Taxing Wealth in the Presence of Liquidity Constraints: Evidence from France*

PRELIMINARY

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Abstract

Real-world wealth taxes include income-based caps to make sure income-poor yet wealth-rich households do not have to sell illiquid assets. We show in the French context that these caps are binding mostly among households at the very top of the wealth distribution, who own liquid yet income-tax-deferred assets. These liquid assets typically amount to at least fifty times the yearly pre-cap tax. When the wealth tax was cancelled in 2017, capped households' taxable income rose swiftly and massively, notably through higher capital gains, life-insurance earnings, and dividends. We conclude that caps reduce the proceeds from wealth taxes, and make wealth taxes act as an additional income tax precisely on the population whose wealth is a better proxy for taxpaying ability than income. A future iteration of the paper will make this argument formally by developing a model of wealth taxation featuring realistic heterogeneity in asset liquidity and income verifiability. The model relates optimal wealth and income tax to the degree of asset liquidity and income verifiability and determines under which conditions a wealth tax cap can be useful. It will further allow us to study how the optimal level of the wealth tax cap relates to estimable behavior responses to wealth tax reforms in terms of income and assets sales.

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Keywords: Wealth tax, wealth distribution, income distribution.

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1 Introduction

In the face of rising wealth inequality and declining progressivity of the income tax, there has been a renewed appetite for a wealth tax to complement existing tax systems (Saez and Zucman, 2019). Yet, wealth taxes have already been implemented in a dozen countries over more than a century (Saez and Zucman, 2022). A common reading of this experience is that wealth taxes generate concerns about liquidity (see e.g. Loutzenhiser and Mann, 2021; Scheuer and Slemrod, 2021) and are for this reason introduced with so many exclusions that their ability to generate revenue is questionable, often to the point that removing them is politically popular (OECD, 2018). In this paper, we analyze this trade-off between tax revenue generation and liquidity consierations for one of the most common wealth tax exclusions, which is that the combined income-and-wealth-tax bill is capped at a certain percentage of taxable income—what is often refer to as tax cap or tax ceiling. We consider the French context, where there have been reforms alternatively strengthening and weakening wealth tax caps, and for which there is detailed household registry data available.

In this paper, we present evidence on the behavioral responses to tax caps using an important French reform—which excluded financial wealth from the wealth tax base, restricting to real estate net wealth—and discuss the implications of our findings for optimal wealth taxes.

We start by discussing a simple framework of optimal wealth taxation in the presence of heterogeneity in asset liquidity and income verifiability. We argue that when income is perfectly verifiable, an income tax is likely to achieve the first best. On the other hand, when assets are perfectly liquid, i.e. they do not sell at a discount and can be sold in infinitesimal amounts, a wealth tax may also achieve the first-best. In the presence of both asset illiquidity and lack of verifiability of capital income, neither wealth nor income taxation may be optimal on its own. This creates a motive for a wealth tax combined with an income-based tax cap. The optimal level of the cap is likely to decline in asset liquidity and increase with income verifiability. Connecting this simple framework to our empirical analysis, we show that the tax cap is likely to be too low either when reported income increases after an income-capped wealth tax is removed or when there are no asset sales following a weakening of the cap.[1]

We then run a detailed empirical analysis of wealth tax caps in the French context. First, we gather descriptive statistics on the population of French wealth taxpayers for whom the tax cap was binding. Using detailed data on households' asset composition, we find that capped households are among the richest in the French population and do not own particularly illiquid assets. In fact, these households are particularly invested in asset classes that are easy to liquidate but whose income taxation can be deferred. Because such assets are high on liquidity and low on income verifiability, it is likely that the cap for these households is set at a suboptimally low level. At all levels of pre-cap wealth tax, capped and uncapped households hold similar amounts of liquid assets: these are always higher than fifty times the pre-cap wealth tax, and a hundred times the post-cap tax.

Second, we investigate the consequences on reported income of the removal of the wealth tax in 2017 for those households whose wealth tax was previously capped. We use a diff-in-diff design where control units are those households whose wealth tax liability relative to their income prior to

[1] In a later iteration of the paper, we will introduce a model of optimal wealth taxation with heterogeneity in asset liquidity and income verifiability. When income is perfectly verifiable, an income tax achieves the first best. When assets are perfectly liquid, i.e. they do not sell at a discount and can be sold in infinitesimal amounts, a wealth tax may also achieve the first-best. In the presence of both asset illiquidity and lack of verifiability of capital income, neither wealth nor income taxation may be optimal on its own. This creates a motive for a wealth tax combined with an income-based tax cap. We pin down the optimal level of the cap and find that the optimal cap declines with asset liquidity and increases with income verifiability. We run some comparative statics and find that a cap is too low either when reported income increases after an income-capped wealth tax is removed or when there are no asset sales following a weakening of the cap.

the reform was quite high but substantially below the cap. We find that previously-capped households report much more income once the wealth tax is abolished, and particularly those kinds of income that can be deferred: life-insurance proceeds, dividends, capital gains.

Related literature and contribution. A number of papers have studied the behavioral responses to wealth taxes (e.g. Seim, 2017; Jakobsen *et al.*, 2020; Londoño-Vélez and Ávila-Mahecha, 2021; Brülhart *et al.*, 2022).[2] These papers are mostly interested in the elasticity of taxable wealth with respect to the marginal tax rate on wealth, i.e. how much levels of taxable wealth respond to changes in the tax rate on wealth. Closer to our setting, Jakobsen *et al.* (2020) exploits the presence of a tax ceiling in Denmark and used capped households as a control group in order to estimate the effect of a change in the marginal tax on wealth. We focus instead on how the *income* declared by households subject to the wealth tax ceiling reacts to the removal of this tax cap (through the removal of the wealth tax). As explained in section 3, we view the strength and composition of the income response to the end of the wealth tax as providing evidence on the extent to which households were able to time their income realization for the purpose of minimization their overall tax burden in response of the tax ceiling.

Our paper makes three main three contributions. First, we use administrative data on taxable wealth composition to document how pervasive liquidity constraints are among wealthy households affected by the tax ceiling ("capped households"), considering both the level of income and the liquidity of assets held. Second, we estimate how income declared by capped households respond to an abolition of the wealth tax. These results on the strength of behavioral responses by type of income, speaks directly the notion that some high income individuals are able to time or manipulate the realization in order to minimize their exposure to the wealth tax. Third, we interpret these results through a conceptual framework that allows to determine whether the ceiling is a useful tool in alleviating liquidity issues while retaining the favorable redistributive properties of wealth taxation.

Plan of the paper. The paper is structured as follows. We present the different data sources used in the paper in section 2. Section 3 introduces a discussion of the role of tax cap in optimal wealth tax cap design, highlighting the trade-offs created by asset liquidity issues on the one hand and income verifiability on the other hand. Section 4 presents descriptive statistics on the population of wealth tax payers in France and speaks directly to the issues raised by assets liquidity identified in the previous section. In Section 5, we detail our empirical strategy in order to identify the behavioral responses to the wealth tax. Section 5.3 present the main results and connect them with our conceptual discussion. Finally, we conclude in Section 6.

2 Data and institutional context

2.1 Data sources

Income tax returns (POTE). The French tax authority, the *Direction générale des finances publiques* (DGFiP) at the ministry of finances, produces every year a file called POTE including the complete detail of income tax declarations for each of the 37 million French tax units, i.e., the amount recorded

[2] See Advani and Tarrant (2021) for a recent review of the literature.

in each of the 3,000 items of the income tax return.[3] We have this information at our disposal for income from 2006 to 2021 (i.e., for income declared in years 2007 to 2022).

Wealth tax returns (ISF). The tax authority also produces a file from wealth tax returns which can be merged with a common identifier to the income tax returns.[4] Only tax units liable to the wealth tax report their taxable assets—with taxable assets above 1.3 million euros—, providing circa 350,000 tax units included every year. Taxable wealth includes all real estate and financial wealth until 2017. After the wealth tax base is reduced to real estate, liable households (approximately 150,000 households) declare only their real estate assets.

Information on payment, and therefore on eligibility to the tax cap, is available for all wealth taxpayers. However, since 2011, only those households with a wealth higher than 2.57 million euros have to fill in a detailed form on the value of their assets, while households below this threshold only declare the aggregate value of their taxable wealth.

2.2 The French wealth tax and its cap

The French wealth tax (ISF) was in place between 1988 and 2017 before being transformed in 2018 into a real estate wealth tax (IFI). The initial purpose of this tax on household wealth was primarily redistributive, as it was the only tax on capital stock that was both progressive and based on a broad definition of wealth, including real and movable assets while subtracting household debts.

It also had significant symbolic importance because it was a declarative tax to which only a minority of wealthy taxpayers were subject (approximately 358,000 liable households in 2017), whereas the other progressive tax, the income tax, affects a much larger portion of the French population (17 million liable households out of 38 million in 2017).

Upon the creation of the French Wealth Tax (ISF) in 1989, a mechanism for capping the tax was introduced. It aimed to limit the ISF amount when the sum of ISF, income tax (IR), and withholding taxes on IR reached 70% of the taxpayer's net taxable income[5]. This provision particularly benefited taxpayers who could easily reduce their taxable income without an effective reduction in their standard of living. In 1991, the cap was increased to 85% of income.

The principle of capping the wealth tax has thus been maintained since 1989, except for the year 2012. Indeed, the cap was initially eliminated by the 2011 ISF reform, introduced by the Fillon government in the amending finance law for 2011. The reform aimed to significantly reduce wealth tax rates, and the removal of the cap was accepted by the Constitutional Council[6]. In 2012, the Ayrault government introduced an exceptional wealth contribution (CEF) in addition to the reformed wealth tax of 2011, which was implemented in mid-2012. The schedule used was that of the 2011 ISF, but no cap mechanism was provided for. However, the new wealth tax introduced from 2013 reintroduced the cap mechanism, limited to 75% of incomes. This exceptional cancellation of the cap provides an ideal experiment, which we analyse later in the paper.

[3] Form 2042 is the main source of information of the exhaustive POTE files.

[4] Form 2725 is the main source of information of the wealth tax files.

[5] The VII of Article 26 of Law 88-1149 of December 23, 1988, defines the cap mechanism.

[6] Article 1 of Law 2011-900 of July 29, 2011, amending the ISF by reducing the number of brackets and the applicable rates (0.25% for the bracket below 3 million euros and 0.50% above), while eliminating the cap mechanism. The Constitutional Council decision 2011-638 DC of July 28, 2011, validated the constitutionality of the absence of a cap mechanism.

3 Conceptual framework

The conceptual framework is still on-going work. Here we summarize the building blocks of the model and detail the comparative statics we are working on.

We develop a simple model of wealth taxation with heterogeneity in asset liquidity and income verifiability. Perfectly liquid assets do not sell at a discount and can be sold in infinitesimal amounts. Verifiable income means that actual and all of a household's income can integrated into taxable income while in case verifiability is low, households have the option (at a cost) to hide some of their income, introducing a wedge between actual and taxable income.

When income is perfectly verifiable, an income tax achieves the first best. When assets are perfectly liquid a wealth tax may also achieve the first-best. In the presence of both asset illiquidity and lack of verifiability of capital income, neither wealth nor income taxation may be optimal on its own. This creates a motive for a wealth tax combined with an income-based tax cap. We study how the optimal cap varies with asset liquidity and income verifiability. We derive comparative statics to study how (estimable) behavioral responses to wealth taxes relate to the optimality of the cap. In particular, preliminary analysis of the model suggests that the tax cap is too low (compared with the optimal level) when reported income increases after an income-capped wealth tax is removed or when there are no asset sales following a weakening of the cap.

4 Descriptive elements on the population of capped households

4.1 Quantitative relevance of the tax cap and comparison of capped and non-capped households

Quantitative relevance of the tax cap. Table 1 allows us to appreciate the quantitative significance of the cap on the entire population of taxpayers subject to the French wealth tax (ISF) in 2017, in general and at different levels of wealth. We observe that approximately 3% of liable households benefit from the cap, but collectively they represent 13.3% of the tax base and 30% of the revenues that would be raised in the absence of the cap (this portion reduces to around 12% after the cap is applied).

This substantial difference between the proportion of capped households and the share of the total tax they would need to pay without the cap mechanism suggests that these households are, on average, positioned very high in the wealth distribution. This is confirmed in the analysis by wealth bracket: about 57% of households with wealth ranging from 10 to 50 million euros benefit from the cap, and this proportion rises to 72.5% for those households whose wealth exceeds 50 million euros, and 64% of the tax base. The proportion of pre-cap tax affected by the cap in this range reaches over 80%.[7]. The flip side of this strong concentration of the cap at the upper end of the wealth distribution is that this phenomenon is relatively rare for wealth below 2.57 million euros—the threshold below which households do not fill in a detailed wealth declaration. We exclude this population from our study due to lack of details on their wealth. Thus, between 1.3 and 2.57 million euros, only 0.57% of households are capped, representing 13% of capped households, while they make up 72% of wealth taxpayers.

