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Laurent Bach
Antoine Bozio
Arthur Guillouzouic
Clément Malgouyres

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Laurent Bach Antoine Bozio

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Abstract

We link French households' tax records to the corporations they control, and build a payout-policy–neutral income measure, with corresponding tax burdens including those of "billionaires": the top 0.0002%. Defined as such, income is more concentrated than taxable income, it better predicts rich-list membership, and persists more among billionaires. Personal taxes remain progressive until the top 0.1%, but eventually decline to 2% of income. Corporate taxes are an imperfect progressive backstop, as total tax rates fall from 45% at the 0.1% threshold to 25% for billionaires. Among these, the tax burden is global and tax-efficient pyramidal control over businesses ubiquitous.

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*Bach: ESSEC Business School. Bozio: Paris School of Economics (PSE), EHESS, IPP. Guillouzouic: Aix Marseille Univ, CNRS, AMSE, Marseille, France and IPP–PSE. Malgouyres: CREST–CNRS and IPP–PSE. The authors acknowledge the financial support of the EUR grant ANR-17-EURE-0001 and INTERTAX project funded by ANR grant ANR-24-CE26-6505. Malgouyres acknowledges also financial support from the ANR through project ANR-19-CE26-0004. Guillouzouic acknowledges financial support from the French government under the "France 2030" investment plan managed by the ANR (reference :ANR-17-EURE-0020) and from Excellence Initiative of Aix-Marseille University - A*MIDEX. We thank the French ministry of finance-DGFiP for providing access to the data, as well as the CASD for secured data access (ANR-10-EQPX-17). Corresponding author: Antoine Bozio, PSE, 48 boulevard Jourdan, 75014 Paris, France.

1 Introduction

By most measures, wealth inequality has substantially increased over the last three decades, with the largest gains accruing to corporate "billionaires", those individuals or families controlling established companies.[1] There is, however, intense debate over whether and how tax systems, which mostly target income, are contributing to this trend (e.g. Saez and Zucman, 2019; Waldenström, 2024). A key element of the debate therefore rests on measuring the wealth, income, and effective tax burden of very high net worth individuals. For instance, in 2011, Warren Buffett publicly stated that his personal pre-tax annual income was 40 million dollars and his federal income and payroll taxes were 7 million dollars (Buffett, 2011). In contrast, Berkshire Hathaway-—-a company of which Buffett and his family owned roughly one-quarter—-had pre-tax earnings equal to 15 billion dollars with corporate tax receipts equal to 5 billion dollars. This example illustrates the broader issue: conventional studies of income distribution often fail to fully capture the income that accrues to wealthy individuals, as well as the taxes they pay, through controlled corporations.[2]

In this paper, we investigate how integrating corporate and personal income tax data affects the measurement of income and effective tax rates along the income distribution, up to the very top with the case of billionaires. To that end, we exploit a combination of fiscal, legal and commercial ownership registries for France, which we match to personal tax registries for the fiscal year 2016. By matching administrative files that link every individual tax record to corporate tax returns, we look through the corporate veil and attribute pre-tax profits to households whenever they effectively control a firm. This integrated micro-data framework lets us construct a comprehensive income measure that adds undistributed profits to personal taxable income. We also exploit newly released country-by-country reporting (CbCR) micro-data on multinational groups to incorporate foreign profits into the picture, and thus assess the role of global corporate income taxes in the tax burden of billionaires. We delve into the complex ownership structure of corporations prevalent in Europe for those very rich individuals and highlight the role of specific vehicles like holding companies.

Equipped with such a bridge between corporations and personal taxpayers, we can empirically measure comprehensive income in the spirit of the standard Haig-Simons notion of income (Haig, 1921; Simons, 1938): for households who do not control companies, this measure is defined as personal pre-tax income including realized capital gains. For households that do control companies, it consists of the sum of the pre-tax income of corporations under their control and of the pre-tax personal income without realized capital gains. Our measure is therefore free of any unrealized capital gains, while at the same time capturing all of the monetary income available to those who control corporations but opt for low payout policies. As a result, our comprehensive income mea-

[1] While there is some debate about a general increase in the top 1% wealth share since the 1980s, with clear evidence on the US (Saez and Zucman, 2020a; Smith et al., 2022b) and more stable evolution in Europe (Garbinti et al., 2021; Alvaredo et al., 2018; Lundberg and Waldenström, 2018; Waldenström, 2024), the evidence for the top 0.01% is firmer (Zucman, 2019; Waldenström, 2024), albeit with debate on the magnitude of the increase. For instance, the top 0.01% wealth share in the US is estimated to have increased from 3% in 1980 to 7% by Smith et al. (2022b), and to 10% by Saez and Zucman (2020a). Recent work, including the value of unfunded pensions in the US, finds also a positive, albeit smaller, increase in the top 1% and top 0.1% wealth shares (Catherine et al., 2025).

[2] See Clarke and Kopczuk (2025) for an overview of the challenges of measuring income.

sure departs from the Haig-Simons comprehensive income mainly to the extent that it excludes the portion of latent capital gains which is driven by price effects.

In order to measure precisely the tax burden of very rich households, one needs to address three additional empirical challenges. First, just as for any study on the distribution of taxes among the population, but especially when combining income and taxes from statutorily distinct vehicles, a decision has to be made regarding the incidence of taxes, and in particular of corporate taxes. Given the evidence from the recent literature (Fuest et al., 2018; Suárez Serrato and Zidar, 2016), we exploit the detail on the factor-by-factor sources of income to compute estimates of tax burden accounting for incidence effects of the corporate income tax. Nonetheless, for transparency reasons, and also because we are focused on a cross-section of taxpayers, we show as our baseline a statutory incidence of the corporate tax, following the classic shareholder ownership theory (Auerbach, 2006).

Second, corporate billionaires often hold control over companies in very idiosyncratic and complex ways compared to the rest of the population of entrepreneurs. As a result, it is necessary to assess the ability of exhaustive registries to fully capture the true income and tax levels of billionaires. While rich lists have known shortcomings—aggregating extended families, non-residents—they provide a useful benchmark for identifying the publicly known firms owned by the most wealthy families of the country. This is why we carefully identify the control vehicles used by the families registered in the French equivalent to the Forbes 400 rich list, the "Challenges" rich list. We are then able to identify the French fiscal residents who, per our broad shareholder-taxpayer bridge, control these vehicles and label those as "rich lists" households. This in turn allows us to provide a detailed assessment of where "rich" households as defined per rich lists fit in the income distributions traditionally used in the inequality literature.

Third, because a single cross-section of data might reflect an unusual year in terms of payout decisions and accumulated capital gains, it is necessary to assert that both the income level to enter the top group and the composition of this group are stable over time. We deal with this challenge in two ways. Regarding the composition, we document the very high persistence of comprehensive income at the top. We also propose an alternative methodology to generate income distributions at the very top over two decades of data, relying only on rich lists, asset prices and accounting data for listed firms. For the year 2016, we are able to compare our preferred, data-hungry, approach to measuring billionaires' income with this imputation-based approach. This is a way to enhance both the replicability of our exercise and its external validity.

Our results are as follows. We first show that comprehensive income is substantially more concentrated than taxable income. While average comprehensive income is only about 25% higher than taxable income in the full population, it is 70% higher within the top 1% and almost an order of magnitude higher among the top 75 taxpayers. The top 0.1% income share almost doubles, going from 3.4% to 6.2%, when one considers comprehensive rather than taxable income. We obtain a more concentrated income distribution than methods relying on dividend-based imputations of undistributed corporate earnings, the most common methods used in the literature. For instance, Garbinti et al. (2018) obtain a top 1% share of 10.8% for 2014 (vs 13.8% for our estimates) and 3.7% (vs 6.2% in our data) for the top 0.01%. Beyond the distribution in the cross-section, we further

show that comprehensive income is considerably more *persistent* than taxable income, especially at the top. Moreover, unlike taxable income, we find that it lines up closely with rich-list membership.

On the taxation side, we find that personal taxes—including progressive income taxes, flat capital levies, wealth taxes, and non-contributory social security contributions—exhibit a progressive structure up to approximately the top 0.1% of the comprehensive income distribution. Beyond this threshold, however, effective personal tax rates plateau and then decline markedly, falling to around 2% for the top 75 households, compared to approximately 35% at the lower bound of the top 1%. At the very top of the distribution, the corporate income tax (CIT) increasingly serves as the primary fiscal backstop. Nonetheless, the substitution of high personal tax rates with the relatively lower CIT rate results in a significant drop in total effective tax rates—from about 45% at the 0.1% threshold to roughly 25% among billionaires.

We provide several methodological comparisons and robustness checks. We show in particular that dividend-based imputations understate top incomes and completely erase the measured regressivity at the very top, underscoring the need for observed ownership links to attribute both income and taxes paid at the very top. While our baseline results rest on the assumption that shareholders bear 100% of the CIT, we show that, somewhat unsurprisingly, adjustments aiming to reflect the shifting of the CIT burden onto labor and lenders make the top-tail average tax rate fall even further (to $\approx 17\%$ in our particular application). We show also that 2016 is unlikely to be an outlier. First, we compute the top *taxable* income entry threshold (for the 0.0002%) for years 2001 to 2019 and find that 2016 is by no means an exception. Second, we recover a top entry threshold for comprehensive income based on rich lists and show that it aligns quite closely to the baseline top entry threshold for 2016 and remains relatively stable over the period 2001 to 2019.

Finally, we highlight the mechanisms leading to such patterns of decreasing tax burden at the very top of the income distribution in the European context. First, pyramidal control over businesses through holding companies is key in explaining the structure of earnings and the tax burden of top earners. We show that retained earnings as a fraction of total comprehensive income reach 96% among the top 75 earners and that almost all top earners are associated with direct stakes in a holding company. This is likely to be specific to European corporate owners as the EU Parent-Subsidiary Directive prevents taxation of intra-group dividends—as opposed to the rise of pass-through businesses in the US (Smith et al., 2022a) and the taxation of dividends between firms (Morck and Yeung, 2005). Second, we show that accounting for foreign operations is essential—around half of total CIT paid by the very top is remitted abroad. With average CIT rates on foreign profits lower than the national rate, the average tax burden of corporate profits is bound to be lower for corporate billionaires.

Related literature. Our results contribute to several strands of the literature. First, this is a new step in the analysis of the distribution of the tax burden, pioneered by Pechman and Okner (1974) and Pechman (1985) in the US, and revived more recently by the distribution of national income (DINA) literature (Piketty and Saez, 2007; Piketty et al., 2018). We confirm the insight from the literature on the distribution of national income (Piketty et al., 2018; Auten and Splinter, 2023) that tax progressivity is overstated by personal tax records. We improve on this literature by using

micro-data recording actual ownership links between corporations and households. Accordingly, we do not have to rely on hardly robust imputation techniques to recover the comprehensive income distribution from personal income statistics (Kopczuk, 2023). This is particularly important in the context of Europe and other advanced economies where the relative share of corporations in business income is high and has been increasing over time,[3] unlike what has been documented in the United States, where pass-through businesses have increased in relative importance (Smith et al., 2019). A set of recent papers use micro data on actual ownership to reconstruct comprehensive income (Bruil et al., 2025; Aaberge et al., 2023; Alstadsæter et al., 2025; Balkir et al., 2025; Palomo et al., 2025; Ring et al., 2025). Bruil et al. (2025) develop an enhanced DINA framework to measure inequality in the Netherlands. Using Norwegian data, Aaberge et al. (2023) assess how accounting for business income (including undistributed profits) affects measures of income inequality and tax progressivity while Alstadsæter et al. (2025) show that measures of comprehensive income built using ownership links are less sensitive to tax reforms which can affect firm payout rates than taxable income. Balkir et al. (2025) compute the tax burden of US households present in the Forbes 400 rich list and compare their estimate to our top 0.0002% estimate. Our findings complement and improve the aforementioned papers in several ways. First, our paper differs in its focus, by looking at effective tax rates at the very top of the income distribution and decomposing the contribution of the different taxes to the decline in progressivity within the top 0.1%. Moreover, we improve the measurement of the corporate income tax, in particular regarding its international aspects by leveraging detailed micro-data on foreign profits and taxes. This is important as, as we move toward the top of the distribution, the CIT plays a key redistributive role and owned businesses become more likely to have substantial operations overseas. Compared to studies which rely on rich list estimates for measuring wealth at the top, we can rely on a precise and consistent definition of tax units. Finally, in terms of mechanisms, we measure explicitly the high prevalence of holding companies and how they allow delaying the onset of personal taxation at the top of the income distribution.

Second, we contribute to the large literature on the measurement of inequality of income and wealth, by presenting evidence on the economic income of owners of business assets. The previous literature has relied on imputations to estimate the wealth and income of those entrepreneurs that have fueled debates among scholars (Saez and Zucman, 2016; Smith et al., 2019; Saez and Zucman, 2020b; Auten and Splinter, 2023). Using ownership data on corporate wealth, we remove the need to impute that income and wealth by observing directly the income of entrepreneurs earned through the firms. Our contribution highlights the large role of the diminishing propensity to pay dividends out of profits at the top of the income distribution.

