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Abstract

The dramatic rise in wealth inequalities has generated debates on the opportunity to tax wealth (Piketty, 2014; Garbinti et al., 2017). Increasing housing prices are, to a great extent, driving these widening wealth disparities. This paper examines the potential redistributive impact of taxing imputed rents, which usually are exempt from income taxation. We estimate tax savings and their distribution between households in France by using a fiscal simulator that Landais et al. (2011) developed. We find that while net imputed rents represent 7% of national net income, their nontaxation amounts to hidden fiscal spending (i.e., tax expenditures) totaling up to 11 billion euros annually. This indicates that nontaxation is the largest public spending directed at homeowners, benefiting mostly the oldest and wealthiest households. Replacing the property tax with imputed rent taxation could favor the youngest and poorest households, who went through a steady decline in their homeownership rates over the past few decades.

Keywords: Housing, Wealth, Imputed Rents, Taxation , Inequalities
JEL Classification: H23, R38, D31, I31, I32

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1 Introduction

Imputed rents are defined as rents that homeowners would need to pay if they were tenants of their property. They represent 7% of net national income and hold major implications when gauging income inequalities (Driant and Jacquot, 2005). Since 1914, French authorities, like most developed countries between 1910 and 1980, had included them in the income tax base, but they were removed in 1965 in France to facilitate better access to homeownership—a period associated with the emergence of a middle class of homeowners. However, some Organization for Economic Opportunity and Development (OECD) countries—e.g., Iceland, Luxembourg, the Netherlands, Slovenia and Switzerland—still include it in their fiscal base and treat imputed rents like any other capital income.

The recent surge in housing prices that started in the early 2000s, combined with the dramatic drop in the homeownership rate in the lowest income decile (Laferrère et al., 2017), brought capital taxation and housing wealth back to the forefront of discourse (Piketty, 2014; Bonnet et al., 2021). According to Piketty (2014), despite world wars having decreased wealth concentration in Europe significantly, the top 1% in France currently owns 25% of total wealth. Within this context, including imputed rents in the tax base of the income tax could be a redistribution tool (Landais et al., 2011). Not only do we present empirical evidence supporting this view, but we also present intergenerational and demographic dimensions in our analysis.

In this paper, we argue that the end of imputed rent taxation should be treated as a subsidy. We partially extend Figari et al. (2017) work to the French context using the TAXIPP micro-simulation model that Landais et al. (2011) developed, in which we assess the amount of income tax that homeowners would save and analyze who benefits from this fiscal incentive. Answering such questions is important to the debate on the prospect of reestablishing imputed rent taxation. Our work also is related closely to Poterba and Sinai (2008), who assess how the user cost of housing would be affected by the end of mortgage interest deduction in the US or the reintroduction of imputed rent taxation. We present three main conclusions. First, nontaxation of imputed rents represents fiscal spending ranging between 9 and 11 billion euros annually, which broadly corresponds to tax receipts from homeowners' property tax. It is also the major fiscal spending directed to homeowners. Second, provided that homeownership rates rise dramatically with age, nontaxation of imputed rents is an important transfer from the young to the elderly. Third, this subsidy mainly benefits the richest fiscal households who are full right owners. Indeed, the average subsidy is relatively small, but is very unevenly distributed. The tax scheme mostly is captured by the top income decile, in which 90% of households own their homes. However, among homeowners with a mortgage, this phenomenon is less striking, as interest repayments steeply reduce these differences, on average withdrawing 70% of rental value from these taxpayers' residences. Considering that homeowners benefit the most from this subsidy casts some serious doubts on its capacity to promote homeownership within the lowest income deciles. As an alternative policy, considering that the property

tax is based on outdated rental value (Chapelle et al., 2020), we propose replacing it with imputed rent taxation. This switch would generate 4 billion additional euros annually, which could be used to decrease other taxation, as suggested in Trannoy and Wasmer (2022). This could make homeownership more affordable for younger and poorer households with extremely low homeownership rates while increasing the cost of homeownership for the top income decile. Such a reform could constitute a first step toward more global housing and land taxation reform, as proposed in several recent works (Bérard and Trannoy, 2019; Trannoy and Wasmer, 2022).

The rest of this paper proceeds as follows: Section 2 discusses how housing is taxed in France and the particular role of income tax. We then discuss homeowner bias in Section 3, arguing that nontaxation of imputed rents should be treated as a subsidy that supports homeowners. We then present our methodology to assess the distribution of the subsidy thanks to TAXIPP in Section 4. Our results are presented in Section 5, and we conclude the paper in Section 6.

2 Housing property taxation in France

As housing represents almost 50% of total wealth in France, interest has been growing concerning its taxation, particularly for redistributive purposes. This seems relevant, considering that housing supply remains inelastic in France. Indeed, it would seem more efficient to tax housing rather than any other type of capital, as Bonnet et al. (2021) illustrated.

However, fiscal pressure on housing property currently remains relatively limited. From national housing accounts data, one can estimate that taxes on the housing sector represent about 4.67% of French gross domestic product (GDP).

Income/wealth generated by housing ownership is taxed mostly through the following three schemes. First, most owners of properties that are occupied, rented, or empty must pay local property tax, which mostly benefits municipalities and their intermunicipal agencies that set tax rates. Property tax represents about 22 billion euros in terms of tax receipts (of which owner-occupiers pay 10 billion). However, this old tax presents several pitfalls, as it is based on cadastral values from 1970, which have almost no connection to current market values (Chapelle et al., 2020). Moreover, tax rates that local authorities set also depend on other resources. Consequently, this tax tends to be regressive (Carbonnier, 2019; André and Meslin, 2021). Tax bases currently are being updated, which could reduce its regressive profile, at least within municipalities (Chapelle et al., 2020).

The second scheme is the real estate property wealth tax (IFI, for Impôt sur la fortune immobilière), which replaced the wealth tax in 2017. This tax is a progressive tax on the value of real estate wealth when the tax base exceeds 1.3 million euros. The tax base is total net real estate wealth that includes 70% of the estimated market

value of the homeowner’s main residence and all other real estate assets, including the share of societies owning real estate. In practice, these taxes only cover a relatively limited number of households and generate relatively modest tax receipts (about 2 billion euros in 2018).

Third, property income might be subject to income tax in which the lowest marginal tax rate was 0% and the highest was 41% in 2010, which then was raised to 45% in 2013. Starting in 1914, all properties’ revenues were subject to this tax, including imputed rent. In 1965, imputed rents were removed from the tax base as a way to better facilitate homeownership. This logic was pushed even further during the 1990s, and between 2007 and 2011, when the new Travail Emploi Pouvoir d’Achat (TEPA) law allowed homeowners with a mortgage to deduct their interest from their income tax, the gap between homeowners and tenants widened further. Nowadays, if interest payments are not deductible anymore, imputed rents remain untaxed, and only rental income is subject to income taxation and a 17.2% flat tax on social contributions¹. In our view, tax policy initiated in 1965 subsidizes homeownership in a way that is not accounted for by national accounts. The next section discusses why. This paper’s purpose is to estimate the fiscal loss that this 1965 policy has generated.

Finally, housing also is taxed through several subsidiary tax schemes, of which a significant amount is accounted for through transaction taxes, e.g., stamp duties or consumption taxes, e.g., the value added tax on new construction/renovations or the housing tax. The latter progressively has been phased out for the poorest households and will be phased out for all households by the end of 2023.

3 Non imputed rents taxation creates a bias toward homeownership

3.1 Definition of the homeownership bias: the case without property tax

This section illustrates why nontaxation of imputed rent was implemented as a subsidy designed to support homeownership. In practice, it is a tax expenditure favouring homeowners with high marginal income tax rates. Consider a household receiving a wage w paying the average income tax rate $\tau(I)$ in which $\frac{\partial \tau(I)}{\partial I} > 0$ and I denotes the household’s fiscal income. This household owns a capital K it can either invest in an alternate asset and get a return $r \times A$ or buy a house for a price P where he can live and save a net Rent R^2 . Without loss of generality, we assume that there are no

¹We examine these social contributions’ implications for our results in additional robustness checks.

²When a loan is contracted, one can assume that R is the net of interest payment, which would be treated as a cost neglecting the leverage effect

capital gains $g_P = 0$. The variation of its net wealth will depend on its tenure choice. In case of homeownership, it will be:

$$\Delta W^0 = [1 - \tau(w)] \times w \quad (1)$$

In this equation, we account for the current situation, in which imputed rent is not taxed. The owner's sole expenditure is their income tax based on their wage $\tau(w) \times w$. However, if they rent while investing in an alternative asset, they will get:

$$\Delta W^T = [1 - \tau(w + rA)] \times [w + rA] - R \quad (2)$$

Nontaxation of imputed rent generates an important difference between owners and tenants. One can illustrate this subsidy by assuming that the net return on housing and the alternative investment are the same, i.e. $rA = rK = R$. In such a case, the subsidy provided to homeowners would be as follows:

$$subsidy = \Delta W^0 - \Delta W^T = \tau(w + R) \times R + [\tau(w + R) - \tau(w)] \times w \quad (3)$$

Or assuming that the impact of nontaxation of imputed rent on the average tax rate for the wage is negligible (i.e. $[\tau(w + R) - \tau(w)] \times w = 0$):

$$subsidy = \tau(w + R) \times R \quad (4)$$

This simple definition is relatively close to the situation in which the alternative investment is another house that is bought to be rented. Indeed, Goode (1960) argues that homeowners could choose to rent their homes, while owner occupation reveals that the returns from this status are higher than renting on the market. Moreover, when receiving the same wage, a homeowner will be better off than a tenant. Thus, the inclusion of imputed rent is in line with Haig (1921) and Simons (1938)'s tax base definition³. For Figari et al. (2017), their exclusion violates the principle of horizontal equity and results in a "homeownership bias".

