

# Impacts of the 2018 Household Capital Tax Reforms on Inequalities in France: A Microsimulation Evaluation

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**Abstract** – This study assesses the impact on standard of living inequality and public finances of the transition from the tax on wealth (ISF) to a tax on real estate assets (IFI), the introduction of a flat-rate tax on capital income (PFU), and the increase of the social tax (CSG) on capital income in 2018. We achieve this through the use of the INES microsimulation model and the ERFIS data, which we supplement by imputing the wealth held by each household on the basis of the Household Wealth survey (*enquête Patrimoine*) and tax data on the ISF and IFI. In the short term, the positive impact of these reforms on standards of living is highly concentrated at the top end of the distribution, although the gains are limited by the increase in the CSG. The cost to public finances is 3.4 billion euros per year. Although they lead to additional public revenues, the short-term behavioural effects of the flat tax on the dividends received by households further accentuate the rise in the standard of living of the wealthiest households.

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The evaluation of capital tax reforms is a key public policy issue for two reasons. Firstly, capital tax can be seen as an exacerbated example of the trade-off between efficiency and equity: on the one hand, capital is very unevenly distributed,<sup>1</sup> more so than labour income (Garbinti & Goupille-Lebret, 2019), which makes its taxation an important tool in the fight against inequality. On the other hand, capital income is more sensitive to tax incentives than labour income (Kleven & Schulz, 2014), which could lower the tax rate that maximises public revenues (Lefebvre *et al.*, 2020). Secondly, there are few findings regarding capital taxation, since very few studies have been carried out in this subject, which is nevertheless very important for economic policy. In 2018, three tax reforms were targeted directly at households holding wealth in France: (i) the transition from the tax on wealth (ISF) to the tax on real estate assets (IFI), (ii) the transition from the progressive taxation of capital income (included in the income tax base) to a flat tax on capital income, and (iii) the increase in the rate of the general social tax (CSG) paid on capital income. The latter two reforms constitute the introduction of a single flat tax (the PFU) of 30% for some of the capital income; this corresponds to the sum of the flat-rate of 12.8% for income tax, and 17.2% for the CSG.

The aim of this study is to evaluate the impacts of these three reforms on standard of living inequality and on the State budget using the INES microsimulation model. For this purpose, we primarily draw upon the ERFS (*enquête Revenus fiscaux et sociaux*, a survey on household tax and social revenue), the INSEE's main database for producing standard of living inequality indicators, and to which the INES microsimulation model is linked. In order to assess the impact of these reforms, we calculate the counterfactual amounts of taxes (ISF, income tax and CSG), i.e. those that would have been paid by households in 2018 had the reforms not taken place. The impact of the reforms is evaluated by comparing these amounts to the amounts of IFI, income tax and CSG calculated by applying the 2018 reforms. Nevertheless, this evaluation faces at least three difficulties.

First of all, there is no database that provides all the components used to calculate both standards of living<sup>2</sup> and the wealth tax<sup>3</sup> for the same sample of households. The analyses presented in this article are therefore based on the imputation, in the ERFS, of the amounts of different types of wealth held by households (Paquier *et al.*, 2019).

This imputation was carried out by combining several methodological approaches and several sources of data (the INSEE's Household wealth survey and the ISF and IFI data provided by the Directorate-General of Public Finances, DGFIP) in order to assign the most precise possible wealth amounts to the households in the ERFS.

The second difficulty is the fact that the impact of the PFU differs depending on the year on which the analysis is performed. Firstly, the tax paid on capital income in 2018 is partly made up of taxes paid on income from 2017, to which the legislation that came into force in 2018 did not yet apply. In addition, certain types of capital income (interest on homebuyer savings plans, for example) were not subject to the PFU when it first came into existence, but are in the longer term.

Finally, several elements suggest that the introduction of the PFU and the modification of the ISF could have had an impact on the stock of wealth held by households in 2018 or on capital income as a result of behavioural responses to taxation. In this article, we will primarily assess the impacts of the reforms with behaviour remaining unchanged. However, we also simulate the PFU and the IFI, taking account of the short-term behavioural effects, by making use of a range of empirical work for the PFU and variations in the stock of wealth observed between 2017 and 2018 for the ISF.

It should be specified that the behavioural effects studied here are purely short term: none of the potential long-term impacts – such as on the accumulation of capital or tax exile – which are often used to justify reforms, are evaluated here. This is not to assume that such impacts do not exist, of course. However, since these reactions are not certain and may take time to manifest themselves, it is also very useful to highlight the short-term effects, which can be observed much more quickly (Bach *et al.*, 2020). That is what this article is aiming to achieve.

Our study follows on from publications evaluating the budgetary and redistributive effects of the 2018 social and fiscal reform package by Biotteau *et al.* (2019), Fabre *et al.* (2019) and Madec *et al.* (2019), together with the reports by

1. At the start of 2018, the wealthiest 10% of households held almost half of the total wealth in France (Cazenave-Lacrouts *et al.*, 2019).  
 2. A household's standard of living corresponds to its disposable income (declared income net of social security contributions, plus benefits and less direct deductions) in relation to a number of consumption units.  
 3. For this reason, the standard of living that INSEE usually uses to study inequality and monetary distribution on the basis of individual data from the ERFS does not take account of the ISF.

France Stratégie (2019, 2020)<sup>4</sup> and the Senate (2019). When compared with all of these works, the main original feature of our article is that it presents a joint analysis – separately from the other social and fiscal reforms that took place in 2018 – of the 2018 reforms that directly targeted wealth-holding households. In addition, we use an original methodology to impute wealth to the households included in the ERFS while ensuring the best possible preservation of the correlation between standard of living and wealth. This is a fundamental step when it comes to correctly measuring the impact of the reforms affecting taxation of the stock of household wealth (transition from the ISF to the IFI) on standard of living inequality. Finally, we also try to take account of certain short-term behavioural reactions of households and to highlight how this changes the outcomes in terms of inequality and the State budget.

This article starts by describing the three reforms studied, the data used and the simulations using the INES model. The second section is devoted to the methodology for assessing the impact of the reforms. The third section details the impact of the reforms, first under the assumption that behaviours will remain unchanged, before analysing how the results vary when potential behavioural effects are taken into account. Finally, a discussion regarding the long-term impact is presented by way of a conclusion.

## 1. The Reforms Evaluated and Simulations Using the INES Model

### 1.1. The Reforms Assessed

A large number of reforms of the taxation of capital have taken place in France since the 1980s (France Stratégie, 2019). We will provide a brief review of those for which the impact was assessed in the article.

#### 1.1.1. Transition from ISF to IFI

Taxes on wealth (the *impôt sur les grandes fortunes*, created in 1981, then the ISF created in 1986) have been modified more than ten times, with the most recent reform being the transition from the ISF to the IFI in 2018, which is what we are assessing here. The 2018 reform amended the definition of the taxable base: (i) moveable assets are no longer included, but the indirect real estate component has been retained,<sup>5</sup> (ii) moveable liabilities are no longer deductible, and (iii) the discounts for investment in small and medium-sized enterprises (SMEs) have been abolished.

