Econ 131
Spring 2021
Emmanuel Saez

Problem Set 2

DUE DATE: March 31

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 New York Times article discussing policies supporting single mothers. Write a short essay [the essay has to fit in the page below] about the article in light of welfare reform and its impact on single mothers' labor supply that we discussed in class.

Washington Post link:

`https://eml.berkeley.edu//~saez/course131/articleps2.pdf`

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) The new COVID bill just enacted makes the Child Tax Credit fully refundable. Therefore, it is going to discourage low income parents from working.

UNCERTAIN: It is true that the COVID bill makes the child tax credit fully refundable so that you get it in full no matter how low your income is (while before, you could not get it in full if your income was low, and you did not get any if your income was zero). This in principle decreases the incentive to work (extensive margin response). The empirical literature does find some response along the extensive margin (Welfare reform and EITC reform). The caveat is that the policy as enacted lasts only 1 year (but might be extended later on).

(c) Inheritances taxes are undesirable if people's motive for accumulating wealth is about leaving bequests to their children.

FALSE: Inheritance taxes can reduce incentives to accumulate wealth if people care about the bequests they leave to their children. But this does not mean that inheritances should not be taxed at all as inheritances contribute to inequality in economic resources and hence taxing them is desirable even if they reduce wealth accumulation somewhat (see the discussion in class about the Piketty-Saez 2013 paper).

(d) People think that the ideal distribution of wealth should be unrealistically equal.

TRUE: The study of Norton-Ariely 2011 that we discussed in class shows that US respondent's ideal distribution of wealth is very equal, more equal than any existing distribution of wealth in market economies.

(e) 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.

(f) In the modern globalized world, taxing corporations has become impossible. That's why countries have lowered their corporate tax rates over time.

FALSE: It is true that countries have lowered their corporate tax rates over time. The justification given was that it was easy for multinational corporations to avoid high tax rates by moving to low tax countries (tax havens). In reality, it's not economic activity that moves to tax havens but reported profits (through sophisticated tax avoidance tricks). However, this is because the current corporate tax is not well designed. It is possible to tax corporations in the modern globalized world with a well designed tax system (see discussion in Saez-Zucman 2019 book).

3. Capital Income and Savings Taxation

Consider a novel type of Cryptocurrency named *Fixed Coin*, which can potentially be taxed. *Fixed Coin* is riskless, offers 40% interest rate per period, and it is the only savings instrument available to *Crypto Land's* residents. 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. 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:

$$C_2 = (100 - C_1)(1 + 0.4)$$

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

$$\max \ln C_1 + \ln((100 - C_1)(1.4)) = \max \ln C_1 + \ln(140 - 1.4C_1).$$

Solving, the first-order condition is

$$\frac{1}{C_1} = \frac{1.4}{(140 - 1.4C_1)} \quad \text{or} \quad 140 - 1.4C_1 = 1.4C_1$$

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

$$C_1 = 140/2.8 = 50.$$
$$C_1 = 50, \text{ so savings is } 100 - 50 = 50.$$
$$C_2 = S(1 + r) = 50(1.4) = 70.$$

Now assume that a comprehensive income tax $\tau = 20\%$ is imposed on both labor and savings income.

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

The 20% 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:

$$C_2 = (100(1-0.2) - C_1)(1 + 0.4(1-0.2)) = (80 - C_1)(1 + 0.32)$$

The new optimization problem is

$$\max \ln C_1 + \ln(80 - C_1)(1.32) = \max \ln C_1 + \ln(105.6 - 1.32C_1)$$

The first-order condition is $1/C_1 = 1.32/(105.6 - 1.32C_1)$

Using the first-order condition, we get

$$\begin{aligned} C_1 &= 40 \\ S &= 80 - 40 = 40 \\ C_2 &= S(1 + (1-\tau)r) = 40(1.32) = 52.8 \end{aligned}$$

(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 $C_2/C_1 = 1.4$ while under comprehensive taxation the ratio is $C_2/C_1 = 1.32$. Which means that this form of taxing income distorts individual's intertemporal consumption decisions.

(d) The substitution effect from the savings taxation should decrease the C_2/C_1 ratio. Explain which effect dominates (income or substitution) in (a) vs (b).

The income effect dominates. The ratio C_2/C_1 drops from (a) to (b). This is because there is a change in relative prices, and the substitution effect makes C_1 relatively more attractive than C_2. However, C_1 decreases in (b) compared to (a). This is because the income effect dominates the substitution effect.

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

$$\text{Revenue} = \tau Y + \tau r S = 0.2(100) + 0.2(0.4 * 40) = 20 + 0.2(16) = 20 + 3.2 = 23.2$$

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

(f) 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 \$23.2 from each individual. In other words, $\tau_L Y = 23.2$. Which implies that $\tau_L = 0.232$.

(g) Find the optimal C_1, C_2, and S.

The 23.2% tax is imposed only on the entire \$100 earned in the first period. The budget constraint is now:

$$C_2 = (100(1 - 0.232) - C_1)(1 + 0.4) = (76.8 - C_1)(1.4) = 107.52 - 1.4C_1$$

The new optimization problem is

$$\max \ln C_1 + \ln(107.52 - 1.4C_1)$$

The first-order condition is $1/C_1 = 1.4/(107.52 - 1.4C_1)$

Using the first-order condition, we get

$$\begin{aligned} C_1 &= 38.4 \\ S &= 76.8 - 38.4 = 38.4 \\ C_2 &= S(1 + r) = 38.4(1.4) = 53.76 \end{aligned}$$

(h) 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 $C_2/C_1 = 1.4$. 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.

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

$$\text{Revenue} = \tau_L \frac{Y}{2} = 0.232(50) = 11.6$$

(j) 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.