We can formulate several remarks from this first definition of the subsidy. First, the subsidy's magnitude increases with the net rent, which will favor homeowners living in expensive homes, e.g., those living in large urban areas where prices are high or those living in large houses. It also will favor households with the highest net equity. Consequently, Modigliani and Miller (1958)'s life cycle theory can lead us to believe that nontaxation of imputed rent will favor the oldest age groups. Second, the subsidy's magnitude increases with the marginal tax rate and, thus, with the owners' income when the income tax is progressive. Goode (1960) finds that nontaxation of imputed rents and interest rate exemptions deepen existing inequalities because homeownership becomes more profitable for households with higher marginal tax rates. This intuition is confirmed by Bourassa and Hendershott (1994), who analyze taxes paid over the life cycle in Australia and find that reestablishing imputed rent taxation would result in a progressive or neutral scenario. Similar studies have been

³Any type of income that increases individuals' ability to consume should be included in the income tax base (Haig, 1921; Simons, 1938)

conducted in England (Yates, 1994) and Finland (Saarimaa, 2011), indicating that imputed rent taxation would lower the Gini coefficient. Finally, focusing on richer households, one can suppose that nontaxation of imputed rent might make a similar impact on homeownership rates through mortgage interest deduction (MID), which works in a very similar way (Glaeser and Shapiro, 2003; Chambers et al., 2009; Hanson, 2012a,b). For example, Hilber and Turner (2014) and Gruber et al. (2021) find that mortgage interest deduction fails to stimulate homeownership rates and tends to lead to higher housing prices, particularly when the supply is inelastic.

3.2 The homeownership bias with the property tax

One might argue that homeowners still are taxed because they must pay a property tax, but even accounting for property tax, the bias toward owner occupation persists. For example, we can compare a homeowner receiving ΔW^O with a tenant who decides to become a landlord and invest in housing⁴. The tenant-landlord will have to pay a rent R while receiving only $(1 - \tau(w + R - \tau_p)) \times R - \tau_p$ where τ_p is the property tax. Thus, in such a situation, both would pay the property tax, and the resulting subsidy would be:

$$subsidy = \tau(w + R - \tau_p) \times [R - \tau_p] + [\tau(w + R - \tau_p) - \tau(w)] \times w \quad (5)$$

This is the definition of the subsidy that we will use in this paper's main scenarios (Scenarios 1–3). If the alternative investment is another asset that is only subject to the income tax, assuming that the impact of the wage's average tax rate is negligible, then the subsidy would equal:

$$subsidy = \tau(w + R - \tau_p) \times [R - \tau_p] - \tau_p \quad (6)$$

Several comments arise from this alternative definition. First, in France, local property taxes are based on outdated rental values, which generate important subsidies for homeowner-occupiers and landlords who own undervalued expensive homes. Second, local property tax is not progressive in France (Carbonnier, 2019; André and Meslin, 2021), resulting in a subsidy that still is increasing with income and might even be negative for low-income owners. Moreover, the property tax is paid regardless of debt level. Furthermore, local property taxes are designed to finance local public goods, which are essential for developing residential areas where houses keep acquiring real estate capital gains, and income tax represents the main redistributive tool at the national level. This alternative definition of the subsidy is relatively close to the redistributive effect of a reform in which imputed rent taxation would replace the property tax (Scenario 4)⁵.

To summarize, a homeowner will receive a positive subsidy if he is in a relatively high-income tax bracket and if the property tax is lower than the tax treatment of

⁴Alternatively, this might also be equivalent to a situation where the alternate investment has a return is $rA = R - \tau_p$

⁵The change in taxation would be $\Delta Taxation = \tau(w + R) \times [R] - \tau(w) \times [w] - \tau_p$

an alternative investment. The resulting bias for a medium/high-income household should be significant if one considers that returns on housing and other investments are similar (Jordà et al., 2019), while the property tax represents 8% of imputed rents when the average tax rate of productive capital is around 30%⁶.

In this paper, we consider whether nontaxation of imputed rent should be treated as a tax credit, as defined by Equation 5, and as such, whether it can be accounted for as public spending in the same spirit as other favorable tax treatments that were put into place to promote homeownership in France. For example, the option offered between 2007 and 2009 to deduct interest paid on a loan for a primary residence is viewed as public spending and still represented fiscal spending of 7 billion euros in 2010. In this standard framework (Goode, 1960; Figari et al., 2017), the reference situation from which the fiscal spending should be assessed corresponds to a situation in which the tax treatment varies with occupation status. We illustrate such a situation in Table 1, accounting for the two main policies generally used to promote homeownership⁷.

	Interest payments deduction for housing loans	Non-deduction of interest payments for housing loans
Imputed Rent Taxation	Neutral environment	Not favourable to owner-occupiers
Non Taxation of Imputed Rent	Very favourable to owner-occupiers	Favourable to owner-occupiers

Table 1: Definition of the neutral environment

France’s tax policy is favorable to homeowners and was briefly very favorable (after the aforementioned TEPA law and in the 1990s). However, many other countries also provide favorable or very favorable tax treatment of homeowners (Kholodilin et al., 2021), particularly the United States (see Sommer et al. (2013)) and United Kingdom (see Figari et al. (2017), for an analysis of several European countries). One can wonder whether a neutral environment should be a climate in which interest payments cannot be deducted and imputed rents are taxed. However, considering that a landlord also can deduct interest payments from declared rent, we consider that interest payments should be deductible⁸. In a competitive market, price increases could suppress the subsidy; however, these adjustments might be limited by frictions in housing markets (Wheaton, 1990; Desgranges and Wasmer, 2000) and large transaction costs (Bérard and Trannoy, 2018). Finally, in our main scenarios, we assume that imputed rents will not be subject to social contributions, considering that, contrary to the income tax, social contributions never included imputed rents in the tax base⁹.

⁶Productive capital tax rate was around 58 % in 2013 (Artus et al., 2013) while imputed rent taxation was around 8%. A reform in 2017 created a flat tax of 30% for most capital income.

⁷Here, we neglect other subsidies that affect tenure choice as social housing, housing allowances, or subsidized loans, as they are accounted for in public expenditures. We will return to this issue later.

⁸In a dynamic setting, the capacity to deduct interest payments raises other issues, as discussed in Section 4.5.

⁹When accounting for social contributions, the subsidy would be $subsidy = \tau(w + R - \tau_p) \times [R - \tau_p] + [\tau(w + 0.932 \times R - \tau_p) - \tau(w)] \times w + 0.172 \times (R - \tau_p)$

4 Assessing the subsidy provided to homeowners with Taxipp

4.1 Taxipp model

Most previous academic work simulates and analyzes imputed rent taxation’s potential redistributive impact. However, our approach is slightly different, as our main goal is not to assess imputed income taxation’s potential impact, but first assess transfers between households due to this fiscal exemption and compare them with other types of housing subsidies in France. In a nutshell, we view imputed rent taxation as a subsidy that should be computed in government spending as housing allowances, and we analyze the extent to which this subsidy differently affects households by income level and age.

For this reason, we create a counterfactual situation by reproducing a neutral fiscal treatment of imputed rents using Landais et al. (2011) fiscal simulator, TAXIPP, a micro-simulation model of mandatory social contributions that, unlike the standard micro-simulation approach, places special emphasis on imputation of high revenues and on calibrating the model based on national accounts. The simulator combines both a Stata code that allows for computing households’ fiscal contribution from their income information and a data set that is representative of the French population. The code is a translation of the 2010 French tax code. The data set comprises more than 800,000 observations of fiscal households and was constructed thanks to a random lottery that reconstructs population patterns¹⁰. The simulator signals when two fiscal households belong to the same household. It provides information on income using Fiscal Revenue Survey (Fichier Echantilloné de L’impôt sur le revenu) data, as well as national housing, labour force and wealth surveys that match these observations with similar households. These two elements allow for simulating fiscal reforms and estimating additional tax revenues and their redistributive consequences in a flexible way, including dimensions that are taxed initially (e.g., labor income) and other dimensions that are not (e.g., imputed rent).

This latter dimension is a key strength of TAXIPP. With other fiscal simulators, e.g., INES, the available variables are much broader and cover imputed rents or property taxes, which are our main study variables. Moreover, TAXIPP’s sample size is larger. One limitation of TAXIPP is that all owners repay loan interest. To circumvent this issue, we compute the distribution of loan interest¹¹.

¹⁰Member of one physical household (living in the same dwelling) can belong to several fiscal households: for example when people are not civically engaged or married.

¹¹Payments were determined by decile and age group using the Wealth Survey, allowing for a more precise distribution of the tax credit and accounting for loan repayments’ life cycle dimension. More details are provided below

4.2 Computing the net imputed rent

Imputed rents correspond to the value that homeowners derive from living in their own dwellings. Goode (1960) defines net imputed rent as the rental value of a dwelling at market prices from which property taxes, depreciation, reparation costs, maintenance, and loan interest payments are deducted. Based on French housing accounts, imputed rents comprise up to 7% of net national income and 70% of net rental income in the private sector. Landais et al. (2011) computed the gross imputed rent for each household using hedonic regression models following standard procedures that French National Accounts use. These hedonic regression models estimate rent as a function of dwellings' characteristics (location [departments and types of urban units], surface, number of rooms, and dwellings' overall quality). We then use several scenarios described in Table 2 to compute net imputed rent using varying parameters, e.g., capital depreciation rate, mortgage interest payments, and property tax. In the first scenario, we use the baseline parameters of Landais et al. (2011). However, we change their approach slightly, estimating mortgage interest payments following the principles of distributional national accounts to add accuracy. Thus, we distinguish between homeowners with mortgage repayments on their main residence and full right owners (i.e. these who finished repaying their mortgage) . We rely on the 2010 Household Wealth Survey to focus on homeowners with mortgage repayments and define groups based on two dimensions: age groups and financial income. Second, for each group, we compute the share of total interest repaid by the group. We then identify the same groups in TAXIPP and use the average amount repaid by the group to infer interest payment amounts for each household. Finally, we assign these interest payments between each household's tax units. We also use the imputed property taxes (IPT) provided by Landais et al. (2011) for physical households that we attribute to each fiscal household. When depreciation and interest payments are greater than imputed rents (4.5% of the sample), the tax base will be set at 0. One limit in our study is that little information is available on the hedonic regressions performed. In particular, the selection between homes rented and occupied by their owners might lead to some bias, and our results might be affected if regressions introduce some systematic bias between age or income groups. In Figures 1 and 2, we perform the same exercise with aggregate data to compare the fiscal base from the simulator with national accounts. Reassuringly, aggregate net rents are very close to the sum of the fiscal base in the micro-data set. Total net imputed rent remains between 53 and 73 billion euros, which represents about 4% of net national income, as in the aggregate data.

