14.41 Problem Set #5
Due Friday, Dec. 3, 2004 at 1PM

1) You graduate from MIT and take a job as a research assistant with a wage of $25 per hour. Your job is extremely flexible: you can choose any number of hours from 0 to 2000 per year.

a) Suppose there is a income tax of the following form:
    Income up to $10,000: no tax
    Income from $10,000 - $30,000: 20% tax rate
    Income from $30,000 up: 30% tax rate
Draw a graph in [hours, consumption] space showing your opportunity set with and without the tax system.

b) Say you choose to work 1500 hours per year. What is your marginal tax rate? What is your average tax rate? Do these rates differ? Why or why not?

c) Suppose that the tax rates in the second and third brackets are increased to 25% and 50%. What is the likely effect on the labor supply of men? What is the likely effect on the labor supply of married women? Explain how the responses might differ between these groups, both in terms of underlying economic effects, and in terms of the empirical evidence on labor supply responses.

d) Suppose that the government replaces the current tax system with a lump-sum tax: each person pays $10,000 per year in taxes regardless of what they earn. Discuss this tax change on equity and efficiency grounds. Draw a new graph in [hours, consumption] space as part of your answer.

e) Instead, suppose that the government replaces the current tax system with a negative income tax: you receive $5,000 from the government and pay a tax of 25% on all income you earn. Discuss this tax change on equity and efficiency grounds. Explain the likely effects in terms of the empirical evidence on labor supply responses. Draw a new graph in [hours, consumption] space as part of your answer.

2) Consider a model where individuals live for two periods and have utility functions of the form: $U = \log(C_1) + \log(C_2)$. They earn income of $100 in the first period. They save S to finance consumption in the second period. The interest rate, r, is 10%.

a) Set up the individual's lifetime utility maximization problem. Solve for the optimal C_1, C_2, and S. [Hint: rewrite C_2 in terms of income, C_1, and r.] Draw a graph showing the opportunity set.

b) The government imposes a 20% tax on labor income. Solve for the new optimal levels of C_1, C_2, and S. Explain any differences between the new level of savings and the level in part a, paying attention to any income and substitution effects.

c) Instead of the labor income tax, the government imposes a 20% tax on interest income. Solve for the new optimal levels of C_1, C_2, and S. [Hint: what is the new after-tax interest rate?] Explain any differences between the new level of savings and the level in part a, paying attention to any income and substitution effects.

d) Suppose now that the government decides it wants to encourage savings for retirement and decides to subsidize savings instead of taxing it. Specifically, the government now offers a one-to-one match of interest income (for every dollar of interest income that you earn, the government gives you another dollar). Based on your answer to c, how do you think this will affect the level of savings? Why? You need not solve for the new level of S—just explain your answer intuitively.

3) Specify whether the following statements are true, false, or uncertain and explain your answer in 1-2 paragraphs.

a) A cut in the capital gains tax rate will promote new entrepreneurial activity and provide good "bang for the buck."

b) Excluding food from a state sales tax is a good idea because food is a necessity.

c) A government law that requires firms to provide life insurance for their employees will impose a burden on the companies' shareholders.

d) Eliminating the top tax bracket of 39.6% in the US will decrease the revenue collected by the personal income tax.

4) President Bush is hoping to introduce a major tax reform during his second term. On Nov. 15, the New York Times ran two op-ed pieces suggesting different ways to reform the tax system. Here is an excerpt from each:

"Why not cut the payroll tax? The Social Security payroll tax is the biggest tax burden faced by poor Americans; cutting it would put more money in their pockets. Such a move would also stimulate hiring, since employers shoulder half the burden of the tax. This plan could be kept revenue-neutral by merely raising the amount of wages subject to the tax - now capped at $87,900."—Dalton Conley, NYT 11/15/04

"America should return the income tax to its pre-World War II status—a relatively low-rate simple tax on a thin slice of the wealthiest Americans. Rather than repealing the alternative minimum tax, as many have urged, Congress should repeal the regular income tax. Enacting a value-added tax - a tax on sales of goods and services collected at all stages of production - at a rate of 14 percent would finance an income-tax exemption of up to $100,000…Wealthier families, meanwhile, would face a vastly simpler income tax at a 25 percent rate on income of more than $100,000 after deductions for charitable contributions, home mortgages, medical expenses, and state and local taxes."–Michael Graetz, NYT 11/15/04

   a) One of these quotes contains an outright misstatement. Identify it, and explain what is actually known on the topic.
   b) For each reform, write 1-2 paragraphs on the likely effects on:
      a. equity
      b. efficiency
   c) Which reform would you recommend, weighing its equity and efficiency costs and benefits? If neither, propose a substantial reform yourself or improve on one of the reforms above, explaining why your reform is better.