#### 1.1.2. Introduction of the Income Tax Component of the PFU

Between 2013 and 2017, the majority of income from moveable assets (dividends, fixed-income investments), capital gains from the sale of securities and some life insurance income in a given year  $N$  were subject to a progressive income tax (IR) in year  $N+1$  (with a 40% deduction for dividends).<sup>6</sup> Life insurance income not subject to the progressive income tax was subject to a withholding tax in the year of receipt. Finally, interest on homebuyer savings plans (PEL, *plans épargne logement*) and homebuyer savings accounts (CEL, *comptes épargne logement*) were exempt from income tax.<sup>7</sup>

The Finance Act for 2018 reformed the taxation of capital income by removing it from the progressive income tax base and introducing instead a single flat-rate tax of 12.8% (hereafter income tax component of the PFU), and of 17.2% for social tax (see below) to arrive at the effective tax rate of 30%. From 2018 onwards, the income tax component of the PFU was applied to capital gains on the sale of securities and income from moveable assets (particularly dividends and interest from fixed-income investments, such as bonds) – for income from life insurance policies, this only applies if they relate to payments made after 27 September 2017,<sup>8</sup> and for interest on PELs and CELs, only if they were opened after 1 January 2018.<sup>9</sup> The PFU corresponding to the income received in a given year  $N$  is paid in connection with the income tax return, so in year  $N+1$ . However, a non-final withholding flat-rate tax (usually at the same rate) is paid in the year in which the income is received and constitutes a tax credit the following year.<sup>10</sup>

4. A summary of the various institutional evaluations can be found in the France Stratégie report (2019). Of these studies, those by the Institute of Public Policies (IPP) have been updated and are presented in Fabre et al. (2019). The latter studies make use of DGFIP data and provide results that are less concentrated at the upper end of the distribution than those published the previous year by the IPP and are therefore closer to the results obtained using our methodology. See also Dherbécourt & Lopez-Forero (2019) on the effective taxation of wealth and capital income between 2011 and 2018.

5. These include, for example, shares in real estate companies (SCIs).

6. With a non-final withholding tax for income from moveable assets (also referred to as the *prélèvement forfaitaire obligatoire*, PFO) in the year of receipt, which was reimbursed in the form of a tax credit the following year.

7. With the exception of PELs more than 12 years old.

8. However, income from life insurance policies more than 8 years old (and within the limit of 150,000 euros of life insurance reserves) is subject to a levy of 7.5% rather than 12.8%.

9. Except for PELs more than 12 years old, the interest on which is subject to the PFU from 2018 onwards. Income from life insurance policies that relates to payments made before 27 September 2017, together with interest on PELs and CELs opened prior to 1 January 2018, continues to be taxed in accordance with the regime in place before 2018.

10. Some households may apply for exemption from the non-final withholding tax in the year in which they received the income if the reference tax income does not exceed a certain threshold. In addition, a household receiving income subject to the PFU can opt for the application of the progressive income tax to that income.

### 1.1.3. Increase in the Rate of the Social Tax (CSG) on Wealth

In 2018, the CSG was increased for all income. That increase took place in parallel with a reduction in the payroll taxes paid by employees and self-employed workers and formed part of a much broader shift from the financing of social welfare from social security contributions to the CSG. An analysis of the overall impact of the shift from social security contributions to the CSG on standard of living inequality in 2018 can be found, for example, in Biotteau *et al.* (2019). As we explained in the introduction, the aim of this article is simply to analyse the impact of this reform on the taxation of capital income. For this income, the rate of the CSG has increased from 8.2% to 9.9%, bringing the total rate of social taxes<sup>11</sup> on capital income<sup>12</sup> to 17.2%. For income that is also subject to the income tax component of the PFU (see above), this tax of 17.2% constitutes the second component of the PFU, resulting in a total PFU rate of 30%. However, the basis for the CSG on capital income is broader than that of the income tax component of the PFU: property income, annuities or interest from life insurance policies in the absence of buy-back, for example, are subject to the increase in CSG,

but they are not covered by the income tax component of the PFU.

### 1.2. The Simulation of Income Tax, the CSG and Taxes On Wealth in the INES Model

The analyses presented in this article are based on the INES microsimulation model.<sup>13</sup> This model simulates the majority of the taxes and benefits in cash. It is primarily underpinned by the ERFS (see Box), which, among other information, brings together socio-demographic information from the Labour Force Survey (*enquête Emploi*) and income declared to the tax authorities for the purposes of calculating income tax. When compared with comprehensive tax sources, the ERFS makes it possible to better simulate

11. In addition to the CSG, there is also the Contribution pour le Remboursement de la Dette Sociale (CRDS, a tax for the social debt repayment, with a rate of 0.5%), the social security contribution (4.5%), the additional "solidarity-autonomy" contribution (0.3%) and the solidarity levy (2%).  
12. In PLFSS 2018, the increase in public revenue linked to the increase in the CSG is calculated at 22.5 billion euros, 2 billion of which relates to the CSG on income from capital. This figure relates to a much broader coverage – all households in the whole of France – than that included in the ERFS, which is limited to ordinary households in metropolitan France.  
13. See <https://www.insee.fr/fr/information/2021951> for a brief description and Fredon & Sicsic (2020) for a more detailed presentation of the INES model and its applications.

#### Box – Data

##### The ERFS (Enquête Revenus Fiscaux et Sociaux)

For each year *N*, the ERFS is composed from the matching of the respondents to the Labour Force Survey (*enquête Emploi*) for Q4 and the fiscal sources for the year, i.e. the income declarations for year *N* (completed in March *N*+1), housing tax as at 1 January of year *N* and the files from the *Caisse nationale des allocations familiales* (CNAF, the fund for family allowances), the *Caisse nationale de l'assurance vieillesse* (CNAV, the fund for old age pensions) and the *Caisse centrale de la mutualité sociale agricole* (CCMSA, a fund specific to the agricultural sector) which provide the social benefits paid.

In the ERFS, some financial income that is tax-exempt or only partially taxable and therefore not well-known from tax sources is calculated by applying rates of return to stocks of assets imputed to the households covered by the ERFS on the basis of the Wealth survey (*enquête Patrimoine*) (Baclet & Raynaud, 2008).

We use here the 2016 edition of the survey. The sample from the ERFS 2016, drawn from the housing tax files, is composed of 118,626 individuals across 53,374 respondent households, so-called "ordinary" households (i.e. excluding people living in collective housing or in mobile homes, and homeless people) in metropolitan France.

##### Fiscal Data from the ISF and the IFI

The data from the 2016 and 2017 ISF files and the data from the 2018 POTE file (*fichier Permanent des Occurrences de Traitement des Émissions*, a management file) as well as IFI files, recently made available by the DGFIP, are also used in this article.

The ISF file used contains the amounts of net wealth taxable under the ISF for all households liable for ISF. For households with net assets of less than 2.57 million euros, only total net wealth needed to be declared on annual tax return no. 2042, which is therefore included in the file. For households with net assets of more than 2.57 million euros, a specific ISF declaration was required and, in addition to the value of the primary residence and fixed assets, we also have details of moveable assets and liabilities.

Those liable for the IFI are required to complete form no. 2042-IFI, to which they attach appendices in which they list and assess assets subject to taxation under the IFI. The 2018 IFI data are included in the data contained within the 2017 POTE file, which collates all of the information from the 2017 income tax returns. This means that details of net wealth taxable under the IFI is available for all households, together with the amounts of reductions for donations and SMEs, the IFI cap and the amount paid for this tax.

benefits and contributions using information from the *enquête Emploi*. It also allows to evaluate the impact of tax and benefit reforms on standards of living, which are measured by INSEE on the basis of the ERFS.

The evaluation presented in this article is based in particular on the simulation of the ISF and then the IFI, as well as the simulations of income tax and the CSG. The simulation of these schemes by the INES model has several specific features that will be addressed here. In the below, we will first look at the simulation of taxes on capital income and on income tax, followed by that of the ISF and the IFI.