The other scenarios are used for robustness checks. In Scenario 2, we account for the change in national accounts that occurred and the particular role of the hypothesis on capital depreciation when switching from base 2005 to base 2010. Indeed, base 2010 adopted a much higher depreciation rate for housing capital, which increased by 10 percentage points between 2000 and 2010. Thus, comparing the difference between Scenarios 1 and 2 allows for accounting for the influence of different hypotheses on capital depreciation. In the third scenario, we replaced the declared property tax

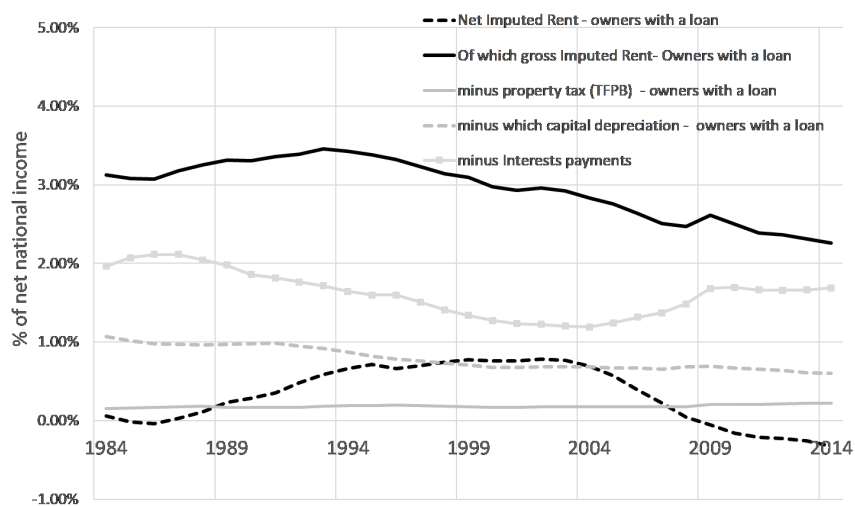
and the imputed mortgage interest payment with constant shares of the gross rent, instead of using those imputed in the initial data set. In our view, this allows us to gauge our results’ robustness when not relying on our imputations for interest payments, nor on the declared property tax that is currently between updates while remaining coherent with aggregate national accounts, as reported in Figures 1 and 2. All these scenarios elicit relatively similar results, with the major change in the tax base coming from capital depreciation hypotheses, creating a discrepancy of about 10 billion euros between the two extreme scenarios (Scenarios 1 and 3).

Finally, the fourth scenario takes a different approach and tries to assess what would be fiscal income under the hypothesis that taxation of imputed rents for homeowner-occupiers can replace the current local property tax. In Scenario 4, we take a different approach and explore potential reform. With the property tax based on outdated rental value (Chapelle et al., 2020), and to limit the potential increase in taxation, we propose replacing it with imputed rent taxation. Thus, we use the same parameters as in Scenario 1, but assume that the local property tax is suppressed for homeowners. We also assume that the property tax is maintained for rental properties and vacant and secondary homes, ensuring some stable revenue for local governments. Furthermore, property tax losses could be offset by granting a share of receipts from income taxation to local authorities. This scenario allows for assessing whether replacing one tax for another for homeowners would translate into a net fiscal gain or loss for the state without considering households’ behavioral responses.

	Scenario 1 (Nat. Accounts Base 2005)	Scenario 2 (Nat. Accounts Base 2010)	Scenario 3 (Nat. Accounts Base 2010)	Scenario 4 (Nat. Accounts Base 2005)
Depreciation rate (% of rent)	18%	28%	28%	18%
Mortgage interest payments	imputed	imputed	70%	imputed
Property Tax (PT)	declared	declared	8%	suppressed
Net/Gross Imputed rent - full owner	82% - IPT	72% - IPT	64%	82%
Net/Gross Imputed rent - owner with loan	12% - IPT	5.4% - IPT	0%	12%
Total Net Imputed Rent (Billions of Euros)	70.6	59.07	55.19	83.31

Table 2: scenarios to calculate the net imputed rent

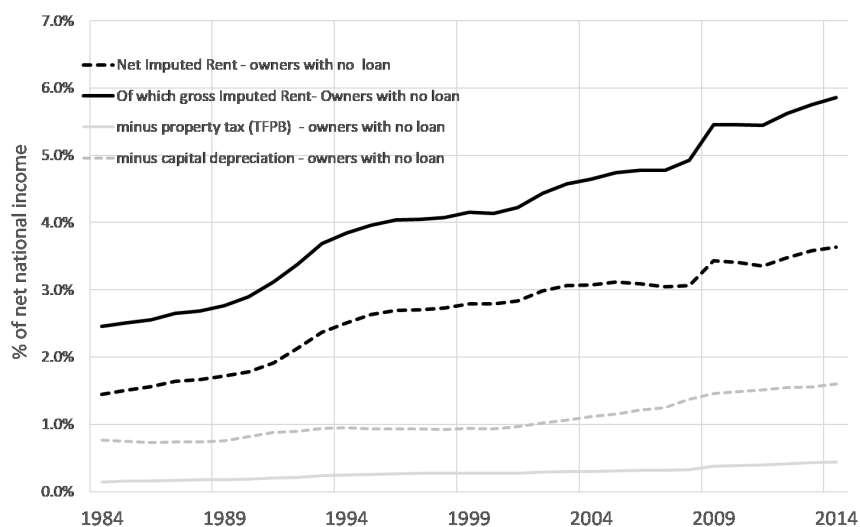
Figure 1: Gross, net imputed rents and property tax for owner occupiers with a loan



Source: Authors' computations from the French housing account 2014 (Comptes du logement 2014).

Decomposed aggregate taxable rents of homeowners with a mortgage (dash line) into its four main components :the gross rent, the capital depreciation, the interests repayment and the Property tax.

Figure 2: Gross, net imputed rents and property tax for owner occupiers without a loan

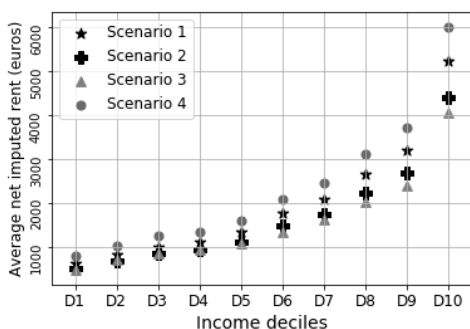


Source: Author's computation from the French housing account 2014 (Comptes du logement 2014).

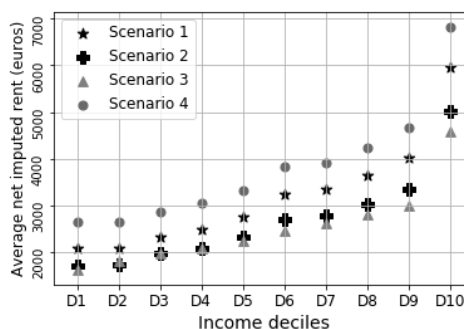
Decomposed taxable rents of homeowners with no loan (dash line) into its three main components : the gross rent, the capital depreciation and the property tax.

In Figure 3, we represent the distribution of average net imputed rents per decile of taxable income for all households, owners with a mortgage, and full right owners. When examining households overall, one can observe that the taxable base dramatically increases with income, which is explained easily by two phenomena. The share of homeowners is higher in the upper deciles. Richer households have a higher housing consumption and, thus, higher imputed rents. Panel C indicates that individuals in the 10th richest decile, who are full right owners, receive the highest net imputed rents. For these households, the average net imputed rent is between 7,000 and 9,000 euros per year. However, it steeply declines as income decreases: The ninth decile only receives between 5,000 and 6,000 euros on average, and the first decile only receives between 2,000 and 3,000 euros on average. The difference between owners with mortgages and full right owners is striking when comparing Panels c) and d). Accounting for interest rate repayment reduces net imputed rent dramatically. For the 10th income decile, owners with a loan receive on average about 1,800 euros in Scenario 1 (around 2,500 when suppressing property tax in Scenario 4), which comprises only around 25% of the subsidy of full right owners with a similar income level.