Third, our work places itself in the literature on the distributional role of the corporate tax (Auerbach, 2006). The main conclusion from this literature is that corporate taxes are not just borne by shareholders but also by owners of other types of capital (Harberger, 1962), workers (CBO, 2016; Suárez Serrato and Zidar, 2016; Fuest et al., 2018; Carbonnier et al., 2022) and consumers (Baker et al., 2020). While we show variants incorporating those incidence estimates for the CIT, our main analysis rests on the statutory incidence theory, which is a useful benchmark when analyzing the

[3] See for instance Aaberge et al. (2023) and Alstadsæter et al. (2025) in the context of Norway, and Bach et al. (2020) in the context of Sweden.

distribution of the tax burden in cross section rather than a specific tax reform (Saez and Zucman, 2023), and we do this very accurately thanks to a combination of personal and corporate tax returns via accurate individual ownership links. One key advantage is that under this approach, we need not differentiate between the incidence of taxes on personal capital income and on corporate capital income, precisely as recent work (Risch, 2023) has shown that taxes on personal capital income may fall on workers just as much as the corporate tax. This allows us to confirm that the corporate tax indeed acts as a backstop to progressive income taxes (Musgrave, 1959; Gordon and MacKie-Mason, 1995) and especially so for the very highest parts of the income distribution. We further contribute to this literature by better incorporating the international aspects of corporate taxation through the use of recently available Country-by-Country Reporting (CbCR) micro-data which we merge with French corporate tax returns. These data provide complete coverage of the global distribution of profits and sales for large multinationals.[4] Crucially, they allow us to relate foreign dividends (observed in French fiscal data) to foreign profits (observed in the CbCR) for a subset of large multinationals. We then use this relationship to back out foreign profits from foreign dividends for all French firms (beyond the CbCR sample). This provides arguably a better approximation of foreign profits than previous papers which either ignored foreign profits or focused solely on foreign dividends (Bruil et al., 2025).

Plan of the paper. The rest of the paper is organized as follows. Section 2 describes the data, with emphasis on the new shareholder–household bridge linking personal and corporate tax records, and sets out our income concepts (taxable income and comprehensive income). Next, in Section 3, we present the income distribution under both concepts and show the much higher persistence of comprehensive income, and place our baseline year (2016) in a longer-run perspective; we also compare our ownership-based approach to dividend imputations and to rich-list evidence. Section 4 explains how we measure each tax (personal and corporate income taxes, wealth tax, social security contributions) and presents the distribution of effective tax rates, together with robustness checks. In Section 5, we examine the mechanisms behind the results, highlighting the role of the corporate income tax as a global backstop tax and the specific role of holding companies. Section 6 concludes.

2 Data and measurement of income

This paper assembles a wide array of administrative data sources, including a unique source of data, akin to a shareholder registry: an exact matching of the universe of individual tax data to the universe of corporate tax data through firms' shareholder information. This is the first time that the French tax authorities have allowed matching these two separate sources of information. This section describes the data sources we use, with a particular focus on the newly assembled shareholder registry.[5]

[4] Fuest et al. (2022) show for instance in the context of German multinational enterprises that CbCR data provide a much better coverage than Orbis.

[5] Note that, because this registry is constructed only for year 2016, we primarily use data sources in this year, even though they may be available for much longer periods.

This section describes the datasets we assemble and how we construct our income concepts. Subsection 2.1 details the administrative and commercial sources, including the shareholder–firm registry. Subsection 2.2 defines taxable income and comprehensive income and explains our treatment of undistributed profits, non-contributory social-security contributions, control, and capital gains.

2.1 Data sources

2.1.1 Household-level data sources

Income tax returns. The French tax authority, the *Direction générale des finances publiques* (DGFiP) at the ministry of finances, produces every year a file including the complete detail of income tax declarations for each of the 37 million French tax units, i.e., the amount recorded in each of the 3,000 items of the income tax return.[6] These data files are available as a tax-unit level panel over the period 2003-2023.

Wealth tax returns. The DGFiP also produces a file from wealth tax returns which can be merged with a common identifier to the income tax returns.[7] Only tax units liable to the wealth tax report their taxable assets—with taxable assets above 1.3 million euros—, providing around 350,000 tax units included in 2016. Taxable wealth includes all real estate and financial wealth until 2017.

2.1.2 Firm-level data sources

Corporate tax returns and group structure (BIC-IS and LIFI). Every fiscal year, firms subject to the corporate income tax must fill in their detailed accounts. These include all elements of assets and liabilities, as well as a wealth of details on the financial results to compute the corporate income tax. The fiscal administration (DGFiP) produces all the elements by legal entity, as well as the ownership links necessary to consolidate accounts at the group level for all domestic subsidiaries. Note that the data contains all links between entities and allows consolidating accounts even when firms have deeply nested structures.

Data on multinational sales and reported profits (OFATS and CbCR). We use two data sets to capture corporate income realized abroad and to impute the associated corporate tax payments. We first use the Country-by-Country Reporting micro data for French multinationals. This dataset has the unique advantage of providing a breakdown of profits, taxes, and activities by tax jurisdiction for a set of large French multinationals.[8] A limitation of this dataset for our purpose is its limited coverage: many French corporations report activities abroad but are not covered by the CbCR reporting requirement. Therefore, we mostly use the CbCR data to compute statistics on the effective corporate income tax rates, which we then use as a target to match based on our broader sample and to measure the propensity of French companies to repatriate dividends from profits

[6] Form 2042 is the main source of information of the exhaustive income tax return files.
[7] Form 2725 is the main source of information of the wealth tax files.
[8] See Aliprandi and von Zedlitz (2023) for a recent analysis of CbCR data and comparison with listed companies' reports.

realized abroad (see section 4.1 for more details). Second, we use the Outward Foreign Affiliates Statistics (OFATS) which measures the commercial presence through affiliates in foreign markets and describes the activities of foreign affiliates abroad controlled by firms based in France. We use this dataset to account for the distribution of sales across jurisdictions and derive an associated corporate tax burden on foreign profits (again see section 4.1).

2.1.3 Shareholder registry (BADS2A): a novel data source linking French personal and corporate tax returns through ownership links

Raw sources on corporate shareholders. The identification of company shareholders in France relies on three complementary sources. First, corporate tax returns require firms to report detailed information on any shareholder owning at least 10% of the capital, including name, birth date, address, and ownership share. Second, commercial data from Bureau van Dijk's ORBIS database, though not exhaustive, collects shareholder information from public records and the financial press, offering good coverage of top professional wealth and enabling links to French firms owned via foreign entities. Third, the INPI database, sourced from commercial court records, provides comprehensive data on legal representatives—often major shareholders—making it particularly valuable when tax or ORBIS data is missing, and essential for verifying management roles relevant to wealth tax exemptions. Appendix A.1 describes these sources in more detail.

Matching procedure. To match individual data with firm data, we have to use directly personal identifiers (name, surname, date of birth, address of residence, place of birth) that are not accessible to researchers. The procedure established with the French tax authorities has been to rely on a third party to realize the matching procedure based on these personal identifiers, which are then dropped when the matched data are delivered to the research team. More details on the matching algorithm are provided in Appendix A.2.

Final data source on shareholder–firm links (BADS2A). The end data source we rely on contains a cross-section, for the year 2016, of all the observed shareholding links. The information is thus observed at level of dyads personal fiscal identifier – firm legal unit, and contains the share of capital owned by each household. Importantly, the data also contains the share of capital owned by persons who may not have been matched with the personal identifier.

2.1.4 French rich list

The French equivalent of the Forbes rich list is Challenges' *Classement des 500 plus grandes fortunes françaises*, an annual ranking compiled since 1996 that estimates the wealth of the 500 wealthiest French individuals or families—derived from shareholdings in businesses (publicly listed or privately valued)—and notably excludes non-business assets and does not deduct liabilities (Challenges, 2012). This list has been utilized in several academic papers to estimate the top tail of the wealth distribution (Vermeulen, 2018; Bach et al., 2019). It draws on multiple sources, including publicly available data on shareholdings and financial statements, in-depth research into the ownership of private firms, professional journals, industry events, award ceremonies, and direct

surveys sent to wealthy households. The known shortcomings of this source are that it includes a large number of corporate owners who are French citizens but not French residents, and that an entry might represent extended families, encompassing multiple tax units, similarly to the Forbes 400 data (Smith et al., 2022b).

2.2 Income concepts and measurement

We present here the definition of the income concepts we rely upon and detail how we measure them given the data we have assembled.

2.2.1 Taxable income (TI).

Taxable income is defined by the French tax administration as all income received by the tax unit, as recorded by the administration, including income that can be deducted from the tax base before the application of the progressive tax schedule.[9] This is a fairly broad concept of income which includes, for example, capital income subject to a flat-rate tax withheld at source, but not subject to the income tax. Taxable income in France is, however, far from being a gross income, as it is net of social security contributions (SSCs), both the employer and employee components. In addition, taxable income does not include undistributed profit from incorporated firms owned by the tax unit.

2.2.2 Comprehensive income (CI).

We define comprehensive income as all income earned and effectively controlled by households, gross of the taxes it might be subjected to. This is a broader measure of income than taxable income. This income is constructed by adding two types of income not subject to income tax: social security contributions on the one hand, and the profits of companies controlled by fiscal households on the other. Importantly, it does not include changes in wealth or unrealized deferred income. This definition also excludes income that can be attributed to a household but over which it has no effective control.

We define CI_i, the comprehensive income of household i, such that

$$CI_i = TI_i + SSC_i + UP_i - CG_i \tag{1}$$

with TI_i the taxable income of the tax unit i, SSC_i is the amount of SSCs of i,
and $UP_i = \sum_j [\text{Share held by } i \text{ in firm } j] \times (\text{Profits}_j - \text{Dividends}_j)$ the undistributed profits, CG_i the capital gains realized in the year by this tax unit if it is a major shareholder in a firm.[10] We explain below how each of these components added to or withdrawn from taxable income is treated.[11]

[9] The French legal concept is called "*revenu fiscal de référence*" (RFR).

[10] This definition implies that we consider pre-tax income after the operation of the pension system (as pensions are included in taxable income) which corresponds to the narrow definition of intermediate income in the DINA framework (Blanchet et al., 2021). A limitation of this approach is that it ignores the redistributive nature of the pension system, but given our focus on top income, inclusive of business income, this choice is likely to be fairly innocuous.

[11] In Appendix B, we provide additional details on the construction of income (treatment of assurance-vie, tax credit etc).

Social security contributions. As France's social security system exhibits a large share of strictly contributive benefits (e.g., pensions with tight tax-benefit linkage), there is a potential issue to consider all SSCs as taxes, given they fund individualized benefits, perceived as such by individuals Bozio et al. (2025). We opt for adding only non-contributory social security contributions to taxable income in order to obtain gross earned income—the reference taxable income is net of social security contributions—and thus we are able to measure a tax rate that includes these compulsory deductions. Non-contributory contributions (illness, family, etc.) are really akin to taxes, in the sense that their payment is not associated with an individual benefit, unlike contributory contributions (pensions and unemployment) which represent a form of compulsory insurance and entail individualized benefits. We do not add the latter to the economic income of households, since pensions and unemployment benefits are already included in the current taxable income of pensioners and unemployed workers.

Undistributed profits. We also add to the taxable income the undistributed profits and losses of companies controlled by fiscal households, in proportion to their effective holdings. In case of losses made by the company, the comprehensive economic income can be lower than taxable income. Conversely, if the firms make large undistributed profits, the comprehensive income can be much higher than taxable income.

An important fraction of profits at the very top of the income distribution is likely to be realized by foreign subsidiaries, and therefore not fully observable in French legal units' accounts. To estimate foreign corporate income, we combine the French corporate tax returns with the CbCR and OFATS datasets, which provide information on the foreign activities of French multinational companies. In the French administrative data, firms record the amount of dividends received from parent companies. Because we observe links between French companies comprehensively, we build a residual amount between what is received by a company and what is distributed by its subsidiaries, and tag this mass as originating from foreign subsidiaries. To correct for the incomplete propensity of subsidiaries to distribute dividends to their mother company, we merge the French fiscal data with the newly available CbCR data. In particular, we confront total foreign profits in the CbCR data to foreign dividends received by French mother companies and compute the average propensity to pay dividends out of foreign profits. We find that 1/3 of profits generated by these foreign subsidiaries are distributed to the mother company in France. We inflate the residual foreign dividends accordingly.[12] Overall, we find a mass of 28.4 billion euros of foreign profits to be attributed to French households.