We can also note, in the last column of Table 1, the very strong concentration of wealth held in the form of life-insurance among capped households. Beyond 50 million euros in wealth, capped households hold 64% of the total wealth, and nearly 84% of the life-insurance. In total, the share of

[7]It is worth noting that, as in the rest of this article, these figures do not include the few dozen households with taxable wealth exceeding 200 million euros, due to missing data.

Table 1: Proportion represented by households capped at the number of liable households, tax amounts, and wealth per wealth bracket

	Total number of households	Share as a % of households	Share as a % of total amounts of :			
			Wealth	Pre-cap wealth tax	Post-cap wealth tax	Life insurance
Full population of wealth taxpayers	356229	3.17	13.30	29.65	11.96	38.13
Wealth ranging from 1.3 to 2.57 M€	257729	0.57	0.61	0.77	0.22	3.98
Wealth ranging from 2.57 to 10 M€	91426	6.25	8.77	12.97	6.88	14.85
Wealth ranging from 10 to 50 M€	6639	56.95	62.17	65.34	38.73	73.28
Wealth exceeding 50 M€	437	72.54	64.14	80.94	41.39	83.80

NOTES: This table shows the total number of tax households liable for Wealth Tax (ISF) in each taxable wealth bracket, and the share represented by capped households of the number of households liable for Wealth Tax, the Wealth Tax base, the pre- and post-capping amounts of Wealth Tax due, and life-insurance holdings.
SOURCES: ISF-IFI (DGFiP), POTE (DGFiP).

capped households in life-insurance ownership is three times higher (38%) than the share of wealth they hold (13.3%).

Distribution of wealth, income and taxes. Table 2 presents summary statistics for the population subject to the French wealth tax who completed a detailed declaration for the 2017 tax year (with reference to income earned in 2016), based on their wealth tax cap status.[8]

The table has four subsections: it displays primary household characteristics, wealth values across different categories, income values, and tax rates. Several observations emerge from this table. First, the composition of households is very similar whether they are capped or not: households on average consist of around two tax units, and the main declaring individual has a median age of 69 years for non-capped households and 68 years for capped households. In terms of taxable wealth, capped households are significantly wealthier than non-capped households: the average wealth of capped households exceeds 13 million euros, while it reaches about 4.7 million euros in the population of non-capped households. This superiority in wealth level of capped households is reflected across all wealth categories. The difference is most pronounced in the life-insurance category, where the average amount is approximately 6 times higher for capped households (3 million euros). In terms of income, the observation is reversed: capped households have considerably lower incomes than non-capped households. The average taxable income of a non-capped household is slightly above 300,000 euros, whereas it only reaches 130,000 euros for capped households. Non-capped households have higher income across all income categories and at all levels of the distribution. Taxes related to taxable income (income tax and social contributions) are logically higher for non-capped households, but the effective rates of these taxes (i.e., the sum of these taxes divided by the taxable income) are of similar magnitude for both categories. The wealth tax over taxable income ratio before the application of the cap, however, is considerably higher for capped households. In fact, the pre-cap wealth tax owed is nearly 3 times as large as taxable income on average. This ratio is 1.3 for the median capped household. Nevertheless, the application of the cap brings the effective tax rates of capped households close to the maximum level: for the median household, taxes related to income represent 28% of the taxable income, to which is added a rate of 53.4% for the wealth tax, resulting in a total tax burden of

[8]Being required to complete a detailed declaration implies a significant level of wealth (over 2.57 million euros).Our comparisons between capped and non-capped households are therefore naturally conditioned on holding taxable wealth that places the taxpayer among the top 3% of the wealth distribution.

Table 2: Descriptive statistics on the sample according to their capping status (in 2017)

	Uncapped					**Capped**				
	Mean	S.d.	Median	1st quartile	3rd quartile	Mean	S.d.	Median	1st quartile	3rd quartile
# fiscal shares	2.076	0.716	2	1.250	3	1.874	0.726	2	1	2.750
Age ref. person	69.28	12.97	69	52	87	67.63	14.76	68	49	87
Taxable wealth (pre-deduc.), k€	4727.3	10792.9	3749.2	2836.3	7018.9	13929.1	22400.6	8760.9	3670.6	26625.2
Taxable wealth (post-deduc.), k€	4473.1	5482.1	3536.1	2699.9	6662.6	13281.8	16014.0	8494.2	3509.1	26091.3
Primary residence, k€	681.8	720.1	505.7	0	1456.8	978.1	1312.2	630	0	2200
Other real estate, k€	1217.2	1585.7	850	9.500	2664.8	1736.5	2887.9	820	0	4313.3
Liquid assets, k€	1196.5	2137.5	664.4	19.70	2763.0	4677.1	8670.1	2067.6	62.92	11392.3
...incl. life-insurance, k€	557.3	1646.1	0	0	1796.1	3191.6	7432.6	208.0	0	8868.4
Listed securities, k€	1243.0	2754.7	616.9	0	2941.7	4191.6	9774.1	1138.6	0	10367.7
Controlled securities, k€	328.9	9869.0	0	0	305.4	1393.6	15398.5	0	0	1630.9
Other mov. assets, k€	434.0	1239.3	59.93	5	1428.9	1810.7	6124.6	108.4	7	4792.8
Debt, k€	-374.1	1966.2	-108.2	-834.9	-26.54	-858.5	2754.3	-153.6	-2094.9	-18.17
Taxable income	311399.6	1065248.4	138642	51483	531539	130812.0	520468.5	60221.5	6921	282361
Business income (pass-through)	4787.3	56421.0	0	0	3481.6	2357.6	79979.0	0	0	668
Other independent income	12350.4	89818.7	0	0	0	2087.4	95721.9	0	0	0
Capital gains	60387.7	814896.1	0	0	12248	10118.0	453404.3	0	0	5980
Other capital income	164533.1	921228.9	53153	5284	258121	89839.1	497527.6	23396.5	354	204121
Real estate income	43250.8	84978.8	15298	0	117026	37694.5	129828.0	1322	0	85275
Income tax (progressive)	79973.3	344751.0	23967	2218	146319	32486.5	190253.6	5637.5	261	72149
Income tax (flat-rate)	35979.6	145923.8	16515.4	6352.4	58403.1	18667.7	79830.5	7937.1	1984.1	38659.5
Pre-cap wealth tax	25820.9	48803.1	17105	1880.5	48402.5	153416.6	236145.8	78689	20515	338800
Post-cap wealth tax	25820.9	48803.1	17105	1880.5	48402.5	49482.9	72534.8	30590	902	107364
Prog. Income tax / Tax. inc.	0.201	0.132	0.190	0.0289	0.380	0.178	0.164	0.129	0.0119	0.442
Flat Income tax / Tax. inc.	0.132	0.0772	0.126	0.0839	0.165	0.219	0.217	0.151	0.0929	0.406
Pre-cap wealth tax / Tax. inc.	0.166	0.147	0.129	0.00794	0.391	3.724	6.637	1.279	0.519	8.957
Post-cap wealth tax / Tax. inc.	0.166	0.147	0.129	0.00794	0.391	0.565	0.350	0.534	0.165	0.956
# obs.			91,290					9,817		

NOTES: Ce tableau contient des statistiques descriptives sur les caractéristiques démographiques, la composition du patrimoine, du revenu et des impôts des ménages, pour l'année d'imposition 2017, selon qu'ils bénéficiaient ou non du plafonnement de l'ISF.
SOURCES: ISF-IFI (DGFiP), POTE (DGFiP).

81%, which is close to the 75% cap rate. For non-capped households, the median rate is approximately 45%.

4.2 Composition of the wealth of capped and non-capped households

Classifying taxable wealth into broad categories. For this exercise, we focus on the year of declaration for the wealth tax in 2017, which is the most recent year this taxation was in effect. As before, we narrow down our analysis to the sample of liable individuals who completed a detailed declaration. It is also worth noting that we consider the gross taxable wealth without any deductions, rather than the effective tax base, in order to reflect the true value of owned assets.

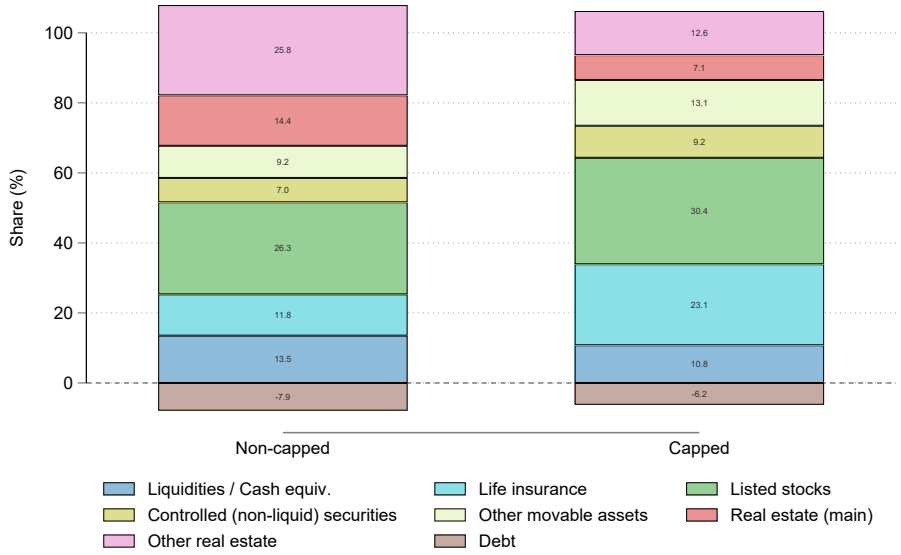
- **Liquid Assets:** This category includes elements reported as "liquid assets", as well as in box "life-insurance".

- **Listed Securities:** This category includes elements reported as "Other securities".
- **Controlled Securities (non-liquid):** This category includes elements encompassing all shares and equity interests held in companies by individuals who have a role within these companies, have signed a Dutreil agreement, etc. Here, they are assumed to be non-liquid due to their attachment to the holder's role within the company or possibly due to conservation agreements.
- **Other Movable Assets:** This category includes all other movable assets, i.e., the net amount of the box for other movable assets excluding life-insurance, the "mobilier forfaitaire").
- **Real Estate (main residence):** This category contains the main residence value, before deduction.
- **Other Real Estate:** This category contains secondary residences, as well as all undeveloped real estate and other rural properties.
- **Liabilities:** This box contains the liabilities.

Composition. Figure 1 presents the share of each of the categories described above in the wealth of individuals subject to the wealth tax who declared a wealth exceeding 2.57 million euros in 2017, distinguishing between those who were subject to the cap (capped) and those who were not (non-capped). Several observations emerge from this figure. On one hand, real estate represents a more significant portion in the wealth of non-capped individuals than in that of capped individuals: it accounts for a total share close to 40% among non-capped individuals, compared to only 20% among capped individuals. Within movable assets, a substantial portion of the assets held by capped individuals is, in fact, highly liquid. For instance, liquid assets make up about 34% of the wealth of capped individuals, compared to 25% for non-capped individuals, and listed securities also constitute a higher proportion, at 30% for capped individuals versus 26% for non-capped individuals. This conclusion may appear surprising. On one hand, one might expect liquid movable assets to generate income (although life-insurance escapes this logic since income is only realized upon liquidation). On the other hand, the notion that the cap benefits households with less liquid and less divisible wealth seems to be widely challenged here. Nonetheless, significant composition effects could be at play, potentially biasing this conclusion. Particularly, differences in the overall level of wealth between capped and non-capped individuals could be the source of this disparity in wealth composition, rather than the capped status itself.

Figure 2 illustrates the proportions of both liquid assets and listed securities for capped and non-capped individuals by wealth bracket. It confirms that the share of liquid assets in the wealth of capped individuals (blue circles) is consistently higher across all wealth categories compared to its counterpart among non-capped individuals (red diamonds), and even exhibits a substantial difference within the wealth range exceeding 100 million euros (nearly 30% compared to approximately 6% for non-capped individuals). The portion represented by listed securities is relatively more uniform between the two groups. For capped individuals (light blue squares), this share constitutes around 22% of total wealth below 5 million euros of wealth and stabilizes around 35% above 50 million euros of wealth. This share is quite similar among non-capped individuals (orange triangles), except that, similar to liquid assets, it drops significantly in the last wealth category, settling at around 15%. Therefore, it is truly this category of wealth exceeding 100 million euros that distinguishes capped from non-capped individuals in terms of their wealth composition: the share of liquid assets remains very high among capped individuals, whereas it decreases significantly among non-capped taxpayers.