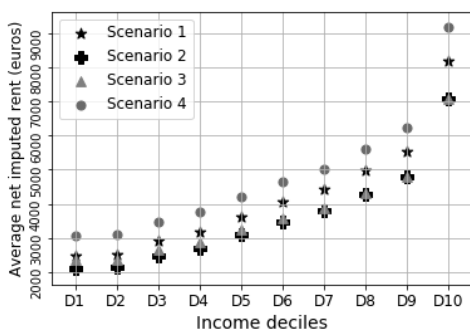
Figure 3: Net Taxable Imputed Rent



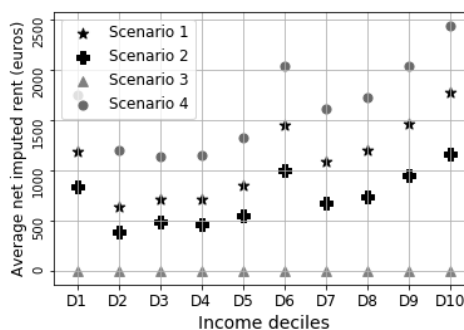
(a) All Households



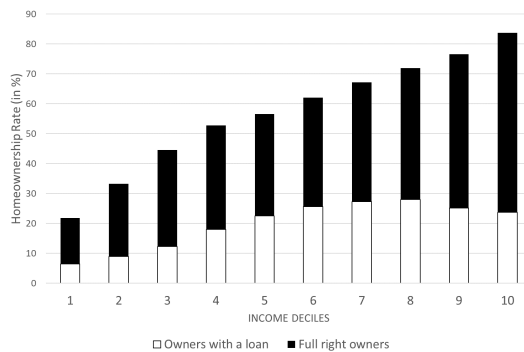
(b) All owners



(c) Full owners



(d) Owners with a loan

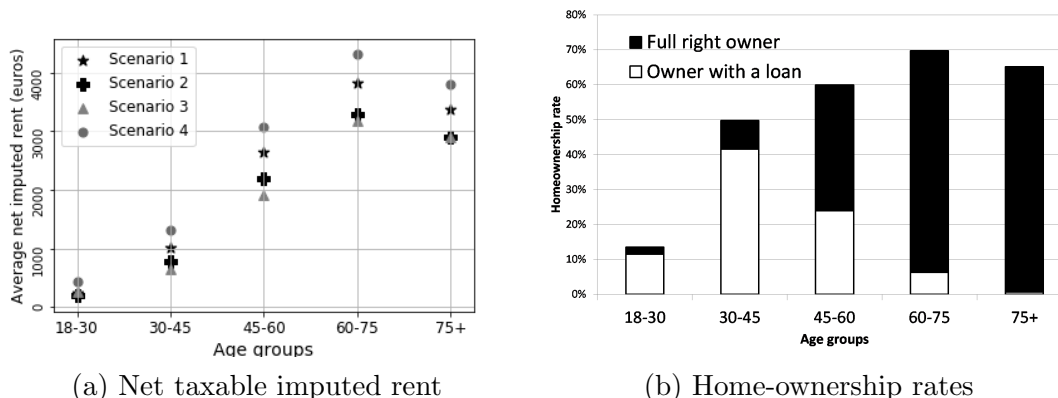


(e) Homeownership rate, by income decile

Moreover, the distribution of imputed rents across age groups reveals a steep inter-generational inequality, as illustrated in Panel a) in Figure 4. Notably, it is unevenly distributed between generations. The average net imputed rents of young households is extremely low, as few own their homes, and among the few owners, most still have a mortgage to repay. Thus, the untaxed imputed rent revenue is undeniably larger for older age groups, representing on average 194 euros for 18-to-30-year-olds, whereas they accounted for 3,713 euros and 3,316 euros for the age-60-to-75 and above-age-75 cohorts, respectively. These patterns can be explained easily when examining Panel

b). Indeed, relatively few households in the 18-30 and 30-45 cohort groups are homeowners (13% and 50%, respectively), and among those who own their homes, a large majority have a mortgage. However, the homeownership rate is relatively high for older groups (more than 60%), and most of the older homeowners are full right owners.

Figure 4: Net Taxable Imputed Rent and Home-ownership rates by age group



Finally, even if the data set is not geolocated precisely, it is also interesting to compare how imputed rents vary across French regions. Our data set only allows for comparing three area types: mainland France (Area 3); large urban areas with more than 200,000 inhabitants (Area 2); and the Paris urban area (Area 1). We report the average imputed rent by area in Figure A.3. One can observe that for homeowners, imputed rents are higher in Paris and in large urban areas than in other regions of the country. However, when considering all households, mainland France receives, on average, larger imputed rents than urban areas with more than 200,000 inhabitants because the homeownership rate is higher in rural areas (Figure A.3 in the appendix).

5 Results

5.1 Non-taxation of imputed rent is the most important subsidy to homeowners

We first present our estimates of the aggregate fiscal subsidy provided by nontaxation of imputed rent. As illustrated in Table 3, following the simulation’s parameters, the total fiscal subsidy represents between 9 and 11 billion euros. This subsidy represents around 25% of the total subsidies dedicated to housing in the 2010 French National Accounts. Indeed, as described in Table A.2 in the appendix, which reported the 2010 housing national accounts updated with our results, total subsidies represented 40 billion euros in 2010. Thus, nontaxation of imputed rent is the second most important housing program after housing allowances, which represented 17 billion euros. Notably, this subsidy is larger than the property tax paid by homeowners, which represented about 10 billion euros in 2010, as illustrated in Table A.1 in the appendix.

Consequently, replacing the property tax with imputed rent taxation for homeowners would be totally self-financed.

Nontaxation of imputed rent appears, by far, to be the major subsidy for homeowners, followed by the deduction of interest rates from loans, made possible between 2007 and 2009 (Travail Emploi Pouvoir d’Achat [TEPA] fiscal device) and still inflicting budgetary consequences years after its repeal. Support to homeownership is underestimated as nontaxation of imputed rent is ignored from National Accounts. We notice that the inclusion of nontaxation of imputed rent dramatically changes the distribution of subsidies between housing tenures. While current national accounts indicate that the vast majority of housing subsidies go to the rental sector, this trend is no longer valid when accounting for nontaxation of imputed rent. Indeed, total subsidies to owners almost doubled and are very close to subsidies created for tenants (around 23 billion euros for owners compared with 26 billion euros for tenants).

When confronting these results with Figari et al. (2017)’s findings, in the case of imputed rent taxation, additional tax receipts would remain relatively modest because the income tax only represents less than 10% of the public revenues in France (Guillot and André, 2014) and is supplemented by social contributions as contribution sociale généralisée (CSG) and contribution pour le remboursement de la dette sociale (CRDS), which are supplemental income taxes with a single tax rate of 17.2%. Notably, including net imputed rent in social contributions’ tax base would generate an additional tax receipt ranging from 9 to 12 billion euros, approximately doubling the reform’s impact. In this paper, we focused on the redistributive impact arising from the income tax.

Table 3: Estimation of the Fiscal Subsidy due to non taxation of imputed rents

	without Imputed rent	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Total tax revenue (Billions of Euros)	53.54	65.60	63.57	62.92	67.75
Estimated subsidy (Billions of Euros)	-	12.06	10.03	9.38	14.21

Notably, these estimates and the redistributive profiles do not account for households’ potential behavioral responses and general equilibrium effects. We discuss these issues in Section 5.4.

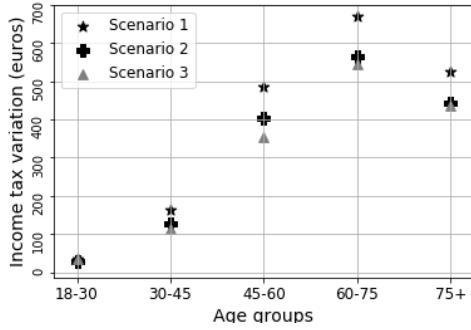
In Table A.3 in the appendix, we also report the characteristics of our micro-sample of fiscal households. Notably, from our estimates, about 1,826,081 euros – mostly from the third, fourth, and fifth deciles – would be taxed if imputed rents were included in the tax base. Nevertheless, on average, their income tax would be less than 300 euros.

5.2 Non-taxation of imputed rent mainly benefits older households

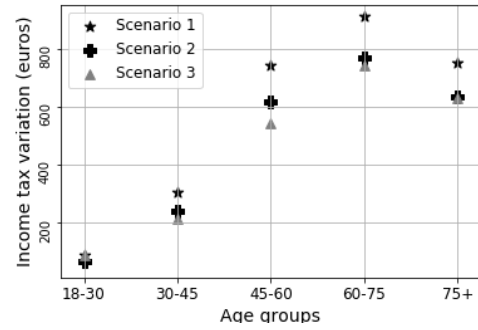
Figure 5 indicates the average subsidy by age group. The overall results emphasize that older groups (those age 60 to 75 and those age 75 and up) are the main beneficiaries of nontaxation of imputed rent. The subsidy closely follows the patterns of net imputed rent received by each generation and the homeownership rate by age group. One can observe that younger households, i.e., between ages 18 and 30, only receive a residual subsidy below 20 euros per year, while those between 30 and 45 receive about 100 euros (Figure 5) because these generations are mostly tenants or owners with a mortgage and, thus, would either need to pay no or very low net imputed rent tax. The average subsidy then rises dramatically for older households, which have a higher homeownership rate and are more likely to be full right owners. Households between ages 45 and 60 or older than 75 receive an annual subsidy of between 400 and 550 euros, while those between ages 60 and 75 receive the highest subsidy, totaling 600 euros.

These trends are confirmed when we divide homeowners into full right homeowners and owners with a mortgage, e.g., the average subsidy is substantially higher for full right owners in the age 45-60 and 60-75 categories, who save an average of around 850 euros in income tax. The amount only would represent between 40 and 90 euros for mortgage payers from these same age cohorts. Conversely, households under 30 with a mortgage, which is the case for most fiscal households of this age group (Figure 4 , Panel b), save an average of approximately 15 euros per year, whereas it would represent around 180 euros for full right owners (less than 0.5% of total full right homeowners across age groups).

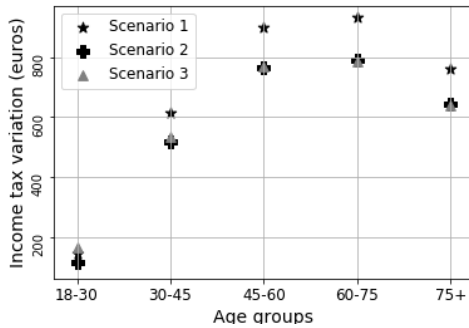
Figure 5: Current Implicit subsidy due to non taxation of imputed rent by age groups



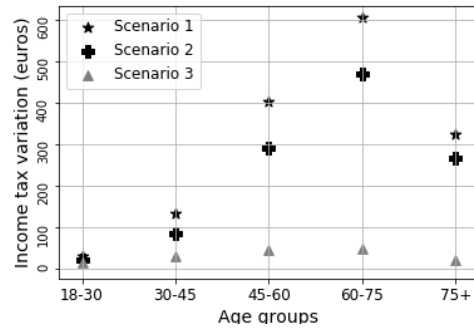
(a) All Households



(b) All owners



(c) Full owners



(d) Owners with a loan

These figures suggest that intergenerational analysis is a key issue and deserves particular attention when considering the possibility of removing this hidden subsidy

With nontaxation of imputed rent mainly benefiting older households, it could exacerbate inequalities in the housing market for two reasons. First, it benefits old households who already received important capital gains in the 2000s and have a high level of wealth, while other housing policies appear to fail to grant access to homeownership to young and poorer households. Thus, it is reinforcing inequalities between generations. Second, given inter vivos donations' growing role in homeownership access, intergenerational inequalities also inflict deep consequences on intragenerational inequalities. In such a context, one can question the relevance of a subsidy that ultimately is advantageous to households who benefited from an inter vivos donation from their relatives to access homeownership. Housing inequalities should not be neglected, as difficulties for modest young people in the housing market can inflict detrimental consequences on their capacity to find a job (Eyméoud and Wasmer, 2016).

