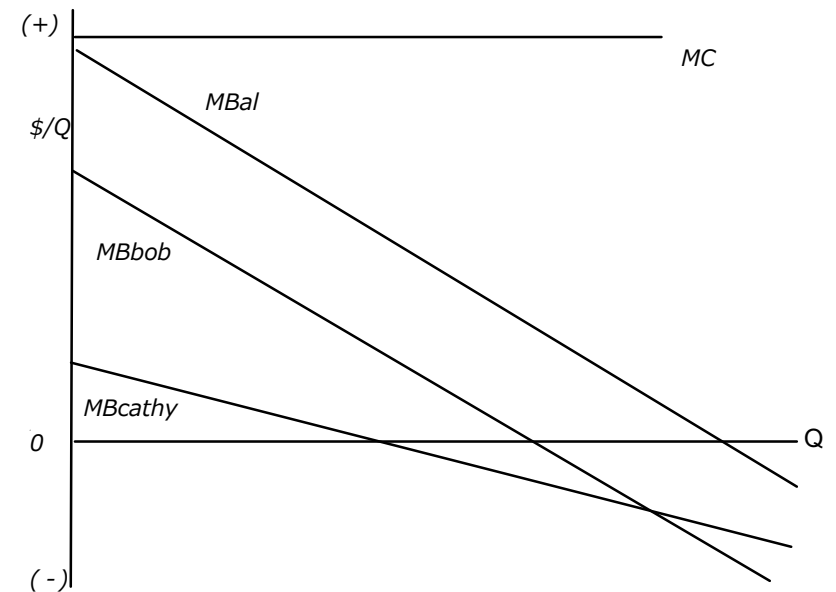
a. Find the social marginal benefit curve for this public good, the free rider output, and the Pareto optimal level of production. Label all important details.

b. Show how Lindahl taxes can be used to finance this public good.

c. Would the median voter prefer the Lindahl solution or the free-rider (high demander provides) solution?

   • (Hint: determine whether a majority vote would move from the Lindahl solution at Q^{**} back to the initial position Q'.)

d. Is there another tax scheme (cost sharing arrangement) that will induce the median voter to oppose government supply (at Q^{**}) to the initial free rider solution? Show an example, and explain the logic of your diagram.

6. **Competitive Elections using a spatial voting model.** Draw a frequency distribution of voter ideal points. Given that diagram:.

a. Show a disequilibrium case in which two candidates (or parties) take positions to the left and right of the median voter.

- Determine which candidate wins the election.
- Does the weak form of the median voter theorem hold in this case?

b. Second, discuss the 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.

- Is this outcome a Nash equilibrium? Why?
- Does the strong form of the median voter theorem hold in this case?
- Briefly explain your reasoning.

7. Voters have fairly weak incentives to be well informed about candidates or public policy issues.

a. Draw a diagram that illustrates the logic of rational ignorance.

b. In a separate diagram, illustrate what happens to the service level of a government services when voters systematically underestimate their marginal tax costs.

c. In a separate diagram, illustrate what happens to the service level of a government services when voters systematically underestimate their marginal service benefits.

d. Discuss the sense in which fiscal illusion may be said to cause voters to make mistakes in such cases.

8. **The Tiebout model**.

a. List three important assumptions of the Tiebout model.

b. List three important properties of the equilibrium that emerges from the Tiebout assumptions.

c. Explain how competition between governments--given the Tiebout assumptions--can solve local public goods problems.

d. Explain why inefficient governments tend to lose residents.

e. Explain why resident (and tax base) mobility tends to generate homogeneous communities.

f. Now consider the extent to which the implications of the Tiebout model are realistic. Which, if any, of the predicted outcomes seem to be true of the towns around Morgantown or the Condo communities within Morgantown?

9. The **median voter model** of local government decisionmaking can be used to show how a "matching grant" from a central government can increase a local government's provision of particular local services.

a. Use a median voter's governmental budget set and indifference curves to show the effects of a matching grant on a local government's output of services.

b. Show that a block grant can improve a median voter's welfare relative to an equally costly matching grant.

- (Hint, this looks like the difference between lump sum and marginal subsidies developed earlier in the course.)

c. In what case, if any, will a conditional block (lump sum) grant have a larger effect on local government expenditures than an unconditional block grant?

10. Develop a 2x2 game matrix to illustrate the logic of the **pork barrel dilemma**. Label all details and briefly explain the nature of the dilemma.

a. Discuss how cost-benefit analysis allows one to escape from the pork-barrel dilemma.

b. Discuss other solutions to the "fiscal commons problem."

c. Explain why log rolling (vote trading) does not always generate gains to trade in the same manner that exchange in ordinary markets does.

11. Use supply and demand curves for labor to analyze the tax burden(s) generated by the **social security** program's "equally shared" 15% tax on labor income.

