Public Economics | Problem Set 2

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1 Chasing Natural Experiments within a Country

a)

In 2017, Italy implemented a High-Net-Worth Individuals regime to attract people with high capital incomes or incomes outside Italy. This regime allows tax residents to pay a lump sum of EUR 100,000 per year on income earned on foreign sourced income and an additional EUR 25,000 for each additional family member for 15 years as long as the individual has not been a resident in 9 out of the last 10 years[1]. Further, it does not require any labour participation in Italy, making it attractive for people with high incomes outside Italy. The EU Tax Observatory[2] evaluates this regime to be one of the most aggressive, with an annual fiscal cost of around EUR 42.1 million.

b)

From what I can see, both in the EU Tax Observatory[3] citations as well as Google Scholar, there has not been any research on the effect of this regime nor on Greece that implemented a similar regime in 2019.

c)

I can use the fact that Greece implemented a similar scheme two years later in 2019 but had no regime for foreigners before that and can thus act as a control group. With this, I can set up a DiD model where the dependent variable is the share number of people who have enough foreign income to benefit from this tax regime.

$$\text{Share that could benefit} = \alpha + \beta_1 \cdot \text{Treatment}_i + \beta_2 \cdot \text{Post}_t + \beta_3 \cdot \text{Treatment x Post}_{it} + \gamma \cdot \text{Year} \quad (1)$$

Where *Treatment* indicates if the country is Italy or not, *Post* indicates whether or not data is from before or after 2017, and *Year* is the number of years in the survey which where γ would then capture any increases or decreases over time. However, this can only capture the short-term effect, as Greece is treated eventually in 2019. Thus, to estimate a long-term effect, I would estimate a contra-factual expected share based on the development in the period up to 2017 and the development in Greece up until 2019. Using this, I can estimate the synthetic DiD using (1).

1. Agenzia delle Entrate, *Invest in Italy - Tax regime for new residents*, accessed April 18, 2024, https://www.agenziaentrate.gov.it/portale/en/web/english/nse/invest-in-italy/tax-regime-for-new-residents.

2. EU Tax Observatory, "New Forms of Tax Competition in the European Union," November 2021, https://www.taxobservatory.eu//www-site/uploads/2021/11/EU-Tax-Observatory-Report-3-Tax-Competition-November-2021-3.pdf.

3. EU Tax Observatory.

As my proposed study is a DiD, I will assume a parallel trend to estimate the regime's effect for the first short-term effects when using Greece as a control; having data from multiple years prior will help establish. Further, there is an assumption that the introduction of the HNWI scheme in Italy did not affect the migration policies or rates in Greece before 2019; there were no changes in the tax policies for foreigners, but there could have been other policies introduced.

For the second part, with the synthetic DiD, I assume that given no intervention, the share of individuals who could benefit from such a treatment would follow the same trajectory as before. As multiple other tax regulations have also been implemented since 2017, I would need to assume that those only affect individuals without the same foreign-sourced income.

d)

To conduct this analysis, I would need administrative data from the Greek and Italian tax authorities on the total number of individuals and the number of individuals who have filled foreign-sourced income large enough to benefit from this regime. Ideally, I would have 5 years prior to 2017 for both countries to properly identify a parallel trend and determine the prior trajectory. Then, I would like data for Greece up until at least 2018; if available further, I would be able to see if the effect was the same across the countries; however, this is not necessary when just looking at the effect in Italy. For Italy, I would like the data up until 2023 to best estimate a long-term effect.

In the report, EU Tax Observatory[4] cites themselves for this data, and thus, they might have access to some of this data. However, to get it directly from the source, I would contact either the Greek tax authority[5] or their statistics. bureau[6] For the Italian data, I could properly get this from the Italian tax authority[7] or the statistics bureau[8]

2 Mobility of High Income US Taxpayers across States

a)

Following the nonprofit organisation Tax Foundation[9], the 5 states with the highest top income taxes in 2021 were California, Hawaii, Minnesota, and New Jersey – the top marginal tax rates can be found in table 1. As there are 8 states with no income tax, I have used data from the 2020 Census[10] to select the 5 with the highest population; those are Florida, Nevada, Tennessee, Texas, and Washington.