Figure 1: Breakdown of wealth of households liable to wealth tax, non-capped and capped

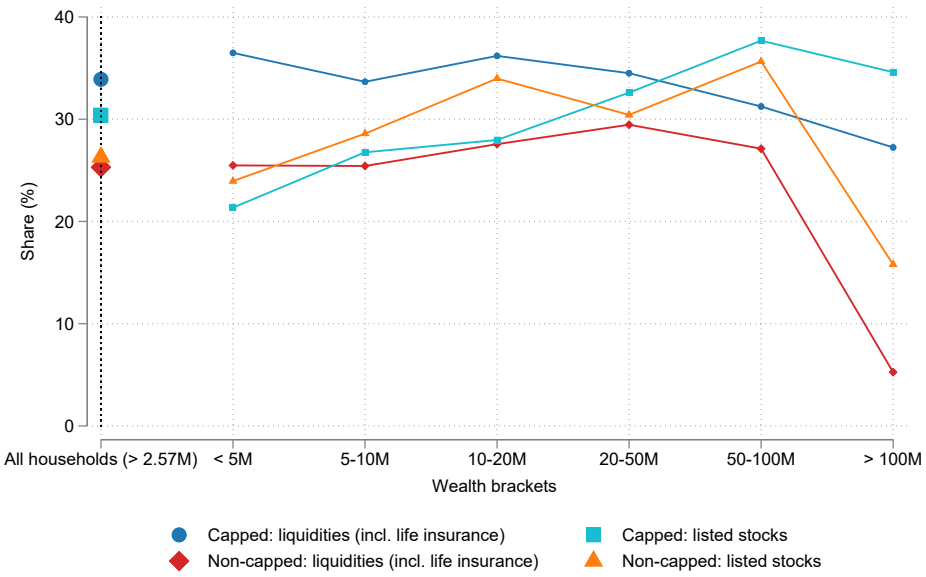


NOTES: This figure shows the composition of taxable wealth by asset category, distinguishing between households benefiting and not benefiting from the wealth tax cap. Values are expressed as a share of gross taxable wealth (debts are therefore represented as an asset with a negative value).
SOURCES: ISF-IFI (DGFiP), POTE (DGFiP).

In Figure 3, we take a slightly different approach from the previous figures. We construct the ratio of declared liquid assets in 2017 to the amount of wealth tax payable by households, before the application of the cap, based on whether they are capped or non-capped. We then sort the population of households according to the amount of their pre-cap wealth tax and divide them into 30 equal parts. We also restrict ourselves to pre-cap wealth tax amounts exceeding 10,000 euros, to avoid extremely high and hard-to-interpret ratios. This ratio is intuitive as it can be interpreted as the number of years of wealth tax that the liquid assets held by the household cover. We observe, on one hand, that the levels are very similar between capped and non-capped households, which is expected given the relative proportions of liquid assets shown in Figure 2. We also note that the value of this ratio reaches above 150 years of pre-cap wealth tax coverage at the lower end of the distribution, and decreases to around 50 years at the upper end of the distribution. Only 2% of capped households have a wealth tax coverage ratio of less than one, and less than 10% have a coverage ratio lower than ten. This shows that capped households could in fact pay the wealth tax without having to sell illiquid assets.

All of these descriptive elements lead to the following observation: the population of capped households appears to be more distinct due to their low incomes than the structure of their wealth. In particular, these households have very high wealth, and a high proportion of this wealth is liquid. The question arises as to the cause of these low incomes, as they would generally correspond to extremely low yield rates on an otherwise liquid average wealth. Thus, as shown in Table 2, the median income of a capped household is approximately 60,000 euros, more than two times lower than that of a median

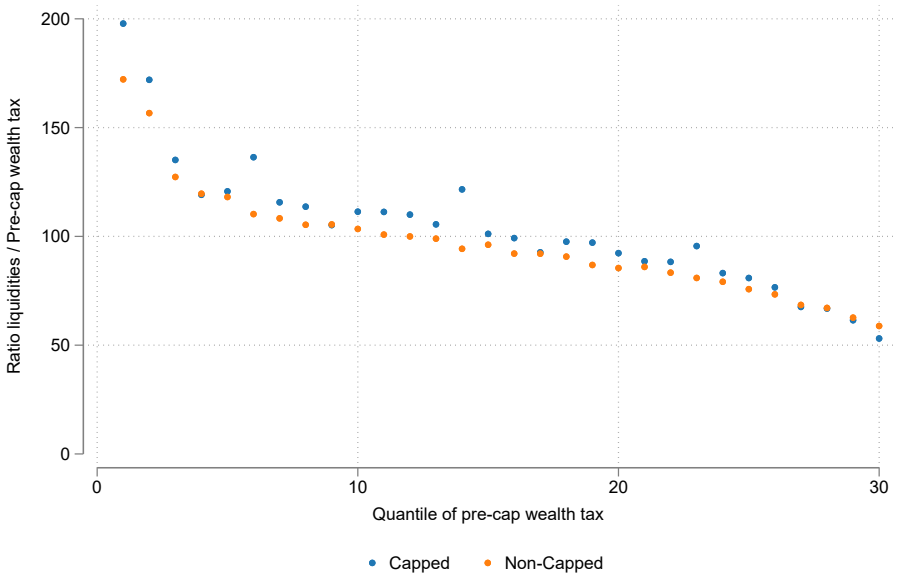
Figure 2: Share of liquid assets in the wealth of wealth tax payers, non-capped and capped, by wealth bracket



NOTES: This figure shows, by taxable wealth bracket, the proportion of total taxable wealth represented by liquid assets (including life-insurance, i.e. boxes CF and CO on form 2725), and listed securities, according to whether or not households benefit from the ISF ceiling. The dark-blue circles measure the share of liquid assets for those with a ceiling, and the red diamonds measure the share for those without a ceiling. The light blue squares measure the share of listed securities for those with a ceiling, and the orange triangles this share for those with a ceiling.
SOURCES: ISF-IFI (DGFiP), POTE (DGFiP).

non-capped household, even though the median wealth of capped households is more than twice that of non-capped households.

Figure 3: Ratio of liquid assets held to pre-cap wealth tax amount



NOTES: This figure shows the ratio between a household's liquid assets and the wealth tax owed before capping as a function of wealth tax level. Households are sorted by wealth tax level (panel a, pre-cap; panel b, post-cap) and grouped into 30 brackets.
SOURCES: ISF-IFI (DGFiP), POTE (DGFiP).

5 Behavioral responses to the wealth tax cancellation

The wealth tax reform that took place in France in 2017 is likely to have a specific effect on households that were subject to the wealth tax cap. Indeed, among wealth tax payers, "tax capped" households experienced a particularly strong decline in the marginal tax rate applied to their additional income. The tax cap implied a higher MTR (75%) as any additional euro of income would increase the denominator by 1 and result in a 75 cents increase in the overall tax burden. The ISF/IFI 2017 reform, by reducing the wealth tax base to real estate assets, significantly lowered taxable wealth, and resulted in lower tax burden for households with a large holding of financial assets. This mechanically led to a large reduction in the number of households affected by the cap.

As mentioned above, the effects of the reforms in terms MTR reduction are strong, and particularly so for incomes that have benefited from a simultaneous reduction in tax rates. Concomitantly to the wealth tax reform, the government reintroduced a flat tax with a rate of 30% on capital income.[9] The combined effect of the two reforms thus reduces the applied rate for these incomes from 75% to 30% for capped households opting for the flat-tax in 2018.

In this section, we want to understand the extent to which capped households—i.e. households previously considered by the wealth tax as wealth rich but income poor—react in terms of incomes and assets to a reform lowering their wealth tax burden. Studying the elasticity of taxable income for this specific group is particularly interesting, as both the implicit yield on their wealth and their

[9] See Bach *et al.* (2021) for a detailed description of the reform.

portfolio composition suggest they may have been favouring assets generating tax-deferred income to avoid taxes, and may therefore be able to manipulate their income to a large extent.

5.1 Empirical approach

We want to understand how capped households react to a sudden decline in their wealth tax burden. Our empirical approach involves a *difference-in-differences* which will essentially compare of wealth taxpayers who would have been subject to the cap as of 2018 had the ISF/IFI reform had not taken place, with wealth taxpayers who would not have benefited from the cap in any case.

However, due to the absence of declarations after 2017 regarding taxable wealth following the ISF rules, we do not have a direct observation of households that should have been capped but were not, and those that would not have been capped regardless. A more detailed description of how we address these identification issues is therefore necessary.

Identification Challenges. A natural approach to approximate the status of households in relation to the reform is to simply compare households that were capped in the previous year or years (*treated households*) to a group of households that were not capped in the previous year(s) (*control households*). However, this approach has a significant flaw in the context we are analyzing: defining a household's treatment status with respect to the reform based on its previous years' cap imposes a condition on the ratio of taxes to income. Implicitly, this compares income dynamics between two groups of households constructed based on their pre-treatment income, differentiating households with particularly low income compared to their taxes. This procedure may present a major flaw if the analyzed income variables are subject to strong mean reversion—which they are. The condition imposed on particularly low incomes through the construction based on past capping implies an increase in income once the condition is relaxed, i.e., in the year of the reform. This could thus be mistakenly interpreted as a causal effect of the reform. We present an alternative group construction strategy, akin to an intent-to-treat design, aimed at minimizing this issue. Even with this alternative strategy, we remain extremely careful about potential reversion to the mean and submit our results to tests allowing to spot what may be triggered by simple reversion to the mean.

Construction of Treatment and Control Groups. In order to mitigate the mean reversion phenomenon, it is necessary to accurately approximate the status of households with respect to the wealth tax cap that would have taken place in 2017, while conditioning as lightly as possible on income evolution just before the reform. One way to approach the problem is to divide capped households from a given year into two groups: permanent capped households, whose income is consistently very low compared to their wealth,[10] and transient capped households, whose cap status is due to exceptionally low income in one or a few particular years. While the first group should be less sensitive to the definition of the treatment period and therefore contribute less to the mean reversion phenomenon, the second group will likely experience a mechanical increase in income right after the treatment definition window. Our definition of treatment and control groups therefore aims at focusing on the first group while excluding the second.

An important point to note regarding the cap is that the primary factor leading to the exceeding of 75% of taxable income in taxes is the wealth tax itself. Indeed, all other taxes rely heavily on bases that are closely related to taxable income. Accordingly, their sum relative to income is mechanically

[10]This can be the case, for example, if they are able to control/retime their income or because they own assets with particularly low yields.

maintained below a threshold well below 75% (the top MTR at the income tax is 45%). On the other hand, the wealth tax is based on a different tax base, and a low income-to-wealth ratio can easily significantly increase the taxes-to-taxable income ratio. We leverage this characteristic of the cap, constructing treatment and control groups using only taxable income and the amount of wealth tax that is due. To dissociate income and taxes as much as possible, we create a "minimal" wealth / income ratio in the pre-treatment period. This ratio is calculated as the average wealth tax burden (pre-cap) owed between 2012 and 2016, divided by the maximum taxable income between 2011 and 2015 (the corresponding period in income years). Our analysis focuses on households for which the weight of the wealth tax has a high recurring impact with a minimum effective ratio of at least 20%. This ratio means that the wealth tax is structurally very heavy for these households and is less likely to reflect transitory income dynamics.

Among these households, we consider households as treated if the minimum effective wealth tax-to-income ratio exceeds 50%, and as controls if this same ratio is between 20% and 50%. This strategy has the advantage of comparing households where the wealth tax weight relative to income is structurally very high, and where the cap is not influenced by the exceptional realization of very low incomes. In practise, this selection allows us to eliminate a significant portion of households with exceptionally low income or exceptionally high wealth tax in a specific year.

Treatment Year. An important question pertains to the actual calendar year in which the reform is expected to start to yield effects. Indeed, the reform was a key element of candidate Macron's program during the 2017 presidential election campaign. Accordingly, the limitation of the wealth tax base to its real estate component was thus widely foreseeable starting around April-May 2017. It was intended to be applicable for the 2018 wealth tax year (i.e., wealth as of January 1, 2018). However, as the cap is determined based on income from the previous year (n-1), the anticipation of the reform could thus impact income as early as 2017.

Nevertheless, certain income sources required time before being realized: specifically, dividends necessitate the closing of an accounting period before being decided upon, and the vast majority of companies were only able to increase distributions once the 2017 fiscal year was closed, that is, in 2018 (Bach *et al.*, 2021). Therefore, an effect on dividends is expected from 2018 onward. However, potential earlier effects may exist for income sources that can be accessed more rapidly, such as capital gains or income derived from life insurance payouts.