### 1.2.1. Simulation of CSG on Capital Income and Income Tax

Income tax is one of the schemes that the INES model is best at simulating. For 2018, if we compare the total tax paid by ordinary households in metropolitan France, as simulated by INES, with that obtained from the DGFIP data (corrected to create coverage equivalent to that of the ERFS), it turns out that INES very slightly underestimates taxes (the difference is -1% for 2018). This difference remains the same, regardless of whether or not the various flat-rate levies on capital income are included in the totals being compared.<sup>14</sup>

The simulation by INES of the social taxes on capital income (the majority of which is made up of the CSG) also results in totals paid by households that are close, albeit slightly overestimated, to the data published by the *Commission des comptes de la Sécurité sociale* (social security accounts committee) corrected to create coverage equivalent to that of the ERFS.<sup>15</sup>

### 1.2.2. Simulation of the ISF and IFI

The simulation of the ISF and IFI in INES comes up against a particular difficulty: there is no information available in the ERFS with regard to the amounts of wealth held by households. Until very recently, the INES model therefore did not simulate the ISF and the IFI, the taxable bases for which are made up of household wealth. To allow an assessment to be made of the transition from the ISF to the IFI in 2018, an imputation of the amount of wealth held by each household covered by the ERFS has been introduced into the latest version of the INES model. This operation is described in the Online Appendix (link at the end of the article) and in greater detail in Paquier *et al.* (2019). It is based on data from INSEE's Wealth Survey for the year 2014 and then on comprehensive data on wealth

taxable under the ISF and IFI and the elements of which it is comprised. The imputation method used ensures good correlation between wealth on the one hand and standard of living and the socio-demographic variables of the ERFS on the other hand. In addition, it ensures that the findings are consistent with DGFIP data. This is a crucial preliminary step for the assessment of the impact of the reforms described in this article.

On the basis of the imputed wealth, an amount of wealth taxable under the ISF is deducted by applying the various deductions,<sup>16</sup> and a tax on wealth is simulated by applying the legislation and taking account in particular of the discount, reductions and cap. This imputation allows INES to create a precise simulation of the ISF or IFI paid by households (Paquier *et al.*, 2019). Therefore, the total ISF paid by ordinary households in metropolitan France in 2017 is 3.9 billion euros, which is close to the values available from external sources. According to our estimates, almost 70% of the total amount of ISF would be paid by the 5% with the highest declared income, compared with around 75% according to the tax data.<sup>17</sup> As regards IFI in 2018, the total amount arrived at by the INES simulations is 1.1 billion euros, so a slight underestimation (of around 2%) when compared with the DGFIP data with the same coverage.

## 2. Method Used to Evaluate the Impact of the Reforms

### 2.1. Measuring the Impacts Using the INES Model

In order to assess the impact of the three reforms directly targeting the holders of wealth that are being studied in this article, a counterfactual 2018 legislation has been defined, i.e. the legislation that would have been in force had the reforms not been implemented (André *et al.*,

14. When including the flat-rate levies, the total simulated by INES for 2018 is 70.8 billion euros, compared with 71.2 billion according to the DGFIP data. If we exclude these levies, the total simulated by INES is 67.3 billion euros, compared with 68.2 billion according to the DGFIP data.

15. The totals resulting from the INES simulations amount to 20.9 billion euros for 2018, compared with 19.7 billion euros in the data provided by the Commission des comptes de la Sécurité sociale, i.e. an overestimation of 6%.

16. The deductions taken into account include the following in particular: 30% for the primary residence, 100% for professional assets, 75% for employee savings in the form of company shares in certain situations, 100% for the Plan d'épargne retraite populaire (PERP, a retirement savings plan), 100% for supplementary and voluntary supplementary pension plans and for the ownership of woods and forests and shares in a forestry group and agricultural leases.

17. According to the France Stratégie (2019) report, based on reference tax incomes (RFR). The differences between France Stratégie's estimate and ours may be due to differences in scope, the unit considered (we reason in terms of households, whereas the France Stratégie report uses tax households), or the income variable (the income declared is not strictly identical to the reference tax incomes).

2015). The usual revaluations of transfers, the increase in the thresholds defining the income tax brackets that are indexed to inflation and also the tax and benefit reforms that took place in 2018, with the exception of the reforms studied in this article, are all included in the counterfactual scenario. Likewise, the cyclical variations in income between 2017 and 2018 are also present in the counterfactual scenario. The INES model is used to simulate the taxes that would have been paid by each household within the sample, the benefits they would have received and therefore their disposable income<sup>18</sup> under this counterfactual legislation. By performing a comparison between the disposable income obtained using the counterfactual legislation and that obtained with the legislation incorporating the three reforms we are studying here, we are able to see their impact via the resulting differences.<sup>19</sup>

For the introduction of the income tax component of the PFU, given the various stages of the progressive implementation, there are several possible options available for the simulation of the 2018 legislation. The first option consists of simulating the legislation actually applied in 2018, i.e. a situation in which capital income received in year  $N-1$  (in this case 2017) continues to be subject to the 2017 legislation (only the non-final withholding taxes change at the time of receipt of the income). The second option consists of adding the impact that is due to the fact that the income from year  $N-1$  is subject to the PFU (which, in reality, could only be observed from 2019 onwards). Finally, a third option consists of also subjecting income from life insurance buy-backs and PEL and CEL to the PFU and therefore of simulating the legislation that, in reality, will only be applied in the long term. We have used the second option for this article as it seems to be the most relevant for measuring the short to medium-term impact of the PFU.<sup>20</sup> Some elements will also be presented using the first and third options.

In order to simulate the PFU, account must also be taken of the fact that tax households that lose out on the introduction of the PFU (i.e. those for which the rate of tax on capital income is lower than the PFU) are able to opt to have their capital income included in the progressive income tax base. Nevertheless, it appears that the extreme hypothesis that all households for which the tax rate is lower than the PFU will opt for the comprehensive income tax system is not especially credible. Indeed, the default option in the tax return is the PFU, and numerous studies popularised by the book by Thaler & Sunstein (2008) have demonstrated that *nudges* or default

options have a much greater influence over behaviour than tax incentives.<sup>21</sup> We therefore simulate a scenario that appears more plausible to us, in which half of households that have an interest in taking the comprehensive income tax system option actually do so.<sup>22</sup>

The findings presented in Section 3.1 assess the impact of the reforms in the event that behaviour remains unchanged, i.e. under the assumption that the reforms do not change the situation of households prior to redistribution. This scenario allows the “pure” impact of the measure to be assessed thanks to the differences in tax bases and rates. In this section, we calculate the 2018 dividends by applying the average change over the previous three years to the 2017 dividends. The procedure is more complex for household wealth: for each household, the assets present in the wealth taxable under the ISF in 2017 are aged by +6.0% in the case of property assets (a rate derived from changes in property prices)<sup>23</sup> and by +5.9% for moveable assets (a rate corresponding to the change in the value of CAC 40 index listed shares between the beginning of 2017 and the beginning of 2018).<sup>24</sup> The reductions for donations and investments in SMEs imputed for the 2017 ISF and the liabilities are maintained at their 2017 levels.<sup>25</sup> The assumption is therefore made that behaviours, particularly in relation to donations, remain unchanged when compared with the situation observed in 2017 (Table 1).

18. The definition of disposable income used here differs slightly from the usual definition: the taxation of capital gains is included among the elements that reduce disposable income in order to take account of the impact of the reforms being studied here on households in receipt of capital gains. Capital gains tax is not normally taken into account in disposable income, since the capital gains themselves are not taken into account.

19. It should be noted here that, for reasons linked to the architecture of the INES model, the interactions between the increase in the CSG and tax (the increase in the deductible CSG reduces taxable income and therefore income tax) is not taken into account here.

20. The first option only provides an incomplete analysis of the impacts of the reform by failing to take account of an impact that came fully into play with effect from the year following its entry into force, i.e. in 2019.

21. See, for example, the case of automatic enrolment in funded pension schemes, which was studied by Madrian & Shea (2001).

22. We carry out a random draw from among the tax households with an interest in opting for the tax rate by applying a draw probability that increases in line with the amount the household is set to lose with the introduction of the PFU.

23. This rate corresponds to the average change in property prices between Q1 2017 and Q1 2018 by department (sources: INSEE), weighted in accordance with the total ISF paid by each department (based on DGFIP data for each municipality).