Concept of firm control. In many cases, shareholders do not have a stake that is sufficient to allow them to influence the company's distribution policy, making it questionable whether households can really dispose of retained earnings accumulated in corporations in which they own stocks. For this reason, as well as data limitations, we allocate to households the undistributed profits of companies in which they own at least 10% of the shares, or where the information available from commercial sources makes it possible to presume a position of control. This 10 % own-

[12] We do so for all firms, irrespective of whether or not they are present in the CbCR.

ership cut-off is also used in national-accounts treatment of foreign direct investment (see System of National Accounts 2008; IMF VM2/21-08): with a stake of 10 % or more, a shareholder enters the class of direct investors in national accounts and is considered to exercise sufficient influence to have the company's retained earnings directly remitted and imputed to her own income—even when no dividend is paid.[13] We confirm that our results on the tax burden are not sensitive to the specific cut-off used to capture this notion of control by providing robustness checks attributing retained earnings to comprehensive income with an observed majority ($\geq$ 50%), in which shareholders have full control over distribution decisions.[14]

Capital gains. Capital gains realized today may largely reflect earnings accumulated in the past. To avoid double counting, we remove capital gains on securities from taxable income for all households which we observe as controlling shareholders in the registry. For this population, which includes all "billionaires", our approach is therefore equivalent to accounting for capital gains on an accrual basis excluding price effects. It departs from the Haig-Simons income definition (Haig, 1921; Simons, 1938) only to the extent that it excludes changes in net worth due to pure price effects. Recent work by Aguiar et al. (2024) argues the ideal tax base when asset prices move both because of retained earnings and changes in the discount rate should depart from Haig-Simons and depend on the realization of capital gains. To the extent that non-controlling shareholders cannot strategically retain earnings in corporate vehicles, our measure fits this recent suggestion among households without controlling positions, which is the largest part of the population. Nevertheless, to construct this ideal measure of annual income also among controlling shareholders, one should withdraw past retained earnings from capital gain realizations, so as to keep only current retained earnings plus the pure price effect. This poses a practical challenge, which we do not address here, as the history of retained earnings accruing to shareholders over the investment history is largely unobserved.

3 Income distribution and persistence

We first document the distribution of taxable and comprehensive income in Section 3.1 in 2016. Then, Section 3.2 compares our comprehensive-income approach to dividend-based imputations and evidence from rich lists. Finally, we study the dynamics of comprehensive income over two decades, as well as its persistence in top brackets, to assert its stability and the representativeness of the year 2016 (section 3.3).

3.1 Income distribution

Comprehensive income yields a national aggregate income of 1,250 billion euros for 2016, or about 68% of net primary factor income as identified by the national accounts (INSEE, 2018). The remaining income that we do not include, due to the lack of available data, is made up of certain

[13] In the international statistical standards, this shows up as "reinvested earnings" and is recorded as the investor's primary income. Holdings below 10% are considered portfolio investment and the associated undistributed profits are not attributed to net primary income.

[14] Bruil et al. (2025) use a threshold of 5%, while Alstadsæter et al. (2025) do not seem to impose a specific threshold.

non-taxable income from work or capital (e.g., profit-sharing, tax-exempt savings plans, etc.), and implicit rents from owner-occupiers.

In Table 1, we compare the income distribution of French fiscal households according to the taxable income and comprehensive income. Each row in the table corresponds to a fraction of fiscal households. The first row shows that average comprehensive income in the whole population is about €32,900, which is about 25% higher than taxable income (with an average of €26,400). To be part of the richest 1% (378,000 fiscal households), one needs to have at least €180,000 in annual comprehensive income; to be part of the richest 0.01% (3,780 fiscal households), the threshold is up to about €2,600,000 in annual comprehensive income.

The concentration of income is more or less the same under the two definitions if we exclude the richest 0.01% of households: excluding this top 0.01% category, the top 10% owns 31.6% of taxable income, as compared to 32.7% of comprehensive income. In contrast, the top 0.1% share differs considerably: the top 0.1% accounts for 6.2% of comprehensive income, which is almost twice as high as the corresponding share for taxable income (3.4%). The relative magnitude of comprehensive income increases as we focus on the very of the income distribution. The last column of Table 1 illustrates this aspect by recording the ratio of income shares within a group across income definitions. This ratio culminates at 6.5 for the the richest 0.0002%—whom we referred to as "billionaires". Among this group, which comprises 75 tax units, comprehensive income is one order of magnitude larger than taxable income, with an average value above €200 million.

3.2 Comparison with other measures used in the literature

We start by comparing the comprehensive income distribution we obtain with what we would get using the widespread dividend-based imputation for ownership links. We then assess the strength of the relationship between taxable and comprehensive income on the one hand, and belonging to the French rich list on the other hand.

3.2.1 Imputation based on received dividends (DINA)

Absent precise data on firm ownership, such as the ones we use in this paper, researchers have resorted to various imputation methods to estimate income accruing to households through corporate shares they own. Among these methods, arguably the most common has been to use the observed share of national (taxable) dividends that households receive, to attribute profits retained by companies proportionally to this share (see e.g. Piketty et al., 2018; Garbinti et al., 2018).[15] Our data offer a unique opportunity to assess the precision of this allocation rule for retained earnings, as we perfectly observe the retained earnings accruing to each household owning a significant share of a firm's capital.

Figure 1 plots the ratio between the dividend-based measure of comprehensive income and our measure of comprehensive income, along the distribution of (our measure of) comprehensive income. It shows that this measure of income is quite close (less than 6% off) to our observed measure of comprehensive income up to the top 0.05% of the observed comprehensive income

[15] Saez and Zucman (2016) and Smith et al. (2022b) use this rule to assign equity ownership in order to compute estimates of the wealth distribution.

distribution: the imputation overestimates income by 2 to 6% up to the entrance of the top 0.1%, and then declines. This decline, however, strongly accentuates within the top 0.05% as one climbs the observed comprehensive income distribution. For our group of billionaires, the imputation severely underestimates their income, which is only 8% of their real comprehensive income. This pattern is confirmed by Table A2 in the Appendix: while the allocation of retained earnings based on received dividends tends to inflate all percentiles at the bottom of the distribution compared to the distribution of comprehensive income, the thresholds are equalized at the entrance of the top 0.01%, but the income share of that group is almost twice as large for comprehensive income than with the dividend-based imputation.

Our estimates imply a higher share of the top 1% compared to what the literature has found without including directly observed retained earnings. For instance, Garbinti et al. (2018) find a top 1% share equal to 10.8% in France in 2014, whereas our estimate is 13.8%, corresponding to a 27% increase. While several methodological differences may explain this discrepancy (because our measure of income departs from net primary income), the fact of measuring retained earnings directly rather than imputing them based on received dividends is a key explanatory factor. As Table A2 shows, the corresponding top 1% share with the DINA dividend-based imputation of retained earnings is 13.0%, which is 6.5% lower. Similarly, while Garbinti et al. (2018) document a 3.7% top 0.1% share, ours rises to 6.2% and is 26% larger than the one obtained by imputing dividends. Therefore, observing directly the ownership links leads to inflating both the level of the top 1% share and the concentration of income within this group.

3.2.2 Wealth recorded in rich lists

Another standard way used by the literature, in particular in the US context, to capture very high net worth individuals and study their income and taxation has been to rely on rich lists (Kaplan and Rauh, 2013; Yagan, 2023; Smith et al., 2022b; Baselgia and Martínez, 2024), which typically rank the wealth of the richest families in a country by valuing their assets, notably their shares in corporations, using stock market prices when these firms are publicly traded, and miscellaneous sources to value shares in private firms. In France, this exercise is traditionally done by the weekly magazine *Challenges*, which issues every year a ranking of the 500 highest fortunes held by French nationals and echoes the Forbes 400 ranking estimating the highest fortunes in the US.

To assess the validity of our income measure and to be able to relate it to top wealth estimates, we recover the firm identifiers of all business owners mentioned in the *Challenges* ranking in 2016, who make up the bulk of the list. We then match this list of firms to our shareholder dataset and measure the probability of being recorded as a shareholder of a top wealth company at different income thresholds. Figure 2 displays the following probabilities, plotted either along the taxable income distribution (Figure 2a) or comprehensive income distribution (Figure 2b), and shows the probabilities of being found in either the top 500 (entire list), top 100, or top 50. Figure 2a confirms the low ability of taxable income to capture very rich individuals: even at the very top of the taxable income distribution, the probability of being found in the top wealth ranking is below 10%. Figure 2b on the contrary, shows the striking correspondence between our measure of income and the presence in the rich list: while the probability of being in the list is roughly 0 below the

top 0.01%, the 75 households with the highest comprehensive income have a probability of being included in the top 500 list close to 85% and have a greater than 50% chance of being in the top 50[16]. We view this as evidence that comprehensive income is able to track the same population of superrich as the one studied in articles relying exclusively on rich lists, while at the same time providing a smooth measure of income for the whole population, therefore bridging strands of the literature studying specifically the superrich to the DINA literature quantifying wealth, income and taxes for the whole population.

3.3 Comprehensive income dynamics

This section investigates the persistence and dynamics of comprehensive income at the very top of the distribution, and assesses whether our 2016 benchmark is representative. We first compare the persistence of comprehensive versus taxable income, showing that comprehensive income remains highly correlated across years even among the very top households, unlike taxable income which displays little persistence at the very top. We then examine the time-series behavior of top income thresholds and averages, highlighting the sensitivity of taxable income to reporting incentives and policy changes, in contrast to the stability of comprehensive income. Finally, we assess whether the 2016 cross-section is exceptional by comparing it to long-run estimates based on rich list data, and find that it is broadly representative of the broader period.

Comprehensive income persistence. To assess persistence, we define for each income measure the G-percentile to which households belonged to in the income distribution in 2013, and look at the rank correlation between the 2013 and the 2016 income. Figure 3 presents the results of this analysis. A striking fact obtained from this figure is that, while the rank-correlation between the 2013 and the 2016 taxable income is as large as 0.7 within the top 10%, this drops sharply when one considers higher brackets of the distribution, and reaches a correlation coefficient of roughly 0 within the top 0.01%. The persistence of comprehensive income contrasts with that of taxable income: the rank-correlation coefficient is also around 0.7 within the top 10% of the distribution, but remains high as one zooms in on the income distribution, remaining above 0.5 even within the top 0.001%. We view the much higher persistence of comprehensive income, contrasting with the extremely low persistence of taxable income, as a key element supporting the idea that comprehensive income is a better measure of the structural contributory capacity of top income households than taxable income. Table A1 shows the transition matrix for both income concepts from one bracket to another over the same period. Diagonal terms (probability of remaining in the same income bracket) are very high and similar for the bottom 99%, but the probability of being in the top 0.001% of top taxable income in 2013 and still there in 2016 is below 15%, while it is as high as 63.5% for comprehensive income.

Top income dynamics and representativeness of 2016 data. A natural concern when focusing on comprehensive income at the very top is whether the very large values we observe in 2016

[16]Symmetrically, we show in Table A3 that less than 10% of French fiscal households controlling a top 500 fortune belong to the top 0.01% in taxable income, while nearly half of them are in the top 0.01% in comprehensive income.

are truly representative, or instead reflect transitory events such as the realization of accumulated capital gains. If top households were regularly converting latent gains into taxable income in years when their underlying income was low, we would expect to observe occasional spikes in taxable-income thresholds far above those of comprehensive income, as realizations would temporarily inflate reported income. Figure 4 plots the evolution of both the threshold (Figure 4a) and the average within (Figure 4b) the top taxable income bracket (top 0.0002%) between 2001 and 2023. None of the figures show spikes that would reflect occasional capital gains realizations. The threshold to enter the top taxable income bracket fluctuates between 10 and 30 million euros over the period, with an increase starting in 2018 that can plausibly be attributed to the introduction of the flat tax, which induced a surge in dividend payouts (Bach et al., 2024). This pattern illustrates the well-known sensitivity of taxable income to reporting incentives and corporate payout policies (Alstadsæter et al., 2025), and highlights its limitations as a measure of underlying resources. At the same time, the fact that taxable income in the top bracket never reaches the levels of comprehensive income observed in 2016 contradicts the hypothesis that very large latent gains are regularly realized. In other words, the absence of occasional spikes in top taxable income relative to comprehensive income is consistent with the notion that a substantial fraction of capital gains at the top are never realized (Msall and Næss, 2025).

Beyond the question of capital gain realizations, it is crucial to assess whether the 2016 cross-section we analyze provides a representative picture of top comprehensive incomes over time, especially in light of the dramatic rise in valuations of dynasties listed in the French rich list. Figure A7 shows that the aggregate valuation of these families almost tripled between 2001 and 2016, and then rose even faster in recent years, increasing by a factor of 2.7 between 2016 and 2024. Such rapid wealth accumulation may reflect changes in discount rates (Aguiar et al., 2024; Catherine et al., 2025), in which case a single cross-section of income like here could still be representative, while a focus on the wealth distribution would instead require a longer observation period. Alternatively, those sharp developments in wealth inequality could signal structural shifts in the capital share of income (Karabarbounis, 2024) or in the concentration of corporate profits (Autor et al., 2020), in which case results from a single year might be misleading.

