WEALTH TAXATION AND PORTFOLIO ALLOCATION

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Abstract

Should governements tax different assets at different rates? The answer depends crucially on the cross-elasticities between asset classes, of which few estimates exist. This paper estimates the cross-elasticity between the two main components of household wealth: financial and real estate assets. In 2017, France transformed its wealth tax into a real estate tax, thereby eliminating wealth taxation on financial assets. Using comprehensive linked administrative income and wealth data from France, I study the effect of this unique reform by contrasting the responses of French residents to non-residents, who remained subject to the wealth tax but were unaffected by the reform. Five years after the reform, French taxpayers have reallocated on average 5% of their real estate holdings toward financial assets. These responses translate into a quite modest cross-elasticity: a one percentage point differential increase in the tax rate on real estate causes taxpayers to reallocate 4.7% of their real estate assets to financial assets. This reallocation is driven by reduced ownership in investment properties rather than owner-occupied housing, and coincides with a surge in dividend incomes. Overall, I estimate that behavioral responses account for approximately 7% of the revenue loss due the reform, indicating that the mechanical impact dominates. These findings have two key implications. First, from an equity perspective, exempting financial assets from wealth taxation primarily served as a tax cut for wealthy households in France. Second, the efficiency cost of taxing real estate more heavily than other assets appears limited. JEL codes: H20, H31, E21, D14, G11.

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1 Introduction

Debates among researchers on the desirability and the enforceability of wealth taxes are old (Judd, 1985; Chamley, 1986) and still ongoing (Piketty, septembre 2013; Saez and Zucman, 2019; Wojciech, 2019). Yet, the empirical evidence to inform this discussion remains scarce. A critical yet understudied dimension is how to design of the tax base itself. In practice, wealth taxes rarely apply uniformly across assets: business assets often receive preferential treatment or full exemptions, retirement savings typically remain untaxed, and real estate is commonly subject to separate tax regimes altogether. While a growing literature studies how taxpayers' level of taxable wealth responds to wealth tax rates, we know remarkably little about how the allocation of wealth responds to the structure of the tax base or to differential treatment across asset classes.

The question has substantial policy relevance. First, while preferential treatment for certain asset classes may be optimal in order to encourage some specific investments (Scheuer, 2013), it may also simply constitute a windfall for existing investors in the absence of portfolio reallocation. Second, from an optimal taxation perspective, a strong rebalancing—synonymous with large cross-base responses—significantly reduces potential revenues from more heavily taxed assets. The magnitude of the reallocation response thus provides an indication of the efficiency cost of differential asset taxation.

This paper tackles this question by focusing on the effect of differential wealth taxation between perhaps the two broadest asset class categories: real estate and financial assets. A typical argument for relatively higher taxes on real estate is that its value today primarily derives from the underlying land (Knoll, Schularick and Steger, 2017), which is inelastic to taxation. To study this question, I leverage a major wealth tax reform introduced in France in 2017 that transformed the wealth tax into a real estate tax. Announced by then-candidate Emmanuel Macron during the 2017 presidential election campaign, this policy aimed to stimulate economic activity by transforming the French wealth tax into a "tax on the real estate rent", thus excluding all assets financing the "real economy" from the tax base. This unique policy change allows me to estimate for the first time the cross-elasticity between real estate and financial assets. Using comprehensive linked administrative income and wealth microdata for France, I show that households rebalanced their portfolio in response to the reform, but that the underlying cross-elasticity between the two assets classes is overall modest. From an equity perspective, this result suggests that exempting financial assets from wealth taxation in France primarily operated as a tax cut for wealthy households. However, the estimated modest cross-elasticity also implies that the efficiency cost of taxing real estate more heavily than other assets is limited.

The French setting is a unique laboratory to study the portfolio reallocation responses to wealth taxes for several reasons. First, in most contexts, policy variation affecting various asset classes differently comes

together with other changes in the tax schedule, making the identification of causal effects difficult. In contrast, the 2017 French wealth tax reform removed all financial assets from the wealth tax base while leaving other features of the tax schedule unchanged. Second, the reform did not increase the wealth tax rate on real estate; thus, incentives to hold this asset are reduced only *relative* to financial assets and there is no reason for taxpayers to adjust their level of taxable real estate through under-reporting, tax avoidance or other motives unrelated to portfolio rebalancing.[1] Third, individuals owning assets in France without being French residents for tax purposes benefited from a full exemption on their financial investments before 2017. As a result, the wealth tax base of non-residents only consists of their French real estate holdings, both before and after 2017. Thus, the reform does not affect their relative incentives to hold housing versus financial assets, in contrast to French taxpayers for whom real estate becomes relatively less profitable. This feature of the tax schedule offers a well defined control group, allowing me to estimate the response to the reform by comparing French residents to non-French residents in a difference-in-differences setting.

I estimate households' reallocation in two ways. First, I study how households' stock of real estate evolves around the reform. Second, I circumvent the fact that financial assets are no longer reported after the reform by focusing on capital income, which remains taxed. In particular, I investigate how income flows generated by real estate and financial assets differentially respond to the policy change. My empirical strategy focuses on households whose real estate exceeds the exemption threshold—1.3 million euros—and who would therefore remain liable to the wealth tax after the reform in the absence of any response.[2]

In the years following the reform, I find that treated taxpayers reduce their real estate holdings relative to the control group of non-residents. My benchmark difference-in-differences estimate shows that, five years after the reform, French taxpayers hold on average 5% less housing wealth compared to the pre-reform period. This five-year observation window after the reform allows me to account for potential temporary portfolio adjustment frictions (Duffie, 2010). Crucially, using non-residents as a counterfactual helps control for general equilibrium effects on house prices, ensuring that the observed changes reflect adjustments in quantities held rather than price fluctuations. The evolution of financial capital income received by French taxpayers around the reform confirms the existence of a rebalancing response. Consistent with taxpayers reallocating their wealth away from real estate and towards financial assets, I show that treated households receive less rental income and more financial capital income—mostly dividends—after the reform. Importantly, the real estate tax base after the reform is comprehensive and includes housing assets held both directly and through a corporate vehicle. As a result, the response should be interpreted as a decrease in the

[1] I do not claim that wealth taxpayers do not under-report their assets or engage in offshore evasion or avoidance, but rather that these behaviors are likely orthogonal to the reform.

[2] The French wealth tax applies to taxpayers owning more than 1.3 million euros in taxable wealth. Below this threshold, individuals are not subject to the wealth tax.

amount of real estate owned by French households rather than as a change in the way they hold this asset type.

The main identifying assumption required to interpret the post-reform divergence in real estate holdings between French residents and non-residents as a portfolio reallocation is that house price fluctuations affect both groups similarly. The absence of differential pre-trends in reported housing wealth prior to the reform is a first evidence lending credibility to this assumption. Then, leveraging a dataset from Lei (2023) combining the universe of property tax records in France with comprehensive property transactions data, I construct price indices to assess whether properties owned by treated French taxpayers and non-residents exhibit similar price dynamics over the entire period. I find that the properties held by both groups evolved on a strikingly similar trend over the entire 2013-2022 period, confirming that non-residents serve as a valid comparison group.

The estimated average response masks sizeable heterogeneity. First, housing has a dual role, used both as a consumption and an investment good, and each type of housing adjusts differently to the reform. In line with Martínez-Toledano (2022) who studies reshuffling responses to housing busts, I find that taxpayers with a higher share of investment properties in their overall housing wealth engage in a greater degree of portfolio rebalancing after the reform. Households whose real estate mainly consists of their primary home do not respond at all. Second, I find that wealth taxpayers using tax preparers are more than twice as responsive as others. Third, in line with the literature on tax incentives for retirement savings (Attanasio and DeLeire, 2002; Chetty et al., 2014), I show that the share of active response is modest: the observed reallocation is driven by a minority of active taxpayers, while the majority remains passive. As expected, these active taxpayers hold a greater share of investment housing and are more likely to use tax preparers, but they are also less frequently married and less likely to live in Paris.

The reallocation estimated so far is a response on the intensive margin, relying on taxpayers who report their level of real estate wealth and thus who remain liable to the wealth tax. However, French taxpayers also respond to the reform along the extensive margin, namely by reshuffling in order to locate below the wealth tax exemption threshold. My results suggest that almost 9% of the treated group of French taxpayers rebalanced their portfolio in order to own less in real estate than the 1.3 million euros exemption threshold after the policy change. This result is in line with the literature finding strong bunching responses to the wealth tax exemption threshold (Londoño Vélez and Ávila-Mahecha, 2022; Seim, 2017). Since taxpayers who locate below the 1.3 million euros cutoff do not have to report their real estate holdings, it is not possible to quantify the magnitude of their portfolio reallocation. However, they experience a drop in rental income similar in magnitude to what is observed for active taxpayers who remain liable to the wealth tax, suggesting that the reallocation in both groups is somewhat comparable. Importantly, both margins of response affect

wealth tax revenues and are accounted for when assessing the revenue impact of the reform.

The reduced form reallocation response can be converted into a cross-elasticity between real estate and financial wealth of 4.7. This means that a 1 percentage point increase in the tax rate differential between both asset classes leads to a 4.7% reallocation of households' housing stock to financial assets.[3] The cross-elasticity obtained here falls on the lower end of available estimates for the elasticity of taxable wealth provided in the literature (Advani and Tarrant, 2021).[4] More importantly, the estimated reallocation response is significantly lower than findings in papers examining settings with ample shifting opportunities (Alvaredo and Saez, 2009; Durán-Cabré, Esteller-Moré and Mas-Montserrat, 2019). This difference highlights the importance of distinguishing the shifting from the real response when interpreting the magnitude of the behavioral response to taxation. The finance literature also provides a valuable benchmark. Consistent with theoretical models predicting that portfolio allocation should strongly react to asset-specific return differentials, Guiso, Fagereng and Ring (2024) find that a 1 percentage point increase in expected equity returns increases portfolio equity share by about 7 percentage points. Translating my cross-elasticity into a comparable parameter for the 2017 reform context reveals a substantially smaller portfolio share response—approximately 3 percentage points.

To get a deeper understanding of the magnitude of the reallocation, I quantify its revenue implications. Using the estimated cross-elasticity, I decompose the post-reform decline in wealth tax revenues into mechanical and behavioral components. While net revenues from the wealth tax fell by approximately 2.9 billion euros following the reform, I estimate that portfolio rebalancing accounts for roughly 200 million euros of this decline. In other words, behavioral responses explain about 7% of the total revenue loss. This finding indicates that, although the revenue impact of portfolio reallocation is non-negligible, it remains modest relative to the mechanical decrease in revenue due of the reform. In the broader context of capital mobility and international tax competition, it suggests that the efficiency cost of taxing real estate more heavily than other assets is relatively limited.

This paper contributes to three main strands of the literature. First, there is a growing body of research studying wealth taxes and how households respond to them (Brülhart et al., 2022; Jakobsen et al., 2020; Zoutman, 2018; Seim, 2017; Agrawal, Foremny and Martínez-Toledano, 2023; Londoño Vélez and Ávila-Mahecha, 2022; Bach et al., 2020; Ring, 2021; Advani and Tarrant, 2021; Alstadsæter et al., 2022; Garbinti et al., 2023; Bach, Guillouzouic and Malgouyres, 2025). While most papers have studied how total reported wealth re-

[3] Note that the cross-elasticity defined here is actually a semi-elasticity rather than a true elasticity, as it measures how reported real estate responds when the tax rate differential increases by 1 percentage point rather than by 1 percent.

[4] As wealth tax rates are generally close to 1%, the wealth tax elasticities typically estimated in the literature—expressed with respect to the net-of-tax rate $1 - \tau$—can also be interpreted as the evolution of reported wealth in response to a 1 percentage point decrease in the wealth tax rate; thus as a semi-elasticity with respect to the wealth tax rate. Thus, the comparison between the cross-elasticity estimated in the paper and wealth tax elasticities from the literature is meaningful.

sponds to wealth taxes, the main contribution of this paper is to focus on the allocation of this wealth and to quantify the portfolio rebalancing response, isolated from other behavioral adjustments. Moreover, common empirical approaches in this literature typically rely on bunching or difference-in-differences methods around tax bracket thresholds and thus mostly capture local effects or responses from moderately wealthy taxpayers. In contrast, a key strength of this paper's identification strategy is its ability to capture heterogeneous responses across the entire wealth distribution, including among the very wealthy—who have been shown to be particularly responsive to taxes in various contexts.

The interpretation of the response varies greatly depending on whether it is driven by shifting behavior or by real rebalancing adjustment. In the former case, taxpayers would change the way they own real estate without changing the structure of their portfolio while in the latter case, taxpayers sell their housing assets in order to invest in real financial assets such as stocks or bonds. The literature studying how households move their assets across bases in responses to taxes has mostly documented the shifting channel and little is known about the real rebalancing channel (Alvaredo and Saez, 2009; Durán-Cabré, Esteller-Moré and Mas-Montserrat, 2019; Kopczuk, 2007; Poterba and Weisbenner, 2003; Poterba and Samwick, 2003; Alan et al., 2010; Desai and Dharmapala, 2011; Kontoghiorghes, 2022). My contribution to this second literature is to estimate real rebalancing responses between real estate and financial assets. In the French context, cases of real estate assets becoming exempt from wealth taxation after the reform are rare. Thus, there is limited scope to reduce *taxable* real estate while keeping *total* real estate in taxpayers' portfolio constant.

Finally, my paper relates to a literature in finance investigating the sensitivity of investors' portfolio to return differentials and in particular to the risk premium (Merton, 1969; Dominitz and Manski, 2007; Gârleanu and Pedersen, 2013; Ameriks et al., 2020; Giglio et al., 2021; Guiso, Fagereng and Ring, 2024). My contribution to this literature is to estimate for the first time the degree of substitution between real estate and financial assets.[5]

The rest of the paper proceeds as follows. In section 2, I describe the institutional context and the tax variation introduced by the 2017 wealth tax reform. Section 3 presents the data. In section 4, I estimate the responses to the reform by looking both at variations in real estate ownership and capital income. Then section 5 estimates the cross-elasticity between real estate and financial wealth and assesses the impact of the reform on government revenue. Section 6 concludes.

[5]My paper also directly speaks to a smaller literature studying the economic effects of the 2017 wealth tax reform in France along various dimensions (Bach et al., 2021*a*; Paquier, Schmitt and Sicsic, 2019; Cagé and Guillot, 2021; Le Pouhaër, 2023; France Stratégie, 2023). There exists to date no clear-cut evidence on salient real responses to the policy. I contribute to this literature by showing that French taxpayers reallocated some of their real estate wealth towards financial assets after 2017.

2 Institutional setting

The first progressive annual wealth tax has been been introduced in France in 1982. After being temporarily removed, it was reintroduced in 1989 under the name *Impôt de Solidarité sur la Fortune* (ISF). After 2017, following the election of Emmanuel Macron, the ISF is repealed and replaced by a real estate tax called *Impôt sur la Fortune Immobilière* (IFI). The aim of this section is to illuminate the key institutional details of the wealth tax and of the 2017 reform that I leverage in the analysis. See Appendix section A1 for a more detailed description of wealth taxation in France.

2.1 The Impôt de Solidarité sur la Fortune

The ISF (1989-2017) applied to taxpayers—defined at the tax unit level (household)—with net taxable wealth above an exemption threshold. The exemption threshold has varied over time but was set at 1.3 million euros after 2013, affecting rougly the top 1% of the household wealth distribution in France. The tax schedule was progressive with rates ranging from 0.5% to 1.5% for the top tax bracket, above 10 million euros.

The tax base. The tax base was composed of all worldwide assets, above the exemption threshold, owned by French taxpayers on January 1^{st} of the fiscal year. Non-residents could also be liable to the ISF under certain conditions, but specific rules apply (see below). The ISF was a self-assessed tax, meaning that taxpayers had to report the value of their assets themselves. The aim of this tax was originally to be comprehensive, but many exemptions reduced significantly the tax base. Most importantly, business assets of owner-managers were fully exempted.[6] Antiques and artworks were also excluded from the tax base. Besides, the tax value of primary home was set at 70% of its market value. This rate was 25% for woods, forests and rural properties.

The simplified tax returns. From 2011 to 2017, taxpayers with taxable wealth below a certain threshold were only required to file a simplified wealth tax return. Under this simplified regime, taxpayers only needed to report their total net and gross taxable wealth, along with any applicable tax credits. From 2013 to 2017, the threshold determining the reporting requirements is set at 2.57 million euros of taxable wealth. For further details on the simplified filing rules and their implications, see Garbinti et al. (2023). In this paper, I restrict the analysis to households with taxable wealth above this threshold in order to (i) observe detailed portfolio composition and (ii) avoid any confounding effects arising from the repeal of the simplified filing regime in 2018.

[6] Business assets are defined as shares in a company, including listed firms, in which the taxpayer undertakes managerial activities as their main activity (from which they receive more than half of their professional income) and in which they hold more than 25% of the capial.

2.2 The 2017 wealth tax reform

Shortly after the 2017 election of Emmanuel Macron as the new President of France, the *Impôt de Solidarité sur la Fortune* (ISF) is replaced by the *Impôt sur la Fortune Immobilière* (IFI), a tax on real estate assets. The stated aim was to "incentivize risk taking over rent seeking" by exempting all investment in "productive capital" from the wealth tax. Importantly, the design of the new tax, introduced in 2018, is very similar to the ISF, except in its restriction to real estate wealth. Indeed, most of the features of the ISF such as the tax schedule, the exemption of business assets, the tax ceiling etc. remain unchanged.

In short, the tax base of the IFI is limited to the worldwide real estate assets of French residents—including houses, apartments, land, and agricultural property—held both directly and indirectly.[7] Partial exemptions on primary residences, as well as on woods, forests, and rural properties, are maintained. As under the ISF, business assets remain exempt, meaning that professional real estate is excluded from the tax base. Finally, some minor restrictions were introduced on the types of debts deductible from the IFI base (see Appendix section A1). In my analysis, I focus on gross wealth rather than net wealth, allowing me to abstract from these minor changes. Overall, the taxation of real estate under the IFI aligns closely with that under the ISF.

It should be noted that the 2017 wealth tax reform came with a second reform aiming to foster private financial investment which introduced flat-rate taxation of financial capital income at 30%. By increasing the effective tax rate differential between real estate and financial assets, this concomitant policy change strengthened incentives for portfolio rebalancing beyond what the wealth tax reform alone would predict. As I show later in the analysis, incorporating this second reform in the elasticity computation yields a somewhat smaller cross-elasticity than would be estimated when considering only the wealth tax reform. This reinforces the paper's main finding: the cross-elasticity between real estate and financial assets is strictly positive but modest in magnitude.

2.3 Non-residents

Tax residency is defined at the individual level, as opposed to the household level. An individual will be considered as non-resident if they satisfy the following three conditions: i) their main home is located outside of France, ii) they don't have any significant professionnal activity in France, and iii) they don't have their main economic interests in France.[8] All non-residents receiving income originating from France are subject to the income tax in France (in proportion to their income of French origin—conditional on specific

[7] The tax base includes shares in companies or partnerships that own real estate directly or through a chain of shareholdings, as well as the portion of the redemption value in life insurance or capitalization contracts that corresponds to taxable real estate. Common vehicles used to hold real estate include *Sociétés Civiles Immobilières* (SCI), *Sociétés Civiles de Placement Immobilier* (SCPI), and *Organismes de Placement Collectif Immobilier* (OPCI). In certain cases, shares in companies or entities holding real estate may be excluded from the IFI tax base. See Appendix section A1 for details.

[8] See https://www.impots.gouv.fr/particulier/suis-je-bien-non-resident

tax treaties). Non-residents may also be liable to the wealth tax if they own assets in France. In that case, the same tax schedule as for French residents applies.[9] Under the ISF, however, non-residents benefited from a full exemption on the vast majority of their financial investment (stocks, bonds, deposits, life insurance etc). As a result, notwithstanding some rare exceptions, the wealth tax base of non-residents before the 2017 reform is already restricted to their French real estate holdings.[10] Therefore, the 2017 policy change does not affect their incentives to reallocate their assets away from real estate.

2.4 Policy variation and Differential Wealth Tax Rates

Figure 1 presents the evolution of statutory top marginal wealth tax rates and observed average marginal tax rates for the full population of wealth taxpayers, distinguishing between asset classes (financial vs. real estate) and residency status (French tax residents vs. non-residents). Panel a) shows the sharp reduction in the top statutory marginal tax rate on financial assets held by French residents following the 2017 reform, while the rate on real estate remains unchanged. Panel b) displays the evolution of observed average marginal tax rates for French taxpayers across asset classes. Due to the progressivity of the wealth tax schedule, observed average marginal tax rates are lower than the top statutory rates. Panels c) and d) report the statutory and observed marginal tax rates, respectively, for non-residents. These rates remain stable throughout the period. The average marginal tax rate on real estate for non-residents is slightly higher but broadly comparable to that faced by French residents. As discussed above, the marginal tax rate on financial assets for non-residents is 0% both before and after the reform.

3 Data

I use a newly released administrative longitudinal dataset produced by the French tax authority providing information on the universe of wealth and income tax returns over the 2006-2022 period. A unique identifier for each fiscal household and taxpayer allows me to match income to wealth tax returns for each household and to follow them from year to year. Details about the data processing and the variables definitions are provided in Appendix sections A2 and A3.

Personal income tax returns. The income tax returns (tax form "2042") include information on the components of taxable income for each member of the household as well as some demographics (age, marital

[9] The taxation of non-residents in France is subject to some bilateral tax treaties. For example, a Saudi tax resident will be exempted from the French wealth tax if they directly own enough EU securities.

[10] I provide in the Appendix section A1 details of cases where the exemption on financial investment did not apply. These cases are however rare. I deal with them in the analysis by dropping all non-residents reporting significant financial wealth at any point in the sample period.

status, children...). For each fiscal year t, income tax liabilities are based on income received in year t-1. Importantly for my empirical strategy, the income tax data contain information on the *département* of residence, which is a piece of information I use to identify non-residents.

Wealth tax returns. The wealth tax returns (tax form "2725") provide information on the components of taxable wealth as well as potential tax credits or reductions reported by wealth taxpayers. Thus, unless the taxpayer falls under the simplied reporting regime, its tax return contains information on the value of primary home, other housing, stocks, deposits... Importantly, when real estate is held indirectly, it is reported together with other financial assets.[11] Thus, precise information on indirect ownership of real estate is only accessible after the 2017 reform, when financial wealth is no longer taxed. In 2018, indirect ownership of real estate represents 17% of taxable real estate. I the analysis, I circumvent this issue by focusing on directly held real estate only. Importantly, due to the broad nature of the wealth tax base after 2017, applying to real estate assets held both directly and indirectly, the reform does not affect taxpayers' incentive to change the way they hold real estate.

Identification of non-residents. Among income taxpayers, I identify non-residents using the information on the *département* of residence reported in the income tax files, where non-residents are coded as "9B3 DRESG". However, some non-residents own sufficient assets in France to be liable for the wealth tax but do not earn taxable income in France, and thus do not file an income tax return. Since this situation only arises for non-residents, I define this second group as taxpayers who file a wealth tax return but no income tax return in a given year.[12]

Descriptive statistics. Table 1, columns 1 and 2 present descriptive statistics for the full population of wealth taxpayers in France in 2016 and 2018. The choice of 2016 instead of 2017 as reference pre-reform year in the paper is made to account for the potential anticipation responses to the reform.[13] On average, ISF taxpayers (2016) are 69 years old. Almost 70% of them receive pension income and about 18% live in Paris. Their average annual taxable income is 150,000 euros and their average taxable wealth is around 2.8 million euros. It is divided between 48% of real estate (including 19% for their primary residence) and 52%

[11] Under box CE, "autres valeurs mobilières" and CD, "Droits sociaux de sociétés dans lesquelles vous exercez une fonction ou une activité".

[12] A deceased individual may have zero income but positive wealth in a given year, since taxable wealth is assessed as of January 1st. To avoid misclassifying such individuals as non-residents, I exclude from the non-resident group any taxpayer who files a wealth tax return but no income tax return in year t, and who subsequently files neither return in year $t+1$. Additionally, a one-year lag between income and wealth taxation introduces complications for new non-residents with French taxable income, as their wealth only becomes taxable in the following year. To address this, I also exclude all new non-residents (defined as those who become liable for French income tax in a given year) who lack wealth tax data for that same year.

[13] Candidate Emmanuel Macron announced in Februrary 2017 his will to reform the French wealth tax and was elected in April 2017 which was almost two months before the wealth tax return should be submitted (June 15^{th}).

of financial assets.[14] Their effective tax rate (wealth tax liabilities after reductions and ceiling relative to net taxable wealth) is 0.32%. The number of wealth taxpayers goes from around 350,000 in 2016 to 130,000 in 2018, the year the reform is implemented. The average taxable wealth decreases to 2.3 million euros because financial wealth stops being taxed but the average taxable income received by IFI taxpayers suggests that they are on average richer than ISF taxpayers (260,000 euros vs. 150,000 euros).

4 The Effect of Wealth Taxes on Portfolio Allocation

The aim of this section is to investigate the extent to which taxpayers reshuffle their portfolio in response to the reform, and to investigate the mechanisms behind this behavioral response. My main empirical approach is to compare French residents' wealth outcomes to non-residents' in a difference-in-differences design.

4.1 Definition of Treatment and Control Groups

Treatment group I define the treatment group as French households who own sufficient real estate before 2017 to remain liable to the wealth tax after the reform in the absence of any behavioral response. Specifically, this group comprises taxpayers who: i) are liable to the wealth tax continuously throughout 2013, 2014, and 2015; ii) file a detailed tax return at least once during this period; and iii) report at least 1.3 million euros in directly held taxable real estate net of debts when filing a detailed return. Since financial and mortgage debts are reported together, I use a conservative definition of net taxable real estate—taking all debts into account—in my preferred specification. Additionally, I restrict the sample to households liable to the income tax all years between 2013 and 2022, thus excluding households disappearing due to death.