4. EU Tax Observatory, "New Forms of Tax Competition in the European Union."
5. Independent Authority for Public Revenue, https://www.aade.gr/en
6. Hellenic Statistical Authority, https://www.statistics.gr/en/home/
7. Agenzie Entrate, https://www.agenziaentrate.gov.it/portale/web/english
8. Istituto Nazionale di Statistica. https://www.istat.it/en/
9. Tax Foundation, *State Individual Income Tax Rates and Brackets for 2021*, February 2021, https://taxfoundation.org/data/all/state/state-income-tax-rates-2021/.
10. U. S. Census Bureau, *TOTAL POPULATION*, Published: U.S. Census Bureau, https://data.census.gov/table/DECENNIALCD1182020.P1.

	Top Marginal Income Tax 2021
Treatment	
California	13.30%
Hawaii	11.00%
Minnesota	9.85%
New Jersey	10.75%
Oregon	9.90%
Control	
Florida	0.00%
Nevada	0.00%
Tennessee	0.00%
Texas	0.00%
Washington	0.00%

Table 1: States with the highest and lowest top marginal tax rate.

b)

In the provided IRS data[11], there is a discrepancy in the number of returns under *All Returns* and the sum of returns in each category[12] I have used the calculated number to ensure that totals will sum to 100%. In figure 1, it is visible how, on average, there is a higher fraction of high-income earners in group C, indicating that the fact this group has a lower top marginal tax rate might influence where individuals and families with high income chose to live. For this comparison to show the true effect, I must assume that the groups are comparable and that there is no other reason for individuals to settle (or not) in the specific states. These reasons are numerous and could include other tax state taxes than just the marginal tax rates, other state-level benefits and the weather in the states. Further, this comparison also assumes that I are observing the steady-state effects. These assumptions seem unrealistic as one could argue that people living in the states elect their legislators who set the marginal tax rate. Thus, the difference in marginal tax rate is a reflection of a difference in the people living in the states, which could affect where people choose to settle.

As also seen in figure 1, there is a great variation, especially among the states in group T. California and New Jersey have a much larger proportion of high-income individuals compared to the rest of the group. This could be an indicator that there are other factors besides the top marginal tax rate that contribute to the high-income share. I could test the assumption that there are no other significant factors through a regression analysis where I test for other variables and try to isolate the effect of the tax rates through if there is a natural experiment upon which I can isolate the effect.

If I naively assuming that the state level taxes is the only difference between the states I can estimate the elasticity of the *number* of high income earners. This is done by calculating the implied elasticity at the state level through the cross sectional variation with the regression:

$$\ln(\text{High Income Earners}) = \beta_0 + \varepsilon \cdot \ln(1-\tau) + u_i \tag{2}$$

11. Internal Revenue Service, *SOI tax stats - Historic Table 2*, February 2024, accessed April 9, 2024, https://www.irs.gov/statistics/soi-tax-stats-historic-table-2.