24. The changes are calculated in relation to the start of the year, since wealth taxable under the ISF is evaluated on 1 January each year, but declared on 15 June. The value of the wealth therefore most likely reflects the value of the property at the start of the year.

25. Conversely, indirect property assets, which need to be separated in order to calculate the IFI for 2018, are taken directly from the data concerning the IFI paid by households in 2018 (indirect real estate assets from 2017 cannot be included in the ISF data as they are not separated out from the rest of the moveable assets). Similarly, moveable liabilities are taken directly from data regarding the IFI paid by households in 2018, as these are not separated out from the other liabilities in the ISF data.

## 2.2. Taking Behavioural Responses Into Account

However, the PFU reform appears to have had a short-term impact on the behaviours surrounding the payment of dividends, and the IFI on declarations of wealth and donations. The introduction of the PFU resulted in a significant reduction in the marginal effective tax rates on capital income.<sup>26</sup> At the same time, an increase of almost 70% in the dividends paid to households between 2017 and 2019 (of which +60%, i.e. +9 billion euros in 2018) is observed in the 2018-2019 fiscal record data. The amounts of the dividends paid are very sensitive to their taxation, as can be seen from the economic literature on this subject (Chetty & Saez, 2005; Yagan, 2015; Bach *et al.*, 2019a; Lefebvre *et al.*, 2020). It is therefore likely that the increase in dividends between 2017 and 2019 can be explained, in part, by the introduction of the PFU.

In the case of the IFI reform, the short-term effects on reporting behaviour can go one of two ways. Cases in which the decrease in the property wealth declared could point to optimisation behaviours in response to the withdrawal of the ISF (for example the replacement of property assets with moveable assets within the wealth portfolio). In cases where the property wealth increases, this could reflect the anticipation of increased controls or a re-evaluation that had not been carried out in previous years.<sup>27</sup> Empirically speaking, the DGFIP data on the ISF in 2017 and the IFI in 2018 show, in all cases, that the IFI reform appears to have brought about changes in the declared value of property, both upwards and downwards.<sup>28</sup>

In Section 3.2, we therefore measure how our results may have been affected had we taken account of these behavioural effects when determining the impact of the reforms. We therefore consider the same counterfactual situation as in Section 3.1, but with a different post-reform situation. We simulate the 2018 IFI using the wealth actually observed in 2018, drawing directly upon the property assets declared and the IFI reductions present in the DGFIP data on the IFI paid by households in 2018. In the case of the PFU, we rely on empirical studies in order to determine the increase in dividends that can be explained by a behavioural response to the introduction of the PFU. In the case of the wealthiest households with the highest dividend amounts,<sup>29</sup> we apply an increase of 30% to the amount of dividends received, as Bach *et al.* (2019b) who calibrate this increase on the basis of the estimates made by Bach *et al.* (2019a).<sup>30</sup>

This increase corresponds to an elasticity of dividends at their marginal retention rate<sup>31</sup> between 1.8 and 2.3 depending on the tax bracket. For the other households, we use an elasticity of 0.7, as estimated by Lefebvre *et al.* (2020) for the period from 2008 to 2017 and with a large population of French households. This estimate is also close to the findings made by Chetty & Saez (2005), Yagan (2015) and Boissel & Matray (2019). This calculation results in account being taken of an increase in dividends linked to the 2018 reform between +2% (for households in the income tax bracket with a marginal tax rate of 30%) and +10% (for households in the 41% tax bracket). In addition, we do not take account of the impact of income shifting of work income to dividends in 2018, partly because, in 2018, work income was not subject to income tax due to the application of withholding tax, which significantly reduced the incentives to income shifting, and, on the other hand, because no studies have been carried out in France that highlight any such behaviour during previous capital tax reforms (Boissel & Matray, 2019; Bach *et al.*, 2019a; Lefebvre *et al.*, 2020). The behavioural impact taken into account brings about an increase in dividends of a little under 2 billion euros. This increase is small compared with the observed increase of around 9 billion euros; it is therefore considered to be a low estimate of the impact of the PFU on the payment of dividends. At the same time, it is of interest to consider a high estimate making the opposite assumption, i.e. that the total increase of 60% for dividends that was observed between 2017 and 2018 resulted from behavioural changes linked to the introduction of the PFU. The differences between the counterfactual situation that we consider in our analyses and the various scenarios studied for the post-reform situation are summarised in Table 1.

26. For those with the highest incomes (subject to the exceptional payment for high earners), it fell by almost 10 points (from 40% to 30%), taking account of the 40% allowance on dividends and the deductible CSG.

27. For example, the fact that all households must, with effect from 2018, declare details of the assets that they hold, something that households with wealth not exceeding 2.57 million euros did not need to do previously, could have prompted households to reassess their wealth more accurately.

28. Between 2016 and 2017, declared property wealth remained stable for more than 40% of households (Paquier *et al.*, 2019). This was only seen in half as many cases between 2017 and 2018.

29. i.e. households in the 41% or 45% income tax bracket and receiving dividends of more than 1,000 euros in 2018.

30. This increase is calculated as follows. Bach *et al.* (2019a) arrive at a fall in dividends received by households in 2013 of 40% as a result of those dividends being made subject to a tax rate in 2013 according to the difference in differences method. Based on an analysis of company data, they observed a fall of 20.7% in the dividends paid in 2013 as a result of the introduction of tax rates, and an increase of 15.3% in 2018 due to the introduction of the PFU. The 30% increase was obtained by means of a cross-referenced product. Since the group involved in the analysis at the household level is made up of households with dividends in excess of 1,000 euros, we also apply this increase to that same population.

31. The marginal retention rate directly complements the marginal rate.

Table 1 – Data taken into account for the various tax bases

	Counterfactual	Estimate	
		without behavioural effects	with behavioural effects
Moveable assets	ISF aged 2017	-	-
Indirect real estate assets	-	IFI 2018	IFI 2018
Direct property assets	ISF aged 2017	ISF aged 2017	IFI 2018
Liabilities	ISF 2017	IFI 2018	IFI 2018
Reductions for donations	ISF 2017	ISF 2017	IFI 2018
Reductions for SMEs	ISF 2017	IFI 2018	IFI 2018
Dividends	ERFS aged 2017	ERFS aged 2017	Amounts obtained using elasticities from the literature (low assumption) or the observed increase in dividends (high assumption)

Notes: "2017 ISF" refers to the data from the 2017 ISF (sources: DGFIP); "2018 ISF" refers to the POTE 2017 data, which include the 2018 IFI data.

Finally, it should be specified that we do not take account here of any possible behavioural effects with regard to income subject to the PFU, other than dividends (for example, interest on fixed-income investments or capital gains)<sup>32</sup> or income not subject to the income tax component of the PFU, but instead subject to the increase in the CSG (such as property income).

### 3. Results

This section starts by presenting the findings on the basis of unchanged behaviours, then evaluates how those findings change when the short-term behavioural effects that may have arisen in 2018 are taken into account.

#### 3.1. The Impacts With Unchanged Behaviour

##### 3.1.1. The Transition From the ISF to the IFI Increases the Standard of Living of the Wealthiest Households, Pensioners and the Self-Employed

If behaviour remains unchanged, the impact of replacing the ISF with the IFI in 2018 on household disposable income amounts to +3.44 billion euros, i.e. a 3.44 billion euro loss

of tax revenue for the State (Table 2). This would correspond to a 0.3% increase in the standard of living of all households in 2018. The reform results in 340,000 households benefiting, while 10,000 households lose out (due to the loss of the reduction for investing in SMEs and the non-deductibility of moveable liabilities with effect from 2018). The average impact on households that are affected by this measure is +9,770 euros for disposable income and +6,720 euros in 2018 for standard of living.

