

Econ 131
Spring 2022
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Problem Set 2 Solution

DUE DATE: March 30

Student Name:

Student ID:

GSI Name:

- **You must submit your solutions using this template.**
- **Although you may work in groups**, each student must submit individual sets of solutions. You must note the names other students that you worked with. Write their names here:

1. Essay

Read the following recent blog post discussing the need for a welfare state. Write a short essay [the essay has to fit in the page below] about the post. The post argues that the welfare state should simply support non-workers (children, elderly, disabled) regardless of means. In contrast, the US welfare state is heavily means-tested (i.e., is targeted to families and households with low income). Discuss the pros and cons of each approach.

Post link:

<https://www.peoplespolicyproject.org/2022/02/18/why-we-need-the-welfare-state/>

2. True/False Statements

Determine whether each statement is true, false, or uncertain and explain why. Answers with no explanation will receive no points.

- (a) A wealth tax as recently proposed by Senator Elizabeth Warren make the US tax system progressive up to the very top.

TRUE. We've seen in class that if well enforced, the Warren wealth tax could sharply increase the tax rate (relative to true economic income) at the very top of the distribution making the very top pay higher rates than any other group. However, this requires the wealth tax to be comprehensive and well enforced (something that did not happen in the European experiences with the wealth tax).

- (b) In 2021, the Biden administration and the democratic congress attempted to increase the tax rate on realized capital gains of high earners starting in 2022. However, they failed to pass anything. Therefore, we should observe no impact of this tax policy debate on realized capital gains.

FALSE: When Biden got elected in late 2020, high earners could reasonably expect that the tax rate on realized capital gains would go up, either in 2021 or 2022. Hence, they were likely to accelerate realized capital gains into late 2020 or during 2021 (when it became clear that the tax increase debated in congress would not start until 2022) to take advantage of the low tax rate while it lasted. Even though the tax reform did not pass (and may not pass in 2022 either), it has nonetheless already generated an anticipated behavioral response.

- (c) If the US adopts the new global 15% minimum tax on multinational corporations, US multinational corporations like Apple or Google will have no incentives to shift profits to tax havens anymore.

MOSTLY TRUE: If Google reports its profits in Bermuda and pays 0% corporate tax there, the US will charge 15% extra to bring the tax on 15% so Google does not save as much by shifting profits to a tax haven. However, as the US tax rate is 21% (above 15%), there is still an incentive to shift profits outside of the US and toward a country that charges 15% or less (so as to pay a total of 15% instead of the US 21% rate).

- (d) Inheritances taxes are desirable if people's motive for accumulating wealth is not about leaving bequests to their children.

TRUE: Inheritance taxes can reduce incentives to accumulate wealth only if people care about the bequests they leave to their children. If people accumulate wealth only for themselves, the tax after they die is irrelevant to their decision. The tax on inheritances reduces what children get and induces children to work more through income effects.

- (e) Evidence from the Israeli Kibbutz implies that redistribution does not hurt people's incentives to work.

UNCERTAIN: As discussed in class, the Kibbutz managed to have very strong redistribution while still motivating their members to work. However, while this might work at the scale of a small Kibbutz community (where everybody knows everybody and social sanctions on slackers can be effective), it is quite possible that, at the scale of a country, almost complete redistribution would reduce incentives to work (we've seen various examples in class that people's labor supply responds some to taxes).

- (f) If wealth comes primarily from life-cycle savings, there should be no tax on capital income.

TRUE: This is the Atkinson-Stiglitz result. However, it requires strong assumptions. In practice, if people have different returns on wealth or if labor income can be shifted into capital income, this result breaks down.

3. Capital Income and Savings Taxation

Consider a 2 period model where individuals earn labor income $Y = 100$ from working in period 1 and do not work in period 2 (retirement). Individuals choose how much to consume in each period. Savings in period 1 earn an interest rate $r = 50\%$. Let C_1 denote consumption in period 1 and C_2 denote consumption in period 2. Suppose that individuals have a utility function $U = \ln C_1 + \ln C_2$.

- (a) Set up the individual's lifetime utility maximization problem and solve for the optimal C_1 , C_2 , and S in an economy without taxes.

Consumption in the second period is savings from the first period plus interest.