Control group I define the control group as non-resident taxpayers liable to the French wealth tax in 2013. Since their taxable wealth consists exclusively of their real estate holdings, I am not constrained to select only those filing detailed returns, which substantially expands the size of the control group.[15]

[14] As mentioned above, all wealth taxpayers with net wealth below 2.57 million euros between 2013 and 2017 (3 million euros in 2011 and 2012) don't have to report their wealth by asset type. Thus, the decomposition presented here is based on the wealth structure of households liable to the wealth tax in 2016 as observed in 2010.

[15] As mentioned in subsection 2.3, although non-residents benefited from a full exemption on the vast majority of their financial investments before the reform, there were some rare exceptions. To ensure a clean control group, I exclude all non-residents who report any significant taxable financial assets during my sample period. Specifically, I remove non-residents who ever report financial assets exceeding 5% of their taxable wealth (boxes CF, CG, CM, CC, CK, CJ, CI, CH), including in 2010, before the introduction of simplified reporting requirements. In addition, indirectly held real estate is reported together with some financial assets (boxes CE and CD). To minimize the possibility that non-residents own taxable financial assets before the reform, I exclude all non-residents who ever report more than 50% of their taxable wealth in boxes CE and CD. This approach provides a conservative definition of the control group, as many of these reported assets likely represent either indirectly held real estate or real estate incorrectly classified as financial wealth (evidence of misreporting includes non-residents incorrectly listing properties as 'primary housing'—a classification impossible for non-residents). The first restriction reduces the size of the control group by 15% while the second restriction reduces it by an additional 26%.

One concern is that shocks affecting non-residents' incentives to acquire French real estate after 2017 could confound the estimated rebalancing response to the wealth tax reform. Morel and Uri (2021) have studied the origin countries of non-residents owning real estate in France. They show that the rankings of the top 10 most important countries remained unchanged between 2009 and 2019, alleviating the concern that a shock has strongly affected investors from any specific country during this period. In the robustness section, I also show that estimating the effect of the reform using an alternative control group composed of French taxpayers leads to very similar results.[16]

Additional restrictions Endogenous switching between groups is a common threat to identification in difference-in-differences settings. In this paper, this can happen through migration responses to the reform—e.g., if non-resident taxpayers migrate to France once financial assets become (wealth) tax free. I address this issue in the difference-in-differences specification by restricting my treatment group to households who are never non-residents between 2013 and 2022 and my control group to taxpayers who remain non-residents throughout 2013-2022.[17]

Descriptives on the estimation sample Table 1, columns 3 and 4, presents descriptive statistics for the treatment and control groups in 2016. The mean treated taxpayer is on average 70 years old and is twice as likely to live in Paris as the average wealth taxpayer. Their taxable income consists for about 50% of wages and pension income and 50% of capital income. They report on average 6 million euros in taxable wealth, slightly more than half of it being real estate and face a 0.53% effective wealth tax rate. Non-residents in the control group are younger than the average wealth taxpayer, 63% of them receive taxable income in France, more than 90% of which is rental income. They own on average slightly less than 3 million euros of taxable real estate.

4.2 Empirical Strategy

In order to estimate behavioral responses to the 2017 reform, I compare wealth outcomes of French wealth taxpayers to non-residents' in a difference-in-differences setting (DiD). The baseline specification is given by:

$$Y_{it} = \sum_{j \neq 2016} \beta_j \cdot Year_{j=t} \cdot Treat_i + \gamma_i + \eta_t + v_{it} \tag{1}$$

[16] This alternative control group consists of French taxpayers whose main housing asset is their primary home.

[17] The ideal specification would be to condition on pre-reform variables only in order to account for the migration response to the reform. Unfortunately, as noted in Appendix section A2, the fact that taxpayers who migrate sometimes change their fiscal identifier prevents me from doing this.

Where Y_{it} is the wealth outcome for household i in year t; $Treat_i$ is a binary variable equal to 1 if household i is in the treatment group and 0 if it is in the control group; γ_i is a household fixed effect and η_t is a year fixed effect. Standard errors are clustered at the household level. The coefficient of interest is β_j, which captures the average difference in outcomes between the treatment and control groups in year t. The reference year is 2016, allowing me to observe any anticipatory reallocation behavior in 2017. Occasionally, I employ a more compact version of the baseline model presented in equation (1) where all post-reform $Year \cdot Treat$ dummies are replaced by a simple $Post \cdot Treat$ dummy.

The main outcome of interest is taxable real estate (in log) reported by taxpayer i in year t. When studying this outcome, I restrict my treatment group to households who never file the simplified wealth tax return and thus who provide information on their level of housing wealth each year they are subject to the wealth tax. This restriction is not needed for non-residents because their taxable wealth consists of real estate only. The baseline specification is based on a balanced sample of taxpayers subject to the wealth tax between 2013 and 2022. Descriptive statistics for this sub-group of treated taxpayers are provided in Appendix table 3 (column 1). I provide in Appendix results based on an unbalanced sample—they are very similar.

The specificity of the 2017 reform, which reduces the incentives for French taxpayers to hold real estate only *relative* to financial assets, makes it possible to interpret any post-reform divergence in taxable real estate between the treated and the control groups as a reallocation response. The key identifying assumption making it possible to interpret the β_j as causal is that the outcomes of the treated French taxpayers and the control non-residents would have evolved similarly in the absence of the 2017 reform. The reported stock of real estate evolves similarly between the two groups before the reform, providing support for the validity of this assumption. Moreover, I show in the robustness section that properties held by wealthy non-residents in 2016 experience a similar price evolution over the 2013-2022 period as those held by similarly wealthy French taxpayers.

4.3 Tax Base and Tax Rate Differential

Figure 2a displays the time series of average net taxable wealth for French and non-residents households. Three key patterns emerge. First, French taxpayers experienced a reduction in taxable wealth of about 50% between 2017 and 2018. An important part of this sizeable drop is mechanical and comes from the exclusion of financial assets from the tax base. One of the goal of this paper is to estimate what portion of this decline stems from behavioral reallocation responses to the tax change. Second, non-residents show no change around the reform period, consistent with the fact that they were not affected by the policy change. Third, before the reform, French residents' average taxable wealth was substantially higher and grew more rapidly

than non-residents', but afterward—once the tax base definition became identical for both groups—they converged in both level and trend. This convergence pattern suggests that most of the reallocation happens in 2018 and that non-residents serve as an appropriate comparison group once the tax base is harmonized across both populations.

Figure 2b shows coefficients estimated from equation (1) where the outcome variable is the difference in marginal tax rates between real estate and financial assets. The difference increases sharply for French taxpayers compared to non-residents after the reform. On average, the difference in marginal tax rate borne by French households after the reform increased by 0.88 percentage points compared to non-residents, which is sizeable. As an illustration, if we assume a 5% rate of return on wealth, this tax difference translates into a $0.88/0.05 \approx 18\%$ gap in capital income tax rate depending on the class of asset generating the income.

Results provided in Figures 2a and 2b make two points. First, the 2017 reform reduced dramatically the wealth tax base for French taxpayers, but not for non-residents. Second, the wealth tax differential between real estate and financial assets faced by French households after the reform is sizeable and leads to important incentives for French taxpayers to rebalance their portfolio.

4.4 Magnitude of the Reallocation Response to the Reform

To quantify the extent of portfolio rebalancing away from real estate in response to the reform, I estimate the difference-in-differences model presented in equation (1) using (log) taxable real estate as the outcome variable. I use a balanced sample of taxpayers liable to the wealth tax throughout 2013-2022. As mentioned in section 4.2, when studying this outcome variable, the treatment group is restricted to households who never file the simplified wealth tax return, thus providing information on their housing wealth each year.

Figure 3a shows the evolution of reported real estate holdings from 2013 to 2022 for both treated and control groups. The stock of real estate evolves nearly identically in both groups before the reform but diverges immediately afterward. Figure 3b, which plots the diff-in-diff coefficients, reveals that French taxpayers experienced an average 4.1% decline in housing wealth compared to the control group over the full post-reform period, with the gap widening to 5% by the end of the period, five years after reform implementation. Although some reallocation continues throughout the post-reform period, the majority occurs during the first post-reform year (2018).

Appendix Figure 10a presents estimates of rebalancing responses using an unbalanced panel of wealth taxpayers with the baseline log-specification, yielding results similar to our balanced panel approach. Figure 10b shows results from equation (1) using taxable real estate scaled by the 2013-2015 average as the outcome variable, yielding a very similar pattern.[18] Figure 10c displays results using taxable real estate in

[18]Scaled values are winsorized at the 99th percentile of the non-zero distribution.

levels (euros), suggesting that five years post-reform, the difference in real estate reported by French versus non-resident taxpayers decreased by 150,000 euros compared to 2016. These estimates are however substantially less precise, which stresses the need for a log transformation. Finally, Figure 10d presents diff-in-diff coefficients when using net rather than gross real estate for non-residents (while maintaining gross real estate for French taxpayers).[19] The larger estimated response here likely reflects the introduction of specific restrictions on deductible debts in the 2017 reform (see subsection 2.2), highlighting the importance of using gross taxable wealth in our preferred specification.

In this paper, treatment assignment depends on past values of real estate holdings, which is also the outcome variable of interest. This creates a potential identification challenge similar to issues faced in public finance literature that compares taxpayers above and below tax thresholds. Such designs might raise concerns that mean reversion drives part of the estimated post-reform evolution in the outcome variable (Weber, 2014; Jakobsen and Søgaard, 2022). The absence of differential pre-trends provides initial evidence against this concern. To further address potential mean reversion issues, I define alternative treatment groups based on real estate reported in earlier years (2011, 2012, 2013, or 2014), then estimate equation (1) using these newly defined treated groups. As shown in Figure 10e, the various definitions of the treatment group have minimal effect on the results, providing estimates that align closely with the baseline specification.

4.5 Differential Inflation For Treated vs. Control

The main identifying assumption in this paper is that the evolution of real estate holdings reported by non-residents provides a valid counterfactual for how French wealth taxpayers' housing assets would have evolved in the absence of the reform. Since wealth taxpayers have to report their real estate holdings at their market value value, their reported stock of real estate is affected by housing price fluctuations. Thus, a potential source of violation of the parallel trend assumption is differential exposure to inflation across the two groups. The absence of differential pre-trend on Figure 3b confirms the plausibility of this parallel trend assumption. Yet, the post-reform period coincides with a strong house price inflation in France (see Appendix figure 9). If properties held by non-residents are located in areas different from where French wealth taxpayers own their properties and if house price inflation in the post-reform period is very different across these areas, a difference between the two groups could reflect differential exposure to inflation rather than a reallocation.

To rule out differential housing inflation between French wealth taxpayers and non-residents, I construct separate house price indices for both groups. This complementary analysis leverages a unique dataset created by Lei (2023) that combines property tax records (Fichiers Fonciers)—which identify private home-

[19] Recall that financial and mortgage debts were reported together for French taxpayers before the 2017 reform.

owners and their detailed housing portfolios with location information—and a comprehensive geocoded transaction dataset (DV3F) that enables housing wealth valuation. The value of properties every year is estimated accouting for both cross-sectional and longitudinal spatial heterogeneity (for methodological details, see Lei (2023)). The resulting dataset constitutes a comprehensive panel of property owners, tracking the value of their gross housing wealth annually from 2013 to 2022. A key advantage of this dataset is the observation of owners' main residences address, which enables precise identification of French residents versus non-residents.

I construct house price indices for both groups using the following methodology. First, I identify French residents and non-residents who owned total gross housing wealth exceeding 1 million euros on January 1st, 2016 (pre-reform). Then, I track this specific housing stock held by each group at that reference date, estimating its price evolution from 2013 through 2022. This approach isolates price effects and is robust to any composition changes in the housing portfolio that might occur in response to the reform. The resulting house price indices are presented in Appendix Figure 18.

The house price evolution of wealthy French residents and non-residents has been strikingly similar throughout the 2013-2022 period, with only a modest divergence in 2022. This parallel trend confirms that non-residents' housing stock serves as a valid counterfactual for how French wealth taxpayers' housing assets would have evolved in the absence of the reform. This finding confirms that the estimated response to the reform is driven by changes in quantities held rather than by price effects.

4.6 Mechanisms

4.6.1 Heterogeneity by Wealth and Income

Studies have shown that top earners are particularly responsive to changes in income tax schedules, notably through the use of tax avoidance schemes (Auerbach, Burman and Siegel, 1998; Gruber and Saez, 2002; Kopczuk, 2005). However, common empirical approaches in the wealth tax literature typically rely on bunching methods or DiD designs around exemption thresholds, which primarily capture responses from moderately wealthy rather than very wealthy taxpayers. In contrast, a key advantage of this paper's identification strategy is that it enables examination of how responses vary across the wealth distribution.

To analyze responses along the wealth distribution, I rank all treated taxpayers by quintile of pre-reform wealth and estimate for each group the compact version of equation 1 where all post-reform $Year \cdot Treat$ dummies are replaced by a simple $Post \cdot Treat$ dummy.[20] Results in Appendix figure 11a reveal remarkably consistent responses across the wealth distribution. Appendix figure 11b similarly demonstrates minimal

[20] Since only French housing holdings are observed for non-residents, total wealth is not observed for this group. Thus, each regression uses the complete control group of non-residents.

response variation across baseline taxable income levels. This flat pattern may initially appear surprising as wealthy taxpayers are more sophisticated and thus more likely to engage in tax planning strategies (Bomare and Reck, 2022). Yet, the French context offers limited opportunities for pure tax avoidance—that is, reducing *taxable* real estate while maintaining constant *total* real estate in taxpayers' portfolios. With this in mind, there is no a priori reason to expect that real rebalancing behavior, which reflects underlying individual preferences, should be more prevalent at the top.

Importantly, the limited variation in reallocation magnitude across wealth levels supports the external validity of the results, suggesting they likely apply to a broader taxpayer population. Moreover, this stable pattern helps rule out concerns that the estimated rebalancing responses are confounded by significant income or wealth effects. This is particularly important because the 2017 reform substantially reduced tax liabilities among top French earners (Ben Jelloul et al., 2018), potentially introducing income effects that could influence portfolio or savings decisions.

4.6.2 Heterogeneity by Housing Wealth and Its Composition

While the baseline level of wealth does not explain variation in taxpayers' responsiveness to the reform, a key question is whether their portfolio composition matters. Appendix Figure 11d provides initial evidence, showing that taxpayers with larger baseline share of housing in their portfolio exhibit stronger rebalancing responses. This raises the important question of whether the composition of housing wealth itself—specifically its allocation between consumption (owner-occupied housing) and investment purposes (tenant-occupied housing)—further explains this heterogeneity. Martínez-Toledano (2022) shows that greater exposure to housing as an investment good explains heterogeneous portfolio reallocation responses to housing market downturns. The 2017 reform provides an ideal setting to test whether this pattern extends to tax-induced portfolio adjustments.

To examine the consumption-investment distinction, I first analyze primary residences, which receive a 30% wealth tax exemption and appear separately in tax returns. I divide treated taxpayers into quintiles based on their 2013-2015 non-primary housing share and estimate equation (1) separately for each group. Figure 4a reveals a striking gradient: taxpayers whose wealth consists primarily of their main residence (bottom quintile) show virtually no response, while those with minimal primary residence exposure (top quintile) reduced real estate holdings by nearly 9%.

This pattern is confirmed when using taxpayers' rental income levels as a proxy for their investment-oriented property holdings. First, I separate treated taxpayers depending on whether they receive any rental income before the reform or not, and estimate equation (1) for both group.[21] Taxpayers with positive rental

[21] Using the full control group for each regression.

income show substantial rebalancing, while those reporting zero rental income exhibit no significant reaction. Appendix figure 11 then confirms this gradient across rental income quintiles: the bottom quintile rebalances less than 3% of real estate holdings, while the top quintile is found to rebalance about 7% of their housing wealth. Overall, this heterogeneity analysis suggests that French taxpayers responded to the reform primarily by divesting investment properties while largely preserving their consumption-oriented real estate, including both primary residences and vacation homes.

4.6.3 Tax Preparers

Previous works have shown the critical role of tax advisors and preparers in shaping households' and firms' tax compliance behavior and avoidance strategies (Erard, 1993; Battaglini et al., 2019; Bustos et al., 2023), notably in the context of wealth taxation in France (Garbinti et al., 2023). Yet, little is known about how they influence broader financial decisions. The 2017 wealth tax reform, by creating incentives for real economic adjustments rather than mere tax avoidance, provides an ideal setting to examine this phenomenon.

From 2019 onward, income tax returns contain information on whether they were completed by a tax preparer ('mandataire'). I analyze how taxpayers using tax preparers differentially respond to the new tax incentives by estimating equation 1 while dividing the treatment group between those using tax preparers in 2019 and those who do not. Results in Appendix Figure 12 reveal a clear difference: taxpayers using tax preparers are more than twice as responsive as others. This result is based in taxpayers' characteristics in 2019, namely one year after the reform is implemented. Thus, a first explanation for this heterogeneity is that taxpayers willing to take advantage of the new incentives introduced by the reform started to seek for professionnal advice, hence to use tax preparers. Assuming that the reform did not influence the probability of using tax preparers, two alternative interpretations emerge from this heterogeneity result. First, tax preparers may directly influence household investment decisions through professional advice. Second, there may be self-selection into using tax practitioners, with these preparers serving as proxies for underlying financial sophistication among taxpayers. Appendix figure 10 show heterogeneity along other dimensions, including debt (figure 10e) and age (figure 10f).

4.7 The Extensive Margin Response

The reallocation estimated thus far represents a response on the intensive margin, focusing on taxpayers who continue to report their real estate wealth and remain liable to the wealth tax. However, French taxpayers may also respond to the reform along the extensive margin by reshuffling their assets to position themselves below the exemption threshold after 2017. This response is likely most pronounced among tax-

payers located just above the exemption threshold. Estimating the extensive margin response amounts to study how the fraction of taxpayers liable to the wealth tax evolves in both treatment and control groups around the policy change. A sudden post-2017 drop in this fraction for the treatment group would indicate that French households react to the policy change by strategically adjusting their real estate holdings to fall below the exemption threshold.[22]

Figure 5a displays the percentage of treated taxpayers liable to the French wealth tax over time, normalized to zero in 2016. Note that since the percentage of treated taxpayers liable to the wealth tax in 2016 is nearly 100%, the estimated coefficients can be interpreted as both percentage changes and percentage point evolutions. While the fraction of French households subject to the wealth tax remains remarkably stable before the reform, there is a drop of approximately 4 percentage points—equivalent to 4% here—in 2018, with the decline continuing throughout the remainder of the study period. By 2022, the share of French wealth taxpayers liable to the wealth tax has decreased by almost 7% relative to 2016. This figure provides a first suggestive evidence that the policy change triggers a response on the extensive margin.

Yet, the post-reform drop in the probability of being liable to the wealth tax may not be entirely driven by responses to the reform. It could well reflect various shocks affecting the French housing market, calling for the use of non-residents as a control. However, in the French context, simply comparing the evolution in the share of taxpayers liable to the wealth tax between treatment and control groups is not very informative. Appendix Figure 14 illustrates this issue by showing results from estimating equation (1) where Y_{it} is a dummy equal to 1 if taxpayer i is liable to the wealth tax in year t and 0 otherwise. The time series graph (left panel) shows how the fraction of wealth taxpayers in both groups evolves between 2013 and 2022, normalized to 0 in 2016. While the series remains relatively constant for the treatment group before the reform, it decreases linearly for the control group over the same period. As shown in the DiD graph, this differential linear pre-trend makes direct comparison between the series from both groups problematic. Nevertheless, the absence of any discontinuity in the control group series at the time of the reform—unlike for French taxpayers—confirms that non-residents can still serve as a meaningful control group in this context.

To address the linear differential pre-trend, I employ a "first difference" specification, in which equation (1) is transformed using $Y_{it} - Y_{it-1}$ instead of Y_{it} as the outcome variable, yielding:

$$Y_{it} - Y_{it-1} = \sum_{j \neq 2016} \beta_j \cdot Year_{j=t} \cdot Treat_i + \gamma_i + \eta_t + v_{it} \tag{2}$$

Where Y_{it} is a dummy equal to 1 if taxpayer i is liable to the wealth tax in year t and 0 otherwise. The other elements are similar to those from equation (1). Because taxpayers from the control group have no taxable

[22]This interpretation assumes that real estate prices do not decrease over the period and that taxpayers do not deplete their wealth through consumption or other means.

financial assets, they are located much closer to the exemption threshold than treated taxpayers before the reform. Thus, my preferred specification restricts the control group to non-residents reporting at least 1.5 million euros in taxable housing wealth in 2013—thus at least 200,000 euros above the exemption threshold—, thereby creating more comparable groups.[23]

Results are presented in Figures 5b (time series) and 5c (DiD). This specification eliminates the differential pre-trend, as the outcome variable now evolves similarly between the two groups before the reform. The coefficient obtained in 2018 (-0.034) indicates that the reform caused a 3.4 percentage point greater decline in the probability of remaining liable to the wealth tax for French taxpayers compared to non-residents between 2017 and 2018. The consistently negative coefficients estimated for all post-reform years in the baseline indicate that the number of French taxpayers liable to the wealth tax continued to decrease more rapidly than for non-residents throughout the entire post-reform period. Summing all post-reform coefficients, the overall differential decrease in the probability to pay the wealth tax for treated taxpayers compared to the control group reaches approximately 9 percentage points. This suggests that in the absence of reallocation incentives, the population of French wealth taxpayers in 2022 would have been higher by about 9% relative to what is observed. Appendix Figure 13 shows estimates obtained using the full control group, without the restriction on baseline housing wealth.

Figure 14 shows how extensive margin responses vary by pre-reform level of wealth (15a), income (15b), real estate wealth (15c), share of housing in total wealth (15d), debt (14e) and age (14f). Estimates of the extensive margin response displayed in these heterogeneity graphs capture the response over the whole post-reform period and are obtained by summing the coefficients obtained for each post reform year.[24] Unsurprisingly, extensive margin responses follow a strong wealth gradient, with wealthier taxpayers much less likely to fall below the exemption threshold. This pattern exists because taxpayers in lower wealth quintiles need only modest reshuffling to drop below the 1.3 million euro threshold, while those higher in the distribution would require massive rebalancing to achieve the same outcome. There is also a strong income gradient, which reflects the fact that taxpayers with higher income are also taxpayers with higher level of wealth. Interestingly, the magnitude of the response on the extensive margin is relatively flat for the bottom 80% of the distribution of housing share in total wealth (15d), and are stronger for the top 20%.

[23] French wealth taxpayers (treatment group) report by construction more than 2.57 million euros in taxable wealth—corresponding to the threshold for the simplified reporting requirements—at least once between 2013 and 2015, while non-residents in the control group may be positioned much closer to the exemption threshold. This difference creates lower year-to-year persistence in the probability to be above the threshold among non-residents compared to French taxpayers before the reform. Applying the restriction to the estimation of the intensive margin response makes no difference.

[24] The standard errors for the summed coefficients are calculated using the 'lincom' command in Stata, which uses the full variance-covariance matrix of the estimated coefficients to compute the standard error of the linear combination.

4.7.1 What Is the Degree of Active Response?

Next, I estimate the degree of active vs. passive behavior, namely I estimate the proportion of taxpayers who actively responded to the reform by reallocating their portfolio. While quantifying the share of taxpayers responding on the extensive margin is straightforward, when focusing on the intensive margin, it is unclear whether a majority of taxpayers sells about 5% of their housing assets or whether a minority of households reacts very strongly while the majority does not respond at all. This rarely estimated active response share is crucial for accurately predicting behavioral responses to policy changes in general (Chetty et al., 2014).

First, I compute for each taxpayer the annual change in housing wealth over the full period. Specifically, I estimate each taxpayer's evolution in reported real estate from year to year by defining Δ_t^{RE} as $\Delta_t^{RE} = \frac{RE_{t-1} - RE_t}{RE_{t-1}}$, where RE_t is taxable real estate in year t. This Δ_t^{RE} indicates how a household's housing asset stock evolved from one year to another. A high positive Δ_t^{RE} for a given taxpayer—during a period of inflation—suggests they have sold a substantial share of their housing assets.[25] Next, I rank all taxpayers by their maximum value of Δ_t^{RE} during the post-reform period (2018-2022), defining those at the top as the biggest sellers. Finally, I estimate the response to the reform by successively removing the top 2.5%, top 5%, top 10%, etc. of biggest sellers from the estimation sample—from both the treatment and control groups.The estimation sample here consists of my baseline balanced sample of taxpayers who remail liable to the wealth tax over the 2013-2022 period. Although this approach relies on post-reform outcomes and thus should not be interpreted as causal, it reveals whether responses concentrate among few taxpayers or distribute more evenly across the population.

Figure 6a shows that responses are driven by a minority of active taxpayers: removing just the top 5% of sellers reduces the estimated effect by more than 50%, while removing the top 20% renders the difference between French and non-resident taxpayers statistically insignificant. In other words, 20% of taxpayers are responsible for the entire post-reform decline in reported real estate. As a placebo test, removing the biggest pre-reform sellers (2013-2016) has minimal impact on estimates (Figure 6b), confirming that large sellers were evenly distributed across groups before the reform.

Overall, in addition to active French taxpayers who responded to the reform on the extensive margin, approximately 20% of wealth taxpayers remaining liable to the wealth tax reallocated their portfolios to take advantage of the relatively higher profitability of financial investments. Appendix table 3 compares the baseline characteristics of both types of active taxpayers (columns 2 and 3) and passive taxpayers (column 4). As expected, active taxpayers responding on the intensive margin hold a greater share of investment housing and are more likely to use tax preparers than passive households, but they are also less frequently

[25] The post-reform period is a period of relatively high house price inflation in France, see figure 9.

married and less likely to live in Paris.

4.7.2 The Evolution of Capital Income

The analysis has thus far focused on housing wealth evolution, assuming that observed decreases reflect reallocation from real estate to financial assets. To circumvent the absence of information on financial wealth holdings after the reform, I turn to the analysis of the evolution of capital income, investigating how income flows generated by real estate versus financial assets differentially respond to the 2017 tax change.

