Econ 230B

Spring 2022

FINAL EXAM: Solutions

The average grade for the final exam is 57.1 (out of 70 points) The average grade (out of 100) including all assignments is 85.9. There are 4A+, 5A, 2A-, 6B+, 3B, 1B-

Questions: 40 points

Answer briefly all 10 true/false questions (4 pts each). Explain your answer fully, since all the credit is based on the explanation. For the answers, base your answers on the substance of what was discussed in class (over and above what you can find in the slides).

1. Disability insurance has small negative effects on labor supply because empirical evidence shows that rejected disability insurance applicants work very little.

   Solution: True based on the famous paper by Bound (1989) and subsequently verified on a bigger scale by Von Waechter-Manchester-Song (2011). Caveat: it is possible that the process of applying to DI, which requires not working for a number of months, could reduce labor supply of rejected applicants. See the recent evidence by Autor et al. 2015 discussed in class. Even with these effects factored in however, the negative effect of DI on work remains relatively small.

2. The US social security system discourages labor supply of the elderly because a significant fraction of US workers stop working at age 62. This response is predicted by the standard life-cycle model.

   Solution: First part is true: there is a spike in retirement hazards at age 62 in the US that is driven by the early retirement age available at age 62 (nothing else changes at age 62 and this spike at 62 did not exist when the early retirement age was 65). Second part is false, if individuals were fully rational and as actuarial adjustment is close to fair, we should not observe a retirement spike at age 62.

3. The 2013 top tax rate increase in the United States led to a surge in reported top incomes in 2012 implying that tax rates on the rich have high efficiency costs.

   Solution: Empirical statement is true. We do observe a spike in 2012 top incomes (see Saez TPE 2017) due to retiming of income from 2013 to 2012 to escape the higher 2013 rates. The efficiency statement is in part false because large retiming does not necessarily imply that the long-term response will be large (indeed findings by Saez TPE 2017 suggest small longer term responses). For tax policies that last many years, the relevant response to judge efficiency costs is the long-term response.

4. Evidence from lottery winners shows that there are substantial income effects on labor supply.

   Solution: Empirical evidence does show negative effects of lottery winnings on labor supply. Imbens et al. AER 2001 for the United States and Cesarini et al. 2015 for Sweden present compelling evidence comparing winners and non-winners conditional on playing. However, the magnitude of income effects is pretty small: \$1 reduces earnings by about \$0.1 so the empirical effects are not "substantial".

5. If individuals with no earnings are considered as less deserving than average by society, then an EITC with negative marginal tax rates at the bottom of the income distribution would be optimal even in the traditional Mirrlees model of optimal taxation.

   Solution: This is true. The optimal tax rate at the bottom in the Mirrlees model takes the form $T'(0) = (g_0 - 1)/(g_0 - 1 + e_0)$ with $e_0 > 0$ the elasticity of the fraction non-working wrt to $1 - T'(0)$ and g_0 the social marginal welfare weight on non workers. If individuals with no earnings are considered as less deserving than average by society, then $g_0 < 1$ and therefore $T'(0) < 0$. Note that this result does not require responses along the extensive margin as in Saez QJE'02 (with extensive margin responses, $T'(0) < 0$ can be obtained under weaker conditions: low income workers more deserving than average).

6. If the average rate of return to capital in the economy is 4%, an annual tax on wealth at a rate $\tau_1 = 1\%$ is strictly equivalent to an annual tax on the flow of capital income at rate $\tau_2 = 25\%$.

   Solution: False. The taxes τ_1 and τ_2 are equivalent for taxpayers who earn a rate of return of 4% on their wealth, but in practice there is significant heterogeneity in rates of returns across the distribution, due in particular to differences in portfolio composition. For taxpayers who have a rate of return different than 4%, the two taxes are different.

7. In the life-cycle model where people work and save when young and live off their savings and returns on savings when old, the government should not tax capital income.