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 different meanings of the term "pay" that are implicit in this law and in your diagrams.

e. Is there a deadweight loss from this tax?

f. Are there net benefits from the program? Explain why there may be net benefits. Is there any evidence that net benefits exist?

g. The existence of a social security program has been shown to reduce savings rates. Explain why this is a likely consequence of pay-as-you-go tax-financed pension programs.

h. What is the effect of reduced savings rates on economic growth? Explain.

12. For many years, social security (OASDI) 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 (government bonds) to the trust fund (the "lock box").

a. Explain why the government will have to raise taxes, borrow (sell bonds to the public), or print money in order meet its future obligations to retired persons.

b. Explain why "a" is true regardless of whether a trust fund is accumulated as **cash, government bonds, or treasury IOUs**.

c. Explain why the same steps would have to be taken **if no trust fund had been accumulated**.

13. The Niskanen Model of Bureaucracy.

a. Use marginal benefit and marginal cost curves to depict the largest budget that the budget maximizing bureaucrat could ever obtain by making "all or nothing" offers.

b. If Niskanen's view of bureaucratic behavior is correct, would it make sense to have bureaucracies?

c. Suppose that bureaucrats try to maximize their budgets but are unable to obtain Niskanen's extreme budget. How would this change your answer to b?

14. Suppose that a government official can grant monopoly power to one of several rival firms in a particular region. Assume that all the firms engage in rent-seeking, with the hope of being the firm chosen.

a. Use a monopoly diagram to illustrate the result of a monopoly grant.

b. Label the potential profits realized by the monopolist and the DWL from the monopoly.

c. How much consumer surplus do consumers lose?

d. If competition for the profits (rents) are as intense as assumed in other competitive contests, what is the total amount "invested" by all the rent seeking firms in the contest. Label that amount.

e. Given "d" what is the true DWL of this particular monopoly?

15. Suppose that the lobbying efforts of special interest groups generate benefits for individual's outside the group. For example, politically active doctors generate benefits for all doctors not just politically active doctors. Discuss what this free riding/externality implies 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?

16. The US has a long term structural deficit in the Medicate and Social Security programs.

a. Discuss the nature of this deficit.

b. Discuss how this deficit can generate deficits in the other part of the budget (the non-retirement portion of the federal budget).

c. Compare the structural deficits associated with social security and Medicare. Which is the more serious long run problem? Why?

d. Discuss steps that can be taken to address this structural deficit.

e. In your opinion, what kind of solutions, if any, would be preferred by the median voter?

f. Use public finance and public choice tools to defend your conclusion.

17. **Subsidies for Health Care**

    a. Use supply and demand curves to illustrate the effects of subsidies on medicines (drugs) [as in the Bush reforms] and on health insurance as in the so-called "Obama-care" program (ACA).

    b. How do such subsidies affect the prices received by the pharmaciutical industry and/or doctors?

    c. Given these effects, which groups are most likely to lobby in favor of such policies?

    d. How do the long term effects of such policy differ from their short run effects?

    e. Would the median voter benefit from such policies?

Additional Puzzles and Problems

18. More difficult Taxation exercises

   a. 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.

   b. 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.

   c. In the same diagram (for e), show that a progressive tax tends to have a larger effect--other things being equal.

   d. Is the effect of the VAT in your diagram (for c) any different than that which would be associated with an increase in income taxes? Illustrate and explain.

   e. Which of the main tax systems (excise, income, sales, vat) tend to generate the least fiscal illusion? Explain your reasoning.

   f. Can there be a neutral income tax? a neutral tax? Explain.

19. Illustrate some of the effects of a Tiebout model by analyzing decisions by two types of individuals (high and low G demand) 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 and also uses an equal cost share tax system.

   a. Determine which persons go to which town.

   b. 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.

   • How would the existence of positive moving costs affect the answer to "c?"

   d. Explain why politics is more important in settings with just two communities than it tends to be in settings with a large number of communities to choose from.

   e. Now suppose that some low G preference individuals prefer jobs in the high service town to those in the low service town and that some high G preference individuals prefer jobs in the low service community to those in the high service town. (So there are now 4 rather than 2 types of people.) Repeat a-d.

20. 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.

   a. 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.

   b. 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.)

21. Write a three paragraph essay that provides an overview of the main tools and conclusions of this course.

22. 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.

a. What is the average annual percentage rate of growth of nominal social security benefits in each period and overall?

b. 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?

c. 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?

23. Use the present value formula to calculate the net benefit that Al receives from the social security program.

a. 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 her benefits are $15,000/year in real terms. Assume that the real interest rate is 4% per year.

- Calculate the present value of Al's tax payments

- Calculate the present value of Al's benefits. (Hint: don't for get that the benefits are not received until 30 years in the future.)

b. Is All better or worse off under social security if her "opportunity cost rate of return" is 4% per year.

c. Now repeat a-b but assume that the real interest rate is 2%/year, 1%/year.

d. Suppose that Al is planning to retire in only 10 years. How would this affect the present value of 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 or return in both a and c..