12. See https://github.com/JohanOelgaard/ECON230B.git under assignment 2 for the specific numbers, difference always ±10

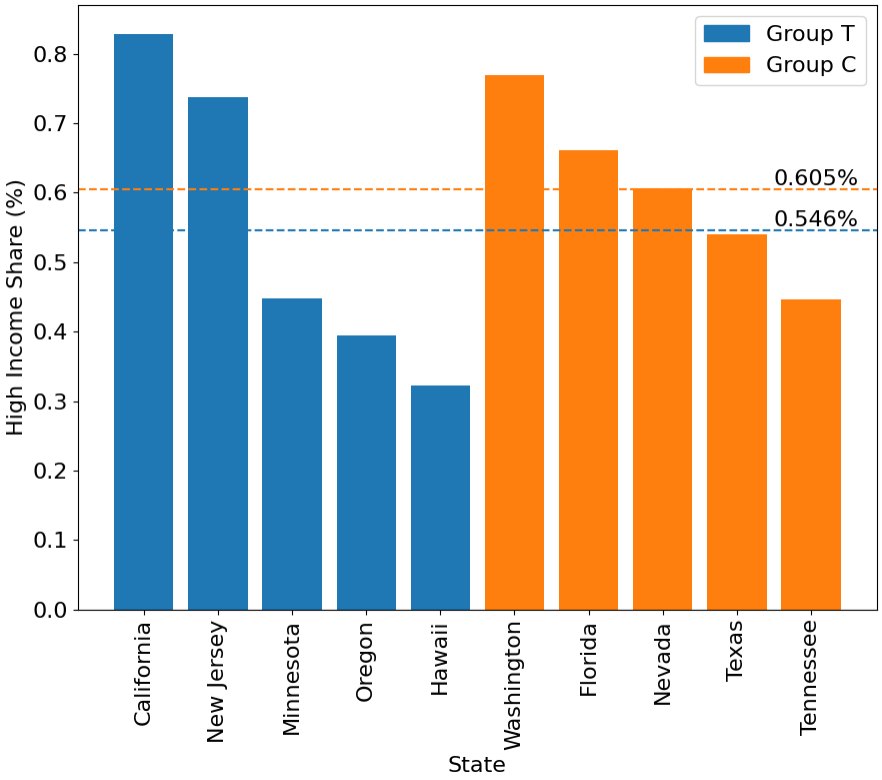

Figure 1: Share of tax returns over $1 million in 2021 in the 5 states with the top marginal income tax rate and the lowest top marginal income tax

As seen from 2 column (1) the calculated elasticity is 2.76, i.e., when taxes decrease by 1% the number of high income individuals increase by 2.76%.

c)

Before the TCJA, individuals could deduct state taxes from their federal taxes, effectively lowering the effect of inter-state differences in taxes. The TCJA from 2017 (effective from 2018) imposed a cap of $10,000 on these deductions. This change has a significant impact on high-income individuals in states with high marginal tax rates because it limits the amount of state taxes they can deduct on their federal tax returns. As a result, the actual cost of state taxes becomes higher for these taxpayers because they can no longer offset their state tax liabilities against their federal taxable income, meaning when combining federal and state tax, there is a decrease in the net-of-tax (increase in the marginal tax rate) for all states with a high-income state tax.

This effectively creates a natural experiment where all states with income taxes all of a sudden experience an increase in the marginal income tax rate while states with no income tax do not experience this sudden increase.

d)

