

**Public Finance Field Exam
August 2012**

Directions: Answer both questions, in whatever order you prefer.

1. Energy Conservation

Over the years, the United States has attempted to influence domestic gasoline usage through a number of policies, including (1) a federal excise tax on gasoline; (2) a subsidy for the blending of ethanol (a corn-based product) with gasoline; (3) a federal tax credit for the purchase of hybrid (gasoline-electric) automobiles; (4) the imposition of CAFE (Corporate Average Fuel Economy) standards, which require that each manufacturer's annual automobile production achieve an average fuel economy (miles per gallon, weighted by car sales) of at least a certain specified level that is common across manufacturers; and (5) a maximum national speed limit of 55 miles per hour, under the Emergency Highway Energy Conservation Act, aimed to limit the energy consumption associated with faster driving.

- a. Assume that there is a negative externality that is increasing in total gasoline consumption. Evaluate and compare the overall effects of these five policies on economic efficiency, taking into account direct behavioral responses with respect to gasoline consumption, other behavioral responses, and consequences for federal tax revenues. Indicate whether short-run and long-run effects of a policy might be different. Clearly state any assumptions you make in order to answer the question.
- b. How would your answer to question a. regarding economic efficiency change if the relevant externality were due to road congestion and accidents, rather than to gasoline usage?
- c. How would your answer to question a. regarding economic efficiency change if the relevant externality were due to "greenhouse" (i.e., carbon-based) gas emissions, rather than to gasoline usage?
- d. Assuming that any tax revenue consequences are offset with a proportional adjustment of the federal income tax, evaluate the incidence of each of the five policies with respect to their tax-burden progressivity.
- e. Some have proposed the implementation of a "cap and trade" system for gasoline use, under which households would be allocated tradable rights, based on prior use, to purchase gasoline, with the total amount of tradable rights set at some desired level of national gasoline consumption. Assuming a negative externality with respect to gasoline consumption, how does this policy compare to those you have previously analyzed, in terms of efficiency and incidence?

2. Incentives to Save for Retirement

The government wants to promote savings for retirement through tax policy. Let us assume (for simplicity) that the current Individual Retirement Account (IRA) program works as follows: each family with total annual income (before the IRA deduction) of less than \$100,000 can invest part of their earnings up to a limit of \$5,000 per year in an IRA. The IRA contributions can be deducted from taxable income and no tax is due on the returns earned in an IRA account. At retirement, the money withdrawn from the IRA faces the regular income tax. (We ignore pre-retirement withdrawals until question h.) We assume that individuals decide whether to make an IRA contribution when they file their tax returns, i.e., after their annual income is realized and their income eligibility is established.

- a. Show graphically how the introduction of the IRA program described above affects incentives to save in a simple two-period model (in which first period is working age and second period is retirement with no labor income). Discuss whether the IRA program increases savings and consumption during retirement.
- b. Suppose that total annual income is unaffected by the IRA program (i.e., individuals do not try to reduce their income to qualify for IRAs). Suppose you have one annual cross-section of micro-data on annual income, IRA contributions, and annual savings. Explain how you could use the data to compellingly estimate the effects of the IRA program on savings. Explain also how you could test with the data the assumption that annual income is unaffected by the IRA programs.
- c. Suppose that the government introduces an additional tax credit incentive to save in an IRA: a family contributing \$ X to an IRA would receive a refundable tax credit equal to 50% of \$ X . The tax credit cannot exceed \$1,000 per family. However, this tax credit could only apply to those with income (before deducting IRA contributions) less than \$50,000. Describe graphically the budget constraint in the basic two-period model. Explain whether this program would increase savings and consumption during retirement.
- d. Suppose that you have one annual cross-section micro-data on income, IRA contributions, and savings after the tax credit has been introduced. How would you use it to estimate the effects of the reform on (1) IRA contributions and (2) overall savings. Make sure to describe carefully your research design and discuss potential issues in your methodology.
- e. Suppose that, instead of the credit, the government adopts a matching program whereby IRA contributions are matched one-for-one up to a maximum match of \$1,000 by the government. (As in c., the match applies only for families with income below \$50,000.) How does this matching program compare to the tax credit in b., in terms of incentives to save to retirement? (Make sure to describe graphically the budget constraint as in a. and c.)

Suppose that you find empirically that this matching program generates higher IRA contributions (inclusive of matching contributions) than the tax credit in c. How would you explain those results?

- f. Suppose now that instead of a credit or a match, the government tries to increase savings by forcing everybody with income below \$100,000 to contribute at least \$2,000 to an IRA. The plan works as follows: if your IRA contributions are less than \$2,000, the government forces you to contribute up to \$2,000.

Describe graphically the budget constraint in the basic two period model. Explain whether this program would increase savings and consumption during retirement. Explain how you would estimate the effects on savings using one annual cross-section of micro-data on annual income, IRA contributions, and annual savings.

- g. Suppose that instead of this IRA forced savings, the government reduces the IRA maximum contribution to \$3,000 and creates an independent forced savings contribution of \$2,000 (also deductible from taxes). Explain why this alternative is economically exactly equivalent to f. Suppose that empirically, we observe that this plan increases savings more than the plan from question f. How could you account for such findings?
- h. We now consider the issue of early withdrawals. We assume that IRA contributions can be withdrawn with no penalty at age 60 or above. IRA contributions withdrawn at a younger age face a tax penalty equal to 10% of withdrawals. (The penalty comes on top of the regular income tax due of withdrawals.)

Under this penalty structure, what should families do under IRA programs from questions a, c, and e? How would you test whether families are behaving according to the standard theory?