Empirical Specification. We estimate a double fixed-effects model in order to measure, in a difference-in-differences framework, the effects of the reform on the treatment group. To make potential mean reversion effects easier to detect, we normalize the coefficients by the level of the year 2015, rather than the last pre-reform year (2016). The basic specification for household i in period t is as follows:

$$y_{it} = \alpha_i + \lambda_t + \sum_{d=2013,\neq 2015}^{2019} \beta_d \times D_{t,d} + \varepsilon_{it} \tag{1}$$

where y is the variable of interest and $D_{t,d} = 1$ if $t = d$ and 0 otherwise.

Winsorization. Constructing a ratio between various income variables and the reference RFR has the drawback of creating very high values when the RFR is very low. These outlier values can then heavily influence the average and artificially inflate the results. To guard against such effects, we

normalize all ratio variables to the 1st and 99th percentiles, which effectively assigns the value of the 1st percentile to all values below it, and the value of the 99th percentile to all values above it.

5.2 Descriptive statistics

Table 3 shown in Appendix, provides summary statistics on the estimation sample, and is very similar to Table 1, which compares the composition of wealth and income between those subject to the cap and those not subject to the cap. In the estimation sample however, the number of households subject to the cap is substantially lower than the number of capped individuals who complete a detailed declaration, which is due to our definition of treatment and control groups, which are not a partition of the universe of wealth taxpayers. The income variables appear relatively similar between the treated and control groups in terms of their level, especially regarding their TI. This means that we are comparing relatively similar groups in terms of total income, but consequently quite different in their levels of wealth, as shown in Table 1.

An important element to note is that a quarter of capped households have an average taxable income lower than 50 euros before the reform, meaning nearly negligible taxable incomes. Since we will use the average pre-reform RFR as the denominator to measure the extent of income variations caused by the reform, we provide all the main results using taxable wealth as the denominator rather than taxable income.

5.3 Main results

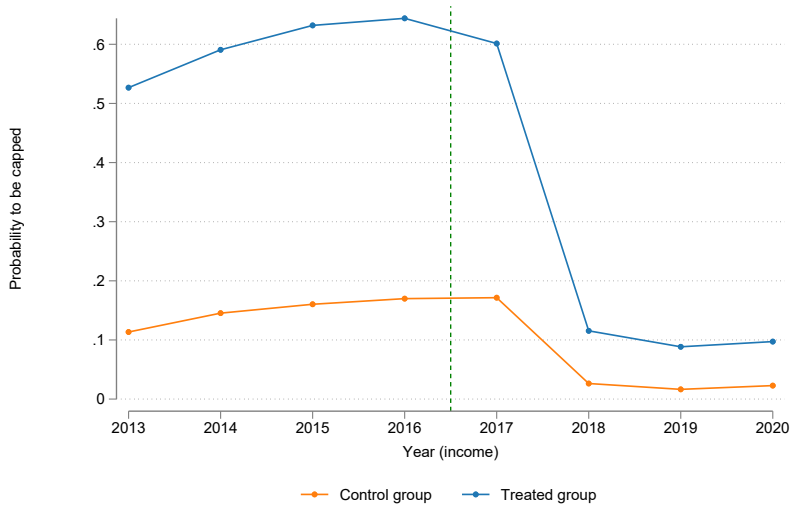
For all the amount variables we analyze, we adopt a normalization relative to the pre-reform taxable income. This reference taxable income is constructed as the average taxable income over the period 2013–2016.

5.3.1 First Stage: Effect on the Likelihood of Being Capped

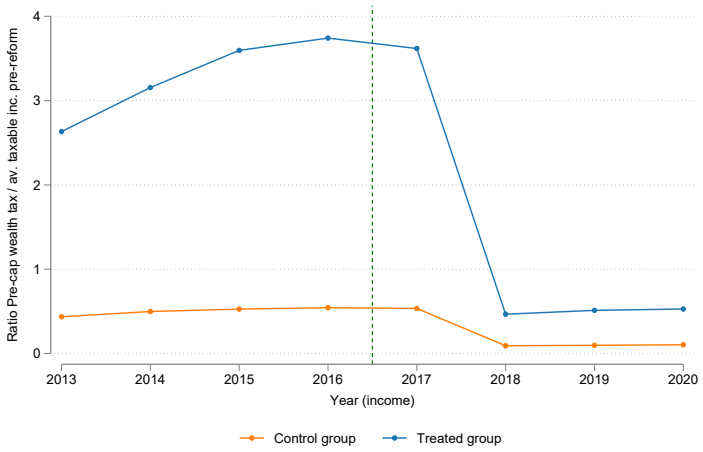
The construction of our treatment and control groups is not directly based on being capped or uncapped prior to the reform. Accordingly, a first test consists of comparing the evolution of the likelihood of being capped between the two groups before the reform in order to capture the magnitude of the shock induced by the elimination of the wealth tax cap in 2017. Figure 4 shows the evolution of the probability of being capped each year within each group (panel a), and the pre-cap wealth tax amount relative to the reference taxable income (panel b). In panel (a), we see that this probability is stable before the reform in the treatment group, hovering around 60% of households, and is also stable but low in the control group, at around 15%. This probability drops almost to zero after 2017 for the control group, and to around 10% for the treatment group. The differential effect of the reform between the two groups is thus about an additional 35 percentage point decrease in the likelihood of being capped for the treatment group. Panel (b) of the figure shows that the pre-cap wealth tax amounted to approximately half of the reference taxable income in the control group prior to the reform. This ratio is about 3.5 in the treatment group. Around the reform, this ratio declines 3 times more among treated group relative to control households.

Figure 4: Evolution of capping status and pre-capping tax rate around the reform, by treatment group

(a) Probability of being capped



(b) Pre-cap wealth tax relative to reference taxable income



NOTES : This table presents the annual average per group (treatment and control) of the probability of being capped (panel a), and of the amount of wealth tax before application of the cap relative to the reference taxable income. The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

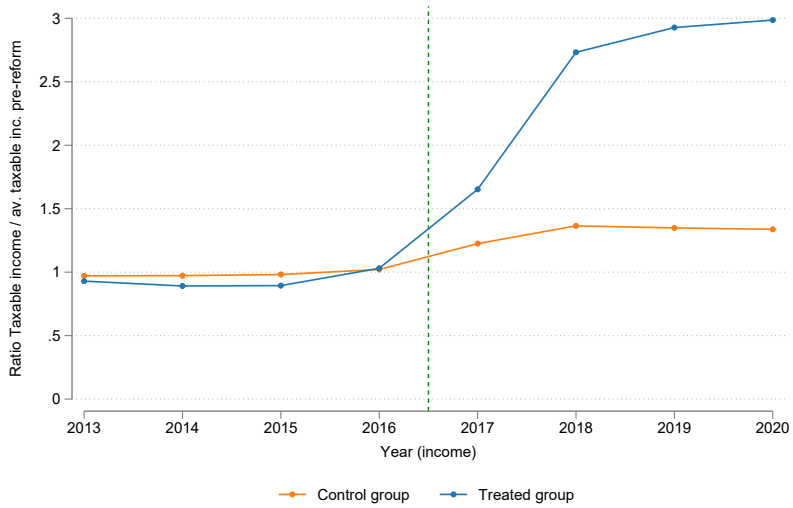
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

5.3.2 Main outcomes

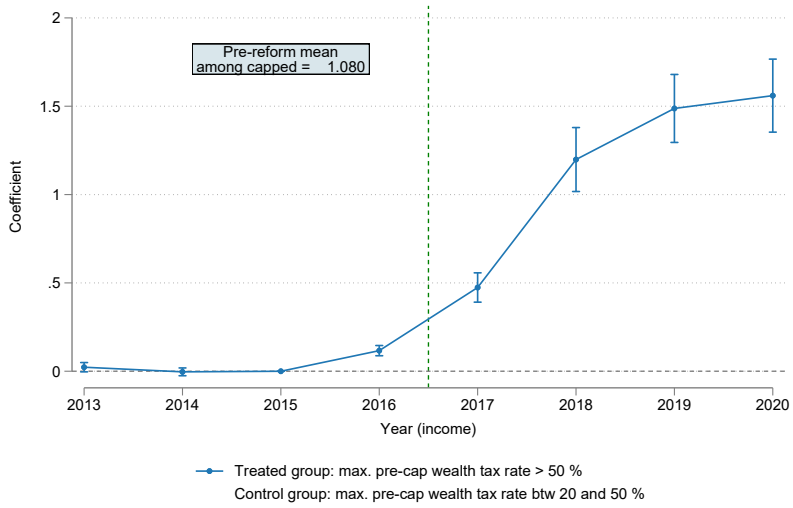
Response on taxable income. Figure 5 presents the response of total taxable income (TI) relative to the average pre-reform household taxable income. For both groups, a very stable evolution is observed

Figure 5: Evolution of taxable income (norm. by value in the reference year) around the reform

(a) Annual averages



(b) Regression coefficients



NOTES : This figure shows the annual average per group (treatment and control) of the taxable income normalized by its value in the reference year (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

around a ratio of 1 for the TI / reference TI. However, a substantial increase in income is observed for the treated households starting from 2017, reaching around 3 times the reference taxable by the end

of the period, while the taxable of control households only increases to around 1.3 times the reference TI.

Return to the Mean and Sensitivity to the Choice of Treatment Definition Period. Figure 6 presents similar estimates to the two previous figures, defining the treatment over alternative periods to the 2012-2016 period. In all cases, it can be observed that it is indeed from 2017 that income increases significantly. This suggests that our way of defining the treatment effectively limits the phenomenon of return to the mean mentioned earlier.

We now present the results of the estimation of equation (1) for the different categories of underlying income to TI: dividends, life-insurance income, securities capital gains, labor and replacement income, rental income, deductible expenses, other capital income.

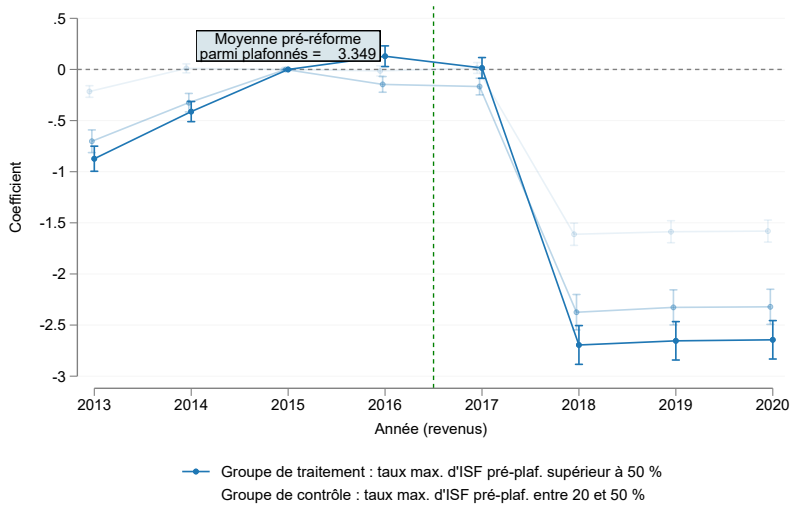
Reaction of dividends Figure 7 presents the results for dividend payments. It can be observed that dividends increase in the control group, notably due to the implementation of the PFU (Bach *et al.*, 2021). Dividends thus rise from 9% to approximately 13% of the average pre-reform TI within the control group, representing an increase of about 40%. However, the increase is even more pronounced within the treatment group, as the ratio of dividends to reference TI increases from 0.12 to 0.23, nearly doubling the amount of dividends received within this group. This is confirmed by the estimation (panel b) with a causal effect of +0.08, indicating a +66% effect due to the removal of the cap.

We further explore the responses of dividends through distributional regressions, using as the dependent variable the probability that dividends exceed various thresholds. Figure 11 in the Appendix presents the relative evolution between the two groups of the probability that dividends exceed 10,000, 100,000, and 1 million euros. The trends are fairly consistent between the groups for all thresholds before the reform, and the probability of exceeding each threshold increases significantly in 2018 and persists thereafter. Surprisingly, the increase in percentage points is quite similar in 2018 and 2019 for all thresholds, even though the initial averages of these variables are quite different. This means that the approximately 1 percentage point increase in the probability of receiving more than 10,000 euros in dividends corresponds to an initial probability of 10.7%, thus constituting an approximately 10% increase from the initial probability. On the other hand, the probability of receiving more than 1 million euros in dividends increases by 0.5 percentage points, but relates to an initial average of 0.2% of households reaching this threshold, indicating that the probability of reaching such a threshold has more than doubled due to the reform. This figure thus informs us that while the average effect of the reform on dividends has a modest magnitude, the frequency of responses is relatively rare, but conditional on reacting, dividend increases tend to be massive.

