Econ 230B

Spring 2019

FINAL EXAM: 2 Hours

Closed notes exam (no computer or electronic device allowed)

True/False Questions: 30 points

Answer all 10 questions (4 pts each). Explain your answer fully, since all the credit is based on the explanation.

1. Disability insurance has negative effects on labor supply because applicants assigned to tough examiners are more likely to work than applicants assigned to lenient examiners.

2. The main reason behind the surge in labor force participation of single mothers in the US in the 1990s is the expansion of the Earned Income Tax Credit.

3. If the elasticity of taxable income of upper income taxpayers with respect to the net-of-tax rate is high, it is self-defeating for the government to impose a very high top marginal tax rate on the rich.

4. The spike in retirement hazard at the Early Retirement Age of the Social Security system is evidence that many individuals do not follow rational model of life-cycle savings.

5. 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.

6. In the standard Harberger (1962) model, part of the incidence of the corporate tax is on labor.

7. The optimal tax rate on bequest is lower when there is more social mobility.

8. International tax competition means that a greater fraction of the corporate income tax is shifted to labor in high-tax countries.

9. With high audit rates at the top of the income distribution, tax evasion among the rich can be reduced to zero.

10. Taxing capital reduces wealth inequality in the long-run.

PROBLEM (30 pts):

We consider an economy made up of individuals who have identical preferences defined over consumption c and labor l, but different wage rates. The utility function takes the simple form: $u(c,l) = c - l^{1+k}/(k+1)$ where $k > 0$ is a given fixed parameter. An individual with wage rate w supplying labor l, earns $z = wl$ and consumes $c = z - T(z)$ where $T(.)$ is the (possibly nonlinear) income tax.

Suppose there is a distribution of skills w with density $f(w) > 0$ over $[0, \infty)$. The total population is normalized to one so that $\int_0^\infty f(w)dw = 1$

(a) (3 pts) Consider a linear income tax system $T(z) = -R + \tau \cdot z$ where $R > 0$ is the demogrant and τ is a flat tax rate. Solve for the optimal labor supply choice l as a function of R and the net-of-tax wage rate $w \cdot (1-\tau)$. Derive the uncompensated and compensated elasticities of labor supply as a function of k. Solve also for the income effect parameter.

(b) (3 pts) Suppose taxes collected are all rebated through the demogrant so that $R = \tau Z$ where Z is average earnings. Solve for the Rawlsian optimal tax rate τ (i.e., the tax rate that maximizes the utility of the worst-off individual). Solve for the utilitarian optimal tax rate τ (i.e., the tax rate that maximizes the sum of utilities). In both cases, explain the intuition behind your results.

We now assume that the government imposes the following two-bracket income tax: $T(z) = -R + \tau_1 \cdot z$ if $z \leq \bar{z}$ and $T(z) = -R + \tau_1 \cdot \bar{z} + \tau_2 \cdot (z - \bar{z})$ if $z > \bar{z}$. $R > 0$ is the demogrant.

(c) (2 pts) Plot the budget constraint on a diagram (l, c).

(d) (4 pts) Assume that $\tau_1 < \tau_2$. Solve for the optimal labor l and earnings $z = wl$ choice for an individual with wage w. Show that there are three cases depending on whether the individual is in the bottom bracket, the top bracket, or exactly at $\bar{z}$.

(e) (3 pts) In this model, explain how the amount of bunching observed at $\bar{z}$ is related to the level of the compensated elasticity of labor supply. Explain briefly how you would estimate the elasticity with empirical cross-sectional data on earnings (and without knowing the underlying distribution of skills $f(w)$).

We now assume that there are 3 types of individuals: disabled individuals unable to work $w_0 = 0$, low skilled individuals with wage rate w_1, and skilled individuals with wage rate w_2. Obviously, we assume that $w_1 < w_2$. We assume that the fractions of disabled, low skilled, and high skilled in the population are $\lambda_0, \lambda_1, \lambda_2$ (and that $\lambda_0 + \lambda_1 + \lambda_2 = 1$). For simplicity, we

assume that, in all the cases we consider, low skilled workers are always in the bottom bracket and that high skilled workers are always in the top bracket.

(f) (3 pts) Taking R, τ_1, and $\bar{z}$ as fixed, compute the tax rate τ_2^* that maximizes taxes collected from the high skilled. Express τ_2^* as a function of k, z_2, and $\bar{z}$.

(g) (3 pts) Taking R and $\bar{z}$ as fixed and assuming $\tau_2 = \tau_2^*$, compute the tax rate τ_1^* that maximizes total taxes collected. Express τ_1^* as a function of k, z_1, λ_1, and λ_2, and $\bar{z}$. Explain intuitively why $\tau_2^* < \tau^* < \tau_1^*$ (where τ^* is from question (b)).

(h) (5 pts) Suppose now that disabled workers face a cost of work q that is distributed according to a cumulated distribution $P(q)$ with density $p(q)$. When a disabled person pays the work cost q, she becomes like a low skilled worker with wage rate w_1 and utility function $u = c - l^{1+k}/(1+k) - q$. Compute the fraction of disabled workers who work as a function of w_1, τ_1, and the distribution $P(.)$.

Under this scenario, how does the tax rate τ_1 maximizing tax revenue compares with τ_1^* from (g) which was derived assuming no disabled person could work (explain the economic intuitions if you cannot do the full math).

(i) (4 pts) Suppose that the government introduces a third tax bracket with rate τ_3 above income level $\bar{\bar{z}}$. We have $\tau_3 > \tau_2$ and $\bar{\bar{z}} > \bar{z}$. Consider a continuous population with utility defined as in (a). Suppose you have access to 5 years of income data before the reform and 5 years of data after the reform. What time series graphs would you draw to visually test whether creating the 3rd tax bracket had an impact on reported incomes? Explain how you could use the graph to estimate the elasticity of earnings with respect to $1 - \tau$ using this reform. Make sure to be precise about the assumption needed for the estimate to be unbiased. You should also discuss how you could test the robustness of your estimates using an alternative method of estimation.