Figure 6: Variation in Taxation when substituting the property tax with imputed rent taxation by age group

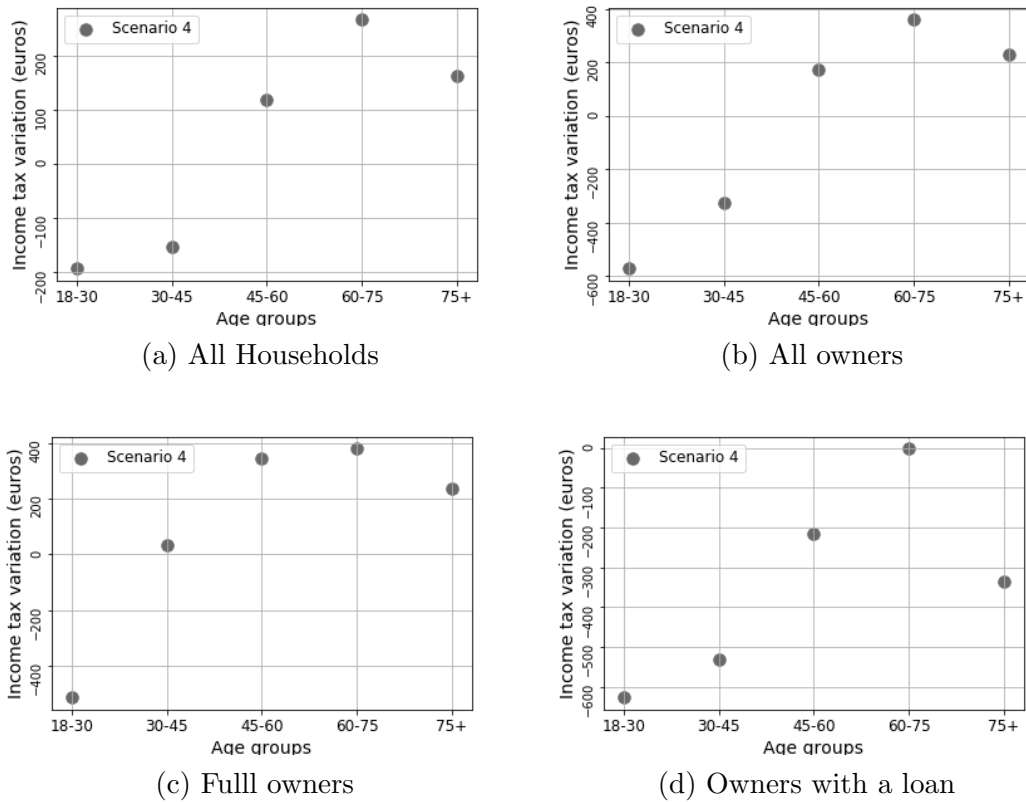
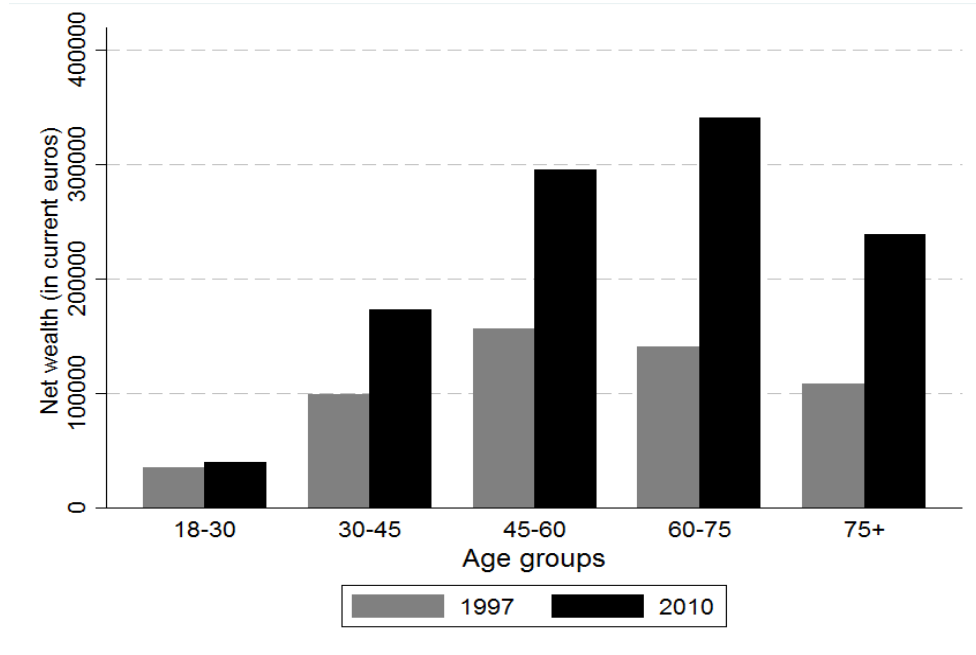


Figure 6 illustrates how age groups would be affected by replacing the property tax with imputed rent taxation for homeowners. As expected, such a subsidy would benefit the youngest and owners with mortgages, given that the youngest have the greatest financial liabilities and are in the lowest income brackets. On average, young households would benefit from a tax cut of around 200 euros, while older households would see their taxation level increase by more than 150 euros. The reform would benefit owners with mortgages significantly, as they would benefit from a drop of 600 euros at their taxation level. Such a reform would constitute a major transfer from the elderly to the youngest households in the short run and could be a suitable response to increasing wealth inequality resulting from a surge in housing prices. Indeed, when examining the evolution of net wealth by age group, as illustrated in Figure 7, one can observe that older generations mostly benefited from appreciating housing wealth, while younger households' wealth remained almost static.

Figure 7: Evolution of net wealth by age group (1997-2010)



Source: Authors' computations from the French wealth survey (1997 and 2010)

5.3 Upper deciles of full right owners are the main beneficiaries

Figure 8 represents the distribution of the subsidy by income deciles. Clearly, non-taxation of imputed rent mostly benefits high-income households. Two factors may explain this. First, as already mentioned, richer households are mostly owners, consume more housing, and are less dependent on mortgage funding; thus, their implicit rent is much higher, as illustrated in Figure 3. Second, it is important to remember that 50% of French fiscal households are not paying any income tax because their total income is below the taxation threshold. This casts some doubts on the capacity of such a subsidy to increase the homeownership rate, as it benefits mostly richer households who are already owners. Indeed, increasing the homeownership rate would require programs mostly focused on poorer households who comprise the vast majority of tenants.

As expected, the subsidy mostly concerns full right owners who receive an implicit subsidy of 2,000 euros for the top income decile, but only between 500 and 800 euros for the seventh, eighth, and ninth richest deciles. Finally, the subsidy received by the lower deciles is below 500 euros and almost null for the first two deciles. As far as owners repaying a mortgage are concerned, the annual subsidy received for the top income decile is slightly higher than 100 euros. Therefore, full right owners in top income deciles receive most of the benefit, while owners with mortgages receive

almost no subsidy. We provide the subsidy's redistributive profile in Appendix. In Table B.1, we estimate the marginal tax rates that are increasing for each income decile. Moreover, Figure B.1 reproduces Figure 8 expressing the variation in taxation in percentage of income. The profile remains the same, with the exception of the ninth decile being less taxed than the eighth decile. Finally, in Appendix Figure A.1, we also examine a case in which imputed rent could be subject to a 17.2% flat rate in social contributions. The profile remains unchanged while the tax receipts for each decile would be higher. Due to the existence of a flat rate, more households in the bottom deciles would experiment a tax hike.

Figure 8: Current Implicit subsidy due to non- taxation of imputed rent by income decile

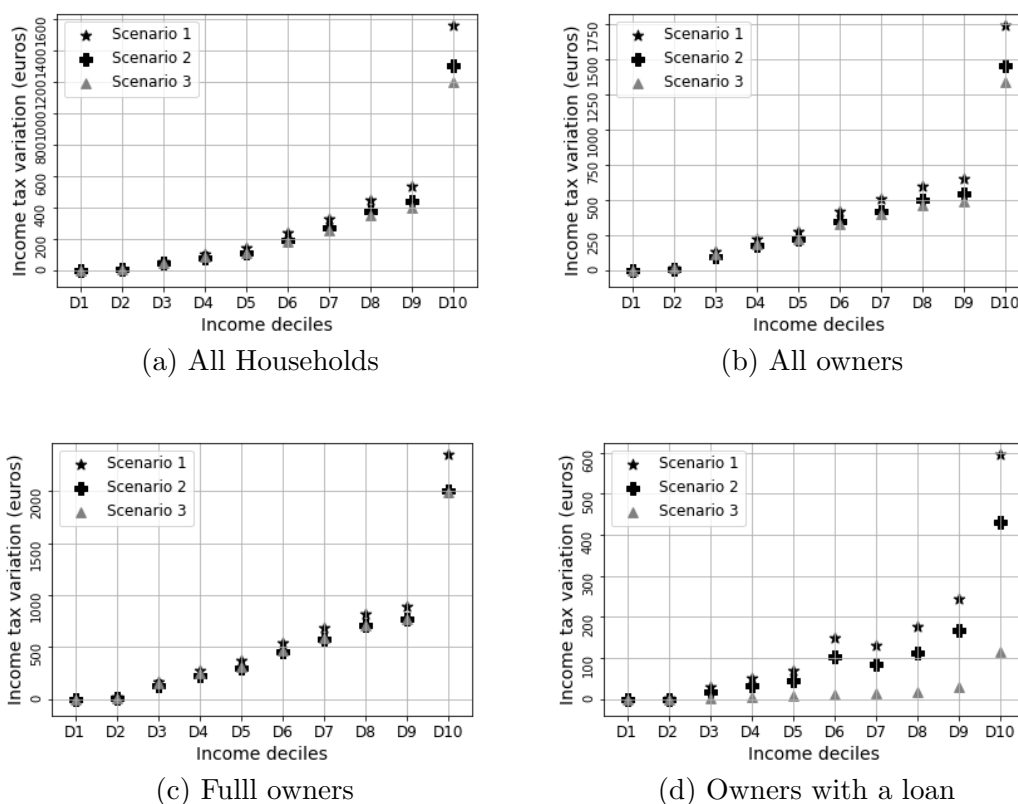
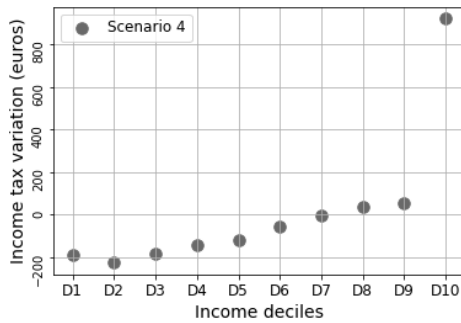