Solution: True, this is the Atkinson-Stiglitz 1976 theorem discussed in class. It says that the the optimal tax rate on capital income should be zero if preferences are weakly separable between consumption and labor and everybody has the same sub-utility of consumption: namely $u^i(v(c_1, c_2), l)$ with $v(c_1, c_2)$ the same across all individuals. In that case, using only a nonlinear tax on labor earnings is sufficient.

8. The rational Allingham-Sandmo model of tax evasion predicts too much tax evasion because it does not incorporate psychological factors such as honesty or guilt.

   Solution: True that the rational Allingham-Sandmo model of tax evasion predicts too much tax evasion. Two broad set of explanations have been put forward: psychological factors and information reporting. There is strong evidence that information reporting matters a lot (IRS studies, Kleven et al. 2011). Blumenthal, Christian, Slemrod NTJ'01 show that letters appealing to morality have no impact on compliance suggesting that psychological factors are not nearly as important.

9. 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 do significant redistribution from rich to poor.

   Solution: True if the elasticity is due to real labor supply responses (as the revenue maximizing tax rate at the top is given by $\tau = 1/(1 + a \cdot e)$ (Saez, Restud'01). However, a high taxable income elasticity is in general due to tax avoidance or evasion. By changing the definition of taxable income (broader base, fewer deductions, elimination of tax favored income items), it is possible to reduce the elasticity of taxable income and then increase the level of redistribution from rich to poor. Furthermore, if the elasticity is due to bargaining effects (as in Piketty-Saez-Stantcheva AEJ'14), then a high top tax rate is actually desirable to prevent "over compensation" of top earners at the expense of bottom 99%.

10. If bequests are due to altruism, they should be subsidized because they create a positive externality.

    Solution: True that if bequests are due to altruism, they create a positive externality on bequests receivers. In a two generation model where parents start with zero wealth and provide bequests with children and where the government maximizes the sum of utilities of parents and kids and count the altruistic utility in social welfare, then bequests should indeed by subsidized (Farhi and Werning QJE'10). However, in general equilibrium, parents also receive bequests. In this context, bequests received are a marker of high economic resources and should be taxed if government values redistribution (Piketty and Saez ECMA'13).

PROBLEM (30 points):

The Biden administration has proposed to strengthen the taxation of multinational corporations and has helped broker an international agreement about a minimum tax on the profits of multinational corporations. To simplify matters, let's assume that all countries currently use a territorial system whereby multinationals profits are taxed based on where such profits are made. I.e., Apple is a US company operating in many countries. Each Apple subsidiary (such as Apple France) reports how much profits it makes in the country where it operates and pays corporate taxes there.

a. (5 pts). Explain the main weakness of the current territorial tax system in terms of tax avoidance for multinational corporations. Suppose you have access to data showing for all multinationals worldwide how much profits they report in each single country and how much corporate taxes they correspondingly pay in each single country. What descriptive statistics would you create to document this main weakness?

Solution: The main weakness is that multinationals can use creative accounting to inflate profits reported in low tax jurisdictions (at the expense of profits reported in high tax jurisdictions). The most famous strategy is to use transfer pricing to shift profits across subsidiaries (transactions that are not done using true market prices but are hard to monitor). The simplest way to document this weakness is to show in which countries multinationals from big countries such as the US report their profits. Is a large fraction of profits reported in tax havens? (tax havens can be defined with the data using profits reported and taxes paid country by country: they are countries that impose low taxes on profits reported, e.g. less than 10% or less than 5%). Zucman JEP'14 discussed in class shows that over 50% of foreign profits by US multinationals is reported in tax havens. The data would allow to repeat this for other countries as well.

b. (5 pts). We assume that the minimum tax international agreement works as follows. If a subsidiary pays a corporate tax of less than 15% on the profits in the country where it operates, then the country where the multinational is headquartered will charge an extra tax to bring the tax rate to 15%. I.e., If Apple Ireland pays only 5% of its Irish profits in corporate taxes paid to Ireland, then the US charges 10% extra tax on these Irish profits to bring the total tax to 15%. Explain why such an agreement would resolve the issue you pointed out in a. Using the same data as in a., how would you check empirically whether the agreement has been successful in resolving the issue in a. (assuming the agreement happens and you have data from both pre and post-reform)?