In order to distinguish between these two possibilities, we need to observe a time series of income accruing to the very top of the comprehensive income distribution. Since we provided evidence earlier in this paper that the majority of the top 75 comprehensive income earners belong in 2016 to the top 50 families listed in the French rich list ranked by business income, we choose to follow that population across editions of the French rich list from 2004 to 2024. In order to do so, we must estimate each rich family's business income out of their reported annual wealth. To do so, we "invert" the wealth of each dynasty and estimate their business income using the industry-level pre-tax income to market capitalization ratio in the Compustat Global database[17]. This exercise shows that the top-50 entry threshold in 2016, around €55 million, is very close to the €61.6 million we measure in registry data. Figure 4b further reveals that both the threshold and the mean top income followed a steady upward trajectory from 2004 to 2019, dipped in 2020 during the pandemic, and rebounded sharply thereafter to reach around €80 million. The estimated distribution

[17] More details on this wealth-to-income inversion are given in the Appendix.

of these top incomes is also consistent with registry-based comprehensive income in 2016, with an inverted Pareto coefficient close to 4 for most of the period before gradually increasing to above 6 in recent years.

Overall, these results show that the characteristics of the comprehensive income distribution we document for 2016 are not an outlier: they align closely with longer-term patterns derived from independent data sources, and remain representative despite the very rapid growth of wealth at the very top in recent years.

4 Distribution of the tax burden

In this section, we use the two income concepts introduced above and seek to measure the tax burden along these two income distributions. We start by explaining how we measure the relevant direct taxes (section 4.1), and then turn to the results we obtain on the distribution of the tax burden (section 4.2).

4.1 Measurement of taxes

We are interested in all direct taxes paid by French households in 2016, which can be based on their personal income (income tax, social security contributions), personal wealth (wealth tax), or on the income generated by companies that they own (CIT).

Personal Income Tax. We observe directly the amount of personal income tax paid by the fiscal household in a given year from the income tax return data, as calculated by the tax administration after deduction of various rebates and application of the income tax schedule. Additionally to this main personal income tax, we calculate the amount of exceptional tax on high income[18] owed by households. We also calculate the amount of flat-rate withholding tax.[19] These vary by income type, and we therefore reconstruct each tax base from the income tax return data.

Wealth Tax. To assess the amount of wealth tax to which households were liable, we simply use the wealth tax data with the variable indicating the amount of wealth tax owed by households in 2016, after the application of rebates, reductions, and the tax ceiling.

Social Security Contributions (SSCs). Social Security Contributions in France are used to cover expenses related to pensions (base and complementary), health, disability, family, unemployment and training. They are paid on wage income and divided into a part statutorily incident on workers (40%, which represents the difference between posted wage and net earnings), and a part incident on employers (60%, representing the difference between the labor cost and the posted wage).

We consider both employee and employer components of SSCs, but only include non-contributory SSCs, which do not entail a clear link between the payment of these contributions and the benefits

[18] *Contribution exceptionnelle sur les hauts revenus*.
[19] *Prélèvement sociaux*, composed of *Contribution social généralisée* and *Contribution au Remboursement de la Dette Sociale*.

they finance (Bozio et al., 2025). Indeed, including them without accounting for the associated benefits might give a misleading picture of the overall pattern of tax rates across income groups. The non-contributory SSCs, which we include, are composed of health, disability, family, and training contributions. Further details on their calculations are provided in Appendix B.

Corporate Income Tax. We attribute the corporate income tax to households based on ownership shares, similarly to corporate income. The measurement of corporate taxes is, however, complicated by the fact that part of firms' income is generated and taxed abroad, and that corporate tax rates vary across countries. To estimate taxes paid abroad, we start from our estimate of foreign corporate income. We use OFATS data, which record sales by French foreign affiliates for a large number of multinational firms. We calculate the share of firms' sales realized in each country and attribute foreign income accordingly. We then apply the effective corporate tax rate measured in the OECD tax data,[20] or the nominal tax rate for countries absent from this dataset. For firms with foreign income but no observed foreign affiliates in OFATS, we apply the average tax rate measured abroad among firms present in OFATS. Finally, we rescale the resulting tax burden so that the overall effective tax rate on foreign profits in our sample of French corporations with profits abroad matches the average effective tax rate on foreign profits obtained using the micro CbCR data. Overall, the tax burden is therefore consistent with the CbCR data by construction, but we extrapolate it to a larger set of companies and use the OFATS dataset to model the heterogeneity across companies depending on where their sales are reported.

Importantly, since we sum income from all companies held by a household, we calculate tax losses carried forward and consider them as a subsidy (accounting for the fact that firms might be unable to use them, more details in Appendix B). This is to avoid a situation in which households owning both companies making profits and companies making losses might end up with nearly infinite corporate tax rates.

4.2 Results on tax progressivity

Progressivity of personal income taxes at the top: taxable versus comprehensive income. Consistent with our two income concepts, we present here two distinct concepts of tax rates. First, we consider the most traditional measure of income, taxable income, which considers the taxes paid directly by households: personal income tax, social security contributions, and wealth tax. This measure is a useful benchmark because it corresponds to the income and taxes usually considered when studying tax progressivity. It does not, however, take full account of the property dimension of direct taxation, since notional rents, property taxes, and housing taxes are not taken into account—even though this has little impact at the top of the distribution. Second, we introduce a measure of the tax rate that takes household comprehensive income as the denominator, thus extending it to non-contributory social contributions and undistributed profits. For the numerator, we add non-contributory social contributions and corporation tax paid by companies controlled by the fiscal households to the personal taxes already mentioned.

[20] OECD data available at https://stats.oecd.org/index.aspx?DataSetCode=CTS_ETR, with low inflation and interest rates scenario.

Figure 5 presents a basic test of the tax progressivity applied strictly to personal taxable income. It shows the distribution of the average tax rate, i.e., the sum of personal income and wealth tax rates with respect to taxable income, ranking households by their taxable income. Within the top 10%, the progressivity of taxes paid directly by fiscal households, as intended by the legislator, is borne out if we consider taxable income as the only contributory capacity. Average tax rates rise until one reaches the top 0.1%, where they equate to 40%, and then plateau within this bracket. This progressivity is mainly due to the personal income tax and, to a lesser extent, the wealth tax. One may note a slightly decreasing pattern of income tax rates at the very top, which corresponds to flat rates (for instance, on capital gains) being more prevalent at the top and a bit lower than the top marginal tax rate in the schedule.

Figure 6 presents a very similar exercise but moves to our comprehensive income measure, and considers all the direct taxes applying to this tax base (therefore adding non-contributory SSCs and the corporate income tax). It displays the distribution of the effective tax rates ranking households by their comprehensive income. This figure shows that the weight of taxes that are supposed to contribute to the progressivity of the tax system becomes very weak among the richest households. All personal taxes remain progressive up to a high level of income (around 626,000 euros of annual comprehensive income, i.e., the top 0.1%), but become flat and then regressive beyond this level. They end up representing a rate of only around 2% of comprehensive income among the 75 richest households. This is compared with about 35% at the entrance of the top 1% of comprehensive income (around 180,000 euros annually).

The role of the corporate income tax at the top. Figure 6 also shows that the corporate income tax really plays the classical role of a "backstop for the personal income tax" (Mintz, 1995).[21] Since comprehensive income includes the undistributed profits of companies owned by households, it is appropriate to include the corporate income tax paid for those households that control companies. From being a minor tax on entry for the 1% of households with the highest comprehensive income, the corporate tax becomes predominant for the 0.01% of the richest households, most of whose income is housed in companies they control.

However, this transfer from a personal income tax base to a corporate income tax base is not neutral in terms of the overall tax burden borne by the richest households. Indeed, this means that the tax rate on personal income and wealth (including contributions) has been replaced by the much lower rate of corporation tax, at 33.33% in 2016 (minus some potential deductions). This is even lower once undistributed income received by companies controlled in countries with lower corporate taxes is taken into account. There is, therefore, a decrease in the overall tax burden once the threshold of the richest 0.1% is passed, with the overall rate falling from almost 45% at this threshold to 25% among the richest 0.0002%. Note that this decrease appears at the very top of the income distribution: the majority of the wealthiest households (95% of the 378,000 households in the top 1% of income) pay high personal taxes because of the progressivity of the personal

[21] There is a long tradition in public finance which ascribes to the corporate income tax the role of a withholding tax on corporate profits, with discussion on the appropriate scheme to integrate personal and corporate income taxes, see e.g., Musgrave and Musgrave (1980).

income tax schedule, but the 18,900 tax households with the highest comprehensive income (the top 0.005%) benefit from a lower overall average tax rate.

Comprehensive vs dividend-imputed income. To understand the differences between our approach and the typical assumptions in the DINA literature, it is essential to compare our findings on the regressivity of the tax system at the top—using comprehensive income based on observed shareholder links—with the estimates using the dividend-imputed income measure commonly employed in DINA analyses. In this alternative approach, CIT is attributed proportionally to dividend-imputed income rather than comprehensive income. Figure A2 in the Appendix presents this comparison. Unlike our main results based on comprehensive income, allocating income and CIT proportionally to received dividends completely eliminates the regressivity of the tax system. The average tax rate peaks upon entering the top 0.01% at a lower level than under comprehensive income (41% compared to 45%), and then remains remarkably stable, fluctuating only between 39% and 41% across the highest brackets. This finding underscores that observing shareholder links is critical not only for accurately estimating top income shares but also for capturing the true pattern of effective tax rates at the very top. In the French context, imputations based on received dividends made by DINA approaches are unable to capture the regressivity of the tax system at the top.[22]

4.3 Robustness checks

In this section, we carry out a number of variants of estimation to assess the robustness of our results to a series of alternative assumptions concerning the notion of control, deferred taxation, and incidence.

Concept of control to attribute retained earnings. Our concept of comprehensive income requires that households have significant control over the distribution of corporate retained earnings for these retained earnings to be considered income. The ownership rate at which households effectively have significant control over the firm's distribution policy is, however, difficult to establish: while a conservative measure would of course be 50% (at which households effectively have full control over the distribution policy), lower rates of ownership are likely to be accompanied with control, for instance because the firm is held within a family. To make sure that the pattern of regressivity we describe is not due to minority shareholder links, we run a robustness check in which we only attribute retained earnings to households whenever the share of a firm owned is at least 50%, providing unquestionable control. Figure A3 shows the overall tax burden along this modified concept of comprehensive income: the regressivity pattern is very similar, and even starker, with the top 75 households under that definition paying only around 22% of the income in taxes.

Accounting for deferred taxation. It is worth noting that income retained by companies is not fully exempt from progressive taxation, since it amounts to an unrealized capital gain that will be

[22] We note that they seem to perform better in the Dutch case (Bruil et al., 2025).

taxable in the future when the shares are sold or the investor moves abroad, donates money, or transmits the shares as inheritance. The case of taxation at the time of realization of a capital gain or transfer of fiscal residence is already taken into account in our estimate from Figure 6, since the numerator of personal income tax includes taxes on realized capital gains as well as taxes on unrealized capital gains at the time of departure abroad ("exit tax"), even though these tax bases are not included in comprehensive income for shareholders, so as to reflect a steady-state situation.

The case of taxation of unrealized capital gains at the time of a gift is, however, common, and gives rise to additional taxation on bequests. Figure A4 presents a simulation of the corresponding taxation. The simulation assumes that the undistributed income is donated and then quickly liquidated by the recipient, and that the donation would not have taken place otherwise.

Figure A4 shows that the additional taxation generated is limited to a few percentage points at the top of the distribution and therefore only slightly reduces the regressivity of the tax system. This effect is weak for two main reasons. First, bequests of company shares are eligible to a 75% allowance, which can sometimes be combined with a 50% reduction in tax, provided that the bequest is made under a shareholder agreement signed by the recipients, so that the effective tax rate on donations of company shares is limited to 5.625%.[23] We assume that all bequests at the top of the distribution are set up under that scheme, which likely only overlooks the case of unplanned death at young ages. Second, the recipient of undistributed income in the form of company shares is, in France, able to liquidate this income without any taxation because the donation removes the unrealized capital gains accumulated by the donor (similar to the step-up basis in the United States).[24] Note also that this exercise only accounts for potential bequest taxes paid on accumulated business income, but does not simulate a bequest tax rate on personal savings, which are proportionally more prevalent at the bottom of the income distribution, therefore understating the overall regressivity.

Incidence. It is standard to inquire whether incidence assumptions change the assessment of the distribution of the tax burden. We discuss here alternative assumptions and present these variants in Appendix.