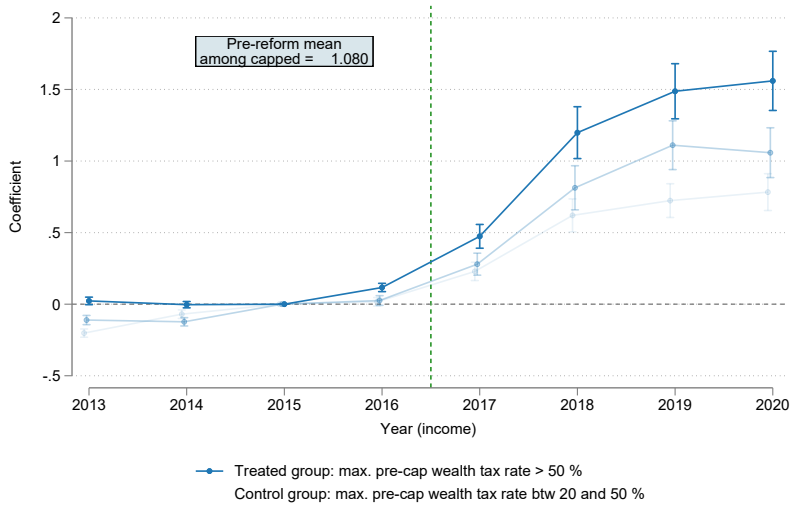
Reaction of realized life-insurance income Figure 8 presents, in panel a, the evolution of realized life-insurance income in each of the groups around the transformation of the ISF into IFI. Once again, a relatively parallel evolution is observed between the two groups before the reform, with a higher level in the treated group, and a slight deviation in the treatment group between 2015 and 2016, attributed to a return to the mean effect, consistent with what is observed for the evolution of the TI. Subsequently, starting from the year of the reform, there is an extremely significant increase in life-insurance income among the treated households, which rise from less than 30% of their average TI in life-insurance income to nearly 60%, almost doubling. Households in the control group also increase their life-insurance income in relative terms, but this increase is much less substantial in absolute terms (+8 percentage points vs. +30 percentage points).

Figure 6: First and second stage regression coefficients, varying the time window for treatment definition

(a) Wealth tax pre-cap relative to taxable income of reference



(b) Taxable income relative to taxable income of reference

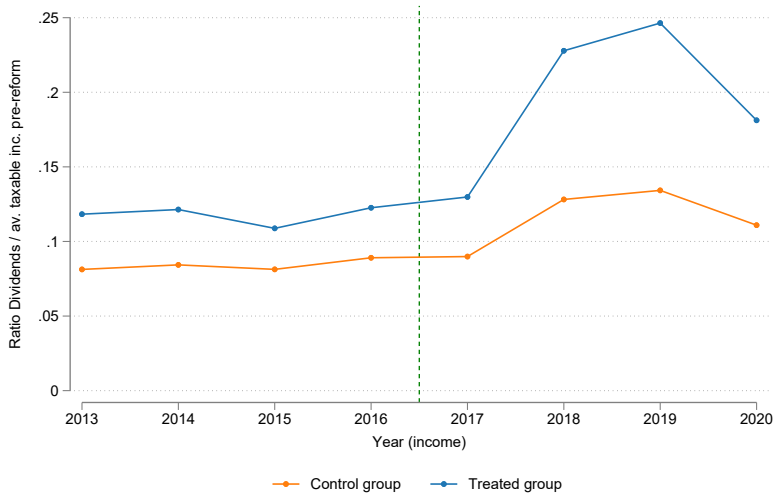


NOTES: This figure shows the regression coefficients (β_d in equation (1)) using as the dependent variable the ratio of pre-capping wealth tax (panel a) or taxable income (panel b) relative to the reference taxable income. In the first version presented, the treatment group is made up of households with a "minimum" ISF/income ratio between 2012 and 2016 greater than 50 %, and the control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 between 20 and 50 %. The other versions presented use the 2012-2015 and 2012-2014 periods as the income window.

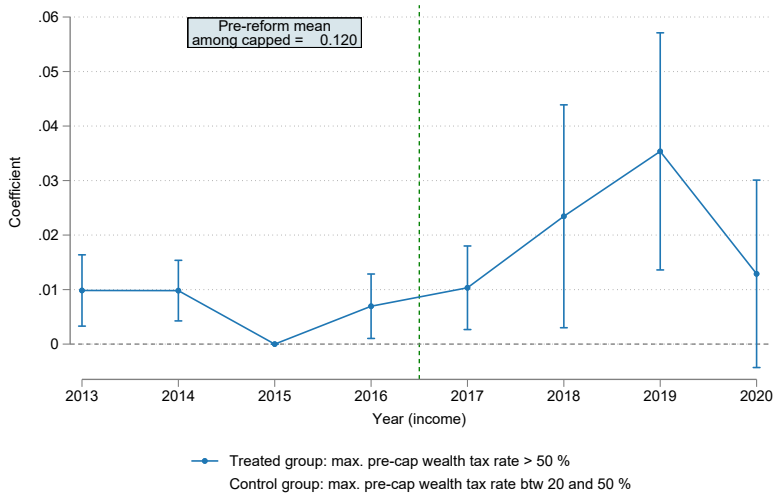
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 7: Evolution of dividends in relation to the taxable income reference around the reform

(a) Annual averages



(b) Regression coefficients

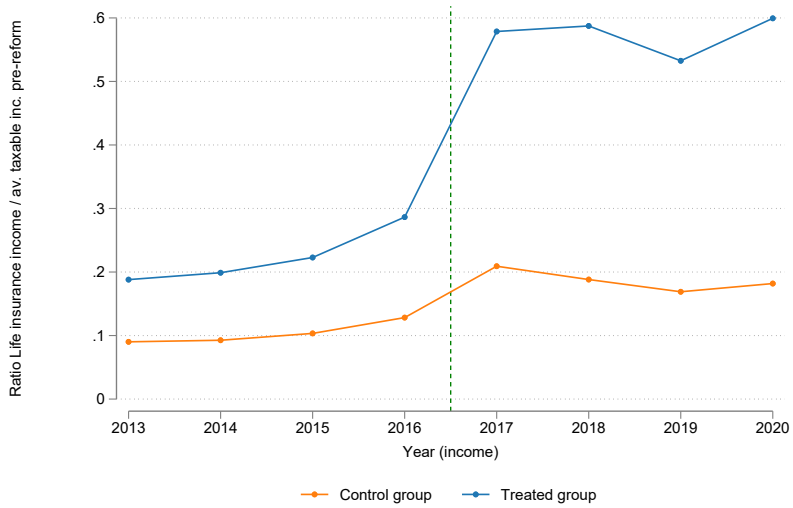


NOTES : This figure shows average annual dividends per group (treatment and control), relative to the reference taxable income (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

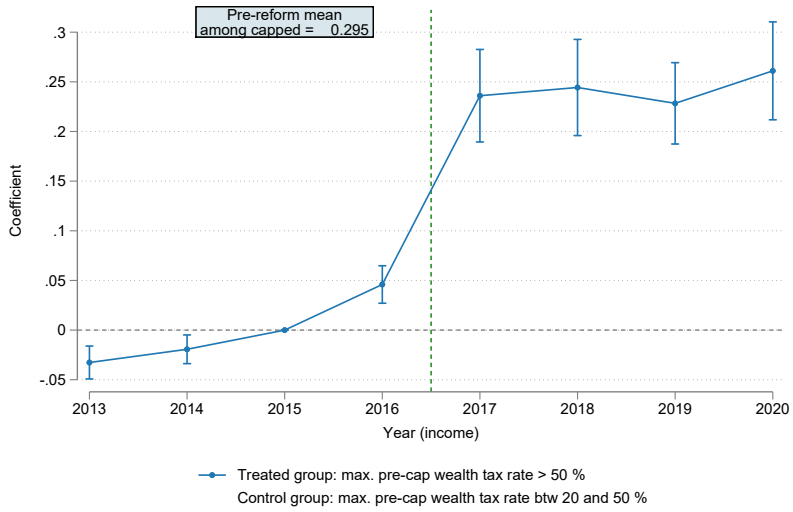
We also study the probability that life-insurance income exceeds different thresholds of realized life-insurance income. Figure 12 in the Appendix presents the estimation results. Unlike dividends, it can be observed that higher thresholds here are associated with weaker effects, indicating that the

Figure 8: Evolution of realized life-insurance income in relation to the taxable income reference around the reform

(a) Annual averages



(b) Regression coefficients



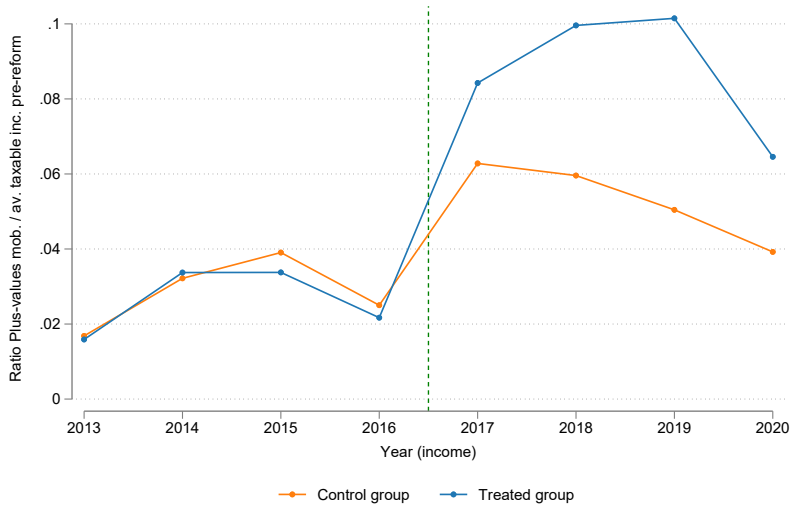
NOTES: This figure shows the annual average per group (treatment and control) of realized life-insurance income compared to the reference taxable income (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

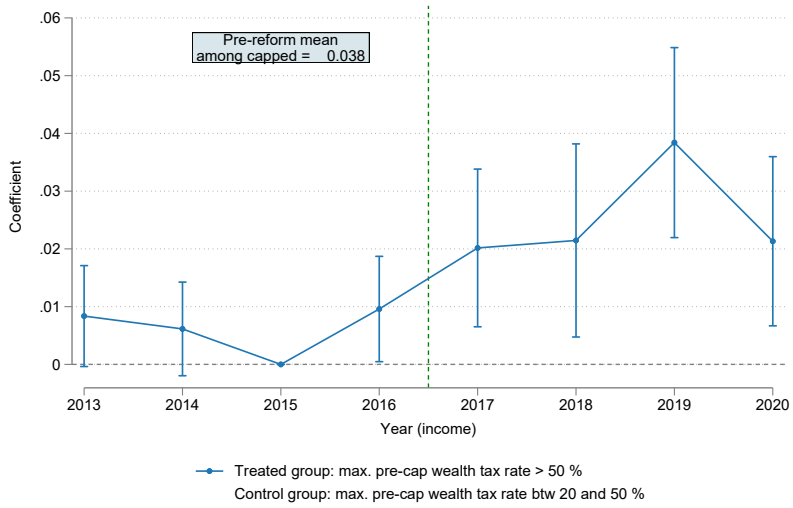
average effect on life-insurance income is not as strongly influenced by rare, substantial reactions as seen with dividends.

Figure 9: Evolution of capital gains on securities in relation to the taxable income of reference around the reform

(a) Annual averages



(b) Regression coefficients



NOTES: This figure shows the average annual capital gains per group (treatment and control) relative to the reference taxable income (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Reaction of Capital Gains Figure 9 presents the evolution of capital gains realized each year by each of the two groups. It is worth noting that the underlying consumption associated with these capital gains can be much higher than the figures we show, as we measure the capital gains, not the

sales proceeds, often after significant deductions. In panel a, it can be observed that the two groups are very similar during the period preceding the reform, both in terms of trends and in terms of the level of their capital gains relative to their average TI. A subsequent increase is then observed in the year of the reform, affecting both groups, but with a magnitude greater by about 4 percentage points of the average TI among the treated individuals, as confirmed by the estimation results presented in panel b.

Reaction from wages and pensions We also study the reaction of wages and pensions, which is presented in Figure 13 in the Appendix. It should be noted that while households are only likely to act on their wage incomes, the population we are studying is relatively older, and thus we include retirement pensions in this category to avoid small differences in the probability of retirement affecting the average values of wage incomes. In panel a of the figure, significant stability is observed in both the control group and the treatment group before the 2017 reform. Subsequently, there is a notable increase in wage and pension incomes of the treatment group, on the order of 30% of the average TI, while the control group remains extremely stable. Panel b confirms, through regression coefficients, the absence of pre-treatment differential trends and the significant post-reform divergence.

