Econ 131
Spring 2017
Emmanuel Saez

Midterm

March 15

Student Name:

Student ID:

GSI Name:

Exam Instructions

- **Closed book/notes exam.** No computer, calculator, or any electronic device allowed.
- **No phones.** Turn them off and put them in your bag.
- **Explanation should be written using pens.** No pencils, except for graphs.
- **You must submit your solutions using the exam packet provided.** If you need more room to write your answers or need to re-draw a graph use the extra pages at the end. Make sure to note it clearly and accurately if your solutions continue on a different page.
- **Do not write your solutions on pages that say "Do not write on this page"**. Answers written on these pages will not be graded.
- **When time is called, STOP** writing, immediately **CLOSE** your exam packet and hold it up until it is collected by one of the GSIs.
- This exam contains a total of 30 points.

Do NOT open this test until instructed to do so.

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1. True/False/Uncertain (questions 1a-f) (15 points, 3 points per question.)

Explain your answer fully based on what was discussed in class, since all the credit is based on the explanation. Your grade depends entirely on the substance of your justification, not on whether you are correct in writing "True" or "False". Note that it is possible to answer each question for full credit with three sentences or fewer, and answers longer than ten lines long will not be graded.

(a) Since top incomes spike enormously in the year before an increase in the top income tax rate (e.g. before the 2013 tax increase), that means that the top income tax rate should be small.

(b) Empirical evidence of bunching at the EITC first kink point shows that the standard static model of labor supply $\max u(c, l)$ subject to $c = wl + R$ is a good depiction of actual labor supply behavior.

(c) The theory of optimal commodity taxation argues that tax rates should be set equal across all commodities, in order to maximize efficiency through "tax smoothing".

(d) Evidence from changes in cigarette taxes in the US shows that the price of cigarettes rises by the full amount of the cigarette tax. Therefore, cigarette producers are bearing the full burden of the cigarette tax.

(e) Preferential tax systems for highly skilled foreign immigrants have a large positive effect on immigration and hence are desirable even if society cares about redistribution.

2. Exercise - Capital Income and Savings Taxation (8 points)

The president has asked you to re-evaluate the costs and benefits of various consumption and income tax proposals that his tax panel has made. To do so, you consider a 2 period model where individuals earn labor income Y 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 $r > 0$. Let C_1 denote consumption in period 1 and C_2 denote consumption in period 2.

(a) Write the individual's budget constraint in an economy without taxes. (1 point)

(b) Write the budget constraint where both labor and income are taxed at rate t as in the current U.S. income tax system (but assume there is only one tax bracket and there are no tax-exempt savings accounts). (1 point)

(c) Write the budget constraint with a consumption tax rate τ and no comprehensive income tax. (1 point)

(d) The tax panel claims that exempting capital income from the income tax while retaining the income tax on labor income is equivalent to shifting to a consumption tax system. Prove this algebraically using the budget constraints in parts (a) and (b), still assuming one income tax bracket. (2 points)

(e) Suppose that individuals have a utility function $U = (C_1)^{0.5} + (\frac{C_2}{1+r})^{0.5}$. Show that a consumption tax rate (τ) does not distort consumption choices. [Hint: Show that individuals will choose a ratio of consumption C_2/C_1 equal to the same expression with the consumption tax or with no taxes at all.] (3 points)

3. Labor income (7 points)

Assume that individuals have the same utility function over consumption and *labor* given by:

$$U(c, l) = (1 - \theta) \ln(c) + \theta \ln(50 - l)$$

where c represents consumption and l represents hours of *labor* and θ is a given parameter, constrained to be between 0 and 1. Here, $\ln(x)$ denotes the natural logarithm of x (this can also be denoted by $\log(x)$).

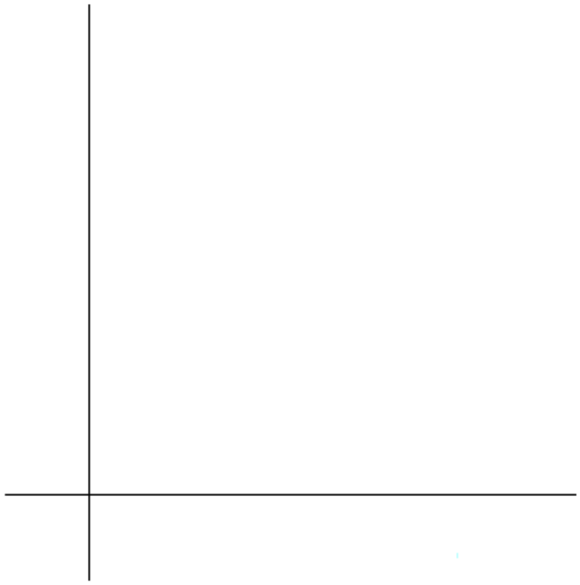
Assume also that the only income that individuals have is from labor income and that the hourly wage rate is given by w.

(a) Write the budget constraint faced by the individual. (1 point)

(b) Set up the maximization problem of this individual and solve for the optimal choices of labor and consumption. (2 points)

(c) Now, suppose that there is a tax of $\tau = 0.2$ on labor income. Solve for the new optimal choice of labor and consumption. (1 point)

(d) On the following graph, plot the solutions you found in parts (b) and (c). Be sure to label all intercepts, optima, as well as the income and substitution effects. (2 points)



(e) For the individual's choice of labor, explain intuitively the direction of the substitution and income effect of the introduction of the tax. Does the income effect or substitution effect dominate? (1 point)

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