There are in fact two conceptually distinct ways to present average tax rates (ATRs). First, one can calculate ATRs based on actual observed pre-tax and post-tax prices or incomes (as in Saez and Zucman, 2023), which reflect the statutory tax wedge as it is legally remitted—this is the approach followed in this paper. Second, one could calculate ATRs under incidence-adjusted assumptions, reallocating tax burdens across agents according to economic incidence models, and simultaneously modifying the counterfactual pre-tax prices that would prevail in the absence of taxes. In this latter approach, while the tax wedge itself may remain similar in magnitude, its distribution across income groups would differ, reflecting who ultimately bears the economic burden after general equilibrium adjustments. Thus, although the ATRs we document require no incidence assumptions to measure the effective wedge, their interpretation in welfare or optimal tax terms may warrant reallocation based on incidence considerations. We discuss below how changing the allo-

[23] This is based on the assumption that the entire business transfer is taxed at the top inheritance tax rate of 45%.
[24] See for instance a report on the cancellation of latent capital gains by the French (Sénat, 2002).

cation of the burden associated with each of the taxes we include might change the overall picture we show.

While the CIT is legally remitted by corporations, its economic burden is distributed among shareholders, workers, and consumers (CBO, 2016; Suárez Serrato and Zidar, 2016; Fuest et al., 2018; Carbonnier et al., 2022; Baker et al., 2020). The classic Harberger (1962) model implies that in an open economy with mobile capital, part of the burden shifts to labor through reduced capital accumulation, while closed-economy models assign it mostly to capital owners. Based on a synthesis of the available empirical evidence, the Tax Policy Center (Marron et al., 2012) splits the CIT burden at 60% on shareholders, 20% on labor, and 20% on the normal rate of return on capital. As reported in Figure A5, attributing only 60% of CIT to shareholders decreases ATRs sharply at the top, while modestly increasing them in the middle of the distribution.[25] Overall, deviating from statutory incidence for the corporate income tax increases the regressivity pattern we observe in the current-tax analysis approach: the peak of ATRs observed at the entrance of the top 0.1% is already slightly lower, and the slope of the regressivity is steeper, implying a tax rate for billionaires of 16.7%.

Social-security contributions in France are statutorily split between the employee and the employer, with a usual distribution of 60% weighing on the employer and 40% on the employee. For non-contributory SSCs, recent evidence (Bozio et al., 2025) concludes to an individual pass-through of these contributions which is statutory, although these taxes may still be shifted by employers on labor at the firm rather than at the individual level (Saez et al., 2019). A natural incidence assumption could therefore be that employer SSCs are normally shifted at the firm level proportionally to the wage bill, rather than following the regressive schedule. Applying this allocation rule would therefore slightly increase the burden of SSCs on high-wage earners. Yet, given the low share of wages at the very top of the comprehensive income distribution, it seems unlikely that this would substantially affect the regressivity pattern we observe.

There is rather little empirical evidence allowing us to gauge the incidence of personal income taxes, and how much of this burden is really passed through to actual taxpayers rather than, for instance, their employers. While Bozio et al. (2025) finds that an income tax increase was fully passed through to employees, Kubik (2004) suggests that a small fraction of income tax changes may be incident on employers. Given the scarce empirical evidence, we do not depart from the assumption that income taxes' eventual incidence corresponds to their statutory incidence. Similarly, we assume that the weight of the wealth tax ultimately falls upon its taxpayers.

5 Discussion and mechanisms

In Section 5.1, we show how the corporate income tax is more a global tax at the very top of the comprehensive income distribution, with an important part of foreign CIT as part of the tax burden of corporate billionaires. In Section 5.2, we document the prevalence of holding companies and its implications for effective taxation at the top.

[25] In this exercise, we simply attribute 20% of total CIT to wages proportionally, and ignore the potential impact on wages this might have, which should be second-order. Similarly, we attribute 20% of total CIT proportionally to received taxable capital income.

5.1 Corporate income tax as a global backstop tax

As explained above (in sections 2.2 and 4.1), we consider corporate income associated with activities abroad and the corresponding CIT payments. In Figure 7, we decompose CIT depending on whether it is paid abroad or domestically. We see that domestic corporate income tax payments are overwhelmingly domestic for most along the income distribution up to P99.999. Among the top 0.001%, however, we see that the share of CIT paid abroad becomes progressively more important and ends up accounting for almost half of overall CIT among the top 75. This pattern reflects the fact that top income households tend to own substantial stakes in large corporations that operate abroad and highlights the importance of accounting for worldwide operations of corporations to measure the very top of the income distribution. This means that the main tax for corporate billionaires is actually the average global corporate income tax, which has been declining in the past decades (Auerbach et al., 2010) through international tax competition.

The magnitude of foreign income and CIT payment is derived from combining CbCR data with domestic tax files as well as survey data on foreign affiliates. These numbers are nevertheless directly observed only for a subset of large firms present in CbCR and the measurement of foreign profits and CIT is somewhat less direct than the domestic ones. Restricting to domestic corporate income and the corresponding CIT however does not change the pattern of regressivity of average tax rates we observe, as Figure A6 shows. It does, however, affect the level of the effective tax rate at the very top, which is around 33 % for the top bracket. This is both due to a base effect (corporate profits are lower, leading to a larger share of personal income and therefore of personal taxes, which rise to 5% of total income at the top), and to a rate effect, as the CbCR average rate on foreign profits we estimate is 25.4%, around 8 percentage points below the 33.33% French statutory rate in 2016.[26]

5.2 The prevalence of holding companies

Figure 8a shows how the composition of income changes across the comprehensive income distribution. The light blue series shows that taxable income, as a share of total comprehensive income, decreases as one moves up the distribution, with a very steep decrease of wage income which is partly compensated by a rise of taxable capital income up to the top 0.01%. At the same time, the share accounted for by incorporated undistributed business income increases monotonically and reaches 96% in the top income group. The plummeting personal income tax rate reflects this shifting composition. It is not self-evident how rich business owners can limit their personal income so much, because the complex businesses they control have heterogeneous liquidity needs and require frequent capital reallocation. As it turns out, the main mechanism permitting these income composition patterns is the fact that firms are increasingly organized as pyramidal business groups as income increases.

By structuring their business assets into a holding company directly owned by the controlling individuals but itself owning directly or indirectly a large number of other operating firms,

[26]The effective domestic tax rate on domestic profits in our matched sample is 32%. It differs from the statutory tax rate for a variety of reasons (tax credits, application of a reduced rate for small businesses, treatment of deficits, see appendix B for more details).

entrepreneurs can decide whether and when they personally receive dividends or realize capital, irrespective of the liquidity and asset reallocation needs of the operating businesses under their control. In such situations, most of capital income registered on personal tax declarations may correspond to the level of personal consumption sought by the individual, while saving is mostly realized within the business group by retaining profits and directly reinvesting them into new corporate projects or financial assets.

Figure 8b shows that, as one climbs the comprehensive income distribution, one becomes increasingly likely to hold a direct stake in a holding company, which only holds shares of other companies and organizes their activities. The blue line shows the probability of owning shares of a holding company along the comprehensive income distribution: this rises from close to 0 to around 18% at P99, and then continues to rise very quickly within the top 1%, eventually plateauing around 80% in the top 0.01%. At the very top, the probability of having a holding company is higher than 90%. Importantly, the red line shows that this increasing probability is not only due to the increased probability of being a shareholder along the comprehensive income distribution: while at P90 less than 40% of shareholders own a firm via a holding, this conditional probability gets very close to 100% at the very top.

This prevalence of holding companies (akin to C-corp pyramids) strikingly contrasts with the rise of pass-through businesses observed in the US since the 1986 TRA (Smith et al., 2022a; Dyrda and Pugsley, 2025). Presumably, the gap between the top marginal corporate and individual rates contributes to the relative popularity of the corporate form in France relative to the USA, but other institutional features also help explain the prevalence of the corporate-form holding companies in France and Europe more generally. The establishment of one or more corporate layers between physical tax payers and their actual businesses is facilitated by the very light taxation of inter-corporate dividends in France (as in the rest of Europe, due to the Parent-Subsidiary Directive), which contrasts again with the US system, where higher taxes on dividends between firms (related by minority stakes) discourage the establishment of pyramidal structures (Morck, 2005; Morck and Yeung, 2005). Another important difference is the U.S. Personal Holding Company (PHC) tax, which is a 20% surtax on undistributed income of closely held companies that derive at least 60% of their income from passive sources (e.g. dividends) and are owned by five or fewer individuals.[27]

6 Conclusion

Using a new shareholder registry, we are able to link French household personal income tax returns to corporate tax returns. We are thus able to measure comprehensively economic income, including at the very top of the distribution. Our comprehensive income measure appears more persistent over time and less influenced by taxes affecting payout policies. The comprehensive income distribution reveals a higher income share of the top 0.1%, and more specifically the top 0.01%. It is also more predictive of rich-list membership.

Using observed information about tax payments from households or from firms they control, we compute the tax burden for each tax unit observed. Personal income taxes appear to be pro-

[27] See Chambers et al. (2020) for a recent practical discussion on the importance of the PHC tax when choosing a corporate or a pass-through form.

gressive up to the top 0.1% of comprehensive income, but represent only 2% of comprehensive income among the top 75 households. We document the backstop role of the corporate income tax for the top 0.01%, as this tax represents the overwhelming share of the total tax burden at the top. Yet total taxes fall as a share of comprehensive income from 45% at the 0.1% threshold to 25% for "billionaires".

The mechanisms behind this result rest on the fact that corporate billionaires have most of their income from firms with large international spread, implying a large share of foreign profits and hence of international corporate income tax payments. The main way those households control these corporations is through holding companies and pyramidal control of business income, allowing dividends to remain untaxed in the holding firm and never appearing as personal income. As a result, at the very top, the tax burden is largely global—with half of CIT being paid abroad—and pyramidal control of business income sources is ubiquitous.

This paper, concerned mostly with measurement issues of both income and tax burden distribution, leaves open for further research normative questions on how best to tax corporate business income given the pattern and mechanisms explicited here.

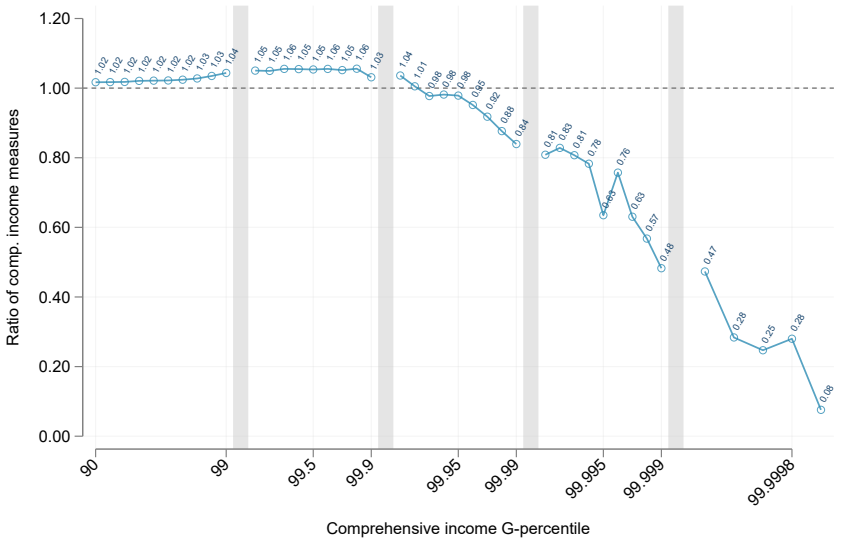
Tables and Figures

Table 1: Income distribution

Percentile	Nb. hslds above	Taxable Income			Comprehensive Income			**Ratio inc. sh.**
		Threshold	Mean above	Inc. share	Threshold	Mean above	Inc. share	
P0	37,833,502		26,400	100.00		32,900	100.00	1.0
P10	34,050,091	3,100	29,300	99.89	3,400	36,500	99.85	1.0
P20	30,266,479	8,700	32,200	97.57	9,700	40,200	97.75	1.0
P30	26,483,450	12,500	35,200	93.33	14,500	44,200	94.04	1.0
P40	22,699,895	15,700	38,800	88.18	18,200	48,900	89.18	1.0
P50	18,915,941	18,800	43,100	81.63	21,900	54,600	82.98	1.0
P60	15,133,006	23,100	48,700	73.79	27,000	62,200	75.62	1.0
P70	11,349,720	28,900	56,200	63.86	33,600	72,900	66.47	1.0
P80	7,566,688	37,100	68,000	51.52	44,300	90,100	54.77	1.1
P90	3,783,318	52,100	92,300	34.96	62,900	128,000	38.91	1.1
P95	1,891,637	69,300	125,000	23.67	86,300	183,000	27.81	1.2
P99	378,333	135,000	265,000	10.04	180,000	455,000	13.83	1.4
P99.9	37,833	391,000	895,000	3.39	626,000	2,035,000	6.19	1.8
P99.99	3,783	1,418,000	3,401,000	1.29	2,592,000	10,875,000	3.31	2.6
P99.999	378	5,882,000	12,320,000	0.47	14,876,000	64,768,000	1.97	4.2
P99.9998	75	14,953,000	26,827,000	0.20	61,540,000	217,289,000	1.31	6.5

NOTES: This table details the percentiles of the distribution of taxable income and comprehensive income. P90 refers to the 90th percentile, which is the income threshold above which one belongs to the top 10% of income earners. P99.9 corresponds to the 99.9 percentile, i.e. the income needed to be in the top 0.1 percent of income earners.

