1. Consider an individual who lives for two periods and has an additively separable utility function of the form

\[ V(C_1, C_2) = \log C_1 + \frac{1}{1+d} \log C_2. \]

Assume that the individual receives an endowment of \( W_1 \) at the beginning of the first period, and then divides this endowment between consumption in the two periods. The pretax rate of return is \( r \). The government has just announced that, for the first time, it will impose a capital tax at rate \( t \) on capital income received in period two. The proceeds of this tax will be paid as a lump-sum transfer to the next generation. Individuals alive today do not care about the next generation.

(a) Find the lifetime indirect utility function, \( V(W_1, r(1-t)) \), for an individual who is just beginning life. Using this expression, evaluate the change in initial endowment (\( W_1 \)) that would be required to make the individual as well off with the capital tax as without it.

(b) What is \( dC_1/dt \)? What conclusions about the welfare cost of capital income taxation can you draw from this finding?

2. Consider an individual with the same preferences as the person in problem 1. Now assume that this individual faces a wage income tax, so that the interest rate at which she can borrow and lend is simply \( r \). Assume that wage income in periods 1 and 2 is fixed at \( Y_1 \) and \( Y_2 \), and that the labor income tax rate in period 1 is \( \tau_1 \) while that in period 2 is \( \tau_2 \). Assume that \( \tau_1 > \tau_2 \), and that both taxes are linear. Further assume that the individual has access to a “tax avoidance technology” that permits wage income to be shifted from period 1 to period 2. If the individual chooses to shift \( A \) dollars from period 1 to period 2, her taxable income in period 1 will be \( Y_1 - A \) and that in period 2 will be \( Y_2 + A \). You may restrict \( A \) to lie between 0 and \( Y_1 \). Using the tax avoidance technology is costly; the cost of shifting \( A \) dollars is \( \beta(A) \). This cost can be viewed as the legal and administrative fees associated with tax avoidance, and it must be paid in period 1.

(a) Find the lifetime budget constraint for this individual, recognizing both the impact of tax avoidance on income net of taxes, and the cost of tax avoidance.

(b) Substitute this budget constraint into the consumer’s utility function and obtain first order conditions for the optimal choice of consumption profile, and for the optimal level of \( A \). Does the optimal level of \( A \) depend on the utility function? Explain why or why not.

(c) Consider the case in which \( \beta(A) = \gamma A^2 \), and assume that \( r = 0 \). Obtain a formula for \( A \) as a function of the tax rates in the two periods, and compute the elasticity of tax avoidance (\( A \)) with respect to \( (1-\tau_1) \). Also compute the elasticity of taxable income, \( Y_1 - A \), with respect to \( (1-\tau_1) \). Which of these two elasticities is likely to be more useful for policy analysis, particularly when \( \tau_1 \) is close to \( \tau_2 \)?
3. A new proposal in the ongoing national debate about how to raise private saving calls for modified IRA accounts with “floors, not ceilings.” Consider a specific plan which would eliminate the current IRA system and replace it with a new plan which allows each taxpaying unit to contribute any saving in excess of 10% of adjusted gross income to a special "Super IRA." These IRA contributions would be deductible from taxable income, and the accruing return on a Super IRA would not be taxed until the funds are withdrawn in retirement.

(a) Contrast the opportunity set for potential savers provided by the "Super IRA" with that from existing IRA accounts. Does the new scheme raise or lower the rate of return to saving?

(b) How would you expect the super IRA to affect saving behavior among different groups in the population? Be as definite as possible.