The gain of 3.44 billion euros is unevenly distributed according to position in relation to the standard of living vigintiles:<sup>33</sup> the average annual increase in standard of living amounts to 830 euros (+1.2%, Figure I) for the wealthiest 5% of people and 150 euros<sup>34</sup> between the 18<sup>th</sup> and 19<sup>th</sup> vigintiles (+0.4%), while it amounts to 90 euros (+0.3%) between the 8<sup>th</sup> and 9<sup>th</sup> deciles

32. The changes observed between 2017 and 2018 do not suggest the existence of any significant short-term behavioural impacts on interest on fixed income investments.

33. The standard of living prior to the reforms being studied is used as a reference for the presentation of the findings throughout the article. The deciles and vigintiles are defined for the standard of living distribution prior to the reforms being studied.

34. These are the average annual impacts calculated for all categories, regardless of whether they are affected by the reform or not.

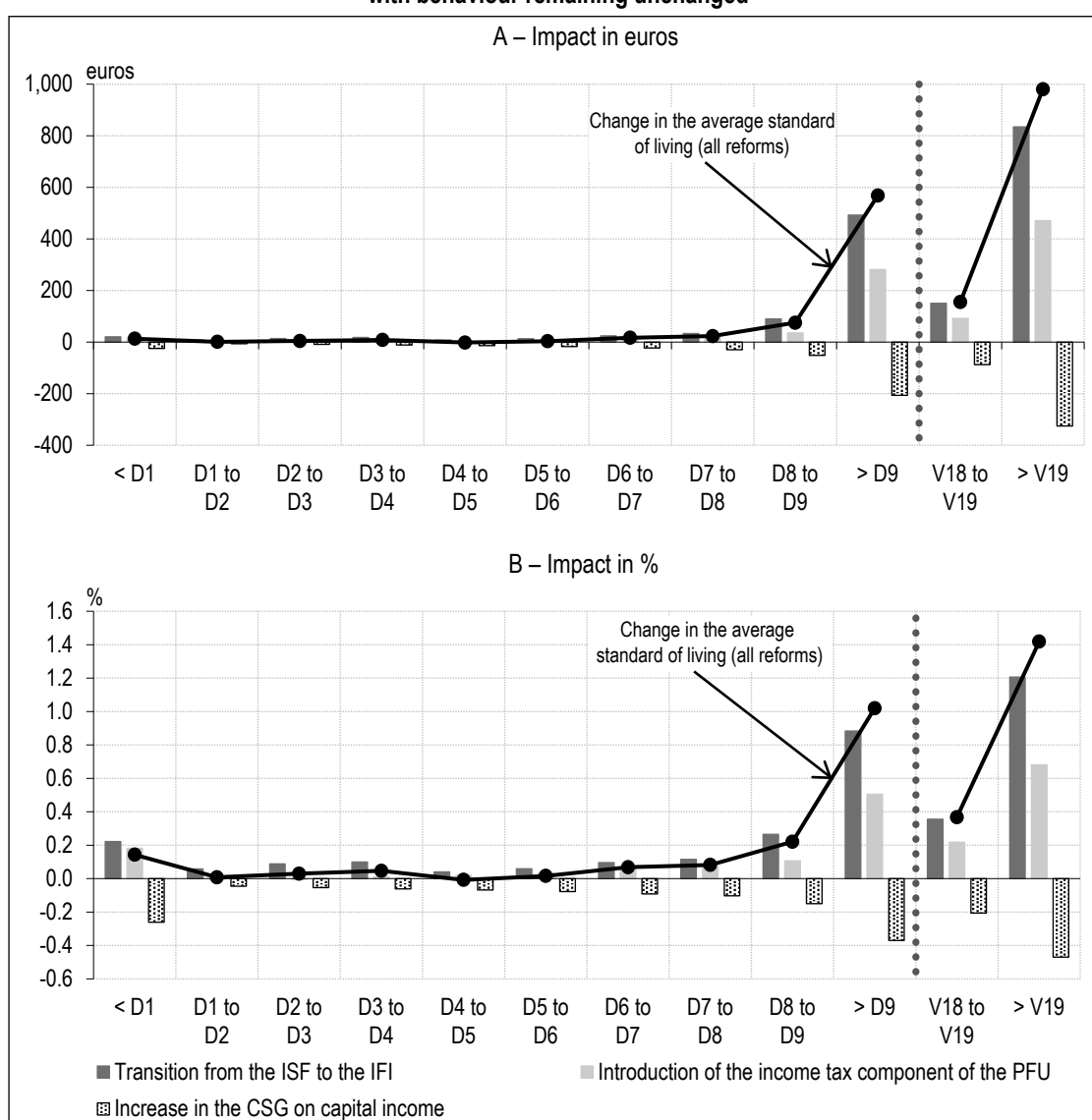
Table 2 – Aggregated impacts of the reforms evaluated with behaviour remaining unchanged

	Impact on total disposable income (in millions of euros)	Number of households that benefit (in thousands)	Number of households that lose out (in thousands)	Average impact on annual disposable income per household concerned (in euros)	Average impact on annual standards of living per household concerned (in euros)
Transition from the ISF to the IFI	+3,440	340	10	+9,770	+6,720
Introduction of the income tax component of the PFU	+1,760	4,910	1,750	+260	+180
Increase in the CSG on capital income	-1,830	0	16,110	-110	-80
Aggregated impact of the three reforms	+3,360	2,460	13,820	+210	+140

Sources and Coverage: INSEE, ERFS 2016 (updated 2018), *enquête Patrimoine* (Household Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.



Figure I – Impact on the average annual standards of living by position in the distribution with behaviour remaining unchanged



Notes: The x-axis represents the position of individuals in relation to the standard of living deciles (D1 to D9) or vigintiles (V18 and V19) had the 2018 reform not taken place.

Sources and Coverage: INSEE, ERF5 2016 (updated 2018), *enquête Patrimoine* (Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.

and 30 euros or less below the 8<sup>th</sup> decile (+0.2% or less). The wealthiest 10% of people therefore obtain 68% of the total benefit in terms of standard of living, while the figure for the wealthiest 15% of people is 76%. Of the 340,000 households that benefit from the reform, around three quarters are above the highest decile and around 60% are above the highest percentile. However, although the increase is concentrated at the top end of the distribution, certain households that are not the wealthiest also benefit. Indeed, the correlation between standard of living and wealth is strong, but not perfect: at the beginning of 2018, 42% of households positioned within the wealthiest 10% in terms of gross wealth also belonged to the wealthiest 10% in terms of standard of living

(INSEE, 2021) and 43% of the 1% of households with the highest initial income are also among the 1% of households with the highest gross wealth (Cazenave-Lacrouts *et al.*, 2019). The increase in the share of inheritances since the 1970s (which represented 55% of total wealth in 2010 according to Frémeaux, 2019) results, for example, in young people, in some cases with lower incomes, having significant wealth, and therefore brings about a reduction in the correlation between labour income and wealth (Garbinti *et al.*, 2021). Therefore, as can be seen from the results obtained by means of matching between the income tax data and the ISF/IFI tax data performed by France Stratégie (Dherbécourt & Lopez-Forero, 2019), 40% of the total for the

ISF is paid by households positioned below the 98<sup>th</sup> centile of the reference tax income (RFR).