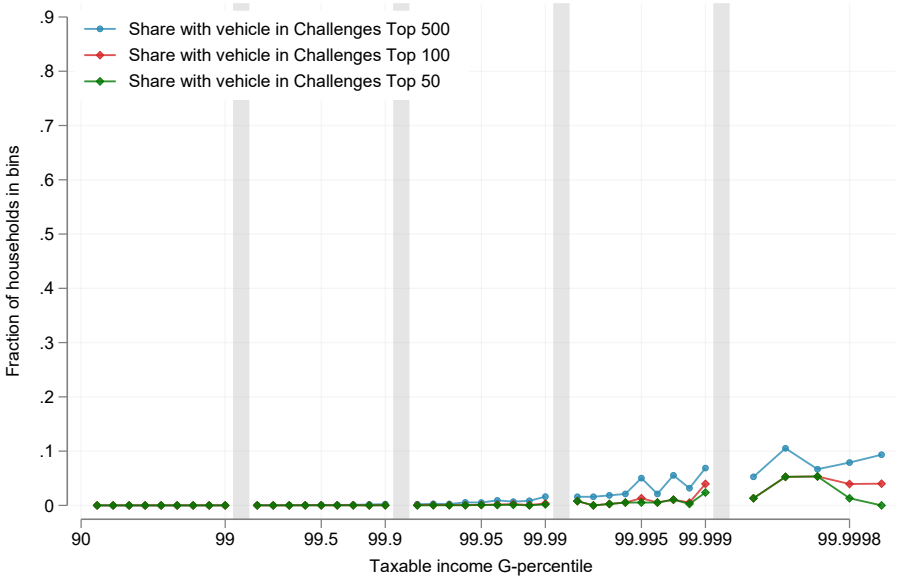
Figure 1: Ratio of dividend-imputed income to our measure of comprehensive income



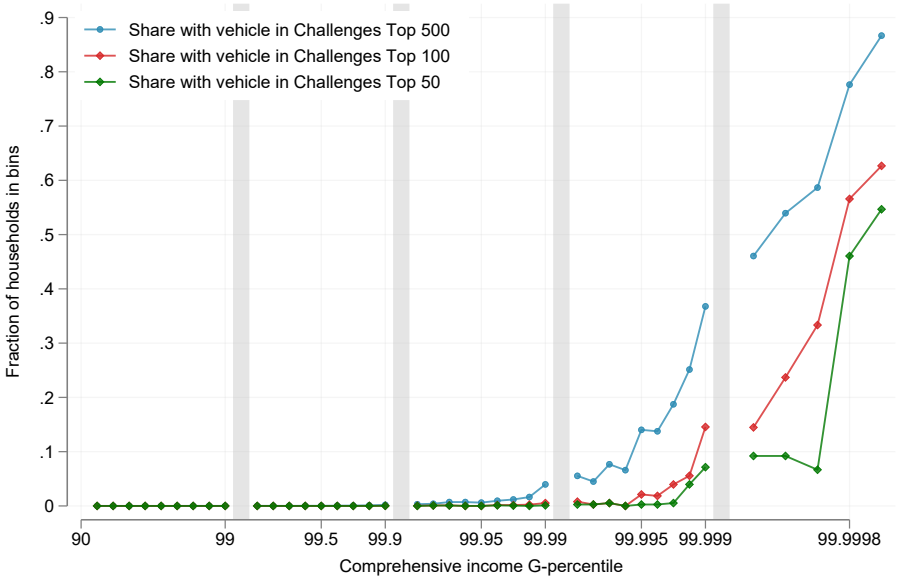
NOTES: This graph represents the average ratio between a notion of income allocating corporations' retained earnings based on each household's share in total dividends received, and our measure of comprehensive income, for each fractile of the comprehensive income distribution. P99.9 corresponds to the 99.9 percentile, i.e., the income needed to be in the top 0.1 percent of income earners. "Inc. share" refers to the income share above each threshold, and the rightmost column shows the ratio of the comprehensive income share over the taxable income share above each threshold.

Figure 2: Share of households with a link to a firm associated to the Challenges rich list

(a) Along the taxable income distribution

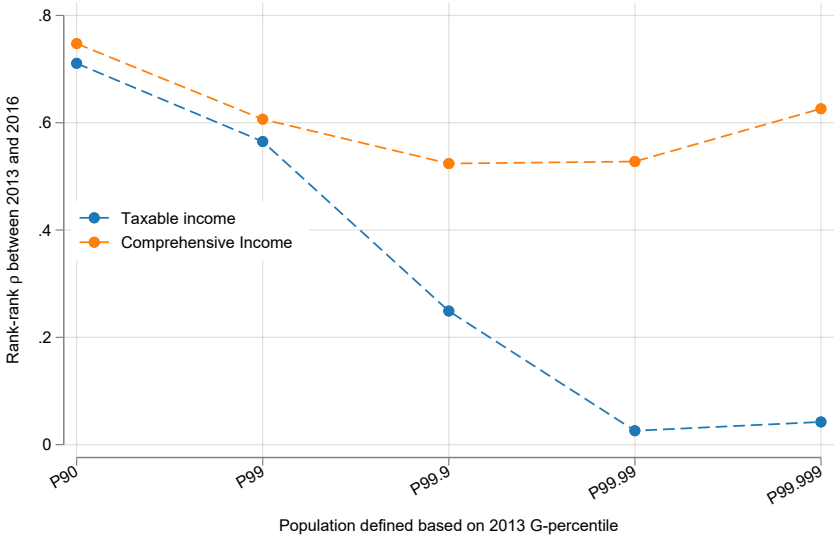


(b) Along the comprehensive income distribution



NOTES: This graphs shows the probability to be found in the Challenges rich list data, at different brackets (top 500 in blue, top 100 in red, top 50 in green), along the distribution of either taxable income (panel a) or comprehensive income (panel b). The graph is displayed in G-percentiles (division of the last quantile into 10 quantiles, and into 5 quantiles at the very top) at the tax household level, sorted by income (taxable in panel a, comprehensive in panel b), within the top 10% of this variable.

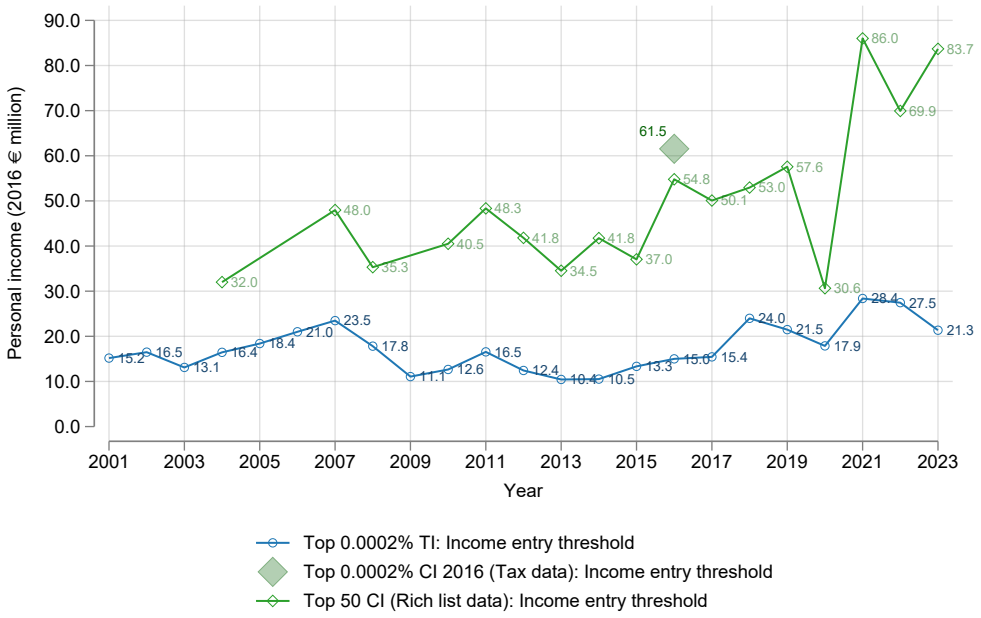
Figure 3: Persistence of taxable and comprehensive income over time, at different income brackets



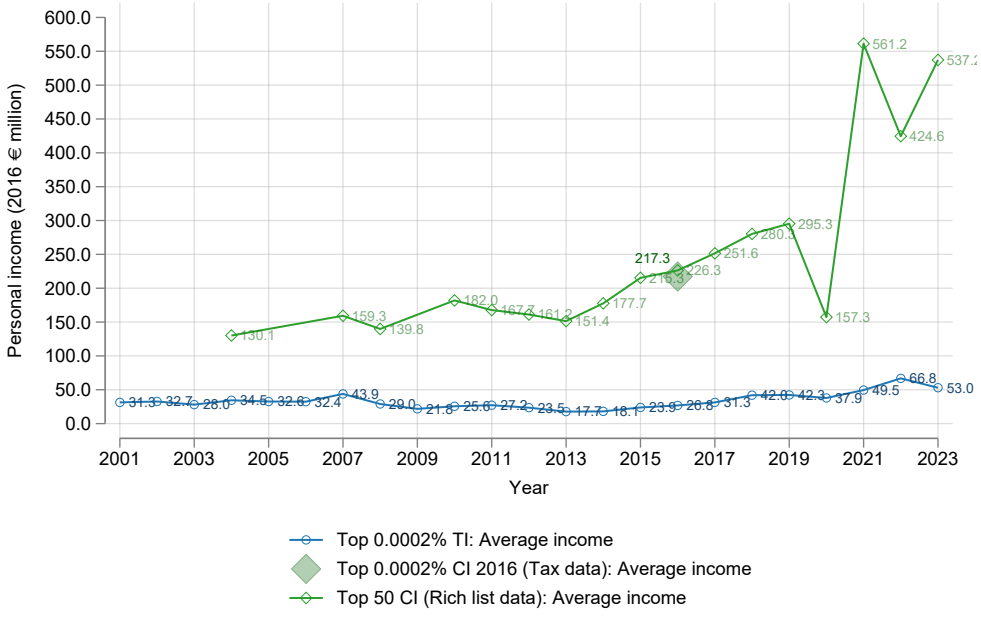
NOTES: This graph represents the rank correlation between 2013 and 2016 in terms of taxable and comprehensive income. Belonging to the top x% is defined in 2013.

Figure 4: Top bracket of taxable income and comprehensive income, over two decades

