Fiscal Policy and Inequality

Problem Set 1

Due October 22nd (by 11pm)

1. Explain why, based on the shape of the social external cost function, speeding should be regulated by a tax rather than a rule. Given this, why do you think speeding is usually regulated by a rule?

2. Draw the standard labor and supply graphs. Illustrate a tax on sellers, and label the change in price and quantity, the burden on buyers and sellers, and color in the deadweight loss. Draw four more graphs with: perfectly inelastic supply, perfectly elastic supply, perfectly inelastic demand, and perfectly elastic demand. In each case, give an example of a market for this type of good, illustrate the effect of a tax, and note how the curves change the incidence of the tax.

3. A taxpayer has utility $x + \sqrt{y}$ from consuming goods x and y. The taxpayer has income R. The prices on x and y are p_x and $p_y + \tau$, respectively, where τ is the tax on good y.

   (a) Set up the optimization problem: the taxpayer wants to maximize utility, subject to the budget constraint.

   (b) Solve for the optimal consumptions of x and y as a function of the prices and the tax.

   (c) How does an increase in the tax change consumption of x and y?

   (d) Express utility as a function of prices and the tax. How does utility change in response to a change in the tax?

4. Empirical section:

   (a) Open the **state-tax-govt-data.csv** data set in your statistical software. This data is annual data on taxes for U.S. states, along with many covariates on the state government and economy. Summarize the number of years and number of states.

   (b) Pick one of the taxes that interests you. Make summary statistics for population (pop_annual), GDP (gsp_q), and the chosen tax. Construct and summarize the tax per capita, as share of GDP, and as share of total taxes (total_taxes).

   (c) Plot the tax amount over time. Deflate the tax by CPI (state_cpi_bfh) and plot the real tax over time.

   (d) Regress population, GDP, and Democrat governor (govparty_a==1) on the chosen tax. Interpret the results. What are the conditions for these coefficients to be causal effects? Are these conditions realistic? Explain.

   (e) Regress population and GDP on the chosen tax, with state and year fixed effects. How should you cluster standard errors? Interpret the results. What are the conditions for these coefficients to be causal effects? Are these conditions realistic? Explain.

   (f) Estimate a fixed effects model with the chosen tax as outcome and a dummy variable for whether the governor is term limited (lame_duck_last_term) as treatment. Interpret the results.

   (g) Perform an event study for the effect of introducing an income tax (individual_income_tax > 0) on population and GDP. Interpret the results.