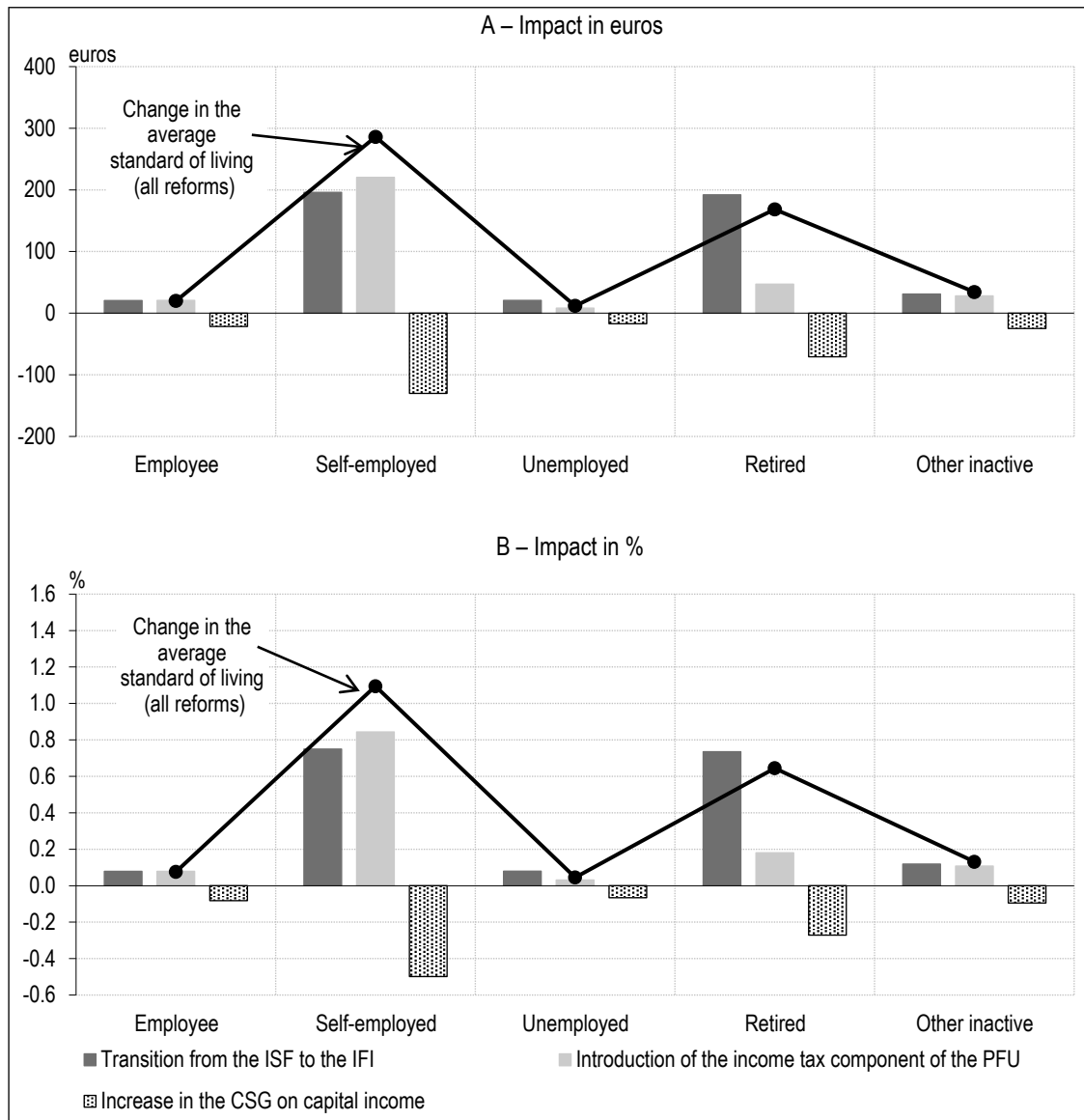
The impact of the reform on the average annual standard of living varies according to the employment status of the individuals in question (Figure II). It turns out that the greatest impacts are felt in terms of standard of living when the individuals are self-employed or pensioners (+0.7%, i.e. approximately +200 euros on average). Among the pensioners, it is those who were previously self-employed who benefit the most from this measure. This can be explained by the fact that they tend to hold greater wealth (with professional capital being added to non-professional capital in some cases, see Lamarche & Romani, 2015). The findings also indicate a greater increase for older people;

the average age of ISF taxpayers is indeed high (69 years according to France Stratégie, 2019); a finding that is consistent with the fact that pensioners have accumulated more wealth during their lives.

### 3.1.2. The Introduction of the PFU Also Favours Wealthier Households, But Not Specifically Pensioners

We will now assess the impacts of the introduction of the PFU of 12.8% for income tax, still under the assumption that behaviour remains unchanged. The assumption is made that all of the life insurance income from 2018 relates to payments made before 27 September 2017, and that all PELs and CELs were opened prior to 2018; none of the income resulting from these

Figure II – Impact on average annual standards of living by activity status with behaviour remaining unchanged



Sources and Coverage: INSEE, ERFS 2016 (updated 2018), *enquête Patrimoine* (Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.

investments is therefore affected by the introduction of the PFU.

The impact of the introduction of the income tax component of the PFU gives rise to an increase in household disposable income amounting to 1.76 billion euros, which represents the budgetary cost of the reform (cf. Table 2). The average annual increases in standard of living are highly concentrated among the wealthiest 5% of households (+470 euros on average, i.e. +0.7%, cf. Figure I), but are also not negligible between the 18<sup>th</sup> and 19<sup>th</sup> vigintiles (+90 euros or +0.2%). They are much smaller below the 9<sup>th</sup> decile. The wealthiest 15% of people therefore obtain 80% of the total benefit in terms of standard of living. 4.9 million households benefit from the reform, but there are also 1.8 million households that lose out. Those households that lose out, the average loss of which is relatively small (80 euros of disposable income per year, compared with an average increase of 390 euros for those that benefit) are the households for which the rate of the progressive income tax on capital income is lower than the PFU, but that have not opted to continue paying tax in accordance with that rate. Our simulation is indeed based on the assumption that 50% of tax households that would benefit in opting for the progressive tax rate actually opt for that rate (see above).

The average annual increase in standard of living is much greater for the self-employed<sup>35</sup> (+220 euros or +0.8%, see Figure II) than for the rest of the population. The very significant increase for the self-employed appears to be driven by managers of companies subject to corporate income tax, for whom the amounts received in the form of dividends is, on average, higher than for the rest of the population.

It should be noted that the transitional impact of the 2018 reform is slightly different, as the income received in 2017 remained subject to the 2017 legislation:<sup>36</sup> for the wealthiest 10% of people, the average annual increase in standard of living was smaller (around 50 euros). This can be explained by the fact that people positioned above the 9<sup>th</sup> decile have higher marginal tax rates than the 2017 PFO rates (21% or 24% depending on income).

### *3.1.3. The Losses Linked to the Increase in the CSG Are Concentrated on the Wealthiest People, but to a Lesser Extent than the Increases Brought About by the Other Two Reforms*

The increase in the rate of the CSG on capital income effectively reduced the disposable

income of households by 1.83 billion euros in 2018 (see Table 2). The 16 million households affected by the reform all lost out. The average loss incurred by these households was 110 euros from their annual disposable income. This loss is much more marked for the wealthiest households: it amounts to 210 euros for the average annual standard of living of the wealthiest 10% of people (or -0.4%, cf. Figure I) and 320 euros for the wealthiest 5% (-0.5%). However, the annual average loss in standard of living is significantly higher for the self-employed (-130 euros, or -0.5%, Figure II) and, to a lesser extent, for pensioners (-70 euros, or -0.3%, compared with -20 euros, or -0.1%, for employees).