(a) Entry threshold

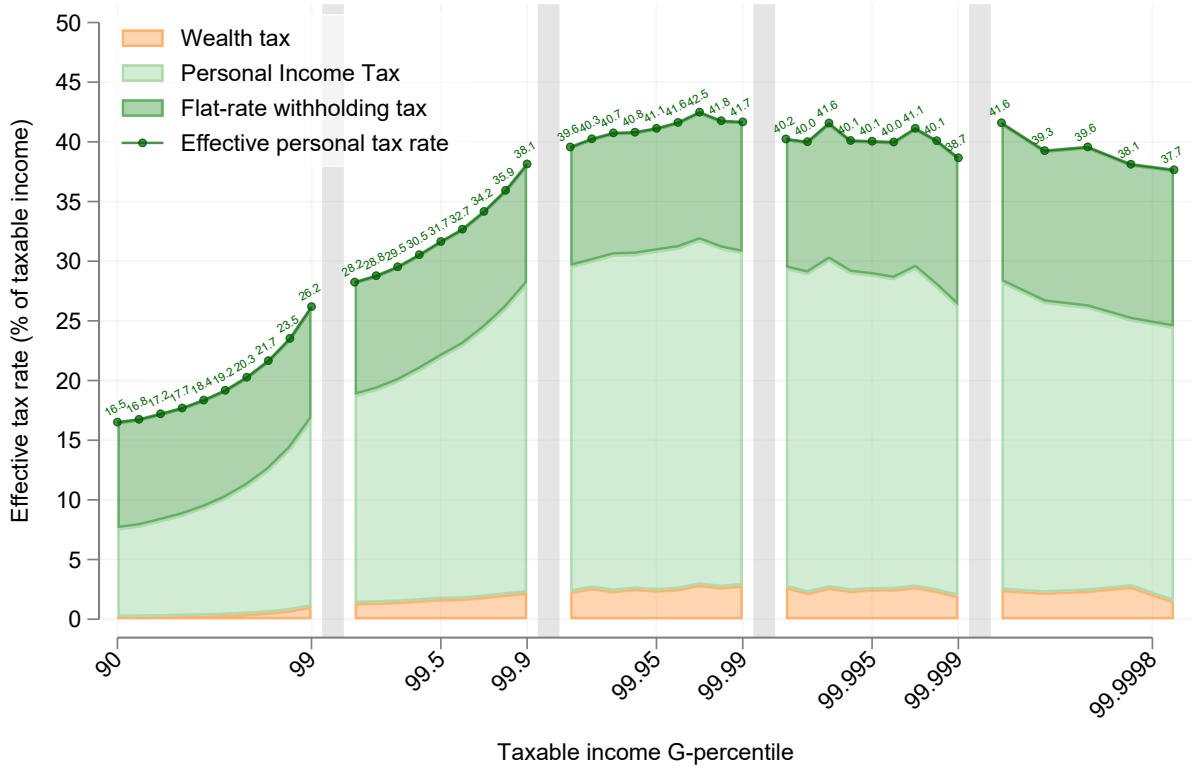


(b) Average within bracket



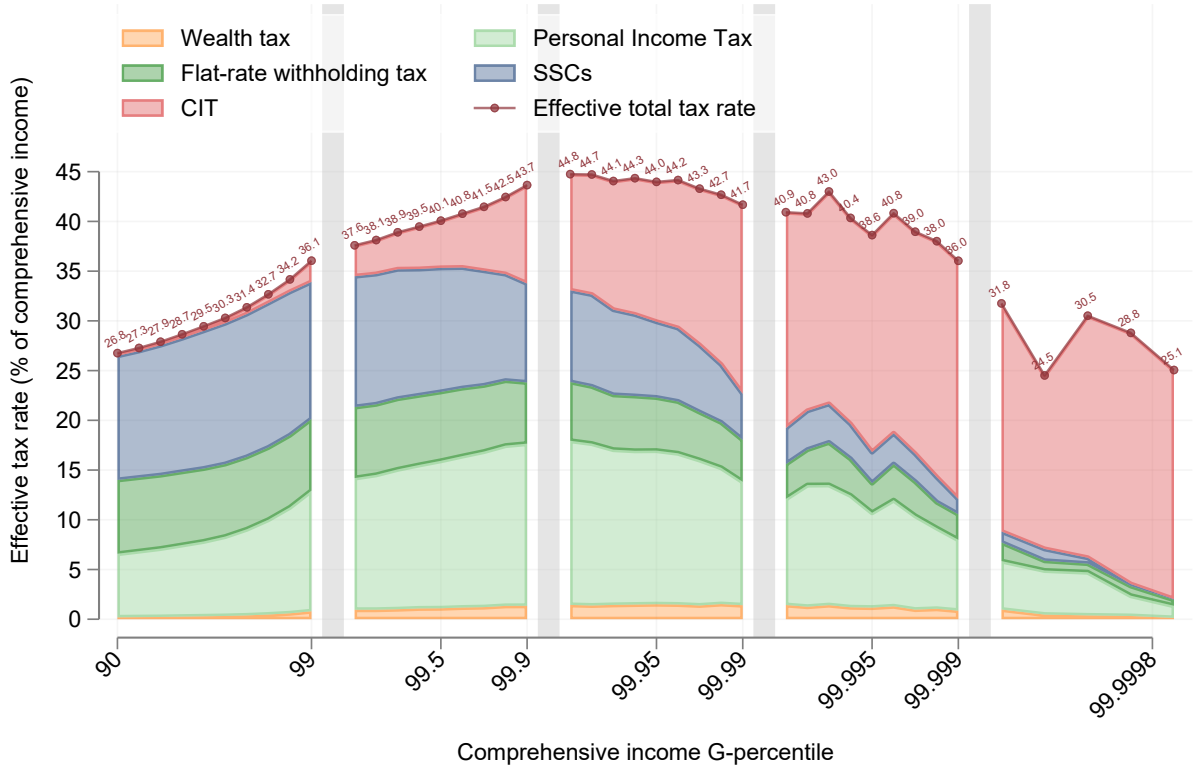
NOTES: This figure represent the entry threshold and average within the top income bracket, for the observed top 75 bracket of taxable income each year (blue dots), the top 75 comprehensive income in 2016 (large green diamond), and the estimated top 50 corporate income estimated using the rich lists data (small green diamonds). Panel a shows the thresholds to be part of the top bracket each year, while panel b shows the average income within the top bracket each year.

Figure 5: Effective tax rates as a share of taxable income



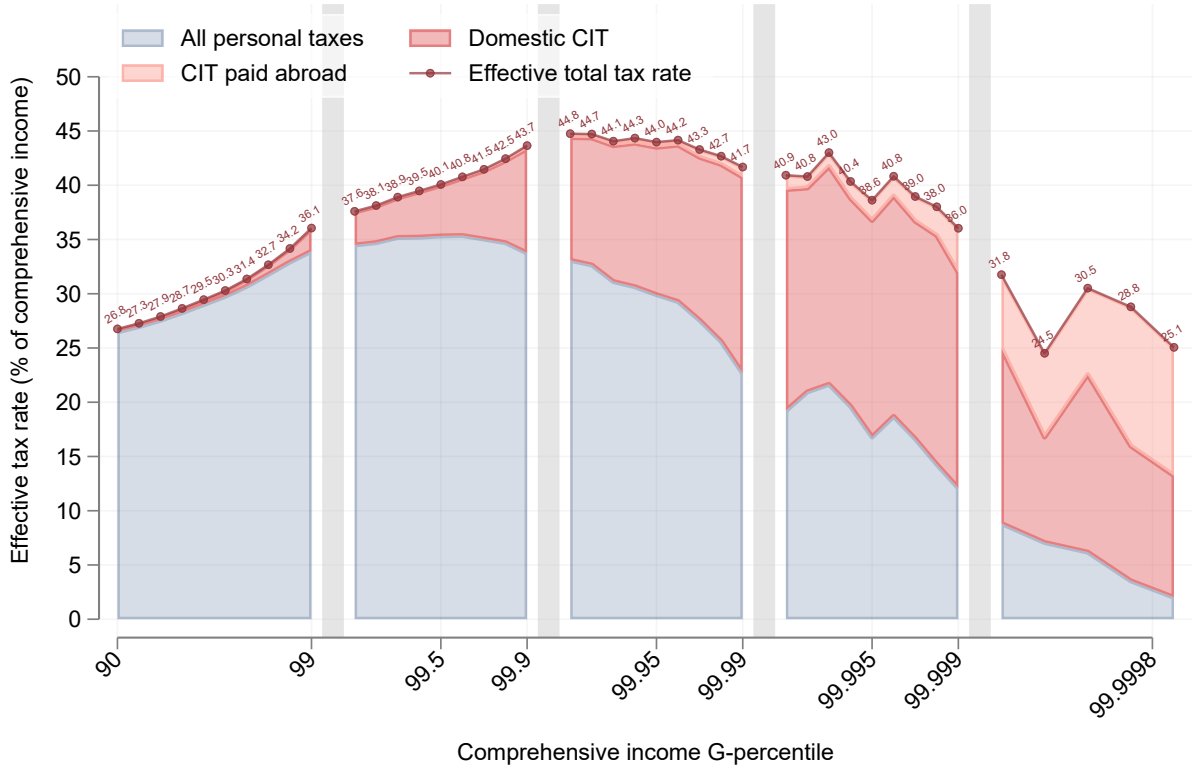
NOTES: This graph represents the distribution of effective income tax rate on taxable income, in G-percentiles (division of the last quantile into 10 quantiles, and into 5 quantiles at the very top) at the tax household level, sorted by taxable income, within the top 10% of this variable.

Figure 6: Effective tax rates as a share of comprehensive income



NOTES: This graph represents the distribution of effective income tax rate on comprehensive income, in G-percentiles (division of the last quantile into 10 quantiles, and into 5 quantiles at the very top) at the tax household level, sorted by comprehensive income, within the top 10% of this variable.

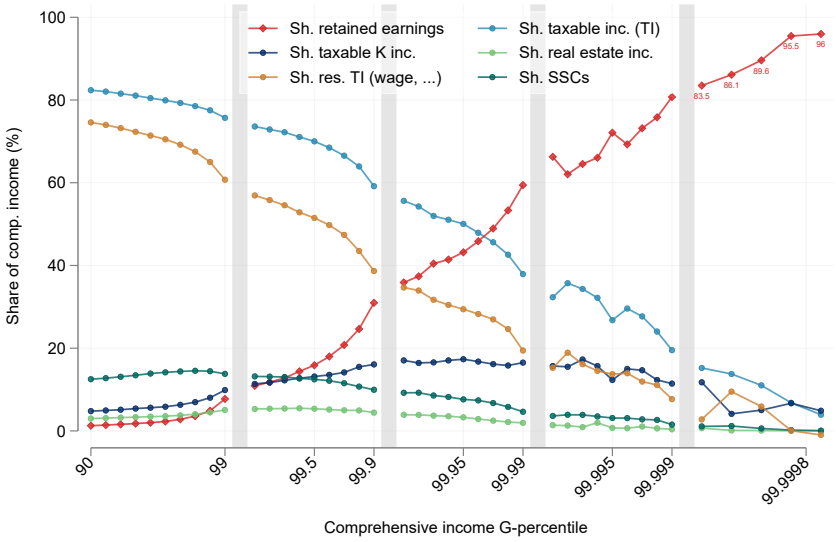
Figure 7: Accounting for the role of foreign CIT



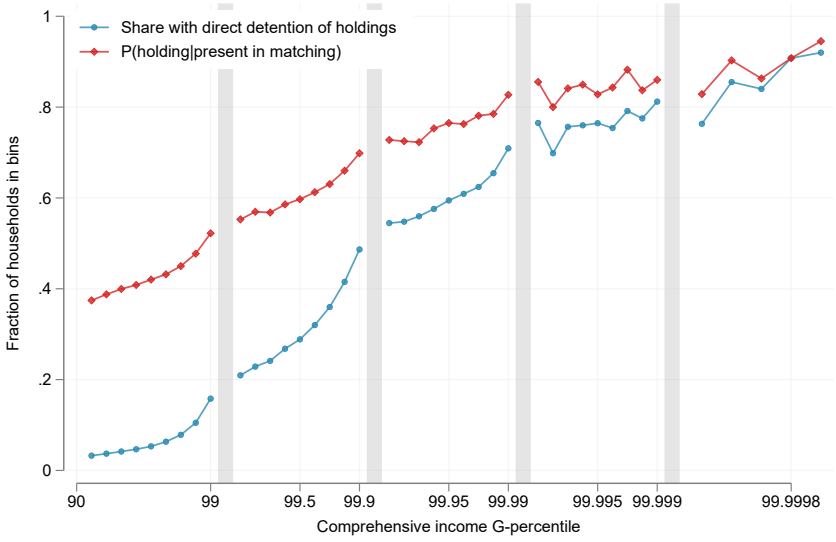
NOTES: This graph represents the distribution of personal tax rates on comprehensive income, in G-percentiles (division of the last quantile into 10 quantiles, and into 5 quantiles at the very top) at the tax household level, sorted by increasing income. The corporate tax payment is divided into domestic and foreign payments.

Figure 8: Composition of income and the prevalence of holding companies along the comprehensive income distribution

(a) Composition of income in the top 10%



(b) Probability of direct detention in a holding company



NOTES: Panel (a) details the composition of households income along the comprehensive income distribution. Panel (b) presents the probability of having a direct detention in a holding company along the comprehensive income distribution. Holding companies are defined conservatively based on the 5-digit industry code 6420Z which corresponds to passive holding companies and therefore excludes active holding companies (*holding animatrices*).

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Online Appendix

Outline

- Appendix A describes the matching procedure and presents statistics on the quality of the match.
- Appendix B presents details on the construction of comprehensive income and the measure of tax burden.
- Appendix C presents details on the imputation based on the French rich list.
- Appendix D presents additional results.

A Construction of the shareholder registry database

A.1 Data Sources

Shareholder information from corporate tax returns. When filing the corporate income tax (CIT) files, firms have the obligation to fill information about each shareholder owning at least 10% of the social capital.[28] Information for each of these "reference shareholder" consists in the name, surname, date of birth, address and percentage of the capital owned. In addition, firms need to report the total number of natural persons and institutions owning shares of the firm, and the total share of each group in the social capital.