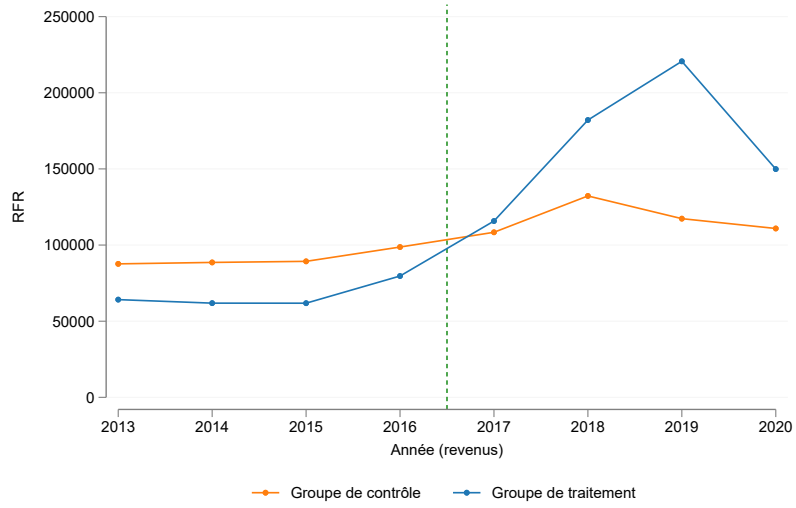
Reaction of real estate income Another interesting question is whether income obtained from real estate, for instance through rental, reacted to the tax reform. Figure14 in the Appendix presents the evolution of rental incomes around the reform for both groups. Differential trends between the groups are observed as early as 2016, i.e., before the reform could have affected the groups. This makes it difficult to causally interpret the evolution of these incomes, even though their evolution is quantitatively significant over the period relative to the TI. One important point to note, however, is that the average of these incomes among the treatment group is strongly negative, indicating that rental incomes were used before the reform as a means to reduce the taxable reference income of these households through recorded deficits.

Reaction of other types of income. Finally, Figure **??** presents the estimation coefficients corresponding to the reactions of other income categories around the reform. We observe either an absence of effect or differential trends between the groups. It should be noted, however, that except for other capital incomes, whose pre-reform average is relatively high (but constitute a category that is challenging to grasp due to changes in the tax declaration form), the other categories have coefficients and pre-reform associated averages that are of very low magnitude, and therefore they are of second order in explaining the reaction of the total TI.

Budget impact. The figure 10 presents the evolution of absolute amounts of taxable income declared in each of the groups around the reform transforming the ISF into IFI, and confirms the earlier result in relative terms: the taxable income declared triples in amount following the transformation of the wealth tax. In other words, the effect of income reclassification appears to be homogeneous across the income distribution. The budgetary implications of this estimation can be significant since the budgetary effect of the estimated cap without behavioral response to income was around 1.1 billion euros in 2016. In our sample of 3,900 capped households per year, which does not include the few dozen households with taxable wealth exceeding 200 million euros, this static tax expenditure was around 320 million euros, but the multiplication by 2.75 of the amount of taxable income declared without a cap (according to our estimate) would have generated approximately 340 million euros in additional revenue at a tax rate of 75%. In other words, once behavioral responses are included, the

budgetary cost of the cap turns out to be twice as high as the static cost. Consequently, the transformation of the cap resulted in a surplus of PFU and CEHR revenues estimated in our sample to be equal to 155 million euros, which is approximately half of the static cost of the measure. These figures should of course be interpreted in light of the assumption of homogeneity of the causal effect on incomes that we estimate, but also the conservative assumption of a causal effect of the treatment reduced to the value of the effect that we estimate in intention-to-treat and not in actual treatment.

Figure 10: Evolution of declared taxable income in levels, around the reform



NOTES: This figure shows the average annual taxable income per group (treatment and control). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

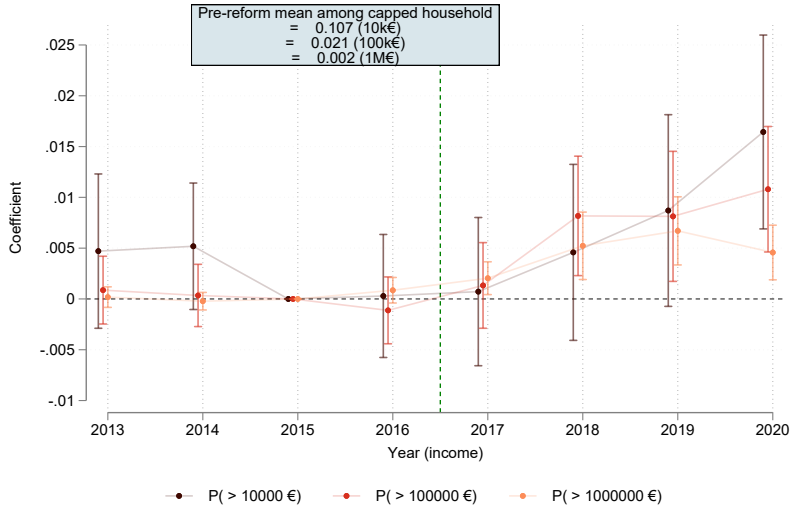
6 Conclusion

In this paper, we show that the wealth tax cap is mostly binding among households at the top of the wealth distribution of the wealth tax payers. We further show that they own liquid yet income-tax-deferred assets. Exploiting the cancellation of the wealth tax in 2017, we show, in a diff-in-diffs setup, that these households quickly generated taxable income out of those financial assets. Additional results show that when the wealth tax cap was temporarily suspended in 2012, they did not turn those assets into income in order to pay the tax. We conclude that in our setting caps reduce the proceeds from wealth taxes precisely when wealth would be a better proxy for taxpaying ability than income. Future iteration of the paper will make this point formally within simple model of wealth taxation relating the optimal level of wealth and income tax and of wealth tax cap to the degree of liquidity of assets and of verifiability of capital income.

ONLINE APPENDIX

A Additional Figures and Tables

Figure 11: Regression coefficients for the probability of exceeding different dividend thresholds under the ISF/IFI reform



NOTES: This figure shows the associated regression coefficients (β_d in equation (1)), using as dependent variables the probabilities of exceeding different dividend amounts (10 000 € in brown, 100 000 € in red, 1 million € in orange). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

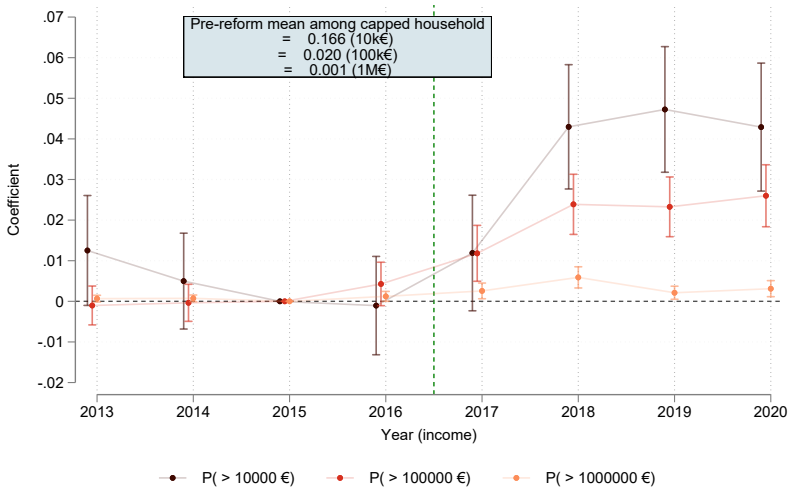
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Table 3: Summary statistics on the estimation sample depending on their treatment status (averages over the period 2013–2016)

	Control Group					Treatment Group				
	Mean	Standard Deviation	Median	1st Decile	9th Decile	Mean	Standard Deviation	Median	1st Decile	9th Decile
Probability of being capped	0.147	0.354	0	0	1	0.598	0.490	1	0	1
Wealth Subject to Wealth Tax (pre-cap)	40754.1	95393.2	17289.5	4687	83726	116018.3	235607.1	36555	4237	279783
Wealth Subject to Wealth Tax (post-cap)	30795.5	58282.2	16176	4253	66620	35426.0	71221.3	14890.5	0	83778
Income Tax	16491.3	78024.5	3446	-879	37490	9050.0	58568.6	421	-1979	22553
Taxable Assets (Million Euros)	4.877	6.999	3.211	1.645	8.978	10.090	16.240	5.034	1.570	21.761
Total Gross Income	91064.3	226528.0	49344	12734	183021	66886.4	226622.1	22864.5	49	159138
Salary + Pensions	36365.4	45784.6	25560	0	79586	31091.9	54542.2	12494.5	0	84821
Dividends	15943.8	125324.1	147	0	22766	11682.6	88022.0	4	0	11421
Rental Income	19546.4	83781.1	5398.5	0	59754	-5170.7	126933.5	0	-7551	28159
Capital Gains from Securities	3966.3	167421.2	0	0	5609	-6007.1	791222.1	0	0	2401
Industrial and Commercial Profits	170.2	32134.9	0	0	0	-2793.3	47324.4	0	0	0
Non-Commercial Profits	433.3	11368.0	0	0	0	250.1	10880.6	0	0	0
Life Insurance Income	6901.4	35779.7	0	0	14025	9725.1	84672.4	0	0	18015
Deductible Expenses	3004.9	15609.3	538	0	6705	2857.0	12325.3	124	0	5700
Other Capital Income	5717.9	36123.8	777	0	12352	5949.0	24694.6	265	0	12169
Income Tax	19650.9	65242.4	4235.5	-903	46791	10776.6	37279.0	735	-2055	29088
Residual (Total Gross Income - Other Income)	4985.9	128403.5	-3292.5	-9457	10001	24996.3	792025.4	-2667.5	-11286	25472
Total Gross Income / Reference Total Gross Income	0.987	0.343	0.992	0.632	1.302	0.936	0.503	0.974	0.178	1.451
Salary + Pensions / Reference Total Gross Income	0.553	0.438	0.526	0	1.033	0.634	0.822	0.444	0	1.288
Dividends / Reference Total Gross Income	0.0840	0.196	0.00316	0	0.281	0.118	0.290	0.000314	0	0.400
Rental Income / Reference Total Gross Income	0.126	0.979	0.102	0	0.760	-0.215	1.961	0	-0.176	0.825
Capital Gains from Securities / Reference Total Gross Income	0.0283	0.153	0	0	0.0768	0.0263	0.193	0	0	0.0611
Industrial and Commercial Profits / Reference Total Gross Income	-0.000582	0.0377	0	0	0	-0.00972	0.0719	0	0	0
Non-Commercial Profits / Reference Total Gross Income	0.00387	0.0283	0	0	0	0.00462	0.0319	0	0	0
Life Insurance Income / Reference Total Gross Income	0.104	0.266	0	0	0.306	0.224	0.500	0	0	0.798
Deductible Expenses / Reference Total Gross Income	0.0407	0.136	0.0116	0	0.0619	0.0942	0.302	0.00399	0	0.139
Other Capital Income / Reference Total Gross Income	0.0839	0.189	0.0133	0	0.234	0.171	0.385	0.0104	0	0.523
Wealth Subject to Wealth Tax (pre-cap) / Reference Total Gross Income	0.502	1.250	0.337	0.195	0.723	3.281	5.705	1.289	0.459	7.148
Wealth Subject to Wealth Tax (post-cap) / Reference Total Gross Income	0.373	0.363	0.318	0.179	0.582	0.951	1.316	0.589	0	2.018
Residual (Total Gross Income - Other Income) / Reference Total Gross Income	0.0882	1.272	-0.0513	-0.234	0.198	0.473	3.260	-0.0527	-0.771	0.905
Total Gross Income ¿ 100 (indicator)	0.984	0.127	1	1	1	0.891	0.311	1	0	1
Salary + Pensions ¿ 100 (indicator)	0.881	0.323	1	0	1	0.699	0.459	1	0	1
Dividends ¿ 100 (indicator)	0.526	0.499	1	0	1	0.400	0.490	0	0	1
Rental Income ¿ 100 (indicator)	0.627	0.483	1	0	1	0.454	0.498	0	0	1
Capital Gains from Securities ¿ 100 (indicator)	0.190	0.392	0	0	1	0.149	0.356	0	0	1
Industrial and Commercial Profits ¿ 100 (indicator)	0.0212	0.144	0	0	0	0.0261	0.159	0	0	0
Non-Commercial Profits ¿ 100 (indicator)	0.0262	0.160	0	0	0	0.0264	0.160	0	0	0
Life Insurance Income ¿ 100 (indicator)	0.459	0.498	0	0	1	0.413	0.492	0	0	1
Deductible Expenses ¿ 100 (indicator)	0.682	0.466	1	0	1	0.512	0.500	1	0	1
Other Capital Income ¿ 100 (indicator)	0.673	0.469	1	0	1	0.567	0.496	1	0	1
Number of Tax Households			13639					3856		
Observations			54556					15424		