Solution: With the new system in place, shifting profits to a tax haven is not as advantageous as in the territorial system because the home country charges a tax so that profits are taxed at least 15% wherever they are reported. Hence, a tax haven that offers 0% corporate tax rate is no longer more attractive than a moderate tax haven that offers a 15% corporate tax rate. So this would kill the pure tax haven model. But because many large countries have corporate tax rates above 15% (e.g., the US has a 21% Fed tax rate + 5% on average at the state level), it is still advantageous to push profits in low tax jurisdictions (but not as advantageous as in a.). With the data, one could check whether the fraction of foreign profits reported in tax havens falls. One could also check whether tax havens bring up their corporate tax rates to 15% (as there is no advantage to have a rate below 15% anymore).

c. (5 pts) Suppose now that the international agreement fails to happen but that the US decides to go alone and impose such a 15% minimum tax on all its multinationals (companies headquartered in the US). Would this work to curtail tax avoidance by US multinationals? What is the weakest point of such a unilateral policy? How would you use the empirical data from b. to check upon this weakest point?

Solution: If the US adopts the unilaterally, then yes this would work to curtail tax avoidance by US multinationals as US multinationals cannot book profits in tax havens without paying the minimum tax. The weakest point of such a unilateral policy is that US multinationals would have an incentive to "invert" i.e., change their nationality. With the data, one could check whether US multinationals change nationality after the reform (and specifically these that benefit the most from using tax havens to avoid corporate taxes).

d. (5 pts) Countries like Ireland currently oppose the international agreement from b. because they claim that the agreement would prevent "fair tax competition" whereby countries compete to attract genuine business activity (as opposed to just paper profits) by having an attractive tax system. Is it true that the international agreement from b. would also curtail such “fair tax competition”?

Solution: Yes, international agreement from b. would also reduce such real or fair tax competition as offering a tax rate below 15% to attract genuine business activity from foreign multinationals is no longer effective (as the home country of the multinational tops up any tax rate below 15%). Hence, system b. also curtails “fair tax competition”.

e. (5 pts) To alleviate the issue raised by Ireland, countries agree to impose the minimum tax only on super profits defined as profits minus 5% of the value of tangible capital (land, buildings, and equipment) and 5% of the payroll (labor compensation) used in the foreign country. Explain why this exemption would indeed still allow countries to “compete fairly” (i.e. attract real economic activity) while preventing pure tax avoidance. Suppose the data from a. also includes payroll and tangible capital value that each multinational reports in each country where it operates and that you have such data both pre and post-reform. How would you use the data to assess whether “fair competition” vs. “tax avoidance” has been affected by the reform?

Solution: Under this scenario, multinationals benefit from having real operations (workers and capital) in low tax places as long as the profits reported stay below 5% of the sum of tangible capital and labor costs, as profits up to this level are exempt from the minimum tax. Hence, a tax haven can benefit from offering a tax rate below 15% if the tax haven is a desirable place to carry out production. This is beneficial for tax havens like Ireland (where capital and workers do produce for multinationals) while not beneficial to small tax havens (like Bermuda) that are too small to attract real economic operations. The way to test this in the data is to define two sets of tax havens: those which mostly attract paper profits (like Bermuda) and those which also attract real activity (like Ireland). This can be done using reported labor costs and tangible capital. Then, the empirical test is to see whether pure tax havens lose reported profits but real activity tax havens do not (or even gain) activity.

f. (5 pts) The actual OECD agreement is b.+e. Discuss whether b. or b.+e. is preferable.

Solution: The response to this question depends on one’s views about real tax competition and the value of taxing multinationals’ profits. Real tax competition makes it harder for the government to raise taxes and specifically corporate taxes on multinationals. Taxes on multinationals are progressive taxes because ownership of multinationals is skewed toward the top of the distribution. The right likes tax competition as a way to limit the size of governments and also dislikes progressive taxes on the rich and therefore would prefer b+e to b. The left dislikes tax competition because it likes having a generous social state and likes progressive taxes in which case b is preferable to b+e.