Econ 230B
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Problem Set 2

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1. CEO Pay response to the 2013 US tax increase

The goal of this exercise is to repeat the Goolsbee (2000) analysis of CEO pay around the 2013 top tax rate increase (instead of the 1993 top tax rate increase as Goolsbee did).

a) First stage: Using online sources, calculate the change in the top marginal tax rate for labor income compensation generated by the 2013 tax increase including both the change in the Federal tax rate, and the Affordable Care Act surtax. How does the size of the change compare with the 1993 tax increase from Goolsbee (2000) study?

b) Timing of the reform: search online to figure out whether people knew in advance that the 2013 tax increase would take place? Is it reasonable to think that executives could respond to the tax change as they did with the 1993 tax change?

c) Expected behavioral responses: Based on what we have learned in class about behavioral responses and your response in question b), through what channel do you expect CEOs to respond in the short and the medium-run to the 2013 tax change?

d) Empirical analysis using CEO pay: use the execucomp data extract posted online (link here) to create a table similar to table 2 in Goolsbee for years 2011 to 2014. From this table, is there evidence of a behavioral response? What components of CEO pay seem to respond the most? Using numbers from this table and the answer to question a), how large is the elasticity of compensation with respect to the net-of-tax rate in the short-run (2012 vs. 2013) and in the medium-run (2011 vs. 2014)? [no standard error required]

2. Mobility of High Income US Taxpayers across States

The goal of this exercise is to estimate the mobility of high income US taxpayers across US states due to variation in state income top tax rates across states and over time. High income US taxpayers are defined as tax filers reporting Adjusted Gross Income (AGI) above $1m.

a) Find online information on the state top income tax rates across all states for **2016** incomes. List the ten states with the highest top tax rates (group T) and the ten states with the lowest top rates (group C) along with the top tax rates in those 10 states. (NOTE: do not

exclude zero tax states, if you have ties, keep the largest states in terms of population to have exactly ten states in each group).

b) Use IRS state level data in excel format for tax year 2016 at (link here) to compare the fraction of high income earners in states in group C and states in group T. Fraction high earners is defined as the ratio of number of tax returns with AGI above $1m to all tax returns in group.

Under what assumption does this comparison identify the effects of state income tax rates on mobility? Is this assumption realistic (how could it be tested)?

If this assumption holds, what is the elasticity of the number of high earners with respect to the net-of-tax rate at the state level?

c) Find online information on the state top income tax rates across all states for **2000** incomes. Find the ten states which had the largest increases in top tax rates (group T) and the ten states which had the largest decreases in top tax rates (group C) from 2000 to 2016. List group C, group T, the 2000 and 2016 top tax rates in those states, and the change in top tax rates in those states.

d) Use IRS state level data in excel format for tax years 2000 and 2016 at (link here) to compare the changes in the fraction of high income earners in states in group T and states in group C from 2000 to 2016. Fraction high earners is again defined as the ratio of tax returns with AGI above $1m to all tax returns.

Under what assumption does this comparison identifies the effects of state income tax rates on mobility? Is this assumption realistic (how could you test it)?

If this assumption holds, what is the elasticity of the number of high earners with respect to the net-of-tax rate at the state level?

e) Let us use the California tax increase at the top of 2012 to identify the effects of top tax rates. Plot the number of fraction of tax filers with $1m+ AGI in California (treatment group) and Texas (control group) from 2009 to 2016. Estimate the DD effect using 2009-2011 as the control years and 2012-2016 as the treatment years. Does this DD estimate pass the parallel trend assumption? How could you construct a more convincing control group using information available from all the other states?

3. Tax Reform Analysis

Consider an economy where the government sets a flat tax at rate τ on earnings to raise revenue. We assume that the economy is static: the total population remains constant and equal to N over years and there is no overall growth in earnings.

Individual i earns $z_i = z_i^0(1-\tau)^e$ where the tax rate is τ. z_i^0 is independent of taxation and is called potential income. e is a positive parameter equal for all individuals in the economy. The government wants to set τ so as to raise as much tax revenue as possible.

a) What is the parameter e? Show that the tax rate maximizing total tax revenue is equal

to $\tau^* = 1/(1+e)$.

b) The government does not know e perfectly and thus requests the help of an economist to estimate e. The government can provide individual data on earnings for two consecutive years: year 1 and year 2. In year 1, the tax rate is τ_1. In year 2, the tax rate is *decreased* to level τ_2. Suppose that the government can provide you with two cross-section random samples of earnings of the same size n for each year. This is *not* panel data.

How would you proceed to estimate e from this data? Provide a formula for your estimate $\hat{e}$ and a regression specification that would allow you to estimate e with standard errors.

c) Suppose now that the economy is experiencing exogenous economic growth from year to year at a constant rate $g > 0$. The population remains constant at N. How is the estimate $\hat{e}$ biased because of growth? Suppose you know g, how would you correct $\hat{e}$ to obtain a consistent estimate of e? (provide an exact formula of this new estimate).

d) Suppose now that you do not know g but that the government gives you a new cross-section of data for year 0 in which the tax rate was equal to τ_1 as in year 1. Using data on year 0 and year 1, provide an estimate of g and the corresponding regression specification.

Using data for all 3 years, provide a single regression specification and a formula for a consistent estimate $\hat{e}_R$ of e that takes into account growth.

e) We now assume again that there is no growth. Suppose that the parameter e differs across individuals and is equal to e_i for individual i. Assume that there are N individuals in the economy. Individual i earns $z_i = (1-\tau)^{e_i} z_i^0$. As above, z_i^0 is not affected by taxation.

As in question 1, express the tax rate maximizing tax revenue τ^{**} as a function of the e_i and the realized incomes z_i. Show that the tax rate τ^{**} can be expressed as $\tau^{**} = 1/(1+\bar{e})$ where $\bar{e}$ is an average of the e_i's with suitable weights. Give an analytic expression of these weights and provide an economic explanation.

f) Suppose now that the parameter e is the same for all individuals and that the government redistributes the tax collected as a lump-sum to all individuals. I note R this lump-sum which is equal to average taxes raised. Suppose that the level of this lump-sum R affects labor supply through income effects. More precisely, the earnings of individual i are given by $z_i = (1-\tau)^e z_i^0(R)$. The potential income $z_i^0(R)$ now depends (negatively) on the lump-sum R.

Suppose that the government still wants to set τ so as to raise as much taxes as possible in order to make the lump-sum R as big as possible. Should the government set the tax rate τ higher or lower than $\tau^* = 1/(1+e)$ obtained in question a)?