The taxation of financial capital income for non-residents in France is subject to bilateral taxation agreements giving rise to tax credits in many cases. Table 1 shows that financial capital income represents a tiny share of French taxable income for non-residents. As a result, the comparability of taxable income between French and non-residents is quite poor. However, many French taxpayers reporting taxable capital income face unchanged incentives regarding real estate holdings after the wealth tax reform. I therefore construct a new control group comprising French taxpayers who: i) were liable for wealth tax throughout 2013, 2014, and 2015; ii) filed a detailed return at least once during this period; and iii) when filing detailed returns, reported less than 1.3 million euros in taxable real estate.[26] As for treated households, I restrict the control group to households liable to the income tax all years between 2013 and 2022, thus excluding households disappearing due to death. Since these taxpayers own less real estate than the exemption threshold before the reform, most stop paying wealth tax after the reform, minimizing their incentives to substitute financial assets for real estate. If any members of this new control group remain subject to wealth tax after 2017, this will attenuate the estimated responses.

I estimate equation (1) for rental income as well as for two types of financial capital income, namely dividend and fixed interest income. Each income type is scaled by its 2013-2015 average and winsorized at the 99th percentile of the distribution of non zero values. When looking at the evolution of rental income, I restrict the sample to taxpayers receiving at least 1500 euros in annual rental income once between 2013 and 2015. When considering financial capital income (dividends, interests), I restrict the sample to households receiving at least 1500 euros in annual financial capital income once between 2013 and 2015. When studying rental income, I control for baseline level of non-primary housing interracted with year dummies, while specifications for financial income include control for baseline equity wealth and baseline financial income interracted with year dummies. All specifications control for taxpayer's age.

[26] As noted in section 3, indirectly held real estate is reported together with financial assets in wealth tax returns—under boxes CE and CD. Therefore, to restrict the new control group to households with strictly less than €1.3M in total real estate, I limit this group to households reporting less than 1.3M euros in directly held real estate plus the sum of holdings reported in boxes CD and CE.

Rental income Focusing first on rental income, panel 7a shows a continuous drop among treated taxpayers after the reform compared to the control group. On average, rental income received by the group of treated households fell by approximately 5.4 percentage points compared to the control group; relative to the 2016 outcome mean in levels of 1.09, it represents a -5.4/1.09 $\approx$ 5% decline in rental income. Given the 2016 average level of rental income among treated taxpayers, this effect represents a drop of about 3,400 euros in annual rental income after the reform compared to before.

Appendix Figure 15a shows the evolution in rental income for three groups of taxpayers: active taxpayers responding on the intensive margin, active taxpayers responding on the extensive margin, and passive taxpayers. As expected, the entire post-2017 rental income reduction stems from active taxpayers—those responding both on the intensive and extensive margins—who experience a drop of about 18%, while passive taxpayers show no significant response. The similar drop in rental income for active taxpayers, regardless of whether they remain liable to the wealth tax or fall below the exemption threshold, suggests that the reallocation in both groups is comparable in magnitude. To further compare the nature of the response among active taxpayers, Figure 15b shows how the fraction of taxpayers receiving *any* rental income evolves around the reform. Strikingly, while there is a statistically significant 3% decrease in the probability of receiving any rental income among active taxpayers responding on the intensive margin, the decrease is about three times as large—around 10%—for taxpayers responding on the extensive margin. This difference indicates that a substantial fraction of taxpayers in the latter group disposed of all their properties held for investment purposes.

Financial capital income As described in section 2.2, a 30% flat tax on financial capital income was implemented in 2018. Bach et al. (2021*b*) find that this reform triggered strong behavioral responses, primarily through increased dividend payouts received by owner-managers. Appendix 10f shows that excluding owner-managers from the sample has virtually no effect on the estimated evolution of housing wealth, alleviating concerns that this additional reform confounds the behavioral response estimated on the housing stock. It may however affect the response on financial income flows. Thus, on top of controlling for pre-reform levels of equity wealth and financial income, I apply this same restriction here. Finally, Bach, Guillouzouic and Malgouyres (2025) show that the 2017 wealth tax reform influenced dividend distributions independently of portfolio rebalancing through the elimination of the wealth tax cap. Therefore, I also exclude from the financial capital income analysis all wealth taxpayers who benefited from the wealth tax cap before 2018.

Figure 7b shows dividend income responses using this restricted sample of treated taxpayers (Appendix Figure 16a illustrates how sample restrictions affect estimates). Unlike the sudden dividend response—driven by retiming—following the flat tax introduction documented by Bach et al. (2021*b*), the increase

in dividend payouts observed here is gradual and sustained throughout the post-reform period. Treated taxpayers' reported dividends increased by approximately 24% relative to 2016, representing an average annual increase of about 9,500 euros. As shown in panel 7c, interest income received by treated taxpayers also responds to the reform, increasing by 14%, though this translates to a more modest average annual increase of 420 euros (see Appendix Figure 16b for results without restrictions). These results indicate that taxpayers redirected their real estate holdings primarily into dividend-paying investments and secondarily into bonds.

Appendix Figures 15c and 15d compare responses between active taxpayers responding on the intensive margin, active taxpayers responding on the extensive margin, and passive taxpayers. Focusing first on taxpayers who remain liable to the wealth tax, we observe that active taxpayers show substantially larger increases in both dividend and interest income compared to passive taxpayers. Though not statistically significant, passive taxpayers also receive somewhat higher financial capital income after 2017, likely reflecting the redirection of their new savings while preserving their existing asset composition. Strikingly, taxpayers responding on the extensive margin show no apparent response in dividend income, while their increase in interest income is similar to that of the rest of the treatment group. While this heterogeneity result should be taken with caution due to the small size of the sample, it suggests that the response on the extensive margin may differ in nature from that on the intensive margin, potentially being redirected toward safer assets.[27] As shown in Appendix Table 3, this group is much less wealthy, less likely to be firm owner, and appears to engage less in tax planning (using tax preparers or benefiting from the ceiling) than the rest of the treatment group.

Despite the restrictions imposed to distinguish between wealth tax and flat tax reform effects, completely eliminating potential confounding effects remains challenging. To provide further evidence that the observed response primarily reflects portfolio rebalancing rather than a reaction to the flat tax, I examine how financial income increases vary with reallocation intensity documented in section 4.7.1. More specifically, I focus on the top 75%, 50%, 25%, and 12.5% and the full sample of sellers within the group of active taxpayers remaining liable to the wealth tax and compare their responses to the passive taxpayers.[28] If financial income changes accurately reflect financial wealth stock adjustments, taxpayers with greater post-reform rebalancing should show larger financial income increases. Appendix figure 17 presents results from estimating the compact version of equation (1) using scaled outcome variables (17a) and their percentage increases (17b). While passive taxpayers show modest, statistically insignificant dividend increases post-reform, active tax-

[27] The sample of treated taxpayers responding on the extensive margin comprises 731 individuals, after applying all sample restrictions. It is defined as taxpayers from the treatment group who become exempt from wealth taxation after the reform, while remaining liable to the income tax (thus excluding people who stop paying the wealth tax because of death).

[28] These represent the top 15%, 10%, 5%, and 2.5% of the full treated group, respectively.

payers exhibit a clear gradient in dividend responses, with substantially larger adjustments among those who rebalance most significantly. This gradient appears similarly for interest income and symmetrically for rental income reductions.

4.8 Robustness Checks

4.8.1 Shifting vs. Real Rebalancing Response

The interpretation of the estimated response to the reform varies greatly depending on whether it comes from a decrease in the amount of real estate owned by taxpayers—real response—or from a change in the way they hold this asset type—shifting response. Shifting strategies are employed by households willing to minimize their tax liabilities without changing their real economic behavior. The literature highlights that such avoidance strategies may be particularly prevalent in some contexts (Advani and Tarrant, 2021), calling for a cautious interpretion of the behavioral response to (wealth) tax changes. Intuitively, the magnitude of the shifting response when studying portfolio rebalancing depends on how broad the tax base is and how easy it is for taxpayers to reduce their taxable assets while keeping their actual holdings of this asset constant. In the French context, cases of real estate assets becoming exempt from wealth taxation after the reform are rare, limiting the scope for such shifting behaviors. The main exception applies to shares of listed companies investing in real estate (SIIC companies).[29] To assess the sensibility of my results to shifting behaviors, I study how dividends paid by such companies—reported separately from other dividends in the tax returns—evolve around the reform.[30] The specification used here is close to the one employed for other capital income types. The outcome variable is scaled by average total rental income (rental income + SIIC dividends) over 2013-2015 and winsorized at the 95th percentile of the distribution of non zero values.[31] Results are provided in Appendix figure 19. Dividend paid by SIIC companies evolves similarly for treated and control taxpayers between 2013 and 2022. This result supports the idea that real rather than shifting responses are driving the results.

4.8.2 Alternative Control Group

Non-residents differ substantially from French taxpayers across multiple dimensions. Given these large differences, a potential concern is that these two groups may be difficult to compare. To validate the results

[29] Provided the taxpayer owns less than 5% of the shares and vote rights of the company. See Appendix section A1 for details on the wealth tax applying to real estate after 2017.

[30] Dividends paid by SIIC are reported in box 2TS in the income tax returns, contrarily to other dividends which are reported in boxes 2DC and 2DA. A few other items are also reported in box 2TS (including life insurance contracts of less than 8 years) but they are not favorable tax-wise and thus are likely to be relatively rare.

[31] The winsorization at the 99% level provides qualitatively similar estimates that are however less precise, due to the fact that relatively few taxpayers receive SIIC dividends.

presented in section 4.4, I estimate the response to the reform using an alternative control group composed of French taxpayers. I construct this alternative control group based on the assumption that taxpayers are unlikely to respond to the 2017 reform by selling their primary residence. Specifically, the new control group consists of French taxpayers who: i) were liable to wealth tax continuously throughout 2013, 2014, and 2015; ii) filed a detailed tax return at least once during this period; iii) reported at least 1.3 million euros in directly held taxable real estate (net of debts) when filing a detailed return; and iv) owned a primary residence that accounted for more than 70% of their total housing wealth.[32]

I re-estimate the response to the reform using equation (1), comparing this new control group with the original treatment group—reduced by removing taxpayers now reassigned to the control group. Figure 20 presents these results. While the resulting rebalancing estimate across the entire period exceeds the baseline—possibly reflecting higher post-reform house price inflation in areas where wealth taxpayers' primary residences are located compared to their other properties—the 2018 drop remains very close to the baseline estimate.

5 Cross-Elasticity Estimates and Revenue Impact

This section leverages the reduced-form estimates of the rebalancing response to the 2017 reform to i) estimate the cross-elasticity between real estate and financial assets and ii) assess the revenue impacts of taxing real estate and financial assets differently. Papers studying behavioral responses to wealth taxation mostly focus on how the wealth tax base reacts to a change in the wealth tax rate. In contrast to the literature, this paper estimates how one specific asset—real estate here—reacts to the tax rate differential with alternative assets—financial holdings here. This motivates the conceptual framework of asset rebalancing, detailed below.

5.1 Conceptual Framework

I build on Piketty and Saez (2013) and Piketty, Saez and Stantcheva (2014) to develop a simple model of asset rebalancing. Consider an economy with a continuum of individuals of measure one and two sources of wealth: housing (i.e., real estate) and financial assets. Governments may impose differential tax treatment across these asset classes for various reasons. Such differentiation may be optimal when asset tax elasticities differ (Ramsey, 1927; Diamond and Mirrlees, 1971) or when aggregate and idiosyncratic shocks in financial markets are correlated (Scheuer, 2013). In response to this differential taxation, rational taxpayers rebalance their portfolios to optimize after-tax returns. For instance, individuals may sell rental properties to invest in

[32] This alternative control group is composed of 1,120 taxpayers, while the resulting treated group consists of 14,550 taxpayers.

financial securities when the latter receive a more favorable tax treatment.

Define taxable housing wealth of individual i, W_i^H, as potential housing wealth $\bar{W}_i^H$ minus X_i, the amount of wealth reallocated from real estate to financial assets. Note that X_i can take both positive and negative values, with positive X_i indicating reallocation from real estate to financial assets and negative values representing the reverse. Individuals who rebalance their portfolios incur a cost $d_i(X)$.[33] Potential housing wealth $\bar{W}_i^H$ reflects individual i's savings decisions and represents the housing wealth individual i would own in the absence of any portfolio rebalancing (i.e., $X_i(0) = 0$). It is a positive function of the net-of-tax rate on housing wealth $(1 - \tau_H)$. Subsection 4.6.1 has shown that income effects are likely limited in the context of portfolio rebalancing responses to the 2017 wealth tax reform. Thus, for simplicity, I abstract from income effects, meaning that an individual's level of housing wealth is not affected by their overall wealth. The amount of wealth individual i reallocates between asset classes (X_i) is a function of the tax rate differential between real estate and financial assets $\tau_H - \tau_F$. This captures the intuition that individuals allocate wealth across real estate and financial assets based on both the specific tax rates and the differential between them. Aggregating over all individuals, we have:[34]

$$W^H = \bar{W}^H(1 - \tau_H) - X(\tau_H - \tau_F) \tag{3}$$

Deriving W^H with respect to $(1 - \tau_H)$ and keeping τ_F constant, we get:

$$\frac{\partial W^H}{\partial(1 - \tau_H)} = \frac{\partial \bar{W}^H}{\partial(1 - \tau_H)} + \frac{\partial X}{\partial(\tau_H - \tau_F)}$$

This equation establishes the link between three elasticities of housing wealth:

1. **The total elasticity** $e = \frac{(1-\tau_H)}{W^H} \frac{\partial W^H}{\partial(1-\tau_H)}$
2. **The savings elasticity** $e_s = \frac{(1-\tau_H)}{\bar{W}^H} \frac{\partial \bar{W}^H}{\partial(1-\tau_H)}$
3. **The cross-elasticity** $e_c = \frac{(1-\tau_H)}{W^H} \frac{\partial X}{\partial(\tau_H-\tau_F)}$

The total elasticity measures the percentage change in taxable real estate in response to a one percent increase in the net-of-tax rate on real estate. The savings elasticity captures how potential real estate wealth responds to a one percent increase in the net-of-tax rate on real estate. The cross elasticity can be interpreted as the percentage of real estate assets reallocated to financial wealth when the tax differential between the two tax bases increases by 1 percentage point. Note that the cross elasticity is actually a semi-elasticity rather

[33] Following Piketty and Saez (2013), I assume that $d_i(X)$ is convex with $d_i(0) = 0$ and $d_i'(0) = 0$, and that $d_i'(X) \lesseqgtr 0$ if and only if $X \lesseqgtr 0$.

[34] Symmetrically, for financial assets: $W^F = \bar{W}^F(1 - \tau_F) + X(\tau_H - \tau_F)$

than a true elasticity, as it measures how reported real estate responds when the tax differential increases by 1 percentage point rather than by 1 percent.[35] By construction, we have $e = \frac{\bar{W^H}}{W^H} \cdot e_s + e_c$. If we start from a situation with no asset reallocation ($\tau_H = \tau_F$), then $\bar{W^H} = W^H$ and we simply have $e = e_s + e_c$. This means that the total elasticity of housing wealth is the sum of the savings elasticity and the cross elasticity.

Estimating the cross-elasticity between real estate and financial wealth is crucial for three main reasons. First, differential treatment of asset classes is common in wealth tax systems globally. Private pension wealth is typically excluded, property wealth may be exempt, and business wealth frequently receives substantial valuation discounts or complete exemptions. Understanding how such differential taxation influences portfolio allocation decisions is therefore of critical importance. Second, in the short run, the savings elasticity e_s is likely to be relatively small, suggesting that the overall elasticity of real estate with respect to taxation may depend predominantly on the cross-elasticity.[36] Third, as I show in Appendix section A5, the revenue-maximizing tax rate on real estate depends substantially on the magnitude of the cross-elasticity. In the extreme case of an infinite cross-elasticity, the revenue-maximizing tax rates on real estate and financial assets should be identical and would depend on a weighted sum of the savings elasticities for both asset classes.

5.2 Estimation of the Cross-Elasticity: Method

For simplicity, the stylized model presented in the previous section defines a single cross-elasticity parameter. However, the French wealth tax exhibits an exemption threshold, implying that wealth taxpayers may respond to the tax differential between real estate and financial assets both along the intensive margin (adjusting the housing stock while remaining liable to the wealth tax) and the extensive margin (reallocating in order to fall below the exemption threshold). While the magnitude of the extensive margin response is very context-dependent and is less informative of the degree of substitution between real estate and financial assets, both margins of response matter for wealth tax revenues.[37] This subsection presents the method used to estimate the cross-elasticity along both margins. The 2017 reform is a close to ideal natural experiment to estimate the cross-elasticity between real estate and financial wealth because it removed financial assets from the tax base, thus decreasing the rate on this asset class to 0%, while the rules for real estate remained unchanged (see figure 1). This feature of the reform allows me to abstract from the savings elasticity and to interpret the change in housing wealth following the reform as driven by a change in the tax differential pushing households to rebalance their portfolios toward financial assets.

[35] As is standard in the literature on behavioral responses to wealth taxation, I interpret $\frac{\partial(\tau_H - \tau_F)}{1-\tau_H}$ as a one percentage point increase in the tax rate differential between real estate and financial assets because $(1 - \tau_H)$ is close to 1. Strictly speaking, however, the tax rate differential is expressed relative to the net-of-tax rate on real estate.

[36] In the French context, this intuition is supported by Garbinti et al. (2023) who find no bunching at pure tax kinks when studying behavioral responses to the wealth tax.

[37] The magnitude of the extensive margin response may depend a lot on e.g. the distribution of taxable wealth, the change in the marginal tax rate or the location of the exemption threshold.

The intensive margin The intensive margin component of the cross-elasticity is defined as here the percentage change in real estate held by wealth taxpayers in response to a one percentage point increase in the tax rate differential between real estate and financial assets. In order to estimate it, I focus on a balanced sample of wealth taxpayers who remain subject to the wealth tax between 2013 and 2022 and use a model similar the compact version of the difference-in-differences model estimated earlier, in which all post-reform year dummies are pooled into one single *Post* dummy. Given that the tax rate differential between real estate and financial assets is endogeneous, I follow the literature and instrument it in a first stage with the interaction term $Treat_i \cdot Post_t$. The first stage and structural equations are respectively given by:

$$\frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} = \delta \cdot Treat_i \cdot Post_t + \gamma_i + \eta_t + u_{it} \tag{4}$$

$$Y_{it} = -\vartheta_c \frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} + \gamma_i + \eta_t + v_{it}^H \tag{5}$$

Where ϑ_c is the main parameter of interest in the paper, namely the intensive margin cross-elasticity between real estate and financial assets; $\frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)}$ is the tax rate differential between real estate and financial assets, divided by the net-of-tax rate on real estate; Y_{it} is real estate wealth (W^H) for individual i in year t in log, $Treat_i$ is the treatment dummy and $Post_t$ is a dummy variable equal to 1 for years 2018-2022. Intuitively, I instrument the change in the tax rate differential by treatment/control assignment status.

The extensive margin As documented in section 4.7, the extensive margin response to the 2017 policy change is sizeable, highlighting the importance of estimating the extensive margin (semi-)elasticity in the French context. It is defined as:

$$\eta_c = \frac{E[\sum_{t \geq 2018} \hat{\beta}_t]}{E[\Delta \frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} | T] - E[\Delta \frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} | C]} \tag{6}$$

Where $E[\cdot]$ is the expectation operator, $\hat{\beta}_t$ is the coefficient estimated from equation (2) in year t, and $\frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)}$ is the tax differential between real estate and financial assets. $E[\Delta \frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} | T]$ and $E[\Delta \frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} | C]$ are expected tax rate differentials for treated and control individuals, respectively. Note that the tax rate differential does not change for non-residents, thus $E[\Delta \frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)} | C]$ equals zero. Importantly, unlike intensive margin responses where behavior is driven by the marginal tax rate on the last euro of housing wealth, extensive margin decisions depend on the average tax rate across the entire base (Bergolo et al., 2022). Thus, $\frac{(\tau_{it}^H - \tau_{it}^F)}{(1-\tau_{it}^H)}$ is expressed with respect to the average—rather than marginal—tax rate differential across asset classes. Moreover, the change in the tax differential is zero for taxpayers who respond on the extensive mar-

gin because their wealth tax rate becomes zero once they fall below the exemption threshold. Therefore, I compute the hypothetical change in the tax differential based on the amount of real estate owned in 2016.[38] In other words, τ_H in the post-reform period is equivalent to the wealth tax rate a taxpayer would face if they had maintained their real estate level since 2016.

The extensive margin (semi-)elasticity can be interpreted as the percentage change in the probability of being liable to the wealth tax in response to a 1 percentage point increase in the tax rate differential between real estate and financial assets. I compute both the short term (2018-2019) and the long term (2018-2022) elasticities. Due to the first-difference specification used when estimating the extensive margin response, the overall effect is the sum of post-reform yearly coefficients rather than their average, making standard 2SLS methods unsuitable. Instead, both the elasticity estimates and their standard errors are derived using a bootstrap procedure with 1,000 iterations, drawing random samples with replacement from the original dataset.

5.3 Estimation of the Cross-Elasticity: Results

Table 2 presents estimates of the intensive and extensive margin elasticities. Each elasticity is expressed with respect to two tax differentials: the wealth tax rate differential $(\tau_{it}^H - \tau_{it}^F)$ and the capital income tax rate differential $(\tau_{it}^H - \tau_{it}^F)R$, where $R = 5\%$ represents the assumed gross rate of return on both real estate and financial assets.[39]

Baseline intensive margin elasticity As shown in column (1), the baseline cross-elasticity between real estate and financial wealth is equal to 4.66 (s.e.=0.80). In economic terms, a cross-elasticity of 4.66 means that 4.66% of taxable real estate is reallocated towards financial assets in response to a 1 percentage point increase in the wealth tax rate differential between the two asset classes. Translating this into an elasticity with respect to the tax rate differential on capital income yields a capital income cross-elasticity of 0.19 (s.e.=0.03). In column (2), I estimate the cross-elasticity when accounting for the introduction of the flat tax on financial capital income in 2018 (see section 2.2 for details). Given that the introduction of the flat tax increases the tax differential between real estate and financial assets, the estimated cross-elasticity, equal to 3.12 (s.e.=0.54), is mechanically lower.

Comparison with other studies To the best of my knowledge, this paper is the first to estimate the cross-elasticity between real estate and financial assets. While no direct comparisons exist, both public finance and

[38] 2016 real estate is defined as the sum of directly held real estate and imputed indirectly held real estate minus debts. As indirectly held real estate is reported together with some financial assets, it is not observed before the reform. Thus, 2016 indirectly held real estate is imputed using the average 2018 share of indirectly held real estate for the entire population of wealth taxpayers.

[39] Note that the tax rate differential is normalized by $(1 - \tau_{it}^H)$ in each specification.

finance literatures provide valuable benchmarks for contextualizing this paper's findings.

Closest to this paper, the public finance literature has examined how tax bases respond to differential treatment across bases. The reallocation response estimated here is substantially lower than in comparable studies. Alvaredo and Saez (2009) document dramatic portfolio adjustments following a 1994 Spanish wealth tax reform that exempted certain closely held stocks. The share of exempted stocks jumped from 1/3 to 2/3 of holdings, translating to a cross-elasticity of approximately 25—five times larger than the real estate-financial wealth cross-elasticity estimated in this paper.[40] Similarly, Durán-Cabré, Esteller-Moré and Mas-Montserrat (2019) find high substitution between financial assets following a more recent Spanish reform, with wealth taxpayers significantly decreasing heavily-taxed unlisted shares while more than doubling their allocation to tax-favored listed shares and funds.[41]

A crucial distinction emerges between "shifting" responses—where taxpayers change their tax base while maintaining their true portfolio structure—and "real" responses that involve actual asset reallocation. The Spanish cases primarily represent shifting responses, while the reallocation in the French context is more likely to involve real responses (see subsection 4.8.1). This distinction partly explains why the reallocation response estimated in this paper is more modest. These comparisons also suggest that substitution is significantly higher between different financial assets than between real estate and financial capital, especially when shifting opportunities are present.

A change in an asset's tax rate directly affects its net return. The finance literature provides relevant benchmarks by studying how portfolio shares respond to changes in expected returns. While theoretical models predict that portfolio allocation should strongly react to asset-specific return differentials (Merton, 1969), my estimated response appears moderate in comparison. My results indicate that a 1 percentage point increase in return on financial assets relative to real estate leads to a 3.1 percentage point increase in the share of financial assets.[42] This response falls between two benchmarks in the finance literature. Several studies document surprisingly low short-term portfolio sensitivities to return differentials (Dominitz and Manski, 2007; Ameriks et al., 2020; Giglio et al., 2021), with Giglio et al. (2021) finding that a 1 percentage point increase in expected equity returns yields only a 0.7 percentage point increase in equity share. However, Guiso, Fagereng and Ring (2024) show that when measured over longer time horizons comparable to my study (5-6 years), the response is substantially larger—a 1 percentage point increase in expected equity re-

[40] Calculated from table 1, column 1 of their paper by dividing the evolution of taxable stocks (-20%) by the average tax differential for the top 1% (0.8%), conservatively ignoring economic growth during the period.

[41] They find that a 1 percentage point increase in the 2011 average wealth tax rate increased the share of listed equity and investment funds in portfolios by 115%.

[42] The 5% drop in real estate reported by treated taxpayers in 2022 in response to a 0.88 percentage point tax rate differential corresponds to a 5.7% drop in response to a 1 pp tax rate differential between real estate and financial assets. Given the real estate share of treated taxpayers (54%, column 1, table 3), this translates into a 3.1 pp decrease in the share of real estate in households portfolio, that I interpret as a 3.1 pp increase in the share of financial assets.

turns increases portfolio equity share by 6.97 percentage points. Thus, even when accounting for appropriate time horizons to overcome portfolio adjustment frictions, my estimated real estate-financial asset rebalancing response appears rather modest.