Figure 9 illustrates the redistribution between deciles after replacing the property tax with taxation of imputed rent. Notably, such a reform mostly would benefit the first five income deciles, who would see their taxation decrease by 200 euros (500 euros for homeowners in the first two deciles). The reform would be neutral for Deciles 6–9, while the 10th decile's taxes would increase by 800 euros (1,000 euros for homeowners). Such a reform would subsidize households in which the homeownership rate is the lowest and tax households with the highest income and homeownership rate. Finally, as illustrated in Figure A.2 in the appendix, no households of the two bottom

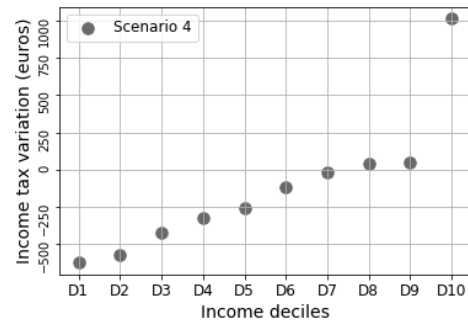
deciles would experience a tax hike while 70% of the households in the top deciles would see their taxation increase.

This is of particular interest provided that the lowest-income deciles experience a dramatic drop in their homeownership rate. In 1984, 43.6% of the first decile owned their homes, while only 24.2% did in 2013. However, the top income decile's homeownership rate increased dramatically, from 74.5% in 1984 to 89.9% in 2013. Ignoring general equilibrium effect, one might hope that such a reform could help improve the poorest households' access to homeownership and partially mitigate these households' housing burden. With progressive taxation that accounts for each household's situation, this substitution could prove more useful than other policies that support homeownership for low- and medium-income households. Indeed, additional policies developed to decrease the cost of homeownership, e.g., subsidized loans, have been proved to be relatively inefficient, making a positive impact on housing prices (Labonne and Welter-Nicol, 2015) and resulting. to a large extent. in a pure windfall effect for potential owners (Gobillon and Le Blanc, 2008). One might expect that such a tax scheme would benefit mostly low-income households by reducing their fiscal burden and reducing the willingness to pay of households in the highest tax income brackets. It remains unclear whether such a reform would reduce housing prices, as it provides some incentives to finance homeownership with debt. Nevertheless, provided that the reform decreases the benefits of homeownership for the top-income decile, one might hope that such a tax scheme could improve low-income and middle-income households' position in the housing market.

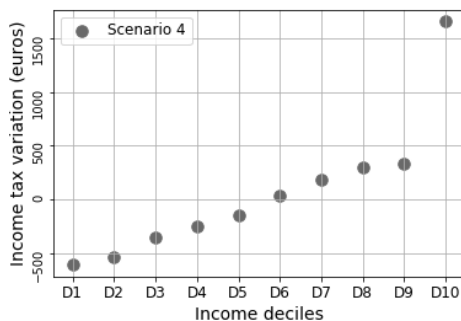
Figure 9: Variation in Taxation when substituting the property tax with imputed rent taxation by income decile



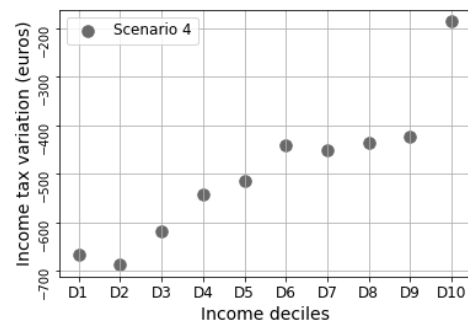
(a) All Households



(b) All owners



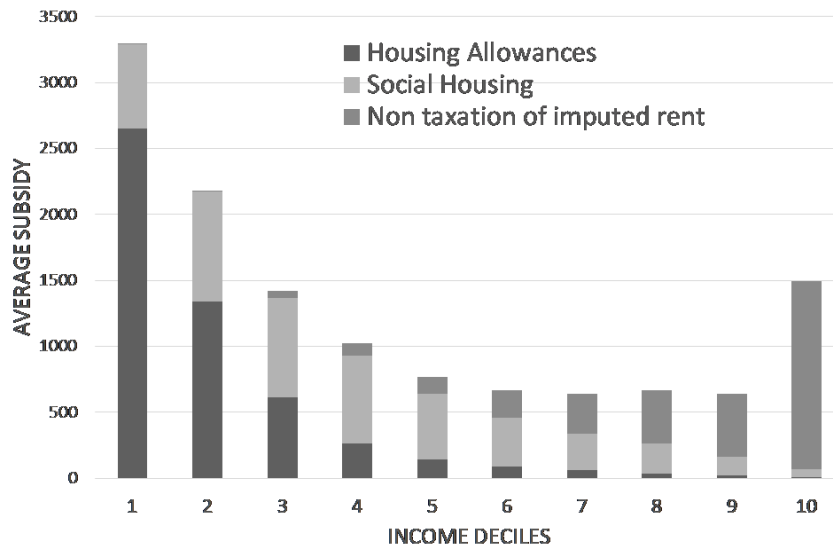
(c) Full owners



(d) Owners with a loan

Finally, in Figure 10, we represent the three main housing policies' redistributive profiles: housing allowances; social housing (the benefits of which were estimated in Trevien (2014)); and non-imputed rent taxation. Notably, non-imputed rent taxation cancels the two previous schemes' redistributive profile. If the first two deciles receive the largest annual transfer (3,200 and 2,200 euros, respectively), then the third income decile receives as much as the 10th income decile (around 1,500 euros). The middle class (Deciles 4–9) receives about 500 euros. While housing subsidies, particularly housing allowances, often are presented as the French fiscal system's main redistributive tool, it is notable that accounting for nontaxation of imputed rents tends to attenuate this view, as the top income decile appears to benefit much more from the fiscal devices than Deciles 4–9.

Figure 10: Distributive profile of the three main housing policies



Source: Authors' computations from Trevien (2014) and Enquête sur les Revenus Fiscaux et Sociaux 2010

5.4 Potential General Equilibrium effects of Imputed Rent Taxation

In this paper, we adopted a static framework with no adjustment in agent's behavior and no general equilibrium effect to estimate the implicit subsidy level that homeowners receive. This approach is standard in the literature to estimate tax savings (Poterba and Sinai, 2008; Figari et al., 2017), but does not account for the incidence of such a policy. Given the high transaction costs on the real estate market and homeowners' low mobility rate, one might argue that the estimated tax savings would be relatively close to actual tax receipts in the case of reestablishing imputed rent taxation during the first years.

In the short term, replacing property tax with imputed rent taxation is likely to generate some redistribution from older to younger generations. Few extant studies have tried to estimate the general equilibrium effect of nontaxation of imputed rent. One notable exception is Skinner (1996), whose Overlapping Generation Model estimates the efficiency cost of the preferential tax treatment of housing. If the model does not include a tenure choice dimension and has no heterogeneity in income, the efficiency implications of the preferential tax treatment of housing complement our estimates, which stress capital gains' role. In this framework, a preferential tax treatment of housing generates a rise in housing prices and, thus, a windfall capital gain for current homeowners at the expense of future generations, who face higher prices for the same houses. This description appears to be extremely close to what is described in Figure 7. The tax incidence might have magnified the intergenerational inequali-

ties that we highlighted. Moreover, Skinner (1996) goes beyond such a tax scheme’s simple redistributive impact and finds that such an intergenerational transfer comes at a large efficiency cost. In a general equilibrium perspective, lower housing prices generated by imputed rent taxation should improve economic efficiency.

From an equity perspective, we stressed that nontaxation of imputed rents mostly benefits wealthier households . Reestablishing imputed rent taxation should increase richer households’ user costs and decrease modest households’ user costs in terms of replacing the property tax. Thus, the net redistributive effect of such a reform, accounting for tax incidence, is difficult to predict. First, owners with a low debt level might try to increase their indebtedness to reduce their net imputed rent, which would decrease non-imputed rent taxation’s redistributive profile in a similar way as that illustrated in the mortgage interest deduction literature (Maki, 1996; Dunsky and Follain, 2000; Hendershott and Pryce, 2006; Gervais and Pandey, 2008; Cole et al., 2011). Second, prices and rents might vary in the medium run. If one might expect a drop in real estate prices for households in the highest income brackets, prices also might capitalize the subsidy that low-income households receive (Hilber and Turner, 2014). The net effect would depend on how segmented housing markets are connected (Piazzesi et al., 2015). Some studies, such as Fack (2005), found that housing allowances tended to be capitalized into the rent that low-income households paid relative to households not concerned by the policy. This might be particularly true in regions where the housing supply is inelastic (Eriksen and Ross, 2015). This evidence suggests that our estimated redistributive impact from replacing the property tax with imputed rent taxation might be a lower bound of its true redistributive effect, as prices might vary for different market segments. High-income households living in an expensive segment also might experience a capital loss, while low-income households living in less-expensive neighborhoods might experience a drop in the capitalization rate.