I start by looking at the change in the high income share between 2016 and 2021

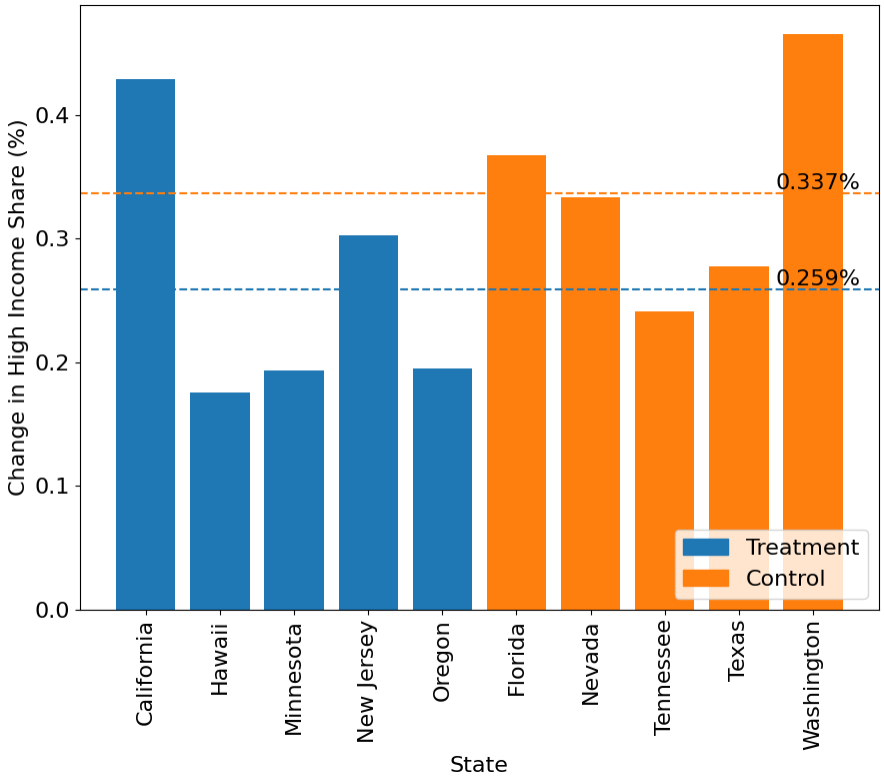

Figure 2: % change in the high income share from 2016 to 2021 for each state.

From figure 2 it is seen that though still large variation especially in the treatment group, the control group has seen a greater increase than the treatment group. This could be due to the effect of the TCJA that increased the effective tax level.

To look at the variation created by the TCJA I construct the following DiD model.

$$\begin{aligned}\ln(\text{High Income Earners}) = \beta_0 + \beta_1 \cdot \text{Treatment}_i + \beta_2 \cdot 2021_t \\ + \beta_3 \cdot \text{Treatment x } 2021_{it} + \gamma \cdot \text{State}_i + u_{it}\end{aligned} \tag{3}$$

The results of this estimation can be found in table 2, column (2). I find the effect of being in the Treatment group in 2021 to be a slightly negative effect of -0.20, hence the log of the number of high income earners decreases by 0.20 from 2016 to 2018, but this is statistically insignificant at the 5% level. When further adding state fixed effects, the estimate for being in the treatment group in 2021 does not change but is statistically significant – as seen in column (3), table 2. To find the elasticity I can under the assumption that there has been made no changes to the state-level taxes use the variation described in c) estimate the effect of the net of tax through an instrument variable estimation. Under the assumption and assuming the interaction term, Treatment x 2021, is orthogonal to the error term it is a valid instrument for the log of net of tax. As seen in table 2 the elasticity is 1.76, i.e. when the net of tax increases by 1% the number of high income returns increase by 1.76%

This estimate seems more realistic than the one calculated in b) as this takes into account fixed effects and exploits legislation to introduce variation to test.

	Cross Section (2b)	DiD (2d)	DiD w. State FE (2d)	IV2SLS (2d)
	(1)	(2)	(3)	(4)
Treatment		-0.3628	0.2560***	0.2560***
		(0.8279)	(0.0470)	(0.0470)
2021		0.9072	0.9072***	0.9072***
		(0.8279)	(0.0399)	(0.0399)
Treatment x 2021		-0.2044	-0.2044***	
		(1.1708)	(0.0564)	
Log Net of Tax	2.7590			1.7595***
	(7.1124)			(0.4852)
Observations	10	20	20	20
R^2	0.0185	0.1376	0.9990	0.9990
Adjusted R^2	-0.1042	-0.0241	0.9976	0.9976
Residual Std. Error	1.3259	1.3090	0.0630	0.0630
F Statistic	0.1505	0.8508	726.8516***	726.8516***

Table 2: Estimation results for the diff-in-diff model for the effect of the of the TCJA. For the IV-estimation the interaction term is used as instrument for log net of tax. The code for the regressions is available at https://github.com/JohanOelgaard/ECON230B.git. *Note:* *p<0.1; **p<0.05; ***p<0.01.