Non primary housing wealth Finding less rebalancing between real estate and financial wealth than across various types of financial assets aligns with theoretical models of portfolio choice with illiquid durable goods (Grossman and Laroque, 1990; Flavin and Yamashita, 2002). These models predict that when a significant portion of wealth is held in illiquid assets that also provide consumption services (like housing), investors optimally tolerate deviations from ideal portfolio allocations due to transaction costs and consumption utility. To reduce the constraints imposed on portfolio reallocation by the consumption role of real estate, I estimate the cross-elasticity between non-primary housing (i.e., total housing minus primary residence) and financial wealth. As shown in column (4), the estimated cross-elasticity is equal to 6.74 (s.e.=0.85), substantially higher than the baseline estimate. This finding that investment properties are more responsive to tax incentives than primary residences is is in line with Martínez-Toledano (2022), who finds a larger reshuffling response to housing busts among households more exposed to investment housing.

Baseline extensive margin elasticity Table 2 displays both the short-run extensive margin elasticity, focusing on the cumulative effect two years after the reform (column (5)), and the long-run elasticity, aggregating the total effect over the entire post-reform period (column (6)). The short-run extensive margin semi-elasticity equals 9.25 (s.e.=2.14), indicating that a 1 percentage point increase in the wealth tax rate differential between real estate and financial assets leads to approximately a 9% increase in the number of wealth taxpayers falling below the wealth tax exemption threshold two years after the tax change. As the extensive margin response accumulates over time, the long-run elasticity is substantially larger, reaching nearly 17. These results suggest that in the presence of an exemption threshold, introducing a tax differential between assets triggers a substantial extensive margin response which potentially reduces tax revenues significantly.

5.4 Revenue Impact of the Rebalancing Response

Method Assuming first a unique cross-elasticity parameter as in section 5.1, a decrease in the tax rate on financial assets—keeping the tax rate on real estate unchanged—triggers a reallocation response that reduces the stock of taxable real estate by $dW^H = -e_c \cdot W^H \cdot \frac{d(\tau_H - \tau_F)}{(1-\tau_H)}$. A change in taxable real estate dW^H reduces real estate tax revenue by $\tau_H dW^H$. As a result, the change in wealth—i.e. real estate— tax revenues due to the reallocation response to the 2017 reform can be expressed as:

$$dB = -\tau_H \cdot e_c \cdot W^H \cdot \frac{d(\tau_H - \tau_F)}{(1-\tau_H)} \tag{7}$$

Then, decomposing the total cross-elasticity e_c into an intensive margin elasticity and an extensive semi-elasticity, the revenue impact of the reallocation response is equal to:

$$dB = -\frac{d(\tau_H - \tau_F)}{(1-\tau_H)}[\tau_H \cdot \underbrace{\vartheta_c}_{\text{Intensive}} + \tau_H \cdot \overbrace{\eta_c}^{\text{Extensive}}] \cdot W^H \tag{8}$$

Where ϑ_c is the intensive margin elasticity and η_c the extensive margin semi-elasticity. This decomposition has a similar flavor to the decomposition of the income shifting response from Waseem (2018) and Bergolo et al. (2022). Importantly, the relevant tax rate for the extensive margin response is the average tax rate while it is the marginal tax rate that matters for the intensive margin response. While this simplified model assumes a linear wealth tax rate, the French wealth tax exhibits a progressive schedule, so the marginal and average tax rates do not coincide. This element is accounted for in the empirical analysis, which will consider respectively the marginal and average tax rate for the intensive and extensive margin elasticities.

Impact of the reallocation on wealth tax revenues Total wealth tax revenue is the product of the tax base, W and the average wealth tax rate τ. In order to account for the progressivity of the wealth tax schedule, the average wealth tax rate τ is weighted by taxpayers' level of taxable wealth. We get:

$$T = \tau W \tag{9}$$

Before the reform, W is the sum of financial wealth W^F and housing wealth W^H, while after the reform, it consists only of housing wealth. In the absence of behavioral responses, mechanical changes in tax revenues due to the reform comprise two elements. First, financial wealth is no longer part of the tax base and thus generates no tax revenue. Second, housing assets held by taxpayers who own less than 1.3 million euros in housing at the time of the reform are no longer taxed and thus generate no revenues.[43] Combining these elements, mechanical changes in tax revenues, holding housing wealth constant, are given by:

$$dM = -W^F \tau^F - W^H_{low} \cdot \tau^H \tag{10}$$

[43] In reality, given the progressivity of the tax schedule, the narrower tax base after the reform decreases the marginal and thus the average tax rate on real estate, which should also contribute to a mechanical decrease in wealth tax revenues. However, this element is completely offset by two forces: i) fewer taxpayers benefit from the tax ceiling after the reform and ii) investments in some SMEs are no longer deductible. As a result, except for the year 2018, when investments in SMEs made until December 2017 are still deductible, the effective wealth tax rate for taxpayers owning more than 1.3M euros in real estate is virtually identical in 2017 and after the reform.

Where W^F is the stock of financial wealth excluded from the tax base and W^H_{low} the stock of real estate held by households owning less than 1.3 million euros of that asset before the reform. The tax rates τ^F and τ^H are defined each year as the average effective wealth tax rate on each asset weighted by taxable wealth.

Combining equations 10 and 8, I decompose the post-2017 drop in wealth tax revenues into mechanical and behavioral components based on 2017 values of W^H and W^F.[44] When estimating the behavioral component of the revenue impact, $\frac{d(\tau_H - \tau_F)}{(1-\tau_H)}$ represents the change in the tax rate differential across assets relative to 2017. The extensive margin elasticity used in this computation corresponds to the total cumulated extensive margin response over the entire post-reform period.

Figure 8 shows the evolution of wealth tax revenues accruing from French wealth taxpayers between 2013 and 2022, decomposing the post-2017 drop into mechanical and behavioral components. The observed drop in net wealth tax revenues between 2017 and 2018 reaches almost 2.9 billion euros.[45] The mechanical part of this drop represents 2.67 billion euros, while an additional decrease of 210 million euros is due to behavioral adjustments to the reform. About half of the behavioral component is attributable to taxpayers rebalancing their portfolios while remaining liable to the wealth tax—the intensive margin response—while the other half stems from taxpayers responding to fall below the exemption threshold—the extensive margin. Overall, the reallocation response to the 2017 wealth tax reform accounts for approximately 7% of the tax revenue losses associated with the reform. Using the revenues actually collected in 2022 as a benchmark, the reallocation response reduced wealth tax revenues by 13.5%. Note that the reallocation response also impacts the income tax base—taxpayers reporting less rental income and more financial income. While accounting for these fiscal externalities is challenging, the taxation of financial income is more favorable than that of rental income in France (France Stratégie, 2021). Thus, the revenue impact of the reallocation response estimated here should be considered conservative.

6 Concluding Remarks

The stated aim of the 2017 wealth tax reform in France was to redirect households' savings from real estate to financial assets, considered more productive for the economy. In this paper, I quantify the magnitude of portfolio reallocation following this reform and show that it has been modest. Combined with evidence that financial asset ownership is far more concentrated among the wealthy than real estate (Roine and Waldenström, 2015; Saez and Zucman, 2016; Garbinti, Goupille-Lebret and Piketty, 2020), these results suggest that

[44] Two features of the wealth tax data mentioned in section 3 prevent direct observation of W^H and W^F: i) the existence of simplified tax returns for taxpayers owning less than 2.57 million euros and ii) the fact that indirectly held real estate is reported together with some financial assets before the reform. I therefore infer W^H and W^F based on reasonable assumptions detailed in Appendix section A5.

[45] These estimates exclude non-resident taxpayers. A Senate report shows that total wealth tax revenues decreased by 2.9 billion euros between 2017 and 2018.

exempting financial assets from wealth taxation primarily functioned as a tax break for wealthy households rather than as the intended catalyst for economic reallocation.

The theoretical case for taxing real estate differently from other assets has deep historical roots. In the 19th century, Henry George advocated for a unique tax on land value, arguing it could generate sufficient revenue to eliminate all other taxes (George, 1879). His central insight—that land's fixed supply makes it inelastic to taxation—aligns with classic optimal taxation theory, which prescribes heavier taxation of less elastic factors (Ramsey, 1927; Diamond and Mirrlees, 1971). While taxing solely land presents practical valuation challenges, taxes on real estate—traditionally viewed as less elastic than other forms of capital—share much of the appeal of George's proposed land tax. However, the theoretical rationale for higher taxes on housing wealth could be weakened in the presence of strong cross-base responses, namely if taxpayers respond by substituting away from real estate toward financial assets.

By leveraging the French wealth tax reform, I provide the first empirical estimates of the cross-elasticity between real estate and financial assets. My findings reveal a strictly positive but modest cross-elasticity, suggesting that the efficiency cost of taxing real estate more heavily than other assets are likely to be overall limited.

The French *Impôt sur la Fortune Immobilière* created by this reform represents a modern progressive property tax with several innovative features rarely seen in combination: a progressive schedule at the household rather than the property level, market-value assessment, inclusion of both directly and indirectly held properties, and debt deductibility. I show that such a tax—with top rates reaching 1.5%—does not trigger significant portfolio rebalancing even among the wealthiest owners, suggesting it has substantial revenue-raising potential. A key lesson from these findings is that progressive property taxation deserves greater attention in both academic research and policy discussions as a potentially efficient and more equitable tax instrument than existing taxes on real estate.

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	All wealth taxpayers		Treatment	Control
	2016	2018	2016	2016
	(1)	(2)	(3)	(4)
Age	69	69	70	64
% Married	58	58	64	36
% Living in Paris	18	26	36	0
% Retirees	69	67	75	1
% Firm owner	15	23	41	2
% Income taxpayers	98	98	100	63
% Tax return filled by third party	14	18	18	14
Gross income	151,944	262,600	279,887	48,490
Pension benefits (%)	42	34	33	2
Wages (%)	19	17	15	1
Rental income (%)	24	36	37	91
Financial capital income (%)	14	13	14	6
Net taxable wealth	2,777,060	2,327,498	5,957,646	2,889,131
Housing assets (%)	48	82	55	96
Primary residence (%)	19	25	14	0
Financial assets incl. indirectly held real estate (%)	52	17	45	4
Liabilities (%)	6	5	6	6
% benefited from tax ceiling	3	0	9	0
Wealth tax	11,374	9,715	34,095	15,677
Wealth tax rate (%)	0.32	0.32	0.53	0.40
Number of tax units	350,530	132,461	19,708	1,520

Table 1: Baseline Summary Statistics - 2016 and 2018

Notes: This table presents descriptive statistics for all ISF taxpayers in 2016 (column 1), all IFI taxpayers in 2018 (column 2) and for the treatment and control groups in 2016 (columns 3 and 4, respectively). In 2016, taxpayers with net taxable wealth below 2.57 million euros don't have to report their wealth by asset type. In column (1), the wealth decomposition is therefore based on the portfolio structure of 2016 wealth taxpayers observed in 2010, before the implementation of the simplification threshold. The wealth decomposition in columns (3) and (4) is based on taxpayers who fill in the detailed returns (96% for the treatment group and 58% for the control group). Information on whether the return was completed by a third party is only available from 2019 onward, so values for 2019 are reported in the table.

	Baseline		Non-primary	Extensive margin	
	Intensive margin		housing	Short-run	Long-run
	(1)	(2)	(3)	(4)	(5)
Elasticity w.r.t. $(\tau_H - \tau_F)$	4.66	3.12	6.74	9.25	16.70
	[0.80]	[0.54]	[0.85]	[2.14]	[4.67]
Elasticity w.r.t. $(\tau_H - \tau_F)$R	0.19	0.08	0.28	0.41	0.73
	[0.03]	[0.01]	[0.04]	[0.09]	[0.20]
Flat tax	No	Yes	NO	No	No
Household FE	Yes	Yes	Yes	Yes	Yes
N Treated	15,670	15,670	15,670	19,708	19,708

Table 2: Cross-Elasticity Estimates

Notes: This table displays estimates of the cross-elasticity between real estate and financial assets both along the intensive margin (columns 1-3) and the extensive margin (columns 4-5). The estimation method for the intensive margin follows a 2SLS procedure in which the tax rate differential is instrumented based on the pre-reform assignment status. The elasticity is estimated using a balanced sample of taxpayers liable to the wealth tax all years between 2013 and 2022. Column 1) displays the baseline cross-elasticity between real estate and financial assets with respect to wealth tax differential. The coefficient of 4.65 (rounded to 5) means that 5% of households' stock of real estate is reallocated to financial assets in response to a 1 percentage point increase in the wealth tax rate differential between the two asset classes. Column 2) computes the cross-elasticity when accounting for the introduction of the flat tax at 30% on financial capital income simultaneously to the wealth tax reform. The estimated elasticity decreases by about 1/4. Column 3) shows the estimated cross-elasticity when focusing on non-primary housing—likely to be more elastic to taxation. Columns 4) and 5) display the short-run and long-run extensive margin-semi elasticities. The tax rate differential is predicted using pre-reform level of real estate. Both the elasticity estimates and their standard errors are derived using a bootstrap procedure with 1,000 iterations. The estimated elasticity of 9 in column 4) means that a 1 percentage point increase in the wealth tax rate differential between real estate and financial assets leads to an approximately 9% increase in the number of wealth taxpayers falling below the wealth tax exemption threshold two years after the tax change.

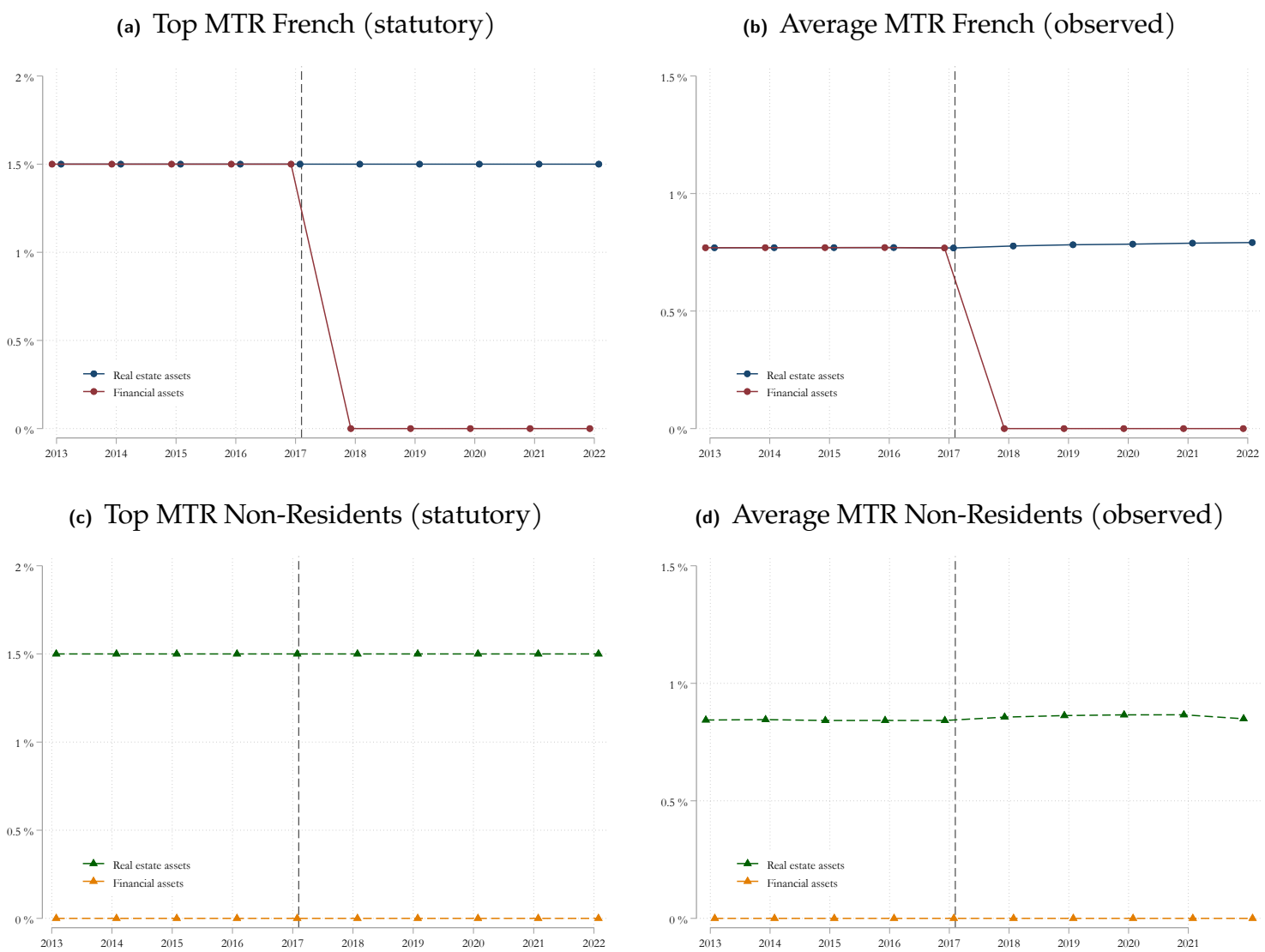


Figure 1: Observed and Statutory Marginal Tax Rates

Notes: This figure shows the evolution of marginal tax rates by asset class and residence status. Panel a) and c) display statutory top marginal wealth tax rates for French and non-resident taxpayers, respectively. Panel b) and d) show observed average marginal tax rate for French and non-residents liable to the wealth tax. By definition, statutory and observed tax rates for real estate and financial assets held by French residents are similar before the 2017 reform. For non-residents, the graphs display marginal tax rates on real estate held in France. Some exceptions to the wealth tax exemption on financial investment for non-residents exist, but they are rare (see Appendix section A1). While the top marginal tax rate on financial assets goes to 0% for financial assets held by French taxpayers after the reform, it remains constant for real estate. In reality, given the progressivity of the tax schedule, the narrower tax base after the reform should decrease the average marginal tax rate on real estate. However, fewer taxpayers benefit from the tax ceiling after the reform, and thus experience a sharp increase in their marginal tax rate, which completely offsets the modest decrease in marginal tax rate that we would have observed otherwise.

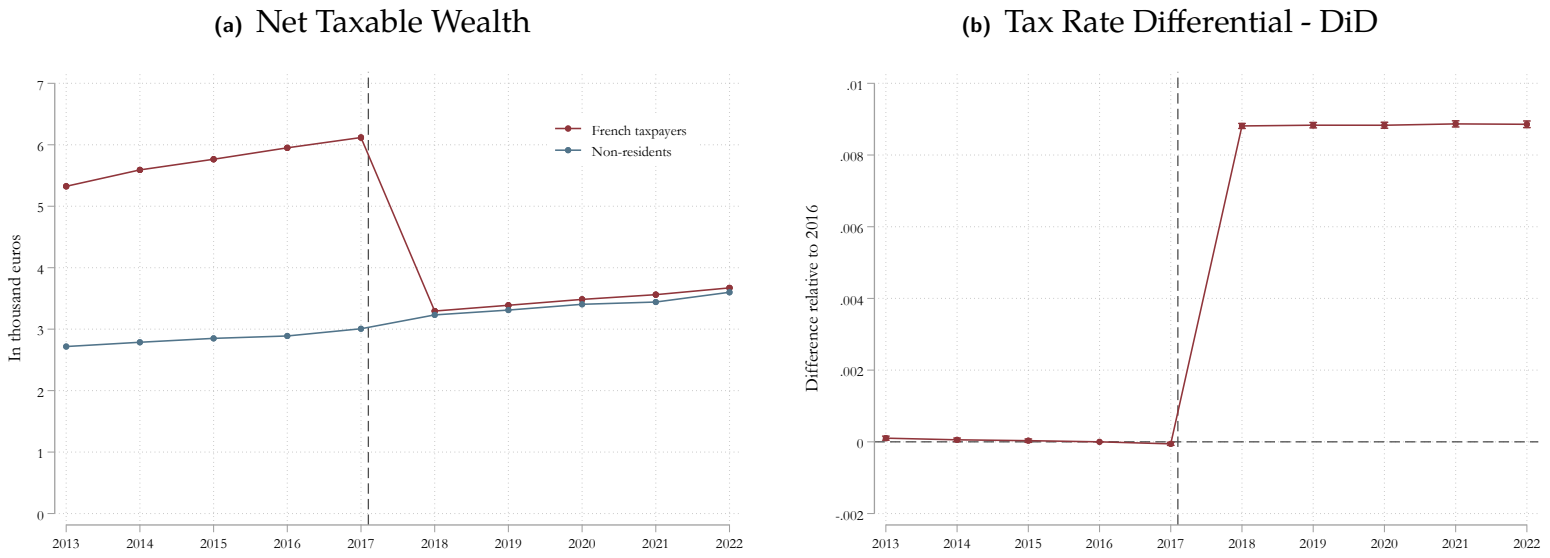


Figure 2: First Stage - Tax Base and Tax Rates

Notes: This figure shows the evolution of the wealth tax base and of the tax differential between real estate and financial assets before and after the reform. Panel a) presents the time series of net taxable wealth for French and non-resident taxpayers. Panel b) plots the coefficients obtained from equation (1), comparing French to non-resident taxpayers, using as outcome variable the difference in marginal wealth tax rate between real estate and financial assets.

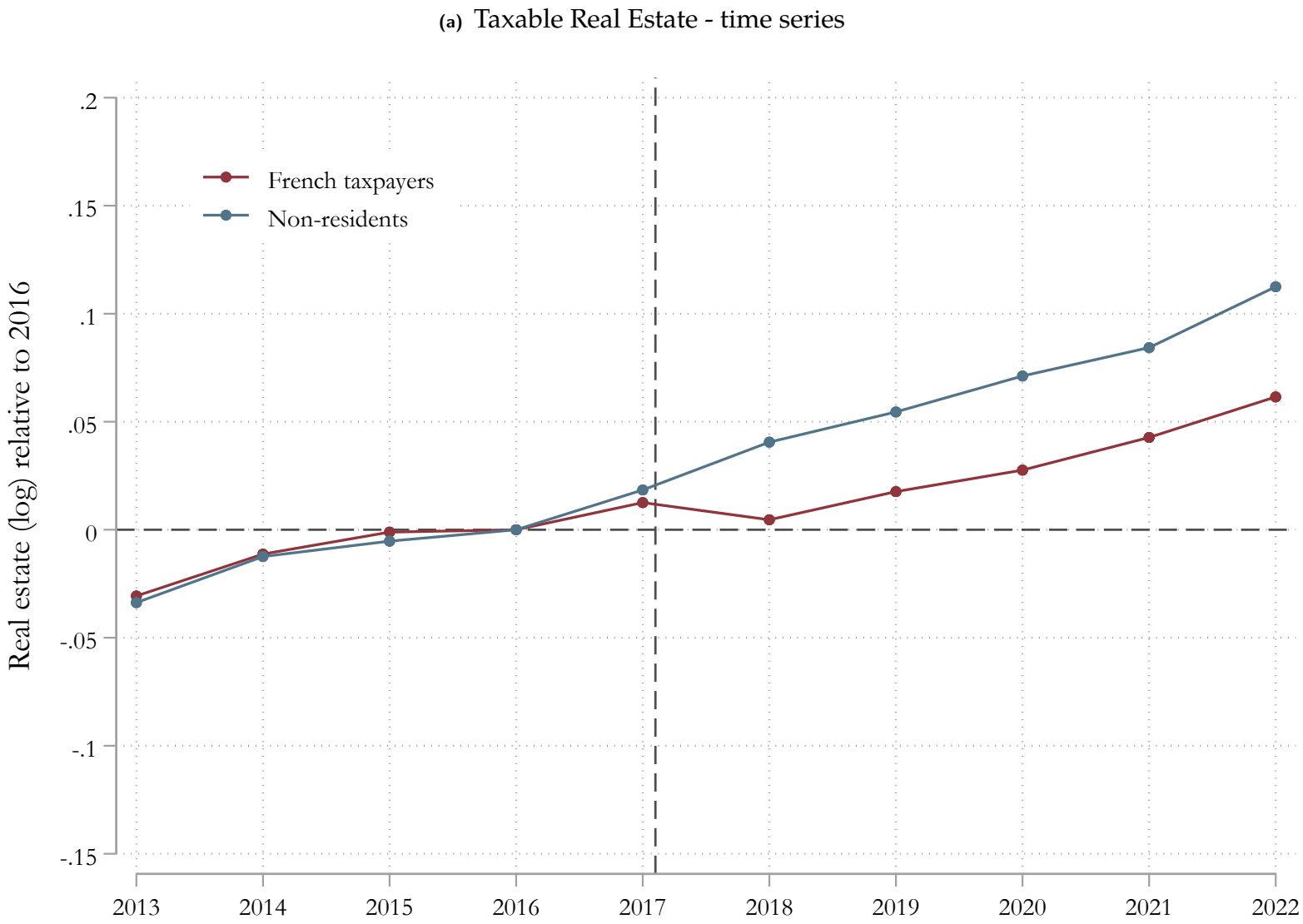


Figure 3: Average Responses to the 2017 Wealth Tax Reform

Notes: This figure shows the evolution of the stock of real estate held by French vs. non-resident taxpayers between 2013 and 2022. It shows the time series of taxable real estate (in log). The stock of real estate evolves strikingly similarly between the two groups before the reform and starts to diverge immediately after. This figure is obtained from a balanced sample of French and non-resident taxpayers. The treated group of French taxpayers is restricted to households who never file the simplified wealth tax return.

Figure 3: Average Responses to the 2017 Wealth Tax Reform

Notes: This figure shows the evolution of the stock of real estate held by French vs. non-resident taxpayers between 2013 and 2022. It displays coefficients obtained from equation (1). On average, the French taxpayers experienced a decline of 4.1% in their stock of housing wealth compared to the control group in the post-reform period, with a difference of 5% in 2022, five years after the reform is introduced. The figure is obtained from a balanced sample of French and non-resident taxpayers. The treated group of French taxpayers is restricted to households who never file the simplified wealth tax return.