6 Conclusion

In this paper, we documented how nontaxation of imputed rent represents a significant amount of fiscal spending, mostly directed toward the wealthiest homeowners with no financial liabilities. Imputed rents are, as observed in National French Accounts, the second-largest housing subsidy in the country after housing allowances. Moreover, we consider that the recent rise in housing prices during the 2000s, which widened the wealth gap between older and younger generations, should re-open the debate on the opportunity to restore a tax on land through imputed rent taxation.

From our computations, using the TAXIPP model and restoring imputed rent taxation in the income tax base, as was the case before 1965, we find that the suppression of a subsidy mainly captured by the top income deciles should not affect homeowners with mortgages and, thus, should not be detrimental to homeownership access. In addition to this, further simulations allowed us to account for a scenario

that potentially replaces the current property tax with imputed rent taxation. Our results indicate that this change in taxation would lower current taxation for the four most modest deciles and emerge as a much more viable policy option that would increase taxation to a lesser extent for the remaining deciles. Recent changes since 2010 are likely to reinforce our findings: The drop in interest rates that took place until 2020 might increase potential tax receipts from a reestablishment of imputed rent taxation, while the raised upper income tax rate, from 41% to 45% in 2013, probably increased the relative size of the subsidy received by the richest households further.

Finally, concerning a broader discussion of intergenerational inequality, discussing imputed rent taxation could help improve inter- and intragenerational equity. In actuality, a new set of policies that include reviving imputed rent taxation, to a certain extent, could stop subsidizing wealthier households that benefited from unprecedented capital gains in the 2000s that created intergenerational inequalities perpetuated through inter vivos donations or inheritances transferred to relatives, reinforcing intragenerational inequalities in France, as Bonnet et al. (2016) described. However, as inter- and intragenerational inequalities are rising worldwide, this assessment applies beyond our case study's French context.

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A Additional Charts and Tables

Table A.1: Property Tax income by source

Contributors	Amount of TFPB	percent
Owners with mortgage	3.392	19.8%
Owners outright	6.767	39.49%
Landlords	2.815	16.4%
Social Housing	2.094	12.2%
Others	2.063	12%
All	17.137	100%

Source: Authors' computations from the French housing account 2014 (Comptes du logement 2014).

Table A.2: Total housing subsidies in 2010

	Main Residences (MR)				Secondary Residences			Total	
	Owners	Rental Sector		Total (MR)	Provisionary residences	Secondary residences	Total		
		Physical landlords	Social Landlords						Other Landlords
		Subsidies to consumers							
Housing allowances	0.948	7.757	5.772	0.760	13.843	14.791	1.137	15.928	
Other allowances	0.005	0.095	0.131	0.038	0.264	0.268	0	0.268	
Fiscal Subsidy	1.061	-	-	-	0.354	1.141	-	1.414	
Total	2.013	-	-	-	14.460	16.474	1.137	17.611	
		Subsidies to Producers							
Operating and investment subsidies	0.134	0.230	1.288	0.497	2.015	2.149	0.027	2.176	
Subsidized loans	2.818	-	-	-	2.833	5.651	1	5.652	
Fiscal Subsidies	7.027	-	-	-	4.249	11.276	-	11.276	
Others	1.252	0.156	1.936	0.419	2.510	3.762	0.099	3.931	
Total	11.231	-	-	-	11.607	22.838	0.100	23.034	
		TOTAL							
Total	13.244	-	-	-	26.067	39.311	0.100	1.233	40.645
		Accounting for non imputed rent taxation							
Non imputed rent taxation	9-11	0	0	0	0	0	0	0	
Total with non imputed rent	22.244 -24.244	-	-	-	26.067	48.311-50.311	0.100	1.233	49.645-51.645

Table A.3: Descriptive statistics of beneficiaries' socio-demographic traits

	All	Never taxed	Become taxed	Always taxed
Weighted Number	35 55 9744	13 023 974	1 826 081	20 709 694
Average imputed rent	2750.89	1374.63	5266.81	3394.55
Average tax without imputed rent	1505.73	0.00	0.00	2585.42
Average tax with imputed rent	1780.99	0.00	291.69	3032.34
Average tax savings	275.26	0.00	291.69	446.92
Demographics				
Married (%)	35.88	22.20	34.25	44.63
Women (%)	45.27	26.37	31.36	58.39
average age	48.27	45.39	61.15	48.94
Age Groups				
18-30 (%)	20.98	27.93	10.01	17.57
30-45 (%)	28.33	30.27	14.20	28.35
45-60 (%)	24.28	19.01	18.22	28.13
60-75 (%)	14.51	10.41	26.90	15.99
> 75 (%)	11.90	12.38	30.67	9.95
Area				
Area 1 (Paris) (%)	13.28	9.27	7.24	16.34
Area 2 (other agglomerations) (%)	32.83	34.30	28.22	32.31
Area 3 (others) (%)	53.89	56.43	64.54	51.34
Gross Income Deciles				
1	10	27.47	0.01	0.00
2	10	26.67	3.32	0.00
3	10	20.48	25.47	2.04
4	10	10.43	25.82	8.33
5	10	6.73	21.44	11.05
6	10	3.90	14.61	13.43
7	10	2.36	4.13	15.32
8	10	1.20	2.56	16.19
9	10	0.43	1.51	16.77
10	10	0.32	1.13	16.87

Figure A.1: Redistributive profile accounting for social contributions, All Households

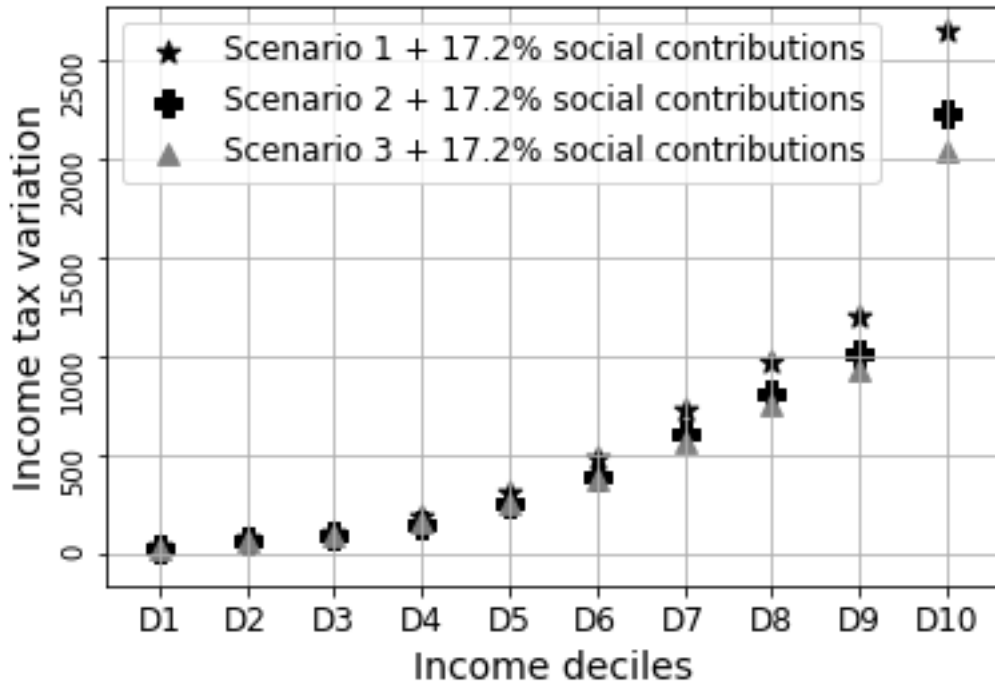


Figure A.2: Winners and losers in Scenario 4

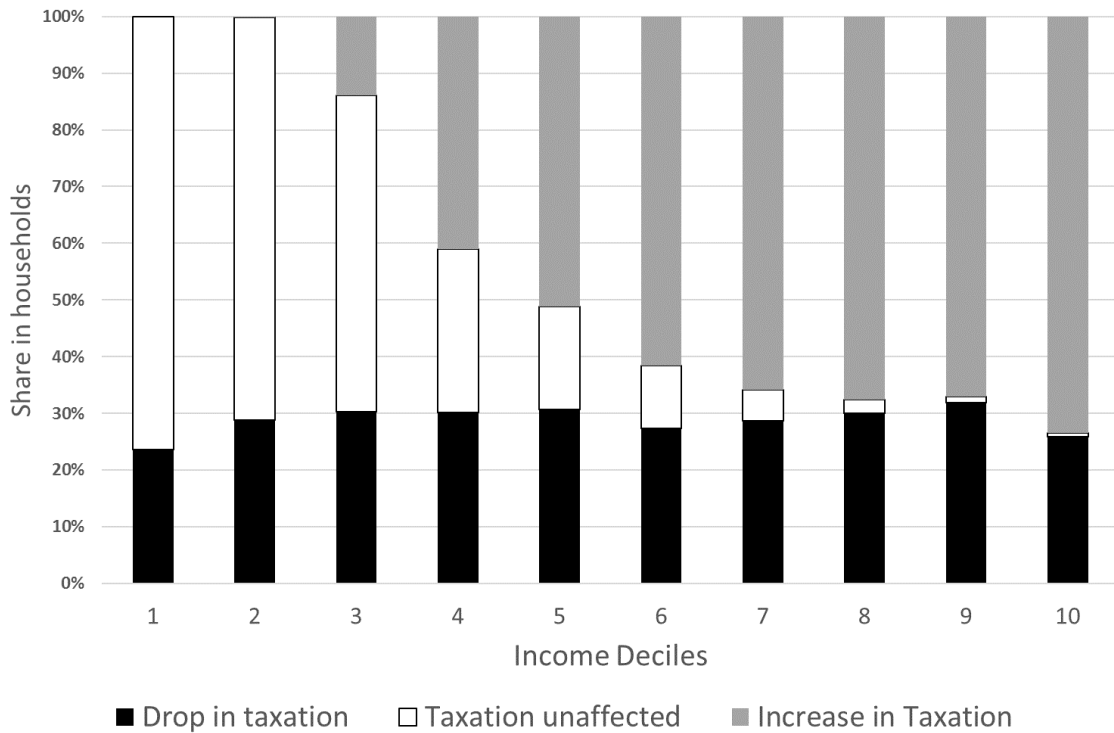
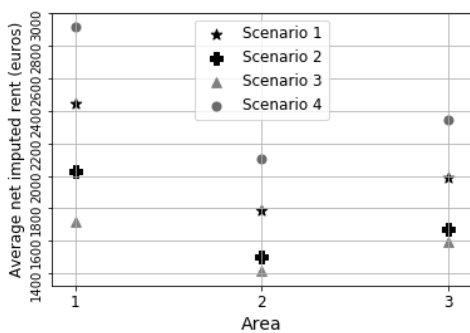
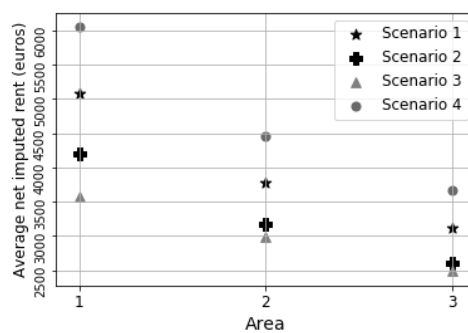