NOTES : Ce tableau présente des statistiques descriptives sur les variables utilisées comme variables dépendantes dans l'estimation en différence-de-différences, selon l'appartenance au groupe de traitement ou au groupe de contrôle. Le groupe de traitement est constitué des foyers ayant un ratio "minimal" d'ISF / revenu entre 2012 et 2016 supérieur à 50 %. Le groupe de contrôle est constitué des foyers ayant un ratio "minimal" d'ISF / revenu entre 2012 et 2016 compris entre 20 et 50 %. L'échantillon de foyers fiscaux est cylindré et le nombre d'observations indiqué correspond au nombre d'observations avant la réforme.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 12: Regression coefficients for the probability of exceeding different thresholds of realized life insurance income around the ISF/IFI reform

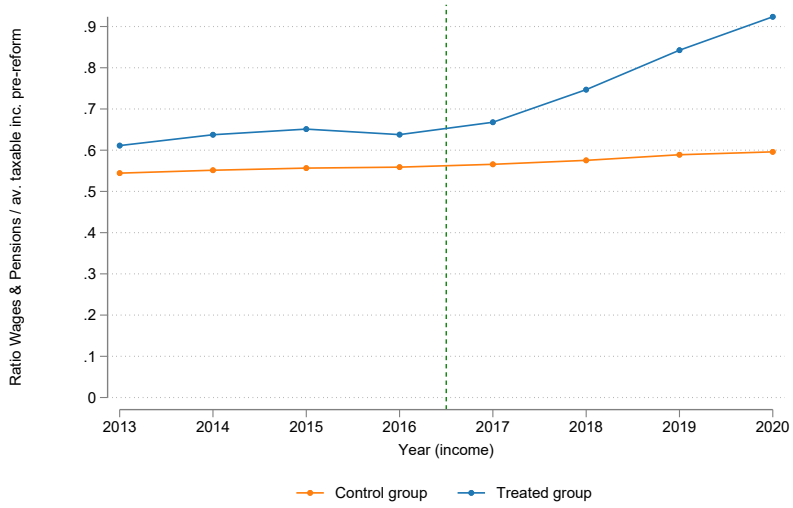


NOTES: This figure shows the associated regression coefficients (β_d in equation (1)), using as dependent variables the probability of exceeding different amounts of realized life insurance income (10 000 euro in brown, 100 000 euro in red, 1 million euro in orange). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

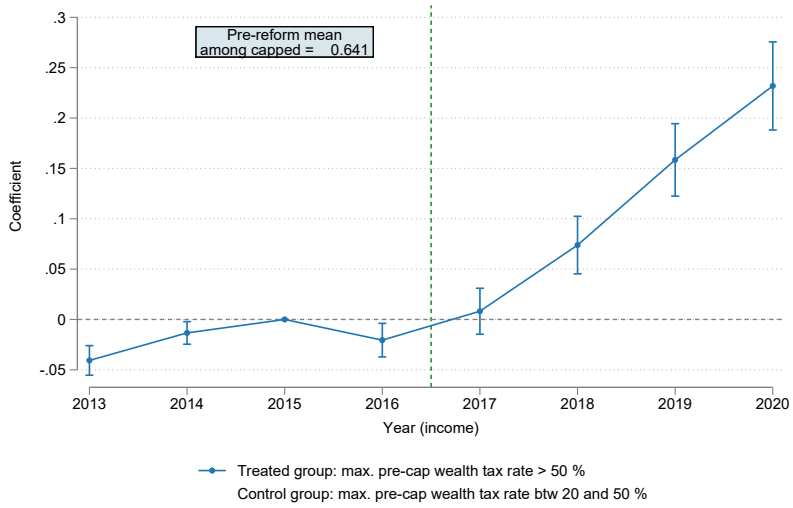
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 13: Evolution of salaries and retirement pensions in relation to the reference taxable income around the reform

(a) Annual averages



(b) Regression coefficients

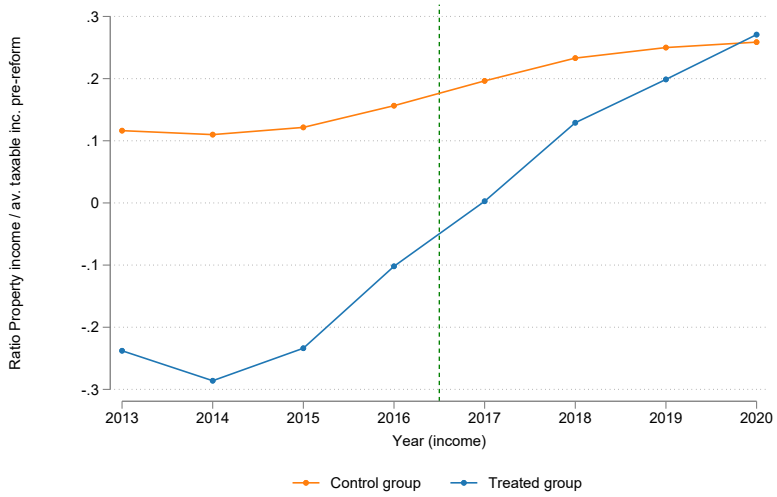


NOTES : This figure shows the annual average per group (treatment and control) of wages and pensions relative to the reference taxable income (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

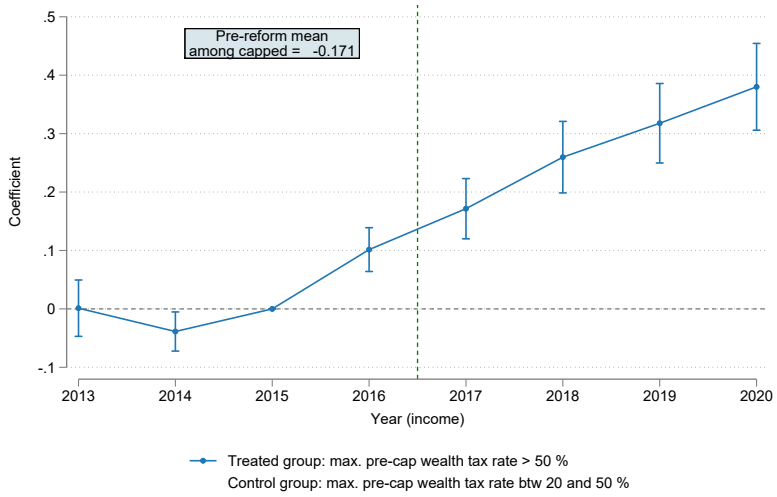
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 14: Evolution of property income in relation to the taxable income reference around the reform

(a) Annual averages



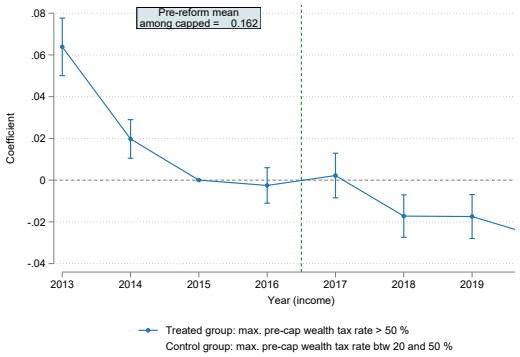
(b) Regression coefficients



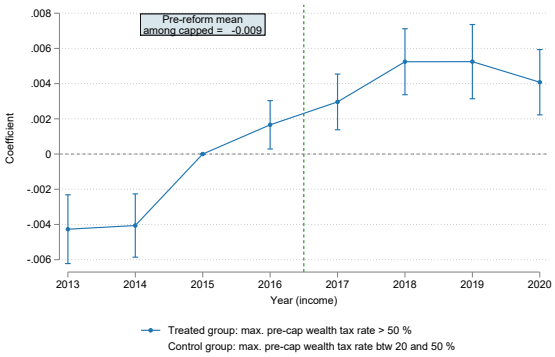
NOTES : This figure shows the annual average per group (treatment and control) of taxable income relative to reference taxable income (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 15: Evolution of other income categories in relation to the reference taxable income around the reform

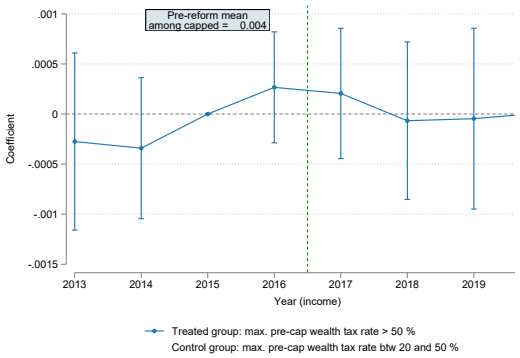
(a) Other capital income



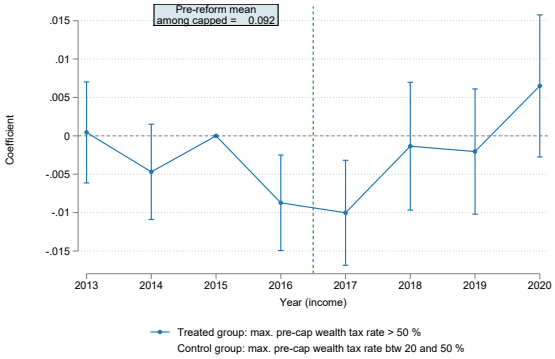
(b) Business income—BIC



(c) Non commercial business income—BNC



(d) Deductible expenses

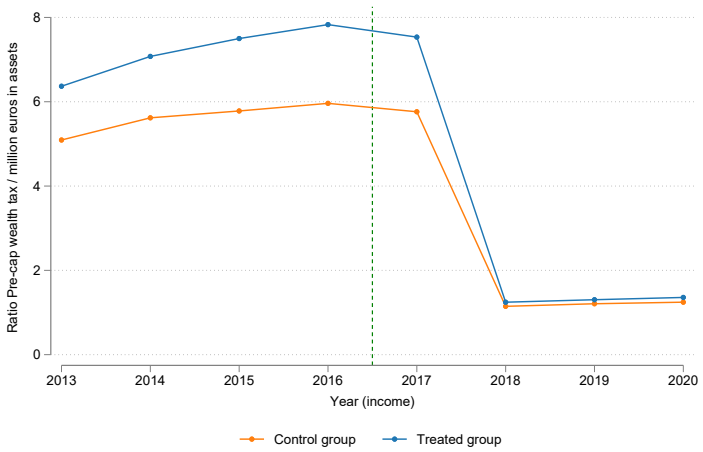


NOTES: This figure shows the annual average per group (treatment and control) of taxable income relative to the reference taxable income (panel a), and the associated regression coefficients (β_d in the equation (1)) using as dependent variables other capital income (panel a), business income—BIC (panel b), non-commercial business income—BNC (panel c), and deductible expenses (panel d). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 16: Evolution of capping status and pre-capping tax rate around the reform, by treatment group

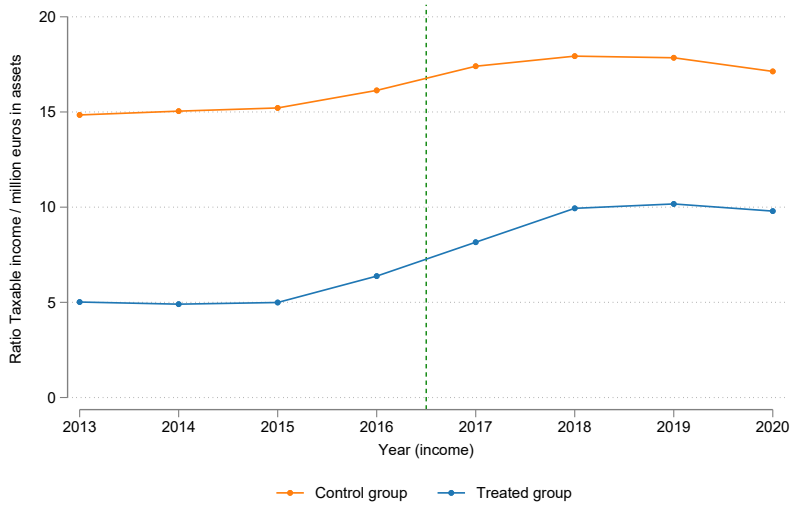
(a) Pre-cap wealth tax relative to taxable wealth