Figure 4: Consumption vs. Investment Housing

Notes: This figure shows the heterogeneity in the response to the 2017 reform by average level of pre-reform non-primary home share (panel a) and rental income (panel b) between 2013 and 2015. Non-primary home share is defined as the average share of total housing wealth that is not primary housing between 2013 and 2015. Pre-reform rental income refers to the 2013-2015 average level of gross rental income defined as the sum of "micro foncier", "foncier régime réel", "meublé non professionnel" and "déficit foncier". Each graph displays coefficients obtained from the estimation of equation (1) using the full control group. Panel a) shows results by quintiles of pre-reform non-primary home share. Taxpayers located at the top of the distribution (p80-p100) are likely to hold a high share of their housing assets in the form of investment properties. Panel b) shows the heterogeneity in responses to the 2017 from taxpayers with no pre-reform rental income (<1000 euros) vs. taxpayers with positive rental income (> 1000 euros). Households benefiting from wealth tax ceilings between 2013-2017 are exluded (in panel b), as these might artificially reduce taxable income. Appendix figure 11 shows that using net—rather than gross—rental income and including taxpayers benefiting from the ceiling has little effect on the estimated reallocation.

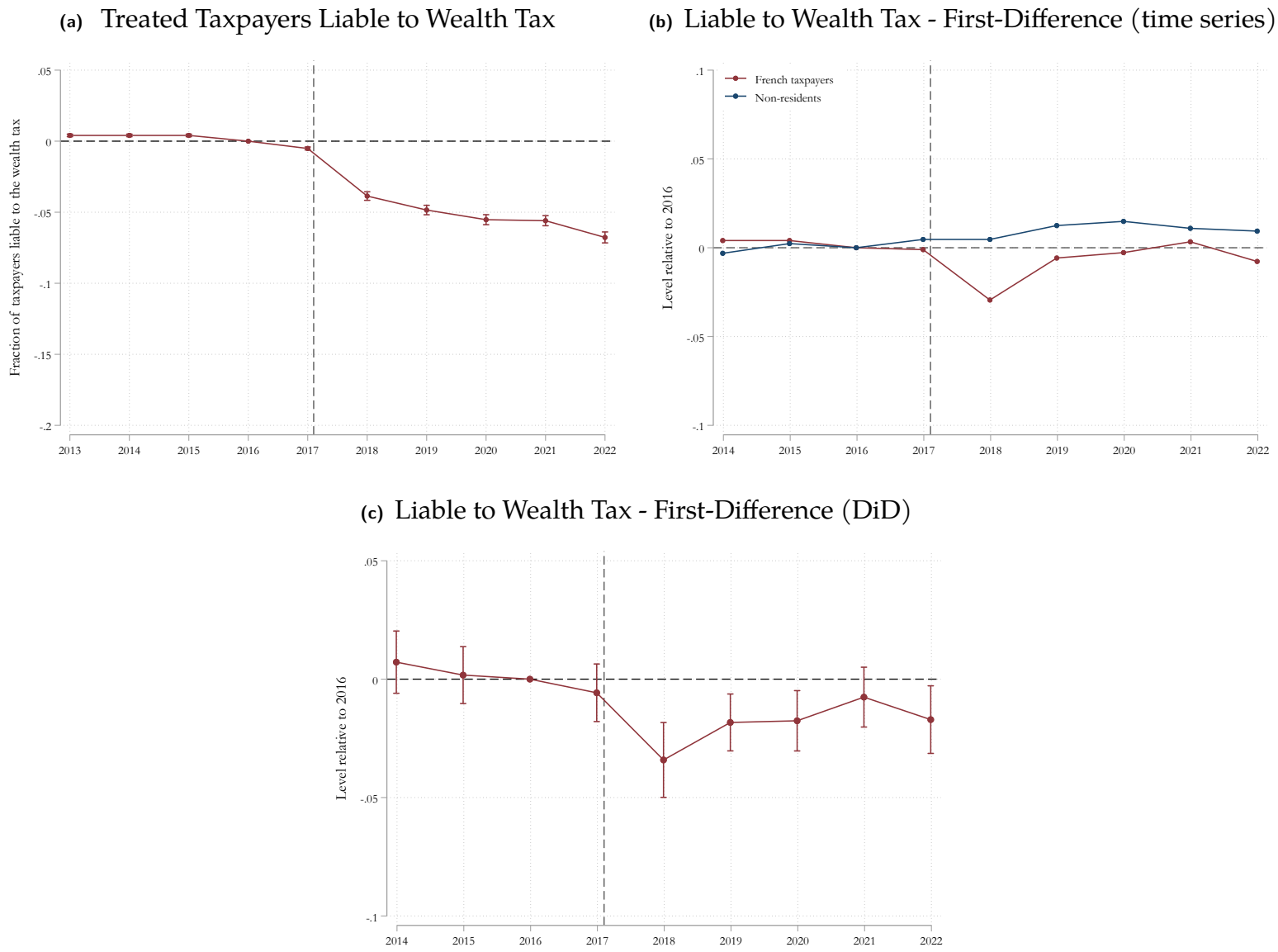


Figure 5: Extensive Margin Responses to the 2017 Wealth Tax Reform

Notes: This figure displays evidence of extensive margin responses to the 2017 wealth tax reform. Panel a) shows the percentage of treated taxpayers liable to the French wealth tax over time, normalized to zero in 2016. Panel b) and c) show first difference coefficients estimated using equation (2). Panel b) displays the time series and panel c) shows the difference between the two series. The control group is restricted to non-residents reporting at least 1.5 million euros in taxable housing wealth in 2013. See Appendix figure 13 for results without this restriction.

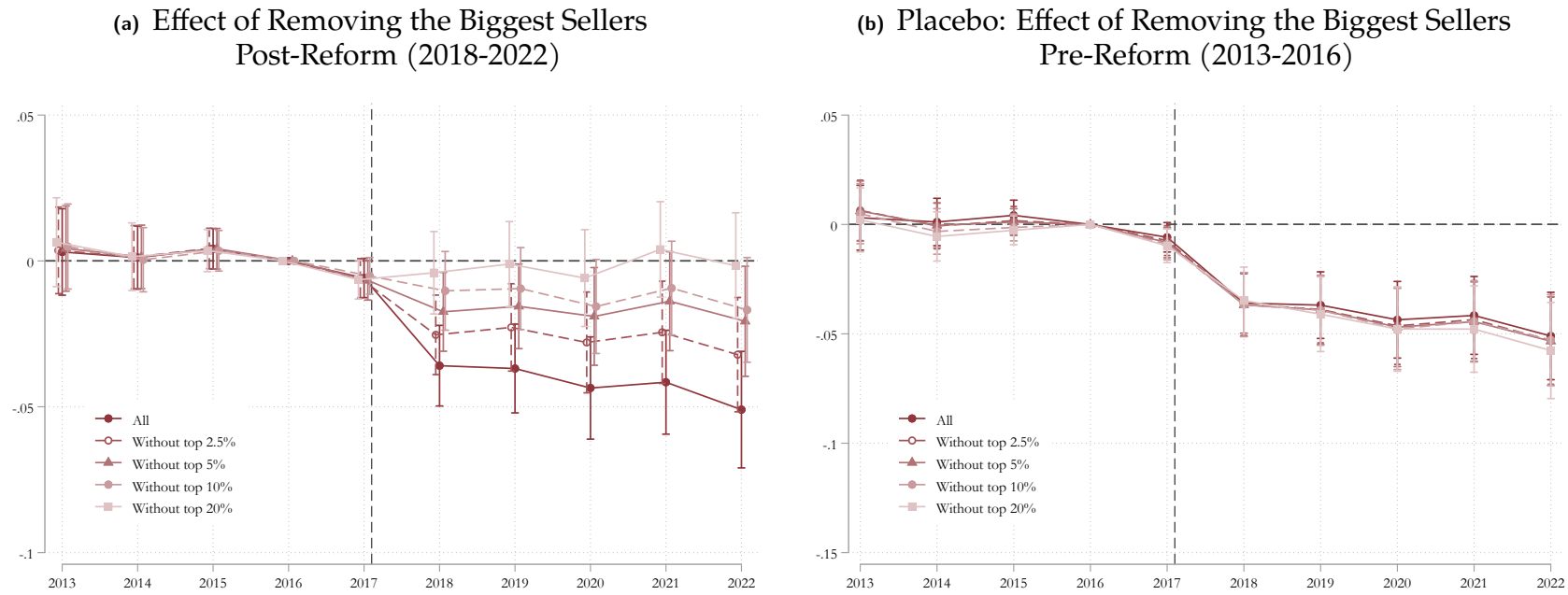


Figure 6: Decomposition Exercise - Estimating the Share of Active Response

Notes: Panel a) of this figure displays estimates of the rebalancing response to the reform by removing successively the 5%, 10% etc. biggest real estate sellers from the estimation sample. The biggest sellers are defined as the taxpayers who experience the highest year-to-year decrease in their real estate holdings after the reform (2018-2022). When removing the top 20% biggest sellers from the estimation sample, the difference in reported real estate between the French and non-residents is no longer significant. Panel b) is a placebo. It defines the biggest sellers based on the pre-reform evolution in real estate (2013-2016). In contrast to what happens after the reform, the graph shows that the pre-reform biggest sellers are relatively evenly distributed across the treatment and the control groups.

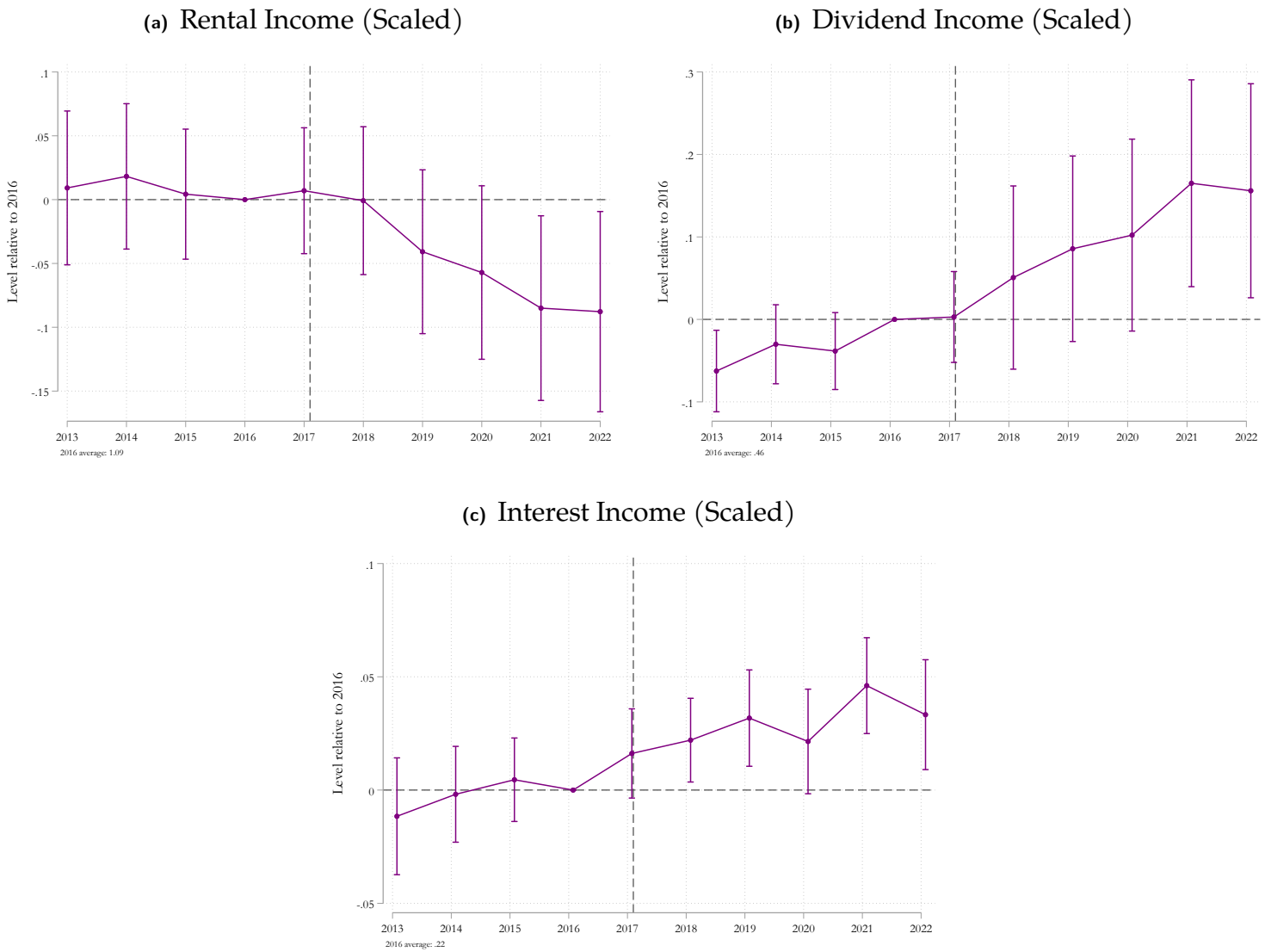


Figure 7: Capital Income Responses to the 2017 Wealth Tax Reform

Notes: This figure shows the evolution of various types of capital income received by taxpayers from the treatment group relative to a control group of French taxpayers who own less than 1.3 million euros—the exemption threshold—in real estate before the reform. Each outcome variable is scaled by its 2013-2015 average and winsorized at the 99th percentile of the distribution of non zero values. In panel a) the sample is restricted to households receiving at least 1500 euros in annual rental income once between 2013 and 2015 and the specification includes controls for baseline level of non-primary housing interracted with year dummies. In panel b) and c), the sample is restricted to households receiving at least 1500 euros in annual financial capital income once between 2013 and 2015 and the specifications include control for baseline equity wealth and baseline financial income interracted with year dummies. Additionnally, specifications in panel b) and c) exclude owner-managers and taxpayers who benefited from the wealth tax cap before 2018 from the estimation sample. All specifications control for taxpayer's age.

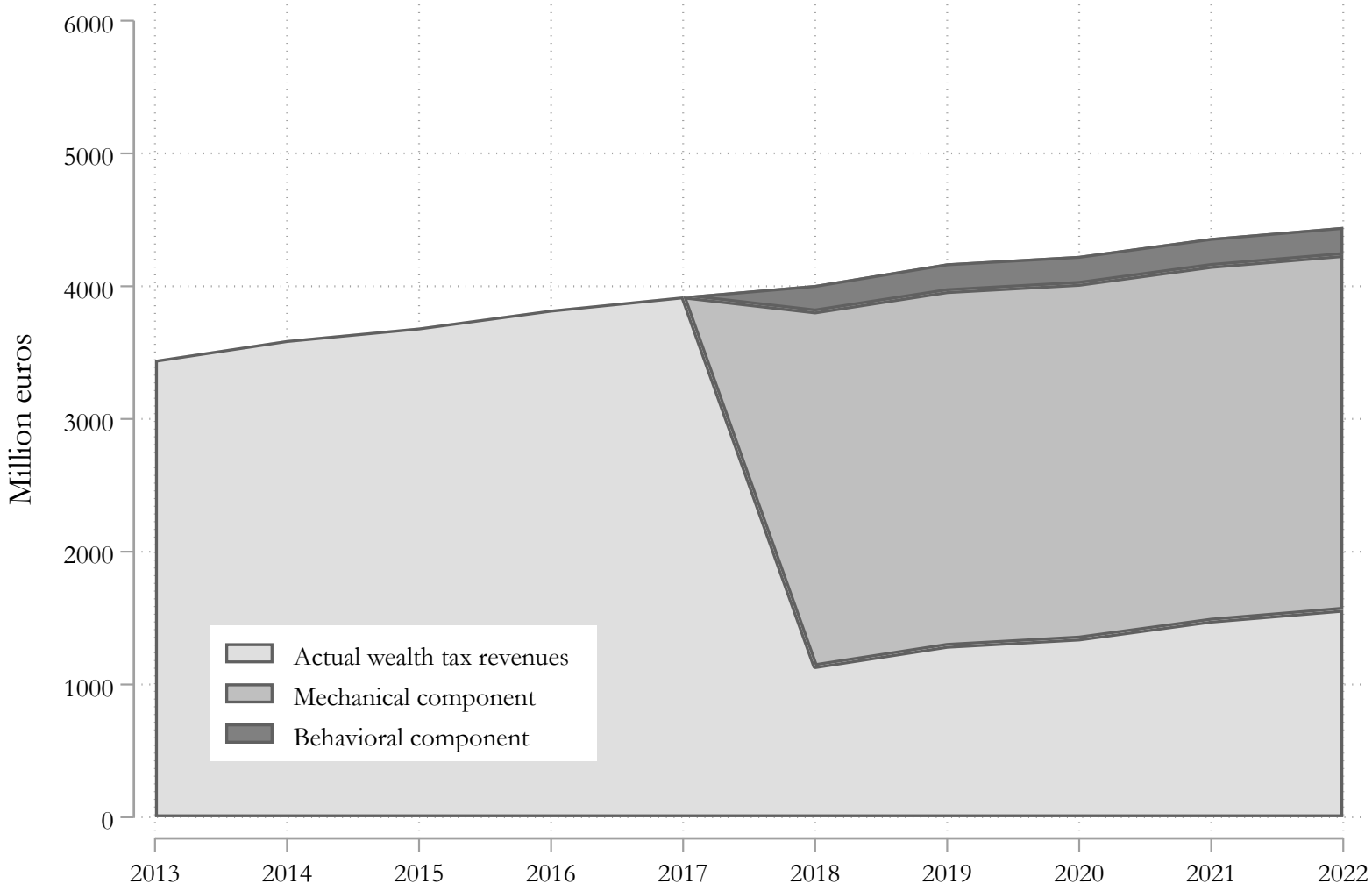


Figure 8: Decomposition of the Wealth Tax Revenue Losses Associated with the 2017 Reform

Notes: This figure shows the evolution of wealth tax revenues in France between 2013 and 2022 and decomposes the post-2017 drop into mechanical and behavioral components, following the method detailed in section 5.4. The intensive margin cross-elasticity used here equals 4.65, while the extensive margin (semi-)elasticity equals 16.7. The observed drop in net wealth tax revenues between 2017 and 2018 reaches almost 2.9 billion euros. The mechanical part of this drop represents 2.67 billion euros, while an additional decrease of 210 million euros is due to behavioral adjustments to the reform. This figure excludes wealth tax liabilities of non-resident taxpayers.

Appendix

A1. Wealth Taxation in France

The Impôt de Solidarité sur la Fortune

The deductibility of debts. Debts existing on January 1^{st} of the tax year that have been contracted by the taxpayer can be deducted from the tax base, provided that they are related to assets subject to the wealth tax.[46] This excludes debts related to business assets or artworks. If a debt relates to a partially exempted asset, the amount deductible is proportional to the fraction of the the asset subject to the tax (e.g. 70% for primary home). Fiscal debts (personal income tax, inheritance tax, wealth tax, property tax and some social security contributions) can also be deducted.

The wealth tax cap. There exists a ceiling mechanism that limits the total amount of income and wealth tax liabilities a taxpayers has to pay relative to their net taxable income. This percentage was 70% when the mechanism was first introduced and was set to 75% from 2013 onwards. It means that after 2013, a taxpayer cannot pay as income and wealth taxes for a given year t more than 75% of the taxable income they received in year t-1. This mechanism is still in force today.

The 2017 Reform

Real estate excluded from IFI tax base. First, assets that qualify as business wealth are exempted. This refers to real assets assigned to the industrial, commercial, craft, agricultural or professional activity of the company owning them. In case of mixed real estate assets (used both for business and privately), the share of the asset's value not used for the professional activity is taxed. Second, certain shares of companies or organisations holding real estate may be exempted from wealth taxation. Three types of shares fall in this category. First, when a taxpayer owns less than 5% of the shares and voting rights in a listed real estate investment company (e.g. *Sociétés d'Investissement Immobilier Cotées*). Second, when a taxpayer owns less than 10% of the shares and voting rights of a company whose activity is industrial, commercial, craft, agricultural or liberal. Third, for some types of collective investment undertakings when i) the taxpayer owns less than 10% of rights of the collective investment undertaking, and ii) the assets of the undertaking for collective investment consist of less than 20% of taxable real estate. Third, real estate held in specific trusts. Properties held through a trust are in most cases subject to IFI, except for i) irrevocable trusts which solely benefit certain charities and ii) pension trusts under a pension scheme set up by a company for its employees. More details can be found in Dupas (2020).

[46] Note however that the capital and interests from a consumption loan can be deducted from the tax base.

Changes in the deductibility of debts. The 2017 reform introduces a ceiling to the amount of debt deductible from the wealth tax base. This affects taxpayers with a taxable wealth above 5 million euros and an amount of debt exceeding 60% of their taxable capital value. For these taxpayers, only 50% of the balance of the loan is deductible above the 60% threshold. For example, if a taxpayer owns 10 million euros in taxable wealth with a mortgage of 8 million euros, the the 60% threshold is 6 million euros. Above 6 million euros, only 50% of the debts is deductible (50% of 2 million euros = 1 million euros). The total amount of deductible debt will be 6 million euros + 1 million euros = 7 million euros, instead of 8 million euros before the reform. Besides, the entire capital of in fine loans could be deducted from the ISF tax base.[47] After the 2017 reform, the amount deductible is subject to a digressive deduction over the duration of the contract. Finally, some taxes remain part of the deductible fiscal debts (property tax, wealth tax, tax on empty dwellings) but some others are excluded (personal income tax, social security contributions).

Wealth Taxation of Non-Residents

Taxation of real estate. Before and after the 2017 reform, real estate wealth owned by non-residents in France is subject to the wealth tax—above the 1.3 million euros exemption threshold. In the case of indirect ownership, only shares of real estate companies (when more than 50% of the company's assets is composed of French real estate) or shares in companies in which their stake exceeds 50% were subject to the ISF. After the 2017 reform, all company shares are subject to IFI, in proportion to the share of real estate owned (with an exemption for shareholdings below 10% in operational companies).

Taxation of financial assets. Even before 2018, the non-residents benefited from a full wealth tax exemption on the financial assets they owned in France (provided that these assets were linked to a company located in France). However, this rule did not apply to shares that represented a *substantial participation* in a French company, which generally refers to investors owning more than 10% of a firm's capital. In most cases, participations between 10% and 25% only would be subject to the wealth tax, as the shares above the 25% of capital ownership threshold would typically qualify as business assets. To ensure a clean control group, I exclude all non-residents who report any significant taxable financial assets during my sample period. Specifically, I remove non-residents who ever report financial assets exceeding 5% of their taxable wealth (boxes CF, CG, CM, CC, CK, CJ, CI, CH), including in 2010, before the introduction of simplified reporting requirements. In addition, indirectly held real estate is reported together with some financial assets (boxes CE and CD). To minimize the possibility that non-residents own taxable financial assets before the reform, I exclude all non-residents who ever report more than 50% of their taxable wealth in boxes CE and CD. Note that many of

[47] Types of debt when the repayment of the capital happens at the end of the contract.

these reported assets likely represent either indirectly held real estate or real estate incorrectly classified as financial wealth (evidence of misreporting includes non-residents incorrectly listing properties as 'primary housing'—a classification impossible for non-residents). The first restriction reduces the size of the control group by 15% while the second restriction reduces it by an additional 26%.

A2. Data Processing

Handling changes of fiscal identifiers The panel structure of the data used in this paper makes it possible to follow taxpayers from year to year. A unique tax identifier is assigned to each household as well as to each spouse within the household. Importantly, when the household structure changes (divorce, marriage etc.) as well as when a household changes their *département* of residence, the tax identifier also changes. Although it is not systematic, this also applies when households migrate.[48] Thus, some individuals appear in several fiscal households in a given year. To follow the maximum number of taxpayers over time, I use the first spouse identifier ("spi1_c") instead of the household identifier, take the max of wealth variables and the sum of income variables reported by the household(s) of an individual in a given year. This allows me to take care of cases for which the income or wealth reported by a given household is split or missing in a given year simply because they move out of their département of residence during the year.

Handling inconsistencies between ISF and IFI data Wealth information in this paper is based on two separate wealth tax datasets. The first one is the ISF dataset ("isf_ifi_2006_2020_casd"), which includes ISF tax returns (2006-2017) and has been extended to 2020. The second one is the IFI dataset ("panel_ifi_2023_diff_complet"), covering wealth tax returns after the reform only (2018-2022). During the years over which both datasets overlap (2018-2020), approximately 10% of households appear in only one dataset as wealth taxpayers. Non-residents are particularly affected, representing 30% of these inconsistent cases. For most discrepancies, I identified that the taxable wealth reported by a household in one dataset exactly matches amounts reported under a different tax identifier in the other dataset. By matching these cases, I reduced inconsistencies to just 0.1% of households. Approximately 30% of remaining cases with inconsistent wealth information are non-residents (130 taxpayers).

Handling remaining missing wealth information in some years These inconsistencies raised concerns about potential missing wealth information for certain taxpayers/years, particularly around the database transition coinciding with the reform period. While this does not affect my main estimates of portfolio rebalancing responses—which rely on a balanced sample of wealth taxpayers—it could influence estimates of extensive margin responses.

Correspondence with the French tax administration resulted in a new IFI dataset release that included previously missing taxpayers, primarily non-residents. Though this attenuated the issue, "holes" remain in some taxpayers' tax payment histories that likely stem from data limitations rather than actual reporting behavior. For example, among non-residents liable for wealth tax in 2013 (my control group), the probabil-

[48] Note that in the case of migration, the individual tax identifier may also change.

ity of having a year with missing taxable wealth—despite positive wealth in both preceding and following years—peaks in 2018.

To address this, I exclude wealth taxpayers with any one-year gap in their tax payment history over the sample period. This ensures that extensive margin response estimates reflect taxpayers who fall below the exemption threshold and remain there for multiple years, rather than those with incomplete data (and eliminates cases where taxpayers might temporarily drop below the threshold for one year before exceeding it again).