The concentration of the impacts of the CSG at the top end of the standard of living distribution is less marked than for the introduction of the income tax component of the PFU (cf. Figure I): for example, the wealthiest 5% and 15% account for 42% and 60% of the total loss in standard of living, respectively, compared with 62% and 80% respectively for the increase linked to the introduction of the income tax component of the PFU. This lower concentration can be explained by the fact that the CSG is a flat-rate tax. The introduction of the income tax component of the PFU results in the PFU rate being applied to capital income rather than the marginal rate defined by the progressive income tax scale; the impact of this is therefore more marked among the wealthiest people, for whom the marginal rate is higher. In addition, the income base subject to the increase in the CSG is larger than the income base subject to the income tax component of the PFU. Property income, for example, which makes up a significant share of the capital income received by households, is subject to the increase in the CSG; however, it is not affected by the introduction of the income tax component of the PFU. However, such income is slightly less concentrated in the wealthiest households than income from moveable assets. Overall, the cumulative impact of the introduction of the PFU as income tax and the increase in the CSG is positive for the standard of living of the wealthiest people (+150 euros for the average annual standard of living of the wealthiest 5%), but negative for that of the poorest 90%. These averages make it possible to

35. The self-employed are identified by means of the ACTEU5 ERF5 variable, which allows for the inclusion of the main managers of private limited liability companies (SARLs) or single owner limited liability companies (EURLs, who declare their income in the wage category).

36. For 2018 only, the impact of the introduction of the PFU is purely linked to the change in the non-final withholding tax rate applied to the investment income for 2018.

highlight the differences in impacts depending on the position of the households in the distribution of standards of living. It should nevertheless be borne in mind that they mask significant disparities between households with similar standards of living, but which hold different types of wealth: for example, among the wealthiest households, those that only receive income from property lose out, whereas those that only receive income from moveable assets benefit.

### 3.1.4. The Reforms Increase Inequality in Standards of Living

The cumulative impact of the three reforms grows significantly with standards of living: the variation in the average annual standard of living is less than or equal to +20 euros below the 8<sup>th</sup> decile (cf. Figure I), while it is 80 euros between the 8<sup>th</sup> and 9<sup>th</sup> deciles (+0.2%), +570 euros (+1.0%) above the 9<sup>th</sup> decile and +980 euros (+1.4%) for the wealthiest 5%. In total, the wealthiest 10% of people obtain 80% of the total benefit in terms of standard of living. The reforms also have an upward impact on the main standard indicators measuring overall inequality in standards of living (Table 3): +0.2 points for the Gini index, +1.9 points for the quintile share ratio (ratio between the average standard of living of the wealthiest 20% of households and that of the poorest 20%), +0.8 points for the ratio between the average standard of living of the wealthiest 10% of households and the poorest 50%, +0.9 for the interdecile ratio.

It should be noted that all the previous findings were presented based on the standard of living of individuals. The impact of these reforms broken down by capital income percentiles is therefore logically even more marked at the top end of the distribution: the impact would be +2,240 euros for the average annual standard of living of the 5% of people with the highest capital income.

## 3.2. Taking Account of Short-Term Behavioural Effects

In this section, we assess how the findings presented above change when the short-term behavioural responses to taxation that may have arisen in 2018 are taken into account.

As regards the transition from the ISF to the IFI, taking account of short-term behavioural responses has little impact on the findings: the benefits for the wealthiest people are slightly lower (20 euros lower for the average annual standard of living of the wealthiest 5%, Figure III) and the increase to total disposable income (and therefore also the cost to public finances) is slightly lower than for the scenario where behaviour remains unchanged (+3.32 billion euros, compared with +3.44 with behaviour remaining unchanged). The optimisation effect between financial and property wealth would therefore be more than offset by the increase in declared wealth (see above).

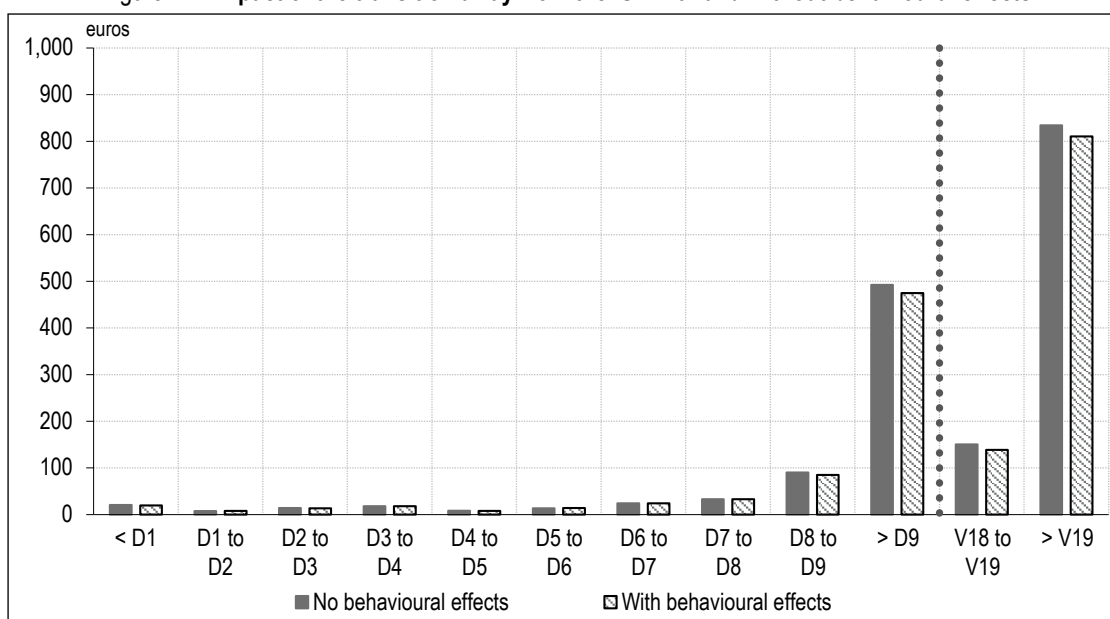
For the introduction of the income tax component of the PFU and the increase in the CSG, taking account of the impact of the reform in terms of the increase in the dividends received by households brings about a more significant change in the assessment of the impact of the reform. The impact on standards of living is therefore highly concentrated at the top end of the distribution: among the wealthiest 10% of people (and the wealthiest 5%, respectively), the total benefit in terms of their average annual standard of living is 80 euros (or 150 euros, respectively) with behaviour remaining unchanged, compared with 310 euros (or 610 euros, respectively) assuming a low impact of the PFU on the dividends and 1,010 (or 1,830 euros, respectively) assuming a high impact (Figure IV). The benefits in terms of standard of living, calculated taking account of the impacts of the PFU on dividends

Table 3 – Evaluation of the impact of the reforms on inequality indicators for standard of living with behaviour remaining unchanged

Inequality indicators for standard of living	Variation between the counterfactual situation and the situation with the reforms (in percentage points)
Gini index	+0.2
Income Quintile Share Ratio	+1.9
Interdecile ratio (D9/D1)	+0.9
Standard of living of the wealthiest 10% relative to the standard of living of the poorest 50%	+0.8
Proportion of standard of living held by the wealthiest 5%	+0.2
Poverty rate	+0.0
Poverty gap	+0.0

Sources and Coverage: INSEE, ERFS 2016 (updated 2018), *enquête Patrimoine* (Household Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.