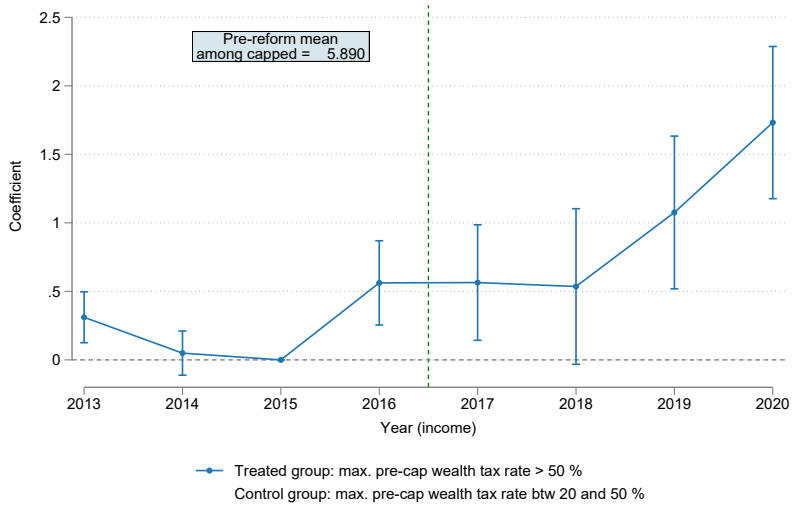
NOTES : This table presents the annual average per group (treatment and control) of the amount of wealth tax before application of the cap relative to the reference taxable wealth. The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 17: Evolution of taxable income (norm. by taxable wealth in the reference year) around the reform

(a) Annual averages



(b) Regression coefficients

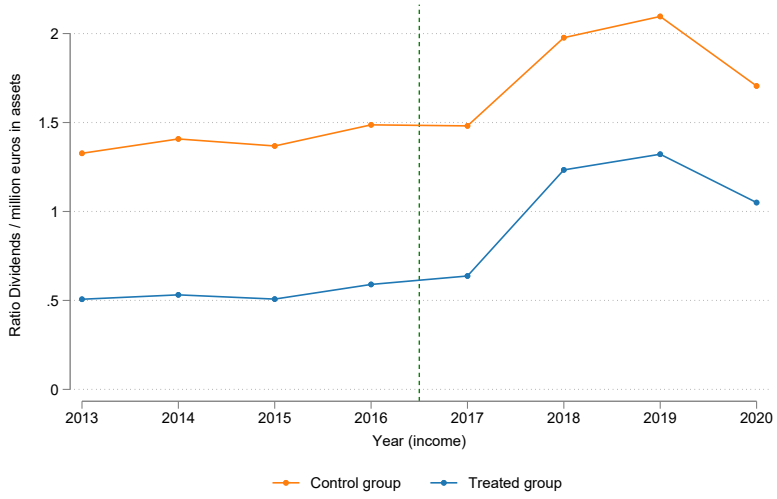


NOTES : This figure shows the annual average per group (treatment and control) of the taxable income normalized by taxable wealth in the reference year (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

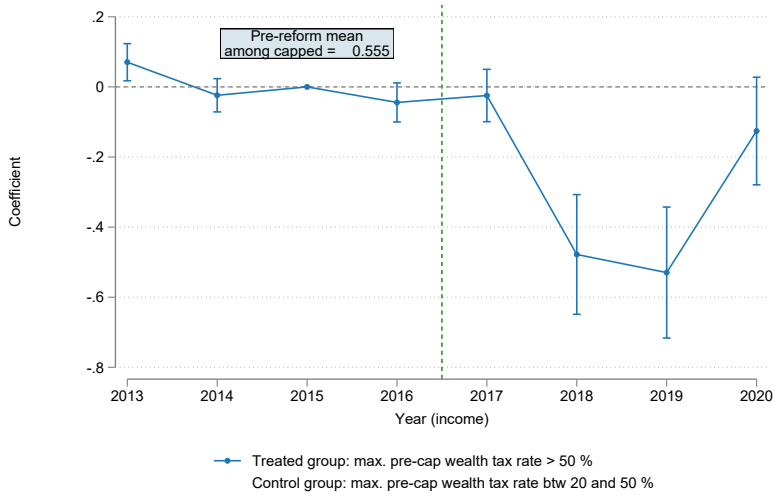
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 18: Evolution of dividends in relation to the reference taxable wealth around the reform

(a) Annual averages



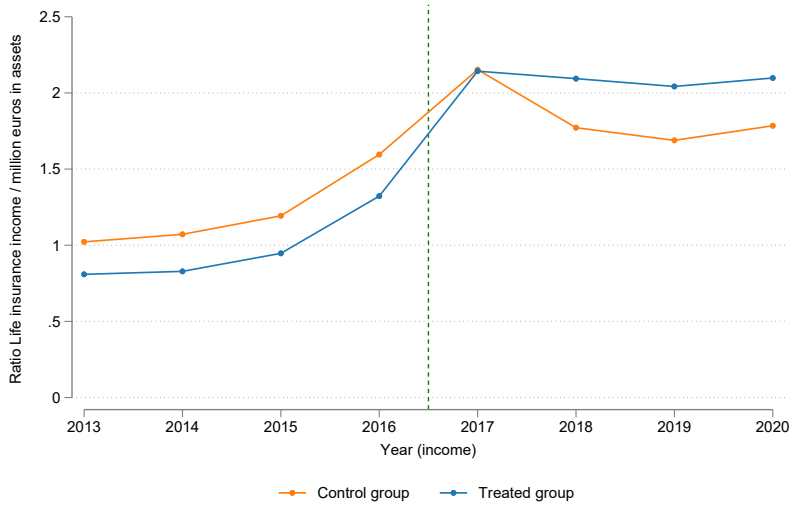
(b) Regression coefficients



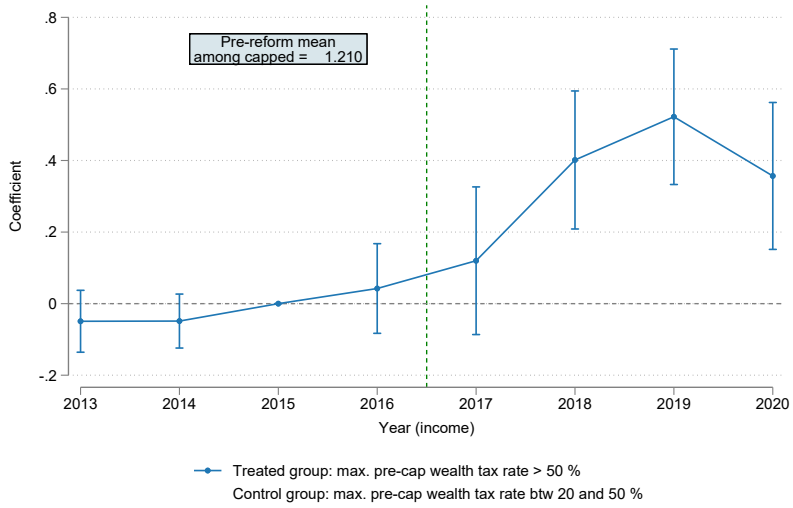
NOTES : This figure shows average annual dividends per group (treatment and control), relative to the reference taxable income (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 19: Evolution of realized life-insurance income in relation to the taxable income reference around the reform

(a) Annual averages



(b) Regression coefficients

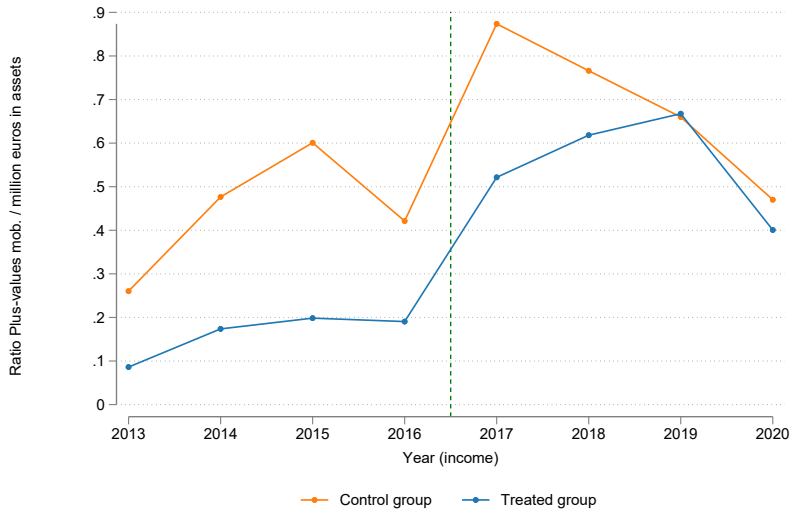


NOTES: This figure shows the annual average per group (treatment and control) of realized life-insurance income compared to the reference taxable wealth (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.

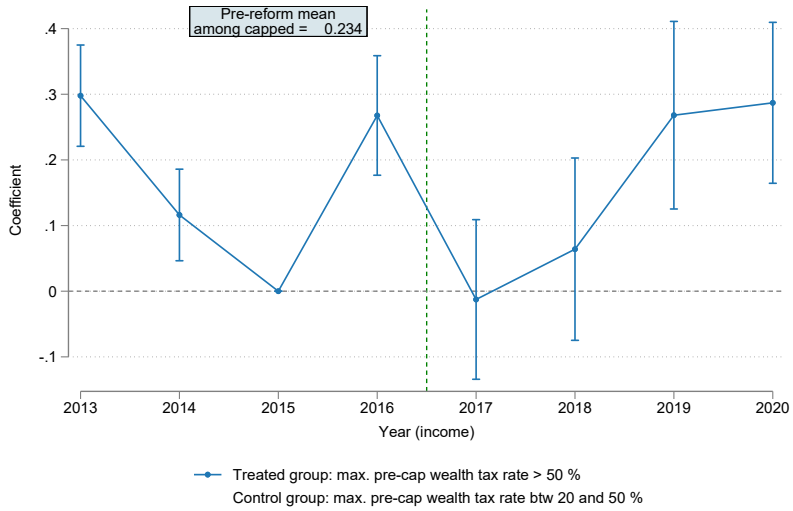
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

Figure 20: Evolution of capital gains on securities in relation to the taxable wealth around the reform

(a) Annual averages



(b) Regression coefficients



NOTES: This figure shows the average annual capital gains per group (treatment and control) relative to the reference taxable wealth (panel a), and the associated regression coefficients (β_d in equation (1)). The treatment group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 greater than 50 %. The control group is made up of households with a "minimum" wealth tax/income ratio between 2012 and 2016 of between 20 and 50 %.
SOURCES : ISF-IFI (DGFiP), POTE (DGFiP).

References

ADVANI, A. and TARRANT, H. (2021). Behavioural responses to a wealth tax. *Fiscal Studies*, **42** (3-4), 509–537.

BACH, L., BOZIO, A., FABRE, B., GUILLOUZOUIC, A., LEROY, C. and MALGOUYRES, C. (2021). Follow the money! Why dividends overreact to flat tax reforms.

BRÜLHART, M., GRUBER, J., KRAPF, M. and SCHMIDHEINY, K. (2022). Behavioral responses to wealth taxes: Evidence from switzerland. *American Economic Journal: Economic Policy*, **14** (4), 111–150.

JAKOBSEN, K., JAKOBSEN, K., KLEVEN, H. and ZUCMAN, G. (2020). Wealth taxation and wealth accumulation: Theory and evidence from denmark. *The Quarterly Journal of Economics*, **135** (1), 329–388.

LONDOÑO-VÉLEZ, J. and ÁVILA-MAHECHA, J. (2021). Enforcing wealth taxes in the developing world: Quasi-experimental evidence from colombia. *American Economic Review: Insights*, **3** (2), 131–148.

LOUTZENHISER, G. and MANN, E. (2021). Liquidity issues: solutions for the asset rich, cash poor. *Fiscal Studies*, **42** (3-4), 651–675.

OECD (2018). *The Role and Design of Net Wealth Taxes in the OECD*. OECD.

SAEZ, E. and ZUCMAN, G. (2019). *The triumph of injustice: How the rich dodge taxes and how to make them pay*. WW Norton & Company.

— and — (2022). Wealth taxation: lessons from history and recent developments. In *AEA Papers and Proceedings*, American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203, vol. 112, pp. 58–62.

SCHEUER, F. and SLEMROD, J. (2021). Taxing our wealth. *Journal of Economic Perspectives*, **35** (1), 207–230.

SEIM, D. (2017). Behavioral responses to wealth taxes: Evidence from sweden. *American Economic Journal: Economic Policy*, **9** (4), 395–421.