A3. Variables Definitions

The variables used in this paper come from the wealth tax and income tax returns.

Wealth variables:

- *Net taxable wealth:* It is defined as the difference between gross wealth and debts and is reported under box "HI" of the wealth tax return.
- *Taxable real estate:* Since real estate held indirectly is reported together with financial assets before the reform, I restrict the analysis to directly held real estate. This is defined as the sum of holdings reported under boxes AB ("résidence principale"), AC ("autres immeubles"), BD ("bois, forêts et parts de groupements forestiers"), BF and BG ("biens ruraux loués à long terme"), BI and BJ ("parts de groupements fonciers agricoles et de groupements agricoles fonciers"), and BK ("autres biens"). These categories refer exclusively to *directly held* real estate assets. When using real estate as the outcome variable, I use boxes BE and BH instead of BF, BG, BI, and BJ to ensure consistency throughout the entire period. Importantly, many control group taxpayers file simplified wealth tax returns, meaning the exact portfolio composition remains unobserved for most non-residents in the sample. I therefore define taxable real estate for non-residents as their gross taxable wealth. As shown in Appendix Figure 21, results using directly held real estate as the outcome variable and restricting the control group to non-residents who file detailed returns yield estimates comparable to the baseline estimates.

Capital income variables:

- *Rental income:* Rental income is defined as the sum of income reported in boxes 4BE ("micro foncier") and 4BA ("revenus fonciers imposables") in the form 2042.
- *Dividends:* I follow the same definition as Bach et al. (2021*b*) and define dividend income as the sum of amounts reported in boxes 2DC and 2DA in the form 2042. Declared dividends represent gross dividend income, prior to any tax deductions or withholding taxes applied to this income.

- *Interests:* I define interest income as the income reporte under box 2TR in the form 2042, refeering to "Intérêts et autres produits de placement à revenu fixe".
- *Dividends from SIIC:* Dividends received from SIIC must be reported in box 2TS ("produits des contrats d'assurance-vie d'une durée inférieure à 8 ans et distributions") of the income tax return rather than with other dividends. This box also includes other income elements, though these are likely rare due to their relatively high taxation. To ensure consistency throughout the entire period, I add income reported under boxes 2XX, 2YY, and 2ZZ from 2018 to this income category.

A4. Recovering the Revenue Maximizing Tax Rate on Real Estate

This section translates the insights from Piketty and Saez (2013) to the context of asset rebalancing. The goal is to illustrate the importance of the cross-elasticity when assessing the optimal rate on real estate and financial assets. For this purpose, I base of the model developed in section 5.1 in order to express the revenue maximizing linear tax rate on real estate wealth for three values of the cross-elasticity. First, when the cross-elasticity is equal to zero, i.e. there is no rebalancing between the two asset classes, the tax revenue function on real estate wealth is defined as $\tau_H \rightarrow \tau_H W^H(1-\tau_H)$. It has an inversed U-shape, corresponding to the well known Laffer curve. The revenue maximizing tax rate on real estate τ_H^* is such that $\bar{W}^H(1-\tau_H) - \tau_H \frac{\partial \bar{W}^H}{\partial(1-\tau_H)} = 0$, i.e. $\frac{\tau_H}{1-\tau_H} e_s = 1$. Hence, τ_H^* can be written as:

$$\tau_H^* = \frac{1}{1+e_s}$$

In this case, the revenue maximizing rate only depends on the savings elasticity. This formula is the standard Ramsey inverse elasticity rule: the higher the savings responses to taxation, the lower the optimal rate. Second, once we allow for cross-base responses to taxation, tax revenues depend on τ_H, the tax rate on housing but also on τ_F, which is the rate at which the reallocated real estate assets will be taxed. The tax revenue function becomes $\tau_H \rightarrow \tau_H W^H(1-\tau_H, \tau_F) + \tau_F X(\tau_H - \tau_F)$, which is increasing in τ_H and in τ_F. For a given τ_F, the rate maximizing tax revenues is:

$$\tau_H^* = \frac{1+\tau_F e_c}{1+e}$$

With $e = \frac{\bar{W^H}}{W^H} \cdot e_s + e_c$. Note that if τ_F is equal to zero, we have $\tau_H^* = \frac{1}{1+e}$ which is the standard revenue maximizing rate. Third, in the limit case where e_c is infinite, and savings elasticities for both real estate and financial assets are finite, the revenue maximizing rates for real estate and financial assets are equal and defined as:

$$\tau_H^* = \tau_F^* = \frac{1}{1+\bar{e}}$$

With $\bar{e}$ the average savings elasticity of real estate and financial assets weighted by the level of each asset. These results highlight the fact that taxpayers' reallocation behaviors bring the optimal tax rates on real estate and financial assets closer together relative to the standard inverse elasticity rule. When the cross-elasticity is very large, the optimal tax rate on real estate and financial assets should be close even if the savings elasticities on both assets are different. This exercise highlights the importance of accounting for the cross-elasticity between assets when deriving optimal wealth tax rates.

A5. Revenue Impact of the Reallocation Responses - Further Elements

Infering total taxable real estate and financial wealth before 2018 Two features of the wealth tax data mentioned in section 3 make W^H and W^F not directly observable. First, when real estate is held indirectly, it is reported together with other indirectly held financial assets—under boxes "CE" and "CD" of the wealth tax return. Thus, precise information on indirect ownership of real estate is only accessible after 2017, when financial wealth is no longer taxed. When investigating the reallocation response, I deal with this limitation by focusing on directly held real estate. However, determining the level of indirectly held real estate is necessary to decompose the revenue impact of the wealth tax change. To do this, I base on the period when this piece of information is available, namely between 2018 and 2022. I compute the ratio of indirectly held over total real estate for all wealth taxpayers in 2018 and infer indirect real estate before the reform by assuming that the average ratio has remained constant.[49] Note that the reform did not change taxpayers' incentives to hold their taxable real estate directly or indirectly, making the assumption of constant ratio of indirect real estate reasonable.

Second, from 2011 to 2017, taxpayers with taxable wealth below a certain threshold—set at 2.57 million euro after 2013—had only to file a simplified wealth tax return. In the simplified return, taxpayers only report total net and gross taxable wealth without breaking it down by asset type. In order to estimate W^H and W^F, I circumvent this limitation by exploiting information reported in 2010, before the introduction of the simplified reporting requirements. In particular, I compute for each taxpayer with taxable wealth between 1.3 million euros and 2.57 million euros the ratio of real estate over total taxable wealth in 2010. Then, I impute the amount of taxable real estate for people filing the simplified tax return by multiplying this second ratio by their level of taxable wealth each year. The assumption here is that the average share of real estate in total wealth remains constant between 2010 and 2017.

[49] I replace imputed indirectly held real estate by zero if box "CE" and "CD" are zero for a given taxpayer.

Based on infered values of real estate, 135,000 wealth taxpayers are estimated to own more than 1.3 million euros in real estate in 2017. This estimate, combined with the 2018 extensive margin response to the reform ($\approx 3.4\%$), predicts well the number of wealth taxpayers in 2018 (132,000), suggesting that W^H and W^F are well approximated.

A4. Additional figures and tables

	Balanced sample	Active Taxpayers		Passive taxpayers	French control
		Intensive Margin	Extensive Margin		
	(1)	(2)	(3)	(4)	(5)
Age	70	70	71	70	67
% Married	65	62	52	66	62
% Living in Paris	38	30	24	40	10
% Retirees	75	76	78	75	71
% Firm owner	43	44	32	42	40
% Income taxpayers	100	100	100	100	100
% Tax return filled by third party	18	22	16	17	19
Gross income	309,944	288,231	142,184	315,043	173,502
Pension benefits (%)	33	31	42	33	43
Wages (%)	14	13	12	15	17
Rental income (%)	38	40	30	37	16
Financial capital income (%)	15	15	15	15	23
Net taxable wealth	6,617,893	6,766,345	3,863,512	6,583,032	3,731,590
Housing assets (%)	54	57	51	54	18
Non-Primary housing assets (%)	41	45	38	40	10
Primary residence (%)	14	13	14	14	8
Financial assets incl. indirectly held real estate (%)	46	43	49	46	82
Liabilities (%)	5	6	5	5	4
% benefited from tax ceiling	11	11	6	10	8
Wealth tax	38,880	41,104	18,863	38,357	15,658
Wealth tax rate (%)	0.55	0.55	0.45	0.55	0.41
Number of tax units	15,670	2,980	1,419	12,690	7,026

Table 3: Baseline Summary Statistics - Sub-Groups of French Taxpayers

Notes: This table is a variation of table 1 and presents 2016 descriptive statistics for four sub-categories of the treatment group (columns 1-4) as well as for French wealth taxpayers in 2016 used as a control group in section 4.7.2. The first of the four sub-categories is the baseline sample used for the estimation of the intensive margin response, namely the balanced sample of French taxpayers liable to the wealth tax all years between 2013 and 2022 who never file a simplified tax return (column 1). The next two sub-categories are sub-groups of this sample, composed of the "active" taxpayers responding either on the intensive margin (column 2) or on the extensive margin (column 3). The latter are defined as taxpayers from the treatment group who become exempt from wealth taxation after the reform, while remaining liable to the income tax (thus excluding people who stop paying the wealth tax because of death). Column (4) refers to passive taxpayers who do not respond to the 2017 reform. Column (5) show descriptive for French taxpayers used as a control group in section 4.7.2, namely French taxpayers who: i) were liable for wealth tax throughout 2013, 2014, and 2015; ii) filed a detailed return at least once during this period; and iii) when filing detailed returns, reported less than 1.3 million euros in taxable real estate. The wealth decomposition in all columns is based on taxpayers who fill in the detailed wealth tax return in 2016. Information on whether the return was completed by a third party is only available from 2019 onward, so values for 2019 are reported in the table.

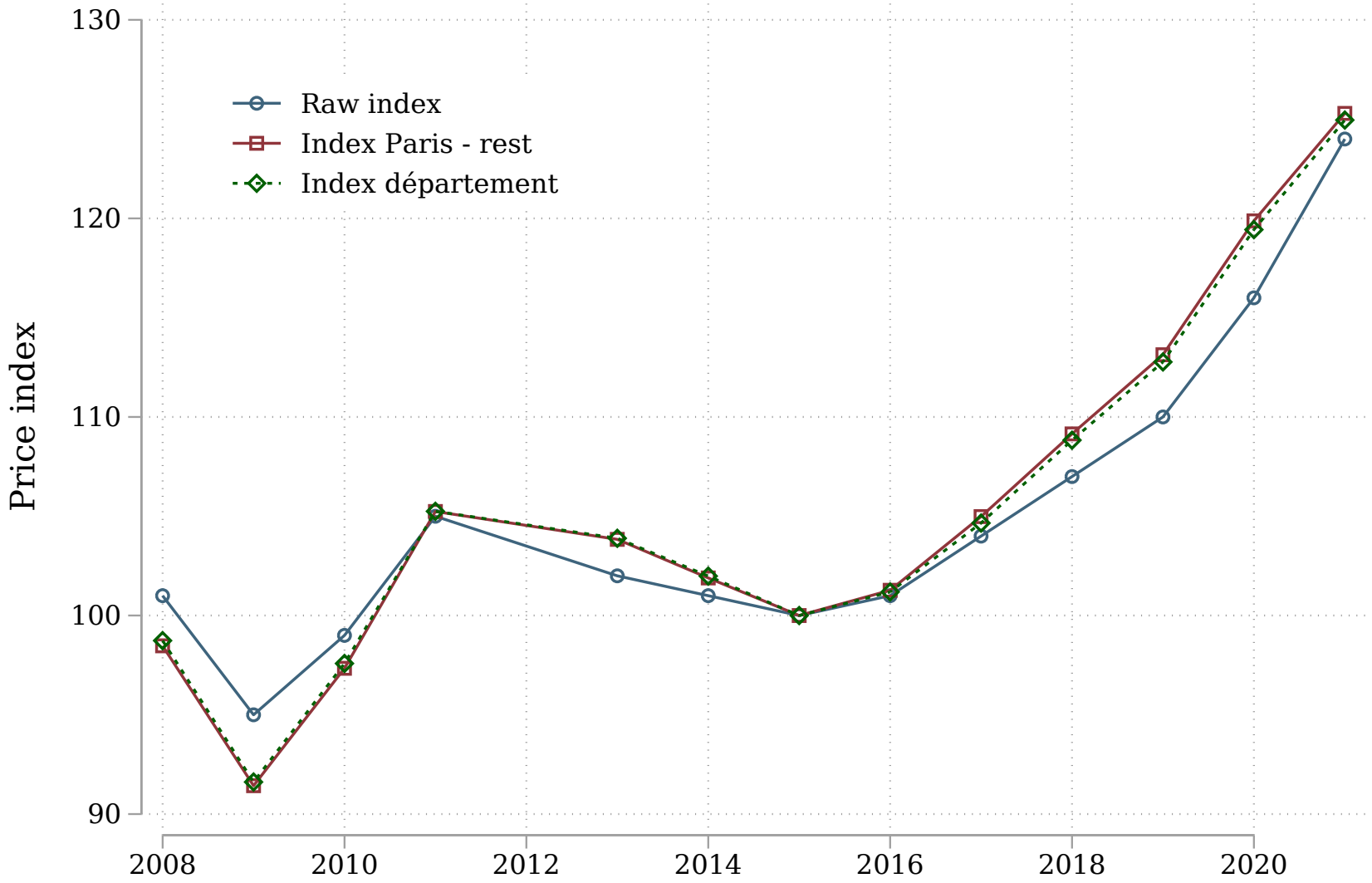


Figure 9: House Price Evolution in France

Notes: This figure displays the evolution of house prices in France over the 2008-2021 period, index 100 in 2015 from the "Indice the prix des logements INSEE". The blue line displays the raw price evolution. The red line shows the price evolution weighted by the relative share of wealth taxpayers in Paris and the rest of France and the price evolution in these two geographic areas. The green line shows the price evolution weighted by the relative share of wealth taxpayers by departement and the price evolution in these two geographic areas.

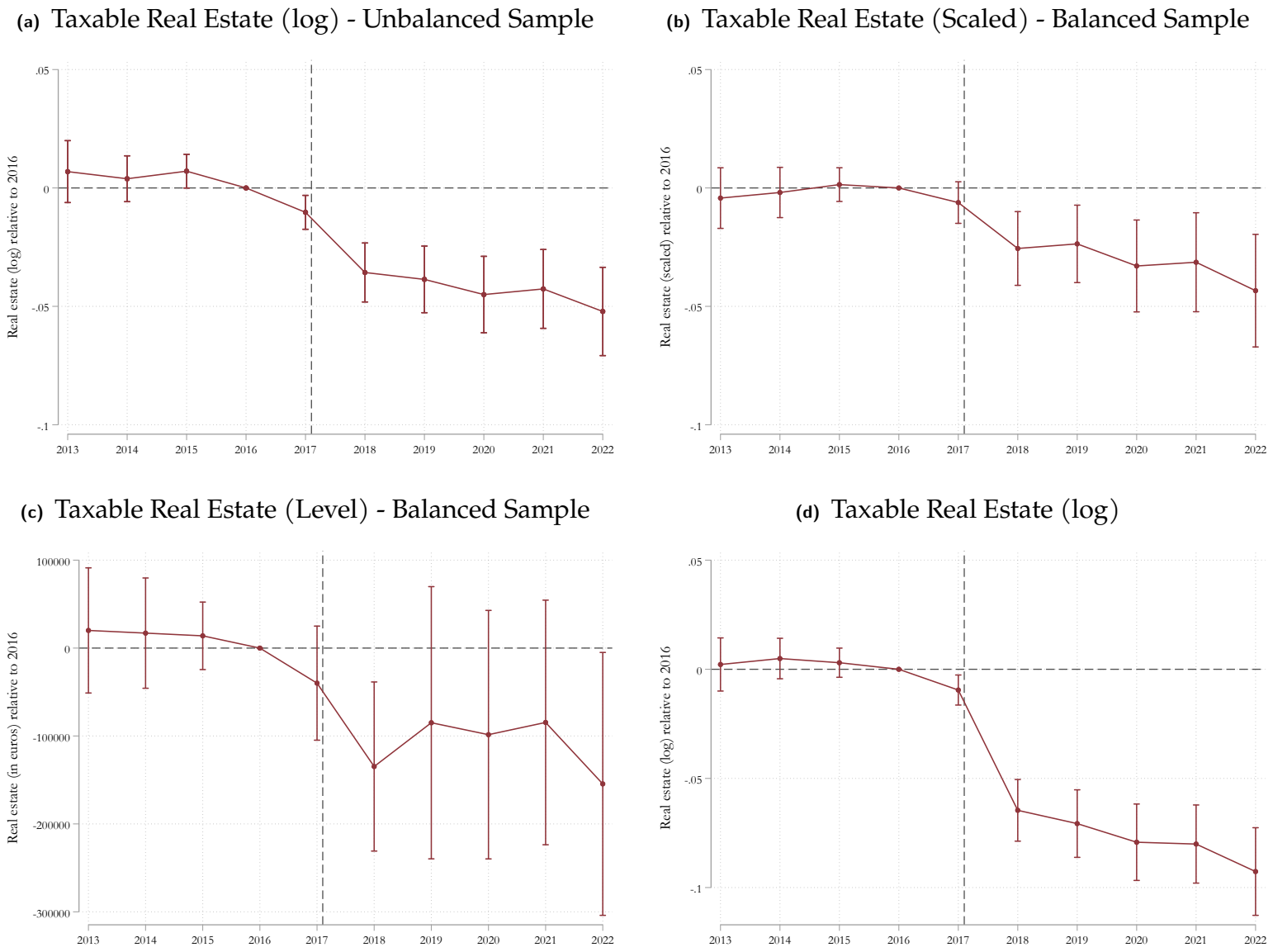
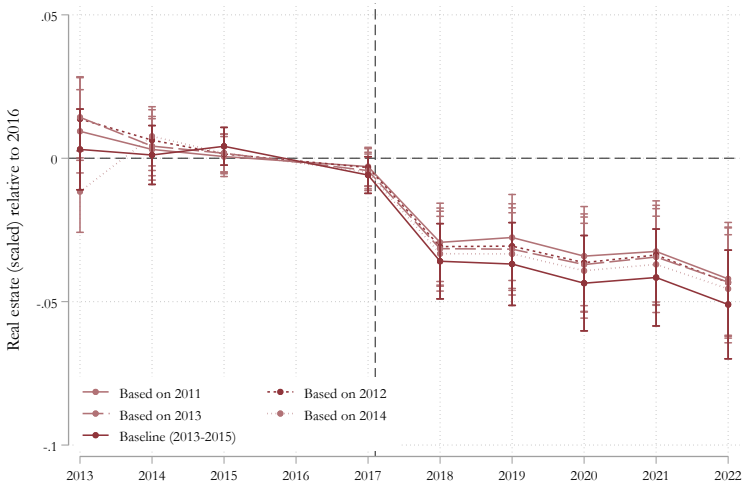


Figure 10: Further Estimates of Portfolio Rebalancing Responses to the 2017 Wealth Tax Reform

(e) Taxable Real Estate (log) - Varying Baseline Year



(f) Taxable Real Estate (log) - No Owner-Managers

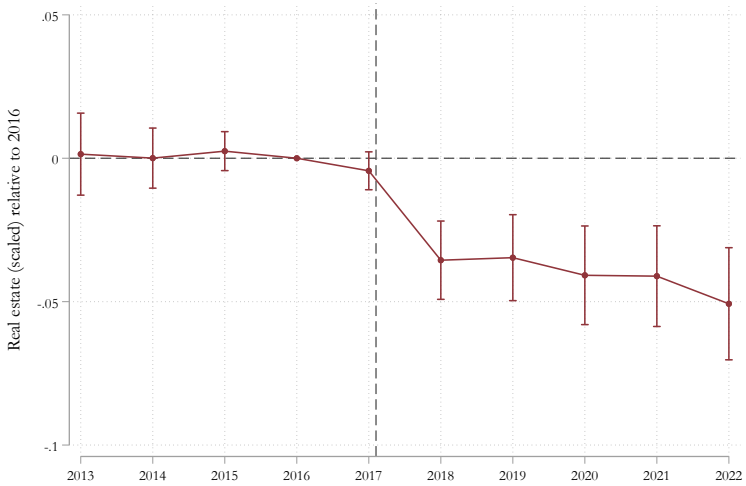
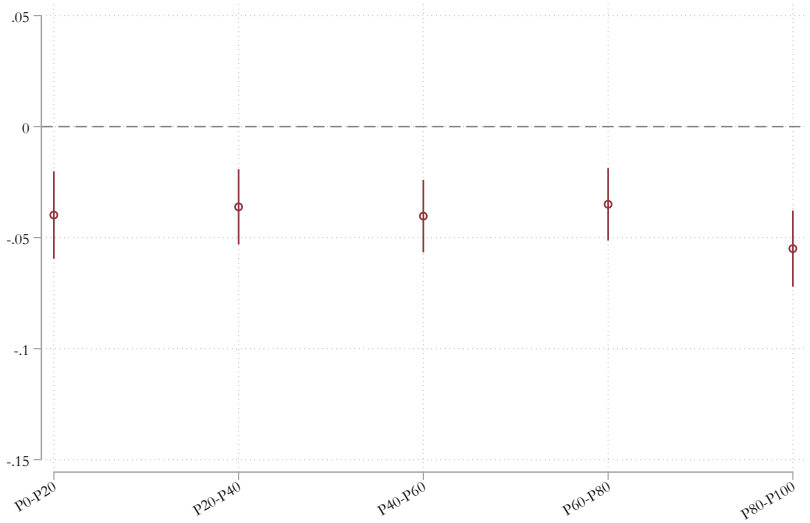


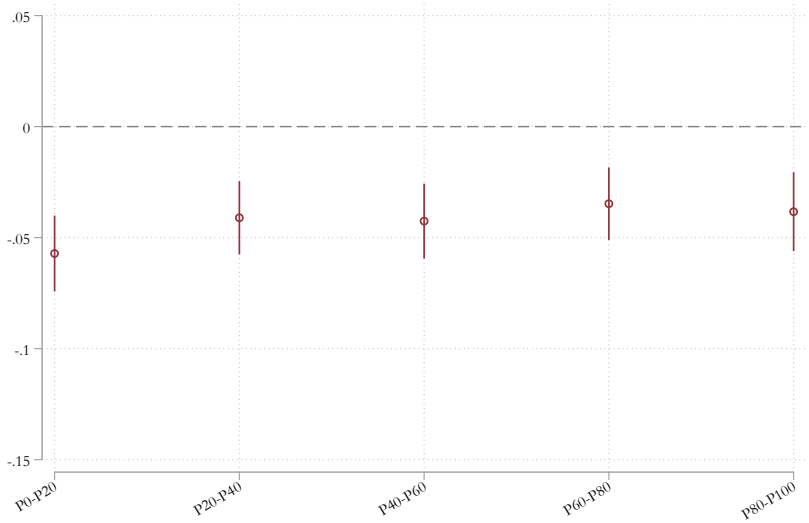
Figure 10: Further Estimates of Portfolio Rebalancing Responses to the 2017 Wealth Tax Reform

Notes: This figure shows the diff-in-diff coefficients obtained from equation (1) using alternative specifications. Panel a) estimates responses on an unbalanced sample of wealth taxpayers. Panel b) displays the diff-in-diff coefficients obtained using as outcome variable taxable real estate scaled by 2013-2015 average (winsorized at the 99th percentile of the non-zero values distribution). In panel c), the outcome variable is taxable real estate in level. In Panel d), the definition of taxable real estate for non-residents is net taxable wealth instead of gross taxable wealth. Panel e) displays the diff-in-diff coefficients obtained with the baseline treatment and with alternative treatment groups defined based on real estate reported in 2011, 2012, 2013 or 2014. Panel f) shows coefficients obtained while excluding owner-managers from the treatment group. Owner-managers are defined following the same defintion as Bach et al. (2021*b*). These taxpayers have been shown to account for a substantial share of the overall dividends payout response to the introduction of the flat tax on financial capital income in 2018. For all specification the control group is the baseline control group.