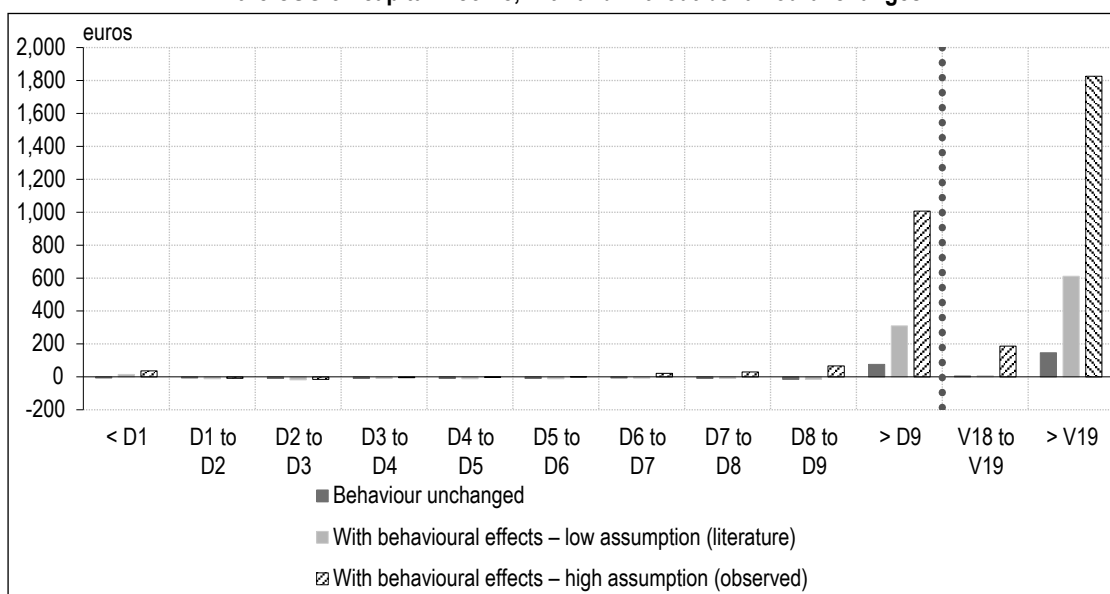
Figure III – Impact of the transition away from the ISF with and without behavioural effects



Notes: The x-axis represents the position of individuals in relation to the standard of living deciles (D1 to D9) or vigintiles (V18 and V19) had the 2018 reform not taken place.

Sources and Coverage: INSEE, ERF5 2016 (updated 2018), *enquête Patrimoine* (Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.

Figure IV – Impact of the introduction of the income tax component of the PFU and the increase in the CSG on capital income, with and without behavioural changes



Notes: The x-axis represents the position of individuals in relation to the standard of living deciles (D1 to D9) or vigintiles (V18 and V19) had the 2018 reform not taken place.

Sources and Coverage: INSEE, ERF5 2016 (updated 2018), *enquête Patrimoine* (Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.

(high or low estimate) include the increase in household income associated with behavioural effects, together with the changes in income linked to the changes in tax scale (whereas, in the absence of behavioural effects, the impact of the PFU is limited to changes in tax scale).

From the point of view of public finances, the increase in dividends gives rise to a surplus of

levies (CSG and income tax) when compared with the scenario in which behaviour remains unchanged: the cost of introducing the income tax component of the PFU falls from 1.76 billion euros with behaviour remaining unchanged to 1.55 billion euros assuming only minor behavioural changes and 0.83 billion euros assuming significant changes (Table 4). The

**Table 4 – Impact of the reforms on public finances with and without behavioural effects (in millions of euros)**

	Without behavioural effects	With behavioural effects	
		(low assumption)	(high assumption)
Transition from the ISF to the IFI	-3,440	-3,320	-3,320
Introduction of the income tax component of the PFU	-1,760	-1,550	-830
Increase in the CSG on capital income	+1,830	+2,110	+3,080
of which: increase in the CSG on income falling under the PFU	+710	+810	+1,190
Aggregated impact of the three reforms	-3,360	-2,770	-1,070

Sources and Coverage: INSEE, ERF5 2016 (updated 2018), *enquête Patrimoine* (Household Wealth survey) 2014-15; DGFIP ISF 2017, POTE 2017; INES model 2018. Metropolitan France, ordinary households whose income is positive or nil and where the household reference person is not a student.

budgetary savings linked to the increase in the CSG on capital income increases from 1.83 billion euros with behaviour remaining unchanged to 2.11 billion euros assuming only minor behavioural changes and 3.08 billion euros assuming significant changes. If we add together the cost associated with introducing the income tax component of the PFU and the budgetary savings linked to the increase in the CSG, taking only the share of the latter that stems from an increase in the CSG payable on income subject to the income tax component of the PFU,<sup>37</sup> we are able to calculate the impact of the introduction of the 30% PFU (tax and CSG): the reform would cost 1.05 billion euros with behaviour remaining unchanged and 740 million euros assuming only minor behavioural changes; the assumption of significant behavioural changes would turn this around, with the PFU supplementing the budget to the tune of 360 million euros.

Overall, although the cumulative impact of the three reforms assessed in this article results in a loss of 3.36 billion euros for the State in the event that behaviours remain unchanged, the cost is only 2.77 billion euros assuming only minor behavioural changes and 1.07 billion euros assuming significant changes.

These findings, which include short-term behavioural effects, therefore tend to show that the introduction of the PFU had much less of a negative impact, or indeed even a positive impact, on state budget, while bringing about significant increases in standards of living for the wealthiest households and minor losses for other households. However, it is likely that other impacts will be felt over the medium or long term; we will come back to this in the conclusion. Generally speaking, the findings presented here must therefore be interpreted as a contribution to the way in which the assessment of the reform may be impacted by behavioural effects, rather than as a complete and definitive assessment.

\* \*

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As a conclusion, we will discuss how the short-term findings could change, taking account of the long-term impacts of these reforms. We discuss, in particular, the impacts of the PFU using recent studies contained within the literature. The transition from the ISF to the IFI could also have long-term impacts on the accumulation of capital, but there is no available evaluation to measure the extent of those impacts.

In the long term, the income tax component of the PFU will apply to new types of income, in particular income from PELs and CELs opened after 2018 and life insurance income relating to payments made after 27 September 2017. Over the long term, this could bring about additional revenues for public finances, as well as an increase in inequality (since PELs/CELs are most likely to be held by those in the top half of the distribution).<sup>38</sup>

Beyond this impact, which is linked to the gradual introduction of the income tax component of the PFU, the behavioural responses to the PFU could also differ over the long term.

First of all, the dividends could continue to increase to make up for the five years (2013-2017) of lower payments. Indeed, Bach *et al.* (2019a) demonstrated that there was no impact on company investment because of the 2013 reform of dividends taxation (inverse of the PFU reform) and they suggest that dividends were likely to have been set aside between 2013 and 2017 while awaiting a more favourable tax regime. With this in mind, the increase in dividends associated with the introduction of the PFU could therefore continue and become larger than that taken into

37. For this purpose, we use the following order of magnitude, calculated within the ERF5: around 40% of the income affected by the increase in the CSG is subject to the PFU in the long term (i.e. following the full implementation of the PFU for income from life insurance and from PELs and CELs).

38. The reform would bring about small losses for this population.

account in the previous section.<sup>39</sup> Conversely, there could be a downward impact on capital gains. Indeed, in the counterfactual situation in which the reform did not take place, meaning that the increase in dividends also did not take place, the retained profits could have increased the capital and therefore the value of the companies, which would ultimately lead to an increase in capital gains when the company is resold. In this case, the amount of tax due in the counterfactual scenario could be higher, meaning that the public finances benefit less from the reform. It should also be noted that, although the 2013 and 2018 reforms had significant impacts on standards of living, they would not have done so with a very broad definition of income, as

per “Haig-Simons”, or with the inclusion of retained company profits. On the other hand, the impact of the income shifting of work income to dividends could be felt by the self-employed in the long term (Pirttilä & Selin, 2011), even if they are not seen in the short run. Taking these impacts into account would likely lead to an increase in the cost of the reform in the medium term as a result of the fall in work incomes (and consequently in income tax and social security contributions) for some of the self-employed. □

39. According to preliminary administrative data, dividends seem to have continued to increase in 2019 by between 2 and 3 billion euros (France Stratégie, 2020, p. 112).

### Link to the Online Appendix:

[https://insee.fr/en/statistiques/fichier/5426465/ES\\_Paquier-Sicsic\\_Annexe-en-ligne\\_Online-appendix.pdf](https://insee.fr/en/statistiques/fichier/5426465/ES_Paquier-Sicsic_Annexe-en-ligne_Online-appendix.pdf)

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