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. matching grant

   g. median voter   p. flat tax

   h. majority rule cycle   q. value added tax (VAT)

   i. median voter model   r. OASDI

2. 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?

3. 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 that 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."

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.

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.

   • 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.

   • Does the strong form of the median voter theorem hold in this case?
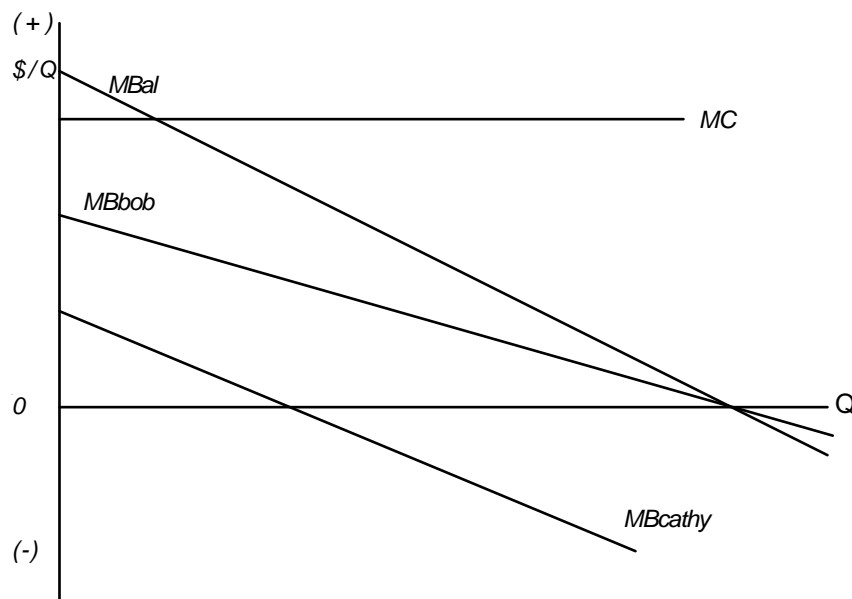
6. Use the marginal benefit and marginal cost curves for a pure public good in the figure above to:

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 a Samuelsonian tax can be used to finanace this public good. (Use the simple equal cost sharing version.)

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

d. Would the median voter prefer the Lindahl solution or the free-rider solution given your answers to A and B?

• (Hint: determine the median voter and explain briefly why she is better or worse off.)

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. Illustrate what happens to the service level of a government services if voters systematically underestimate their marginal tax costs.

c. Illustrate what happens to the service level of a government services if voters systematically underestimate their marginal service benefits.

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

8. The Tiebout model has a number of testible implications about community services and the nature of a cummunity's residents.

a. List three important assumptions of the Tiebout model.

b. Explain how competition between government--given these assumptions--can solve the public goods problem.

c. Explain why inefficient governments tend to lose residents.

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

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

a. Use a median voter's government budget set and indifference curves to show the effects of an (unconditional) block grant on a local government's output of services.

b. Show that a block grant can 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 earlier in the course.)

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

d. Does your analysis suggest a "fly paper effect?" Why or why not?

10. The Niskanan Model of Bureaucracy.

a. Depict the largest budget that the budget maximizing bureaucrat could ever obtain.

b. If Niskanan'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 Niskanan's extreme budget, how would this change your answer to b?

11. 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. 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?

12. 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.

13. Use supply and demand curvesfor labor 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.

14. 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 (the "lock box").

   a. Explain why the Social Security Program will have a cash flow problem in the future if taxes and benefits are held constant.

   b. 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.

   c. Explain why "a" is true regardless of whether a 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**!

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.

   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. Now, show that a progressive tax tends to have a larger effect--other things being equal.

   c. 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.

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

   e. 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.

    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?

17. Use the present value formula to calculate the net benefit that Al recieves 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 3%/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 recieved until 30 years in the future.)

    b. Is All better or worse off under social security if her "opportunity cost rate of return" is 3%/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.

18. 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.)

19. 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

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

20. Illustrate some of the effects of a Tiebout model by analyzing decisions by four 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. 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.
   • How would the existence of positive moving costs affect your answer to "c?"
d. 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.