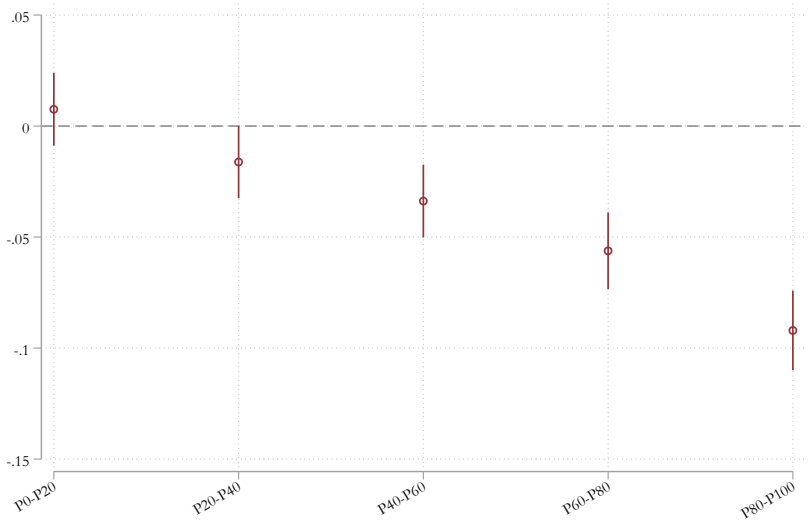
(a) By Level of Wealth



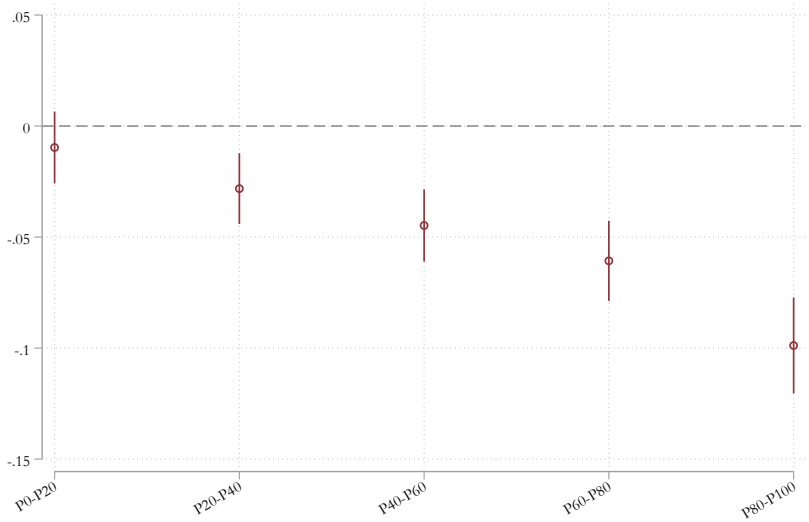
(b) By Level of Income



(c) By Level of Real Estate Wealth



(d) By Share of Real Estate Wealth



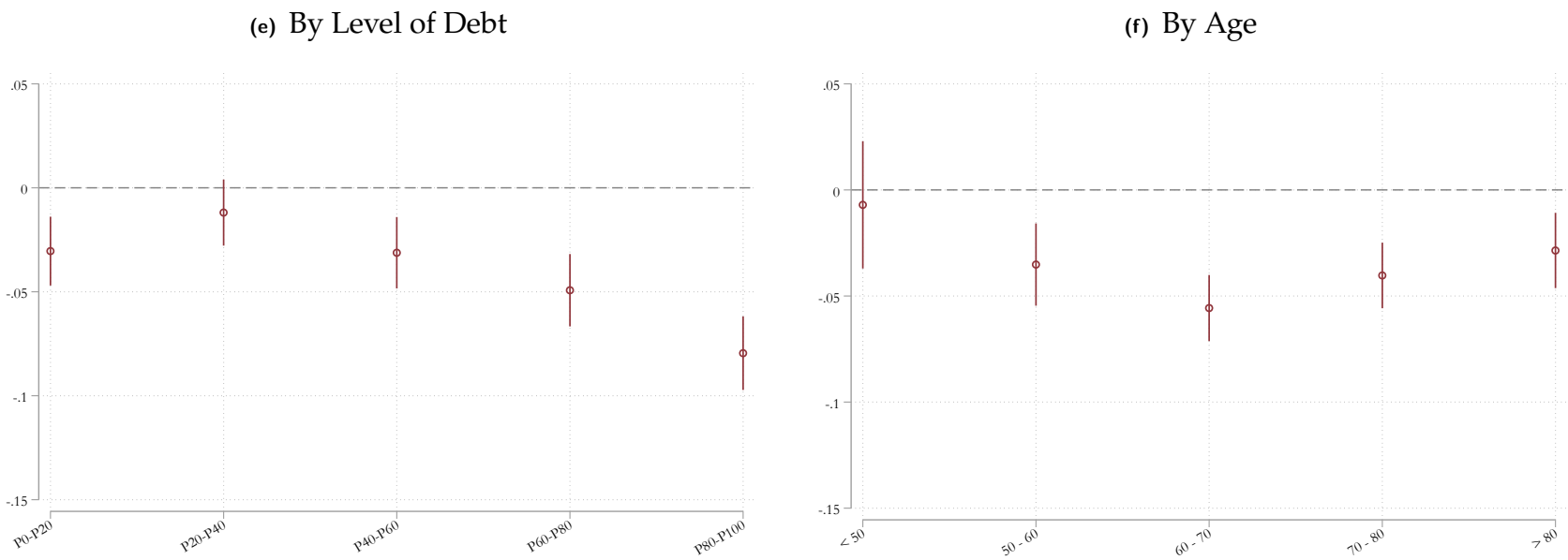


Figure 10: Reallocation Responses to the Reform - Heterogeneity

Notes: This figure shows the heterogeneity in the response to the 2017 policy change, ranking treated taxpayers by quintiles of various pre-reform distributions (2013-2015 average). More specifically, taxpayers are ranked by level of pre-reform taxable wealth (panel a), taxable income (panel b), real estate wealth (panel c), share of real estate in total wealth (panel d), and share of debt in total wealth (e). Panel f) displays results for different age groups, based on 2016 age information. Each regression estimates the compact version of equation (1) using the full control group of non-residents.

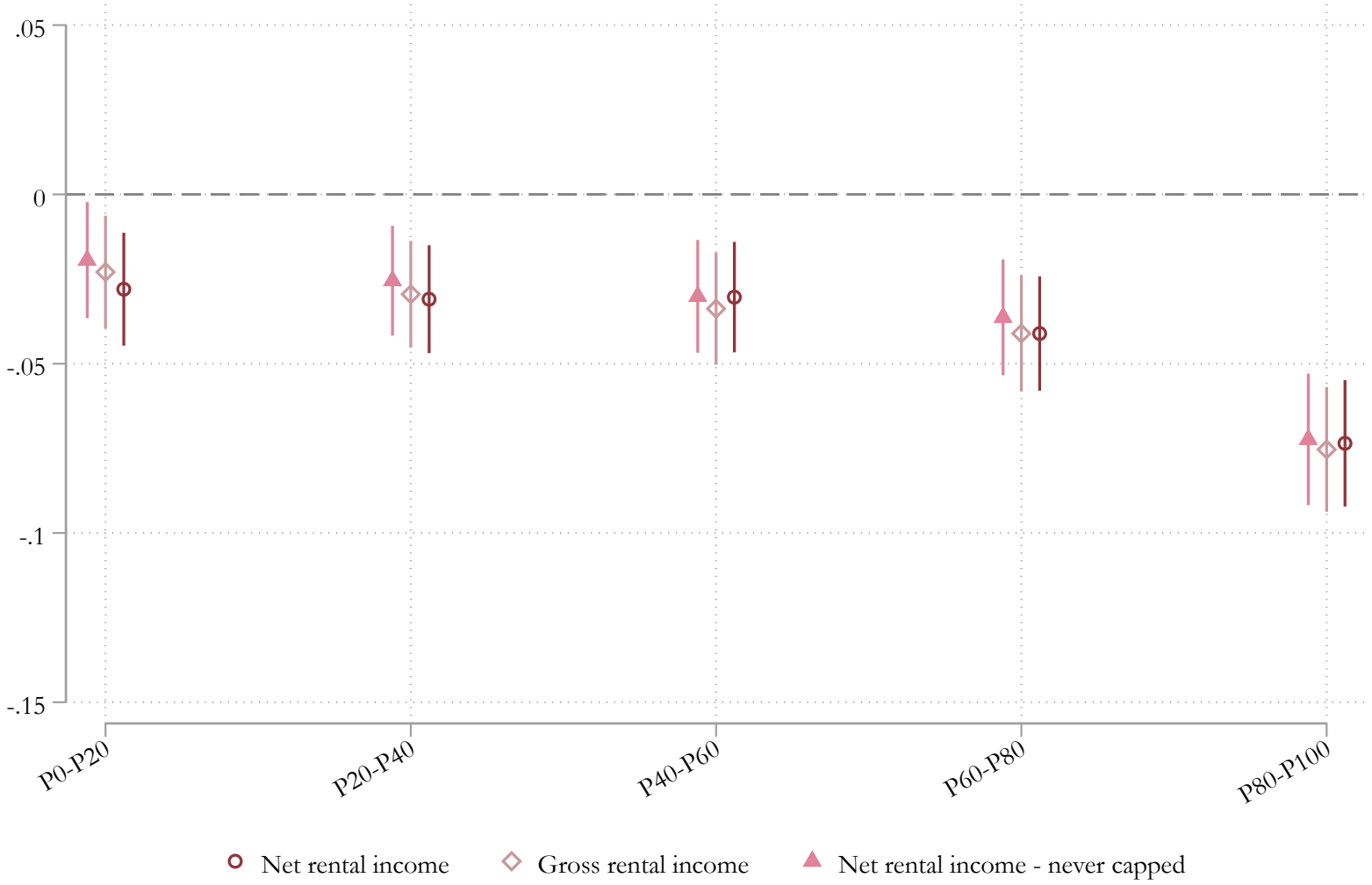


Figure 11: Consumption vs. Investment Housing - Response by Level of Rental Income

Notes: This figure shows the heterogeneity in the response to the 2017 reform by level of pre-reform rental income (average over 2013-2015 period). Each regression is estimated using the full control group. The figures group taxpayers according to different definitions of rental income, namely net rental income (baseline, circles), gross rental income (squares) and net rental income after removing taxpayers benefiting from the tax ceiling before the reform (triangles).

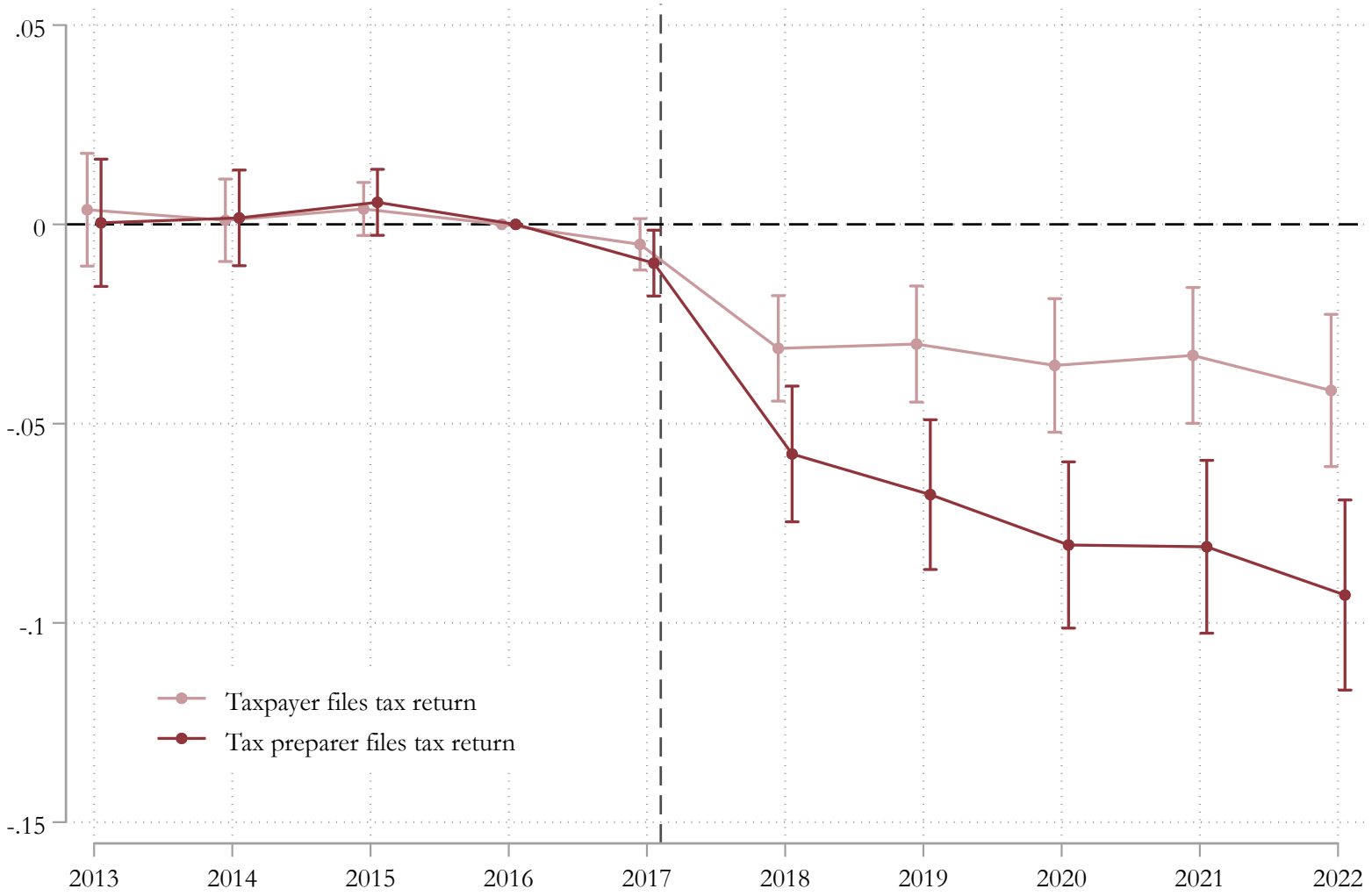
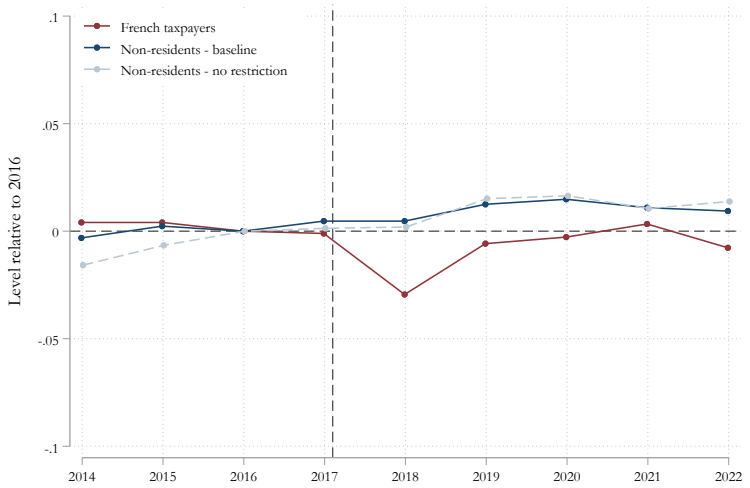


Figure 12: Responses to the 2017 Wealth Tax Reform - Tax Preparer vs. Not

Notes: This figure shows the evolution of the stock of real estate held by French vs. non-resident taxpayers between 2013 and 2022. Coefficients are obtained from equation (1), where the treatment group is split into those filing their tax return themselves ("Taxpayer files tax return") and those using a tax prepaprer ("Tax preparer files tax return"). Each regression is estimated using the full control group. The figure is obtained from a balanced sample of French and non-resident taxpayers. The treated group of French taxpayers is restricted to households who never file the simplified wealth tax return.

(a) Liable to Wealth Tax - First-Difference (time series)



(b) Liable to Wealth Tax - First-Difference (DiD)

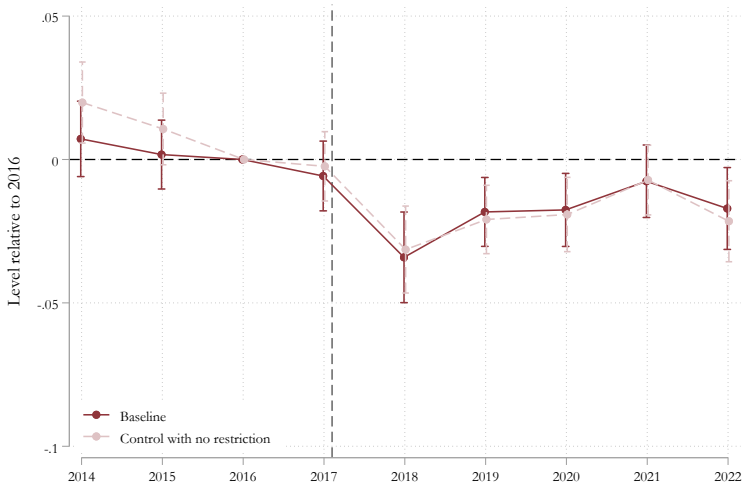


Figure 13: Extensive Margin Responses to the 2017 Wealth Tax Reform

Notes: This figure shows estimates of the extensive margin response to the reform obtained from equation (2). Panel a) displays the time seriess and panel b) shows the difference between the two series. Each graph displays the results obtained with the baseline control group (restricted to non-residents reporting at least 1.5 million euros in taxable housing wealth in 2013.) and to the full control group. While the restriction has very little influence on the post-reform estimates, it greatly reduces the differences across groups before the reform. The pre-reform difference in trends observed when using the full control group arises from the fact that non-resident taxpayers have no taxable financial assets, and thus are located much closer to the exemption threshold than treated taxpayers.

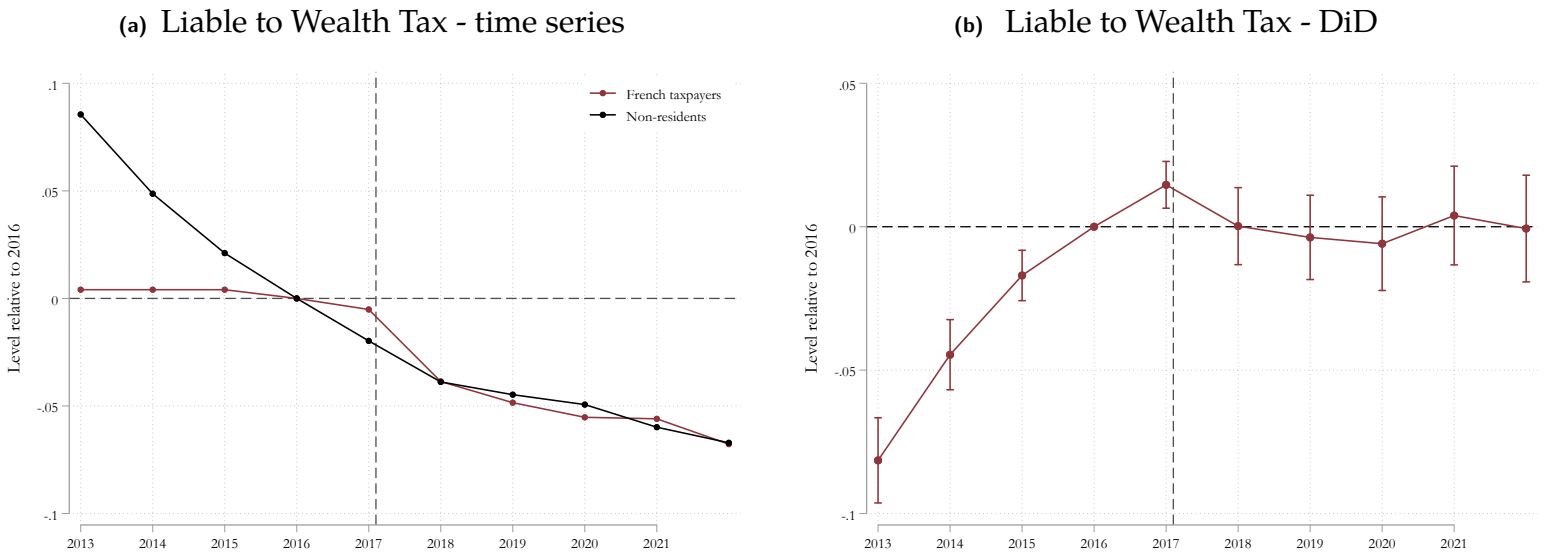
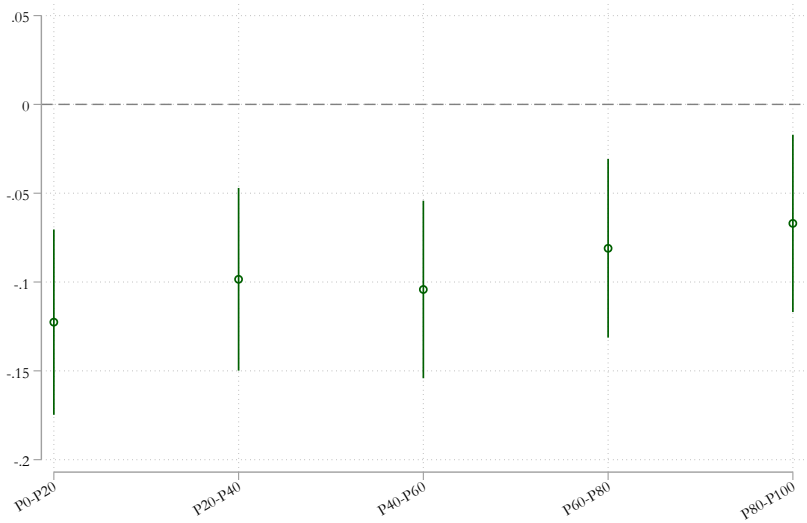


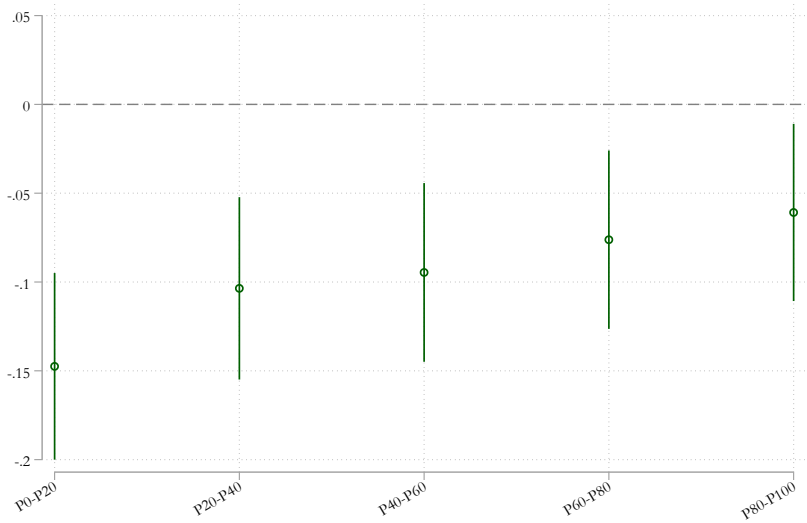
Figure 14: Extensive Margin Responses to the Reform - Differential pre-trends

Notes: This figure displays the coefficients estimated from equation (1) where the outcome variable Y_{it} is a dummy equal to one when taxpayer i is liable to the wealth tax in year t. Panel a) shows time series coefficients while panel b) displays the difference-in-difference estimates. The linear differential pre-trend makes the direct comparison of the tax payment history between the French and non-residents not very informative.

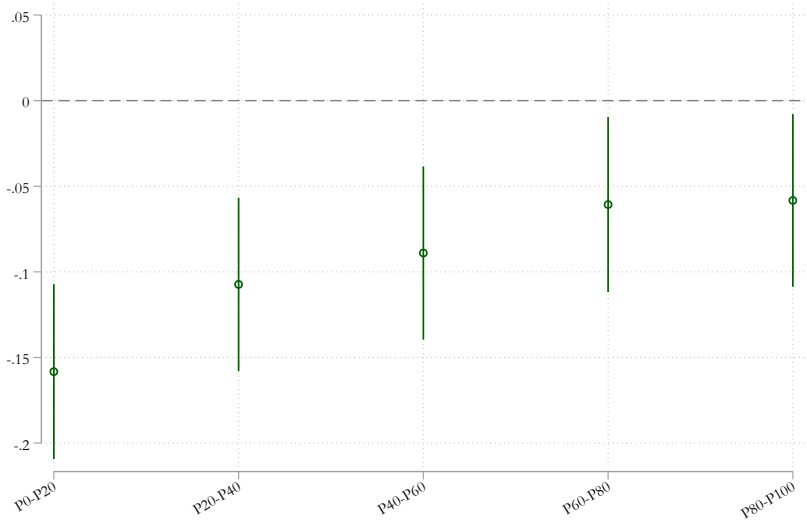
(a) By Level of Wealth



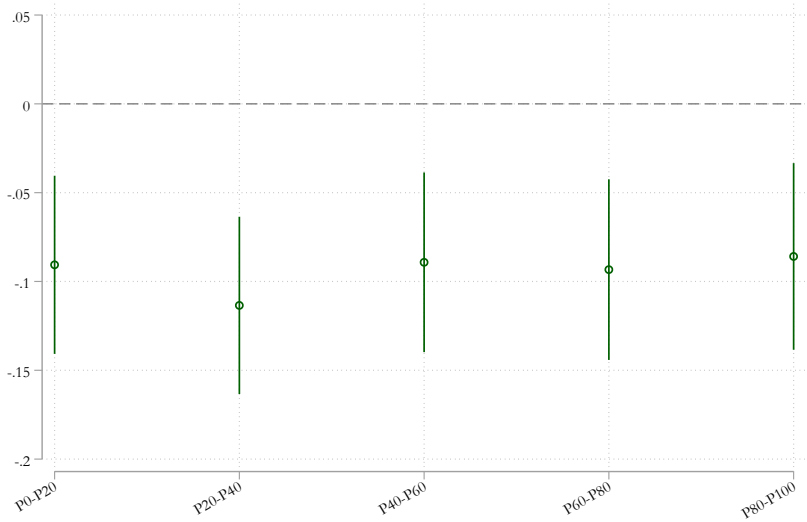
(b) By Level of Income



(c) By Level of Real Estate Wealth



(d) By Share of Real Estate Wealth



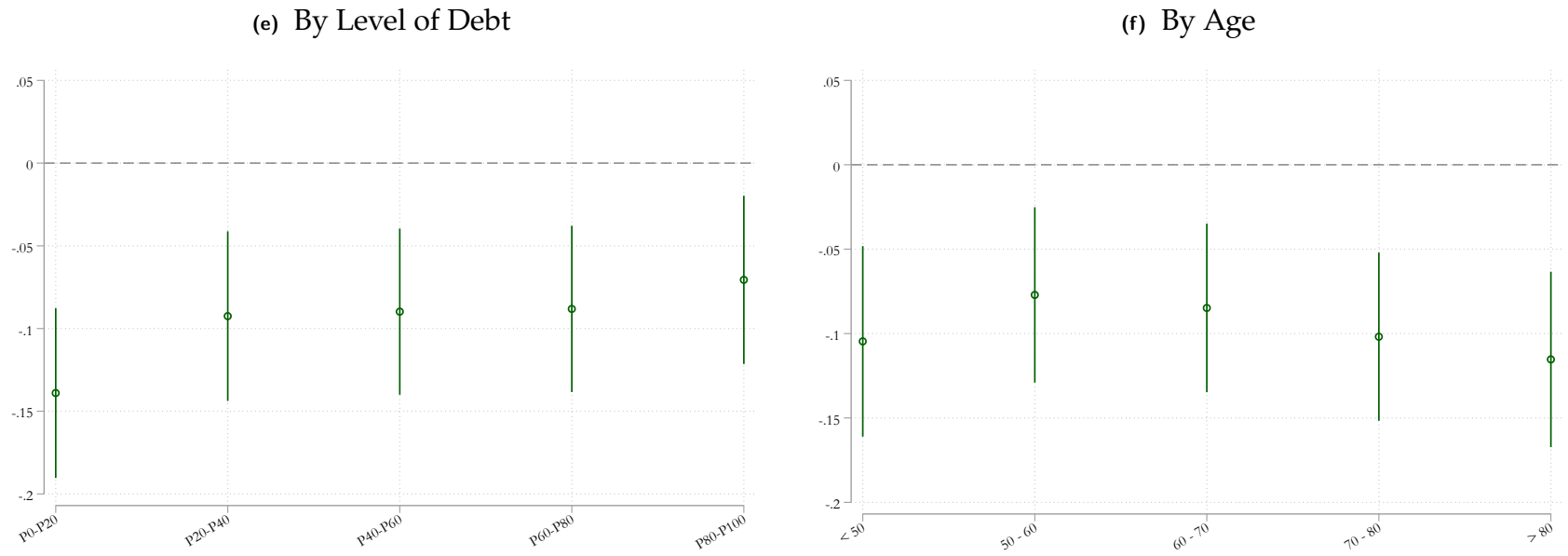


Figure 14: Extensive Margin Responses to the Reform - Heterogeneity

Notes: This figure shows the heterogeneity in the response to the 2017 policy change along the extensive margin, ranking treated taxpayers by quintiles of various pre-reform distributions (2013-2015 average). More specifically, taxpayers are ranked by level of pre-reform taxable wealth (panel a), taxable income (panel b), real estate wealth (panel c), share of real estate in total wealth (panel d), and share of debt in total wealth (e). Panel f) displays results for different age groups, based on 2016 age information. Estimates displayed here—obtained from the estimation of equation (2)—capture the response over the whole post-reform period and are obtained by summing the coefficients obtained for each post reform year. The standard errors for the summed coefficients are calculated using the 'lincom' command in Stata, which uses the full variance-covariance matrix of the estimated coefficients to compute the standard error of the linear combination.