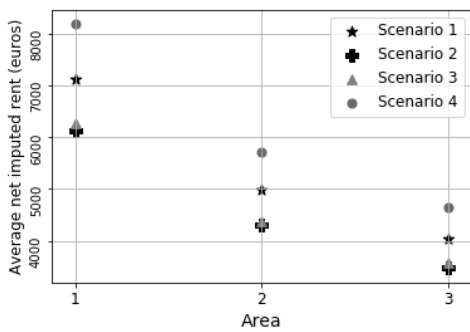
Figure A.3: Net Taxable Imputed Rent by area



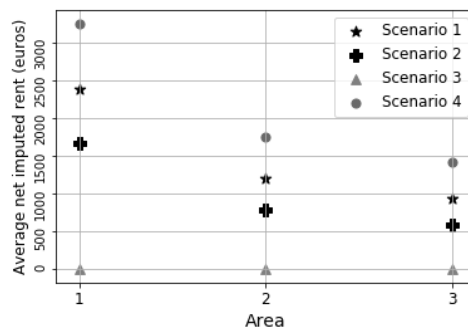
(a) All Households



(b) All owners



(c) Full owners



(d) Owners with a loan

B Estimating the marginal tax rate of imputed rents

As emphasized in Equation 5, the magnitude of the subsidy is defined by the marginal income tax rate of households and their net imputed rent. As the income tax schedule is progressive, we estimate in column 1 and 3 of Table B.1, the following equation:

$$Y_i = \tau_j \times D_{d(i)=j} \times R_i + \epsilon_i \quad (\text{B.1})$$

We interact the income decile dummies ($D_{d(i)=j}$) with the imputed rent (R_i) to recover the marginal tax rate of each income decile j (τ_j). In column 1, Y_i is the implicit subsidy estimated in scenario 1 and defined in equation 5. In column 3, Y_i is the variation in taxation resulting from a substitution of the property tax by imputed rent taxation¹² as defined in scenario 4. Columns 2 and 4 estimate the following equation :

$$Y_i = \tau \times R_i + \epsilon_i \quad (\text{B.2})$$

which allows us to recover τ which is the average marginal tax rate of imputed rent for the whole sample of landlords. The dependent variables are the same as in columns 1 and 3.

Following closely results shown in Table B.1, we observe that in the first scenario, all income deciles would face a progressive increase in their income tax payment if imputed rent taxation was reestablished in France while keeping the current fiscal system. In fact, the first and second deciles would pay respectively 0.01 and 0.0248 euros per net taxable euro concerning imputed rent leading to a marginal taxation of 1% and 2.48%. On the other hand, middle-classes in the 5th and 6th deciles would pay respectively 0.110 euros and 0.139 euros per net taxable euro, with marginal rates at 11 % and 13.9%. Finally, upper classes in the 9th and 10th deciles, would pay 0.167 euros and 0.346 euros per each net taxable euro, which would imply a 16.7% marginal tax rate for the 9th decile and a marginal rate of 34.6% for the 10% highest incomes in France. In addition to this, it can be observed that when only regressing the first scenario on taxable net imputed rent without controlling for income deciles, we see that overall, for every net taxable euro in imputed rent, there would be a 0.273 euros increase, which represents a 27.3% marginal tax rate.

Concerning the fourth scenario, which consists of simultaneously reintroducing imputed rent taxation and eliminating property tax for homeowners, the fiscal burden is transferred from a local regressive tax to a progressive national tax. Looking at results in columns 3 and 4 (Table 5), we can conclude by merely looking at the signs in our coefficients, that the first income deciles would benefit from a decrease in income tax, favoring redistribution. Marginal negative rates for the 40% most modest revenues in France would be comprised between -12.8% (first income decile) and -2.24% (fourth income decile). Moreover, for the middle class (from the 5th

¹² $Y_i = \Delta Taxation = \tau(w + R) \times R - \tau(w) \times w - \tau_p$

and 6th deciles), marginal rates would represent 0.349% and 3.61%, lower than those calculated for the 1st scenario. Finally, for the highest income deciles, eliminating property tax, would lead to marginal tax rates lower than those described in Columns 1 and 3: 11.3% for the 9th decile and 6.43% for the 10th decile. When regressing solely the dependent variable on net taxable imputed, the overall marginal tax rate is 23%. The progressivity is also confirmed when investigating the variation in taxation in percentage of income as illustrated in Figure

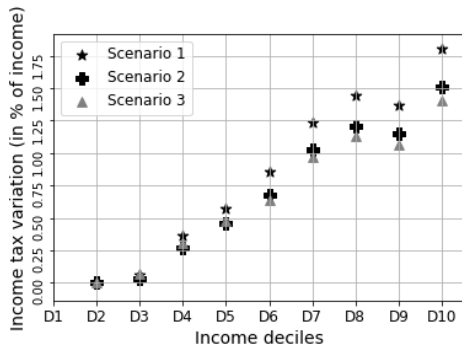
	(1)	(2)	(3)	(4)
	Maintaining the property tax Δ Taxation	Δ Taxation	Suppressing the property tax Δ Taxation	Δ Taxation
1st Income Decile * R	0.0100*** (0.000882)		-0.128*** (0.00130)	
2nd Income Decile * R	0.0248*** (0.000796)		-0.103*** (0.00117)	
3rd Income Decile * R	0.0672*** (0.000700)		-0.0485*** (0.00103)	
4th Income Decile * R	0.0917*** (0.000670)		-0.0224*** (0.000988)	
5th Income Decile * R	0.110*** (0.000595)		0.00349*** (0.000878)	
6th Income Decile * R	0.139*** (0.000506)		0.0361*** (0.000746)	
7th Income Decile * R	0.160*** (0.000457)		0.0591*** (0.000673)	
8th Income Decile * R	0.168*** (0.000393)		0.0665*** (0.000579)	
9th Income Decile * R	0.167*** (0.000342)		0.0643*** (0.000504)	
10th Income Decile * R	0.346*** (0.000150)		0.230*** (0.000222)	
R		0.273*** (0.000208)		0.160*** (0.000246)
<i>N</i>	489578	489578	489578	489578
<i>R</i> ²	0.920	0.777	0.697	0.463

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

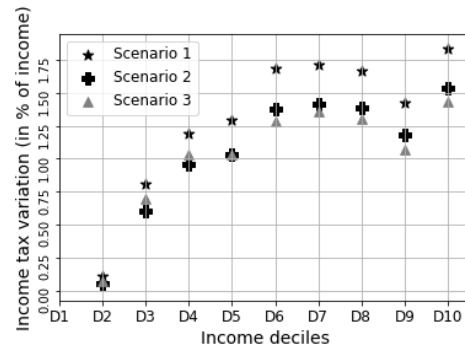
The dependent variables in column (1) and (2) correspond to the implicit subsidy received by a household because of non imputed rent taxation computed in scenario 1 with the current fiscal system. The dependent variables in column (3) and (4) indicates the change in taxation after the substitution of the property tax by the imputed rent taxation computed in scenario 4. For columns (1) and (2), interaction terms represent the marginal values per income decile based on R in euros.

Table B.1: Marginal taxation rate by net taxable imputed rent and income decile

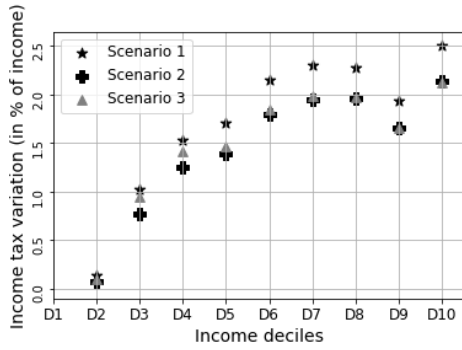
Figure B.1: Redistributive profile in % of income



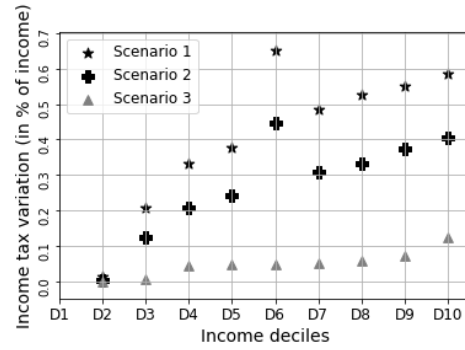
(a) All Households



(b) All owners



(c) Full owners



(d) Owners with a loan