Savings is just income from the first period minus consumption during the first period:

$$C_2 = (100 - C_1)(1 + 0.5)$$

The utility maximization problem is $\max \ln C_1 + \ln C_2$ subject to the budget constraint.

When the budget constraint is incorporated into the expression for C_2 , as shown, the maximization problem is

$$\max \ln C_1 + \ln((100 - C_1)(1.5)) = \max \ln C_1 + \ln(150 - 1.5C_1).$$

Solving, the first-order condition is

$$\frac{1}{C_1} = \frac{1.5}{(150 - 1.5C_1)} \quad \text{or} \quad 150 - 1.5C_1 = 1.5C_1$$

Using the first-order condition, we get the following:

$$C_1 = 150/3 = 50.$$

$$C_1 = 100, \text{ so savings is } 100 - 50 = 50.$$

$$C_2 = S(1 + r) = 50(1.5) = 75.$$

Now assume that a comprehensive income tax $\tau = 10\%$ is imposed on both labor and savings income.

- (b) Find the optimal C_1 , C_2 , and S .

The 10% tax is imposed on the entire \$100 earned in the first period and on the interest earned from savings (rS). The budget constraint is now:

$$C_2 = (100(1 - 0.1) - C_1)(1 + 0.5(1 - 0.1)) = (90 - C_1)(1 + 0.45)$$

The new optimization problem is

$$\max \ln C_1 + \ln(90 - C_1)(1.45) = \max \ln C_1 + \ln(130.5 - 1.45C_1)$$

The first-order condition is $1/C_1 = 1.45/(130.5 - 1.45C_1)$

Using the first-order condition, we get

$$C_1 = 45$$

$$S = 90 - 45 = 45$$

$$C_2 = S(1 + (1 - \tau)r) = 45(1.45) = 65.25$$

- (c) Compare the ratio of consumption C_2/C_1 in (a) and (b). Does the comprehensive income tax distort consumption choices?

Under no taxation $C_2/C_1 = 1.5$ while under comprehensive taxation the ratio is $C_2/C_1 = 1.45$, which means that this form of taxing income distorts individual's intertemporal consumption decisions.

- (d) How much revenue does the government collect from each individual under the comprehensive income tax system?

$$\text{Revenue} = \tau Y + \tau r S = 0.1(100) + 0.1(0.5 * 45) = 12.25$$

Suppose now that the government is considering switching to a system where only the labor income is taxed.

- (e) Find the labor income tax τ_L that would raise as much revenue as is collected under the comprehensive income tax system.

This new tax must collect \$12.25 from each individual. In other words, $\tau_L Y = 12.25$. Which implies that $\tau_L = 0.1225$.

- (f) Find the optimal C_1 , C_2 , and S .

The 12.25% tax is imposed only on the entire \$100 earned in the first period. The budget constraint is now:

$$C_2 = (100(1 - 0.1225) - C_1)(1 + 0.5) = (87.75 - C_1)(1 + 0.5)$$

The new optimization problem is

$$\max \ln C_1 + \ln(87.75 - C_1)(1.5) = \max \ln C_1 + \ln(131.625 - 1.5C_1)$$

The first-order condition is $1/C_1 = 1.5/(131.625 - 1.5C_1)$

Using the first-order condition, we get

$$C_1 = 43.875$$

$$S = 87.75 - 43.875 = 43.875$$

$$C_2 = S(1 + r) = 43.875(1.5) = 65.8125$$

- (g) Compare the ratio of consumption C_2/C_1 in (a) and (f). Does the Labor income tax distort consumption choices?

Under no taxation and under labor taxation the ratio is $C_2/C_1 = 1.5$. Which means that just taxing the labor income doesn't distort individual's intertemporal consumption decisions.

Consider now that individuals have the opportunity of shifting half of their labor income into savings income.

- (h) How much revenue would be collected from each individual under the labor income taxation system?

$$\text{Revenue} = \tau_L \frac{Y}{2} = 0.1225(50) = 6.125$$

- (i) Under this scenario which tax system would collect more revenue? Explain.

If individuals have the possibility of shifting labor income into savings income, a comprehensive tax system would be able to collect more revenue not only by directly taxing the shifted income but also by deterring income shifting.