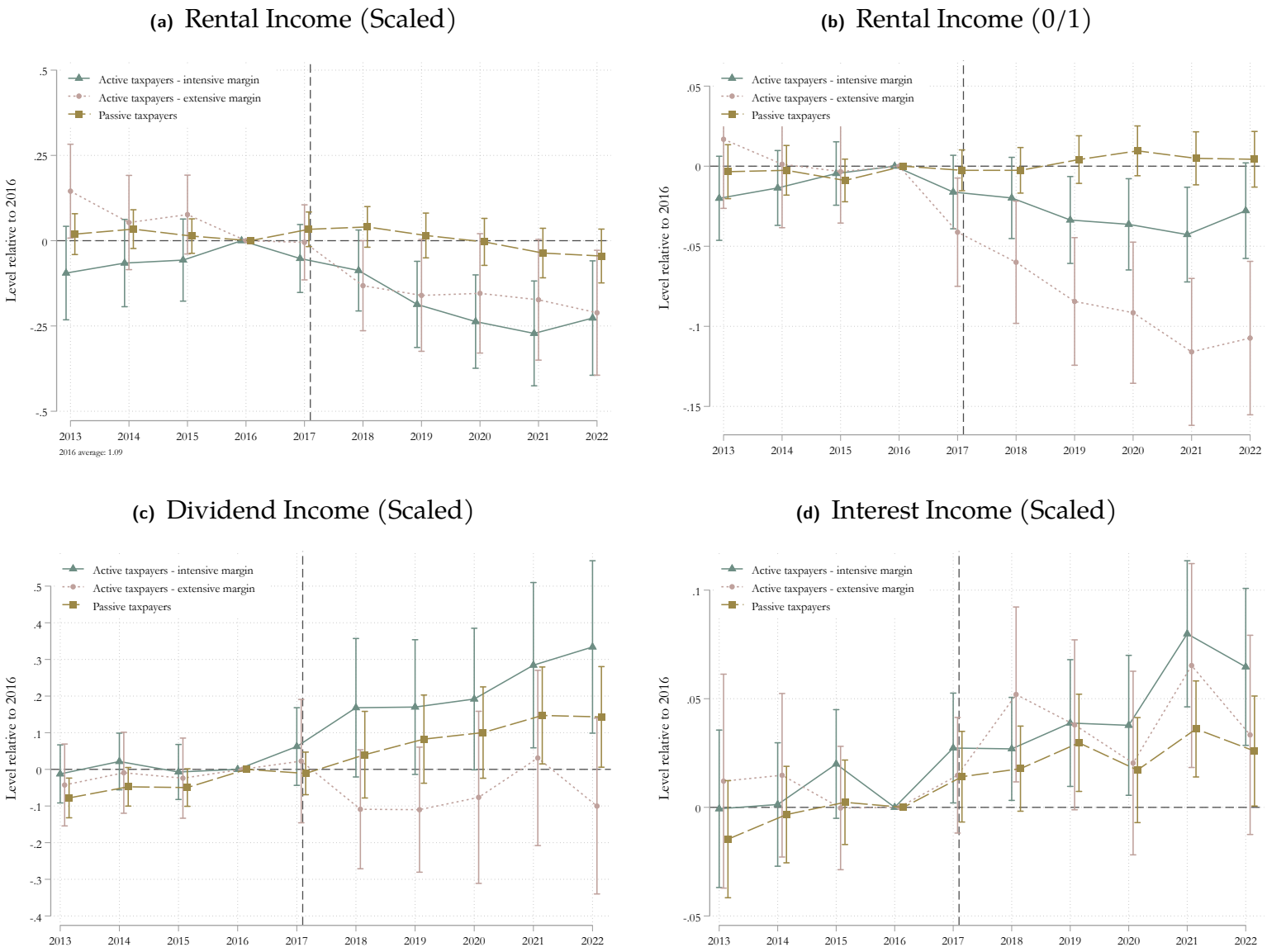


Figure 15: Capital Income Responses to the 2017 Wealth Tax Reform

Notes: This figure illustrates the evolution of rental, dividend, and interest income received by active and passive taxpayers, relative to a control group of French taxpayers whose pre-reform real estate holdings fell below the exemption threshold. Each outcome variable is scaled by its 2013-2015 average and winsorized at the 99th percentile of the non-zero value distribution. Active taxpayers exhibit a significantly more pronounced drop in rental income compared to their passive counterparts. A similar pattern is observed for interest income. For dividends, active taxpayers who remain liable to the wealth tax (intensive margin) experience a larger increase compared to passive taxpayers, while taxpayers falling below the exemption threshold (extensive margin) show no apparent response in dividend income.

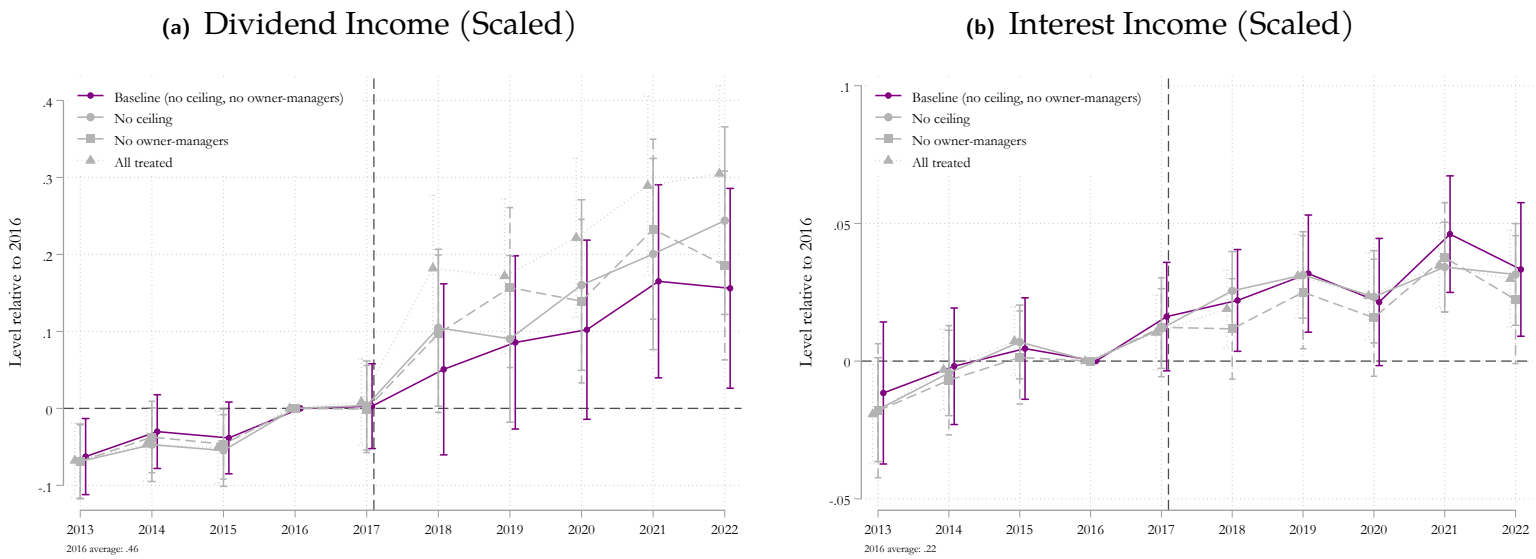


Figure 16: Capital Income Responses to the 2017 Wealth Tax Reform

Notes: This figure illustrates the evolution of dividend and interest income received by treatment group taxpayers relative to a control group of French taxpayers whose pre-reform real estate holdings fell below the exemption threshold. It shows how various restrictions applied to the treatment group affect the estimated response. The baseline—represented by the pruple curve—represents the preferred specification, as shown in figure 7. Each outcome variable is scaled by its 2013-2015 average and winsorized at the 99th percentile of the non-zero value distribution.

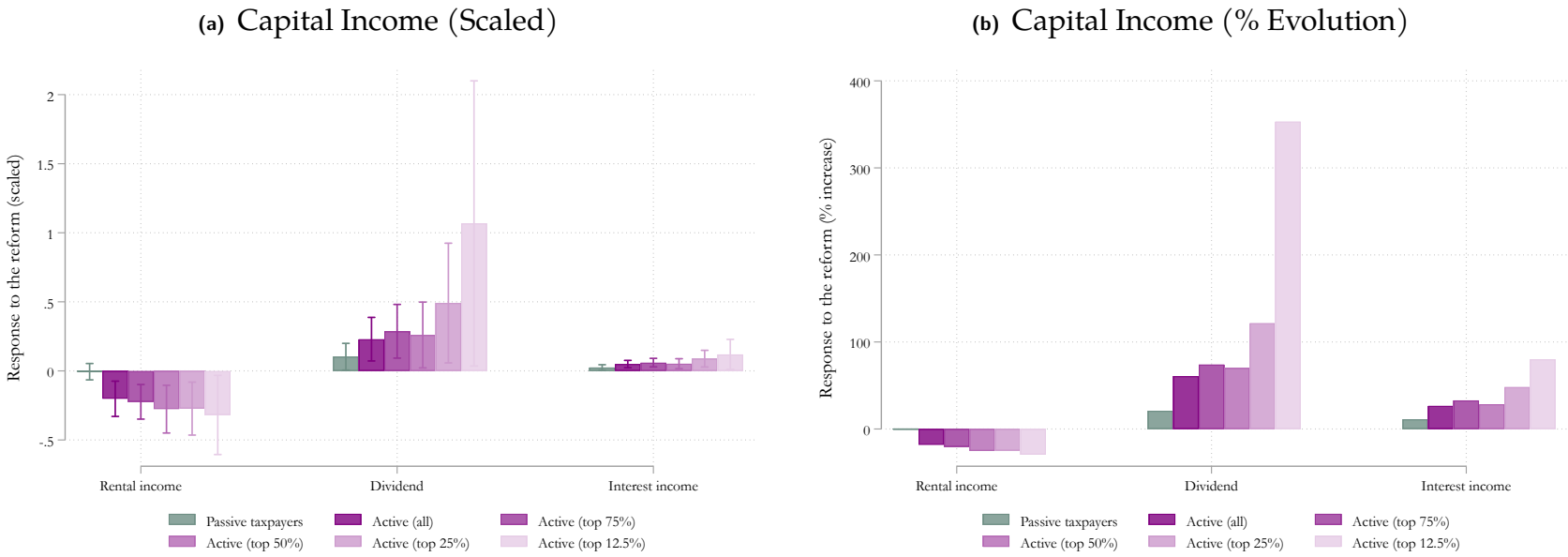


Figure 17: Capital Income Responses to the 2017 Wealth Tax Reform

Notes: This figure shows the evolution of various types of capital income estimated with the compact version of equation (1) for six sub-categories of the treatment group relative to a control group of French taxpayers who own less than €1.3M in real estate before the reform. The six sub-categories of the treatment group are i) the full group of active taxpayers (the biggest real estate sellers), ii) the top 75%, 50%, 25% and 12.5% within the group of active taxpayers and iii) the passive taxpayers. Outcome variables in panel a) are scaled by their 2013-2015 average. Panel b) translates the estimates into percentage changes.

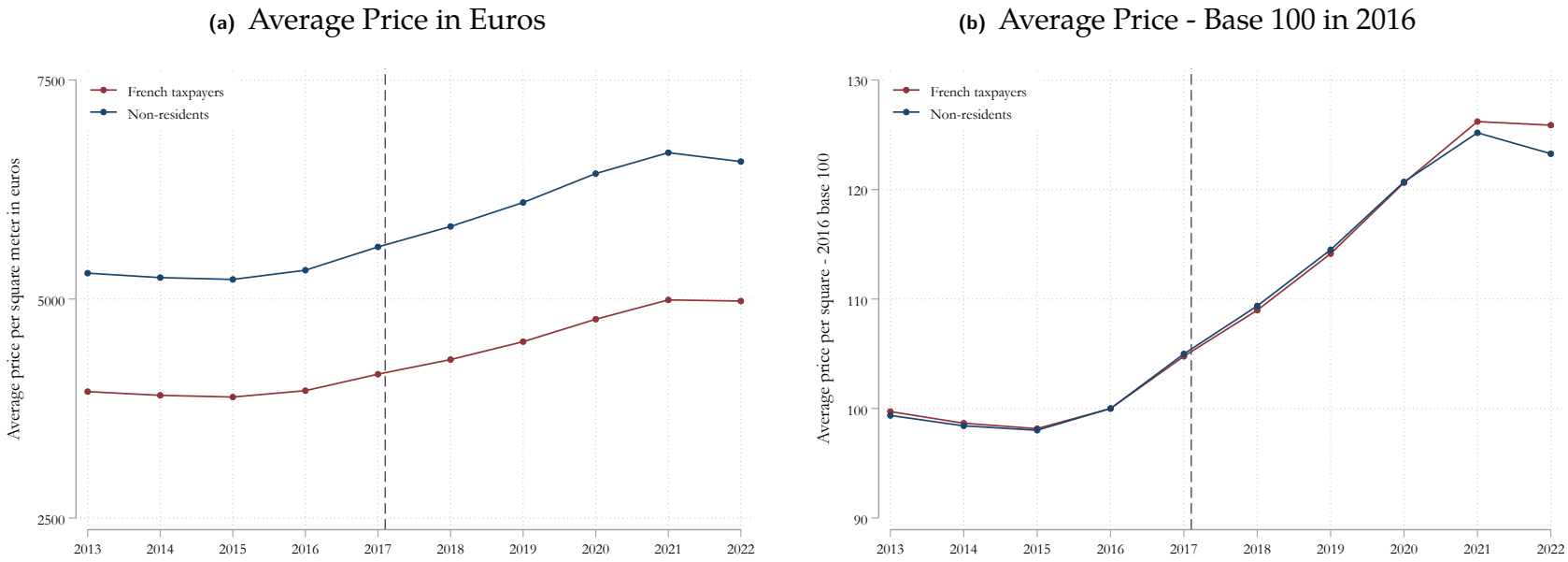


Figure 18: House Price Index for French vs. Non-Residents

Notes: This figure shows the price evolution of the housing stock held by wealthy French residents vs. non-residents as of January 1st, 2016. Wealthy owners are defined as property owners with gross housing wealth exceeding 1 million euros in 2016. The data is constructed from a dataset created by Lei (2023). The figure reveals strikingly similar house price evolution between wealthy French residents and non-residents throughout the 2013-2022 period. The modest divergence in 2022, with somewhat lower inflation for properties held by non-residents, suggests that non-residents provide a conservative estimate of how the housing stock of French residents would have evolved in 2022 in the absence of the reform.

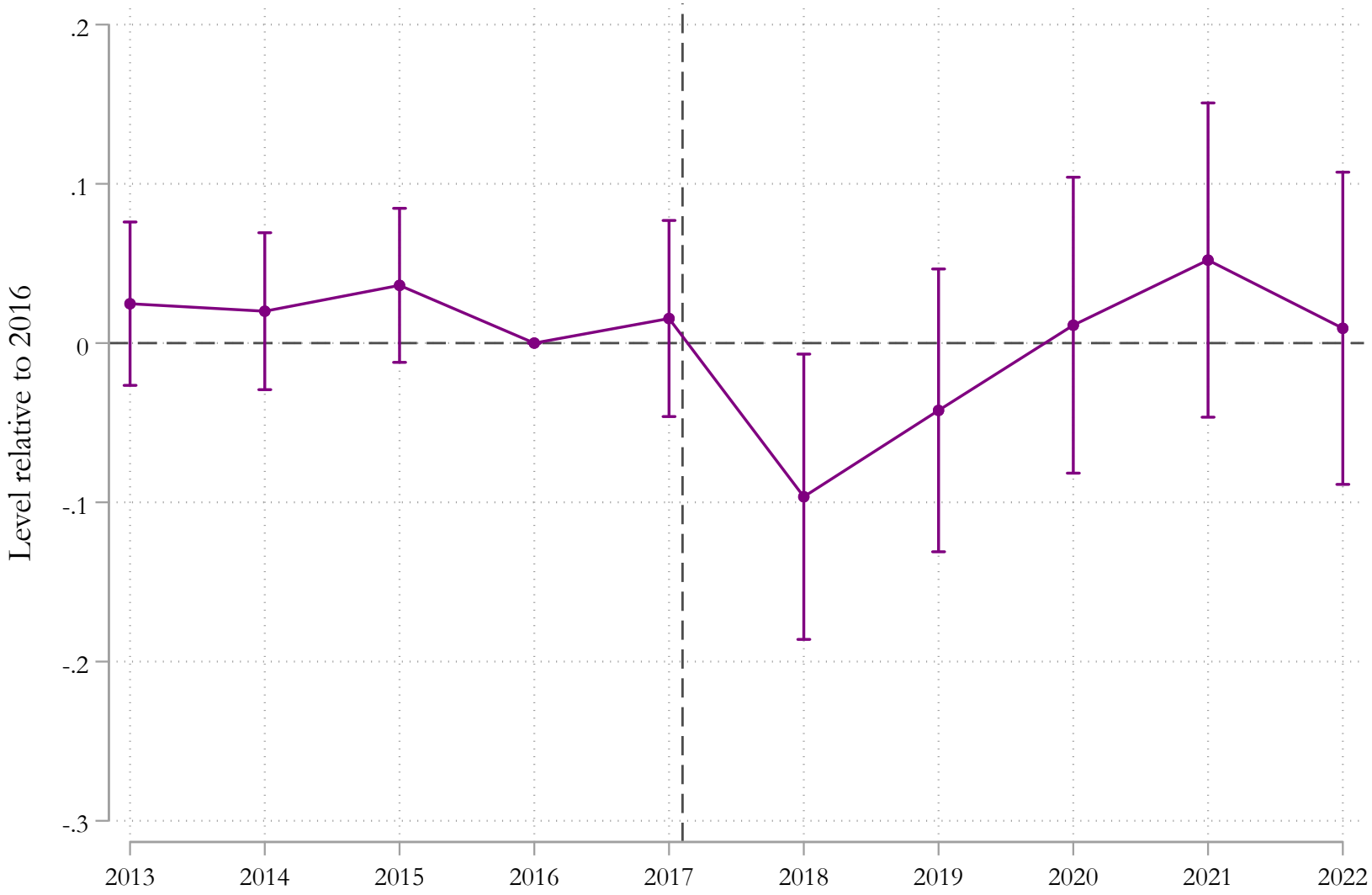


Figure 19: Response to the 2017 Wealth Tax Reform - SIIC dividends (scaled)

Notes: This figure shows the evolution of dividends from listed real estate companies (*Sociétés d'Investissement Immobilier Cotée* - SIIC) received by taxpayers from the treatment group relative to a control group of French taxpayers who own less in real estate than the exemption threshold before the reform. The outcome variable is scaled by average total rental income over 2013-2015 and winsorized at the 95th percentile of the distribution of non zero values. The sample is restricted to households receiving at least 1500 euros in annual financial capital income once between 2013 and 2015.

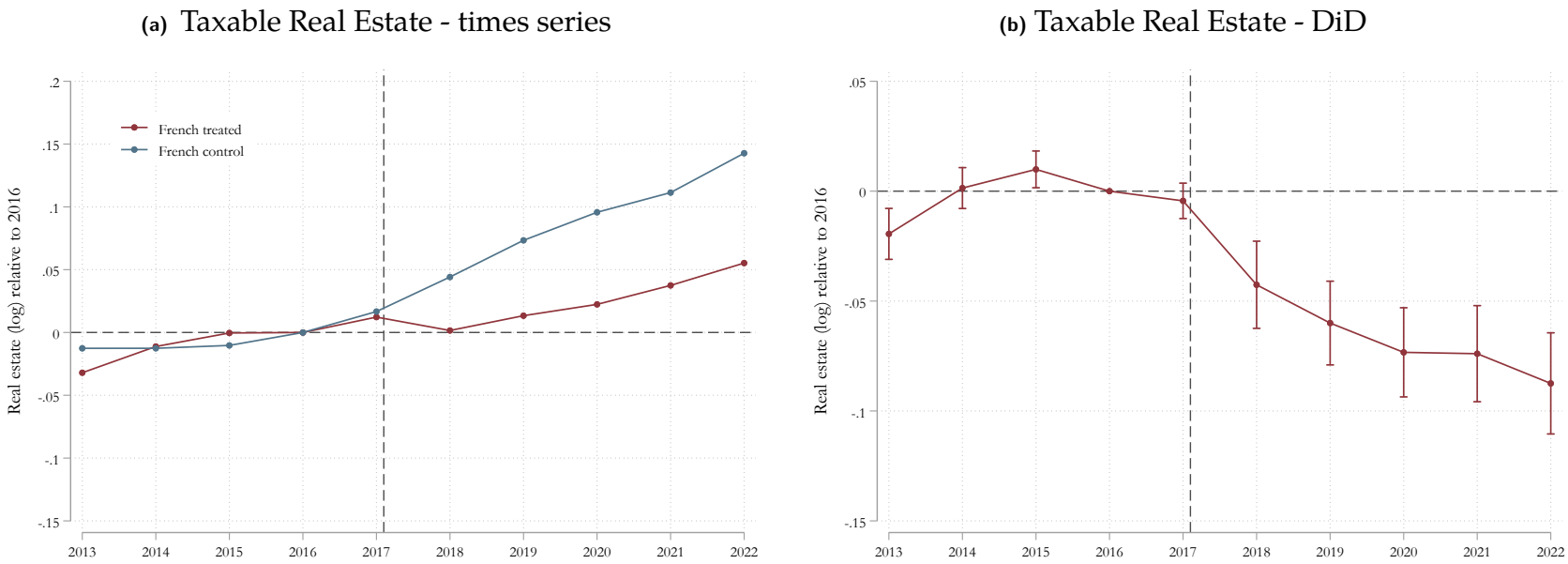


Figure 20: Response to the 2017 Wealth Tax Reform - Alternative Control Group

Notes: This figure shows the diff-in-diff coefficients obtained from the estimation of equation (1) on a balanced sample of wealth taxpayers using an alternative definition of the control group. This new control group consists of 2,168 French taxpayers who i) are liable to the wealth tax all years in 2013, 2014 and 2015, ii) file a detailed return at least once over this period and iii) when they file a detailed return, report at least 1.3 million euros in directly held taxable real estate net of debts and iv) whose primary home accounts for more than 70% of the value of their total housing wealth. The treatment groups is defined as the original treatment group reduced from taxpayers that are now in the new control group (14,550 taxpayers). Panel a) shows the times series while panel b) displays the DiD coefficients.

Figure 21: Response to the 2017 Wealth Tax Reform - Robustness on Non-Residents' Outcome Variable

Notes: This figure shows the diff-in-diff coefficients obtained from equation (1) by defining taxable real estate for non-residents as directly held real estate rather than gross taxable wealth. This approach requires focusing on non-residents who consistently file detailed tax returns to observe their true portfolio allocation, thus reducing the sample size of non-residents in the control group to 570. Importantly, there are indications that information on the exact portfolio composition of non-residents may contain errors and asset misclassifications. Evidence of such issues includes a non-negligible share of non-residents incorrectly listing their properties as "primary housing"—a classification impossible for non-residents. Similar misclassification likely occurs between directly and indirectly held housing assets, with some non-residents potentially reclassifying their assets as indirectly held after 2018, when the tax base for indirectly held real estate becomes slightly more comprehensive (see section section A1). To prevent these data limitations from affecting estimates, I exclude non-residents who consistently report zero indirect real estate (boxes CD and CE of the tax return) but suddenly report positive indirect real estate in 2018. Additionally, restricting the control group to non-residents filing detailed returns mechanically makes them significantly wealthier than their French counterparts. My preferred specification (solid line) shows the rebalancing estimate controlling for baseline housing wealth, while the dashed curve shows the estimate with no controls. Overall, although slightly smaller in magnitude, the estimated portfolio reallocation obtained from this specification is close to the baseline.