Shareholder information from commercial data (ORBIS). Bureau van Dijk (BvD) collects shareholder information from various sources (financial press, official publication for listed firms and registry from commercial courts). When the shareholder is a natural person, his or her surname, first names, date and place of birth can be provided, in particular if this shareholder is also the legal representative of the company. As there is no public register of company shareholders in France, the source is not exhaustive in the sense that only a minority of firms is covered and only a portion of the shareholders of each company is informed. However, the source is by nature better informed for the highest professional wealth, and it is in particular through this that information that financial press compiles top wealth lists like Forbes 400, or Challenges 500 for the French case (Challenges, 2023). In addition, BvD traces shareholders beyond the French residency and makes it possible to associate with a natural person residing in France with French firms owned by foreign vehicles. Finally, this data source is filled independently from the tax records, which makes it a complementary source when the tax information is missing.

Shareholder information from commercial courts (INPI). The legal representatives of a French company must be registered by French commercial courts. The identity (surname, first name, place and date of birth, address) and the precise function of each representative (manager, chairman, managing director, administrator, etc.) are thus recorded in a database which is then centralized by the *Institut national de la propriété intellectuelle* (INPI). Since 2017, the INPI has made all of this information available in open data. Before 2017, the same information was accessible under license and made commercially available with the ORBIS database. This data is useful to us in several ways. First of all, the definition of professional wealth for the wealth tax exemption requires verifying that the holder of shares in a company also effectively participates in its management, which the INPI database allows us to verify. Second, when the shareholder information from tax record and from ORBIS is incomplete, the identity of the representatives remains of very good quality. This is useful, as it turns out that in unlisted companies the legal representatives are also major shareholders of the company in 83% of cases.[29]

[28] Forms 2059-F for firms filling the detailed CIT returns, and form 2033-F for firms opting for the simplified version.

[29] This figure is computed from firms with non-zero value wholly owned by natural persons and which register their shareholders in the tax records.

A.2 Matching procedure

The matching procedure between individual tax data and firm level data on shareholder has required a number of legal steps and the support of the French tax authorities. It relies on a close collaboration between the research team at the Institut des politiques publiques (IPP), the DGFiP and the CASD, the institution in charge of remote access for protected data. We describe here briefly this matching process.

Matching process. To match individual data with firm data, we have to use personal information (name, surname, date of birth, address of residence, place of birth) that are not accessible to researchers. The procedure established with the French tax authorities has been to rely on a third party to realize the matching procedure based on these personal identifiers, which are then dropped when the matched data are delivered to the research team. DGFiP has thus provided the income tax data with personal identifiers (POTE and 2059/2033 forms).

Intermediate dataset (BADS). The first step of the matching process has been, for the authors of this study, to build a database from information in INPI and ORBIS identifying managers and shareholders of all French firms. This information is compiled into a database called *Base de dirigeants et actionnaires des sociétés* (BADS). Individuals are identified by their name, surname, date of birth and place of birth. BADS contains 8.7 million individuals having had at least once between 2000 and 2020 a role of manager or shareholder of a French firm, with 2016-2017 being the period with the widest coverage. This corresponds to 16.9 million firm-individuals observations.

Matching algorithm. The matching algorithm produces two files. The first file consists in matching first the BADS database with the income tax data (POTE), and then in a second step to use 2033 and 2059 forms to complement the match: this provides the best coverage for the year 2016 specifically.[30] The second file uses only the 2033 and 2059 data, and matches them with the individual tax data, so as to provide a coverage which is stable over time (period 2015-2021).

For both files, the algorithm starts by uniquely identified individuals in BASD and POTE from variables name, surname and date of birth, then variables place of birth and place of residence are added, and finally for those individuals with same date of birth, a match using Jaro-Winkler distance is applied. For the first file, the algorithm exploits in a second step the fact that the firm identifier (SIREN) is available in both the BADS and the 2033-2059 files to improve the match. It starts with the unique identification of individuals based on name, surname and date of birth, then in turn removes one of these criteria but uses the firm identifier.

Conflicting or missing information on shareholder ownership. Once the match has been made, it is necessary to make choices between the different sources (tax data, INPI, ORBIS) in order to determine firms' shareholders. There are several reasons why these data sources should not necessarily match each other. First, variables of personal identification are reported in a disparate

[30] Matching algorithm has been developed by Yacine El Bouhairi (CASD), in close relationship with the research team and Gérard Forgeot (DGFiP).

manner. For instance, the same person can appear with names written in a slightly different way depending on the years in which they are registered. Second, the sources are themselves incomplete for some companies in some years, either because some shareholders are missing or because the shares owned are not reported.

We have selected the different sources with the following approach. As a general rule, we use the following priority order: tax source (2033-2059), Orbis, INPI. We therefore start by dropping duplicates of firm–household identifiers with this order of priority in case sources disagree on the share of capital owned. We also complement the data from the matching with firm-level sources providing some information about ownership: the LIFI files, and the BIC-IS file, which allow constructing a share of capital owned by natural persons. We use these data to check and correct some potential mistakes in the matching (foreign firms, unit whose capital is owned by State or public entities, mutuals and other widely owned entities). Whenever we only information we have in the matching comes from INPI (legal representatives), we add further conditions from the LIFI files for these matches to be considered valid. These conditions include being mentioned as "associé" (partner) or similar roles, being related to a firm with non-zero physical owners.

Once these valid household matches are selected, we proceed with a step of correction of the shares of capital owned. We spot inconsistent rows which make the total within the firm to be either above or below the total of shares owned by natural persons as declared in the balance-sheet data, and correct the individual shares for them to match this total.

Final data source on shareholder–firm links (BADS2A). The end data source we rely on, named BADS2A,[31] contains a cross-section, for the year 2016, of all the observed shareholding links. The information is thus observed at the personal fiscal identifier – firm legal unit level, and contains the share of social capital owned by each person. Importantly, the data also contains the share of capital owned by persons which may not have been matched with the personal identifier.

Quality of the match. At the firm-level, in the final matched household–firm dataset, 93.6% of firms have at least one identified physical shareholder, and these matched shareholders represent on average 83.5% of the share capital, with 88.9% of the firms having complete shareholder information (the sum of shares held by identified shareholders matches the overall share of capital held by natural persons).

At the household level, given that there is no official registry of shareholder with French residency status, there is no obvious benchmark for assessing a match rate. One way of obtaining a lower bound of our matching rate is the following. In 2018, a withholding system was implemented for the income tax and replaced the previous system which was effectively lagging by a year. As a result, one year of income was untaxed: to avoid shifting responses, the tax administration decided to tax exceptional income, and in particular forced firm managers (most of which are suspected owners) to declare wages they received as directors (which could easily have been shifted to the untaxed year otherwise). Out of the 609,971 households who declare such wages in

[31] *Base des actionnaires et dirigeants de sociétés doublement appariée.*

2018, 90.2% of them are both present in our matched data and in the personal tax data in 2018.[32] A complementary exercise which we conduct is to use the wealth tax data: while most shares were tax exempt at the wealth tax (as *biens professionels*), some shareholder statuses were not completely exempt but benefited from large rebates (such as those under shareholder pacts). Within the list of households declaring such shares (filled in boxes CM, CC, CD, CH, CI and CJ of the 2725 tax form), 81.6% are also found as shareholders in our matched data. Note that this number largely underestimates our matching rate, as it *de facto* excludes majority owners, who were eligible for a full wealth tax exemption, but have the best coverage in our data. A final exercise we conduct is to study retiring owner-managers of SMEs, who are eligible to a large tax rebate if they realize capital gains at the time of the retirement. Among the population of 15,302 households who were present in the tax data in 2016 and realize such capital gains between 2017 and 2021, we find that 94.5% are present in the matched shareholder data. These tests suggest that our matching rate is likely above 90%.

B Additional details on the construction of variables

B.1 Corporate income

The measure of income is close to corporate taxable income but is slightly broader. We detail below the several treatments we perform to go from taxable income to our preferred notion of corporate income.

Additional details on the construction of corporate income and corporate taxes. Here we detail how we build corporate income. We start from taxable income and reintegrate a number of items.

Treatment of tax credits.— Consistently with national accounts, we count corporate tax credits as subsidies and add them to business income. We accordingly compute CIT gross of tax credits. The main tax credits we consider are the R&D tax credit, the Tax Credit for Competitiveness and Employment (CICE in French), and the tax credit for corporate sponsorship (charitable giving).

Treatment of losses.— We consider corporate income after the application of carry-back and carry-forward losses, and we compute CIT accordingly after the application of both carry-forwards and carry-back losses. For carry-forwards, we take into account that firms have a non-zero probability of being unable to use them to offset future profits—due to firms disappearance following a merger or bankruptcy for instance. Following Cooper and Knittel (2010), we use an average probability of 0.6 of using these losses. We take this probability and multiply it with the value of carry-forwards times the nominal corporate income tax rate this year to obtain the value of the tax relief attached to the carry-forwards.

Treatment of corporate capital gains.— We integrate corporate capital gains in our definition of corporate income, as the measure of CIT we use includes taxes paid on capital gains.

Treatment of special deductions.— A set of programs allows firms to deduct some of their corporate income, including, for instance, empowerment zones (*ZFU*) or innovation clusters (*Pôle de*

[32] These tax boxes are 1AN, 1BN, 1GB and 1HB. Restricting the test to boxes 1GB and 1HB yields an extremely similar proportion of households found in the matching (90.7%).

compétitivité) from their taxable income. As they constitute income to the owners of the firms, we include them to our definition of income.

B.2 Definition of undistributed profits

We consolidate corporate profits and neutralize inter-corporate dividends. We then define undistributed profits as total consolidated profits at time t minus dividends distributed by the mother company at time t.

B.3 Life insurance income

We measure life-insurance income as the realized capital gain at the time of withdrawals (partial or total surrenders). For a subset of wealth taxpayers, we observe the value of their life-insurance holdings (case CO of the wealth tax complete form). For these taxpayers, we impute life-insurance income even in the absence of withdrawals by assuming a return of 4,6% on *unités de compte* (proxied by the CAC 40 gross total return index, dividends reinvested, in 2016, per Vernimmen newsletter) and 0,5% on euro-denominated funds, *fonds euros* in French (proxied by the French 10-year OAT yield). We assume a portfolio split of 30% *unités de compte* and 70% *fonds euros* in line with aggregate statistics.

B.4 Other treatments

Here we detail the treatment of other variables.

Dividends in households data.— For tax units receiving dividends but for whom no shareholder link is observed in our matched shareholder-firm data, we apply the 2016 French statutory rate of 33.33% to account for the CIT paid on the profits allowing these dividend distributions.

Social security contributions and flat-rate withholding income tax.— Non-contributory SSCs are calculated using the microsimulation tool TAXIPP 0.4. This microsimulation model is developed at the *Institut des politiques publiques* (IPP), and includes a payroll tax module. The model takes as input the payroll tax schedule, as collected in the IPP Tax and Benefit Tables (Institut des Politiques Publiques, 2023), and calculates employer and employee payroll taxes, reductions in employer payroll taxes, flat-rate income tax (CSG and CRDS), and various other payroll taxes. There are multiple schedules for SSCs depending on whether employees are managers or not, and whether they contribute to specific regimes (in particular, these rates are different in the public sector). Schedules are applied to monthly income and depend on multiples of the Social Security Threshold, with rates generally decreasing as a function of income. Since we only observe annual taxable income by type of income, we recalculate annual posted wage based on observed net wage income with a full-time full-year assumption, and apply the generic private sector SSC rates to this tax base. We consider as *cadres* those workers above 1 social security threshold, and as *non-cadres* the workers below this threshold. We assume that households with pass-through business income (BIC and BNC) pay SSCs under the craftsmen and shopkeepers regime (*artisans-commerçants*).

C Construction of comprehensive income based on rich lists

Rich lists provide an annual assessment of wealth held in controlled businesses by tight groups ("families" or "dynasties") of citizens and/or residents of specific countries. In the case of France, the Challenges rich list publishes since 1996 a market value estimate of each business stake held by the five hundred biggest business dynasties, as ranked by the market value of each dynasty's business stake. In the main text, we use this information to deliver an approximation of how much business income is effectively accruing to each dynasty each year, and then provide an estimate of the level of business income required to be part of the top 50 business dynasties as ranked by their estimated business income. In this appendix, we detail the assumptions behind this approximation.

As we do not observe in our data the family links that make up the dynasties recorded in Challenges, we cannot directly observe either the profits accruing to the businesses controlled by the Challenges dynasties nor the size of the business stakes each family owns. This means we cannot use the measurement method we use in the rest of the paper, whereby we attribute each tax unit a stake-based percentage of the controlled businesses' pre-tax income. However, conditional on industry context, the journalists' wealth assessment implicitly provides information on the profits of the underlying businesses. Indeed, when values are derived from market quotes, we may assume that financial markets are somewhat efficient and track the current cash flows of the company, with a discount rate and growth parameter which likely depends on the period and line of business. When market quotes are instead unavailable, we may assume that industry-and-year-specific cash-flow-based multiples are used to proceed to the valuation reported in the magazines. Moreover, the value reported in the Challenges magazine implicitly includes information on the size of the family stake, which is precisely the other piece of information we would otherwise miss.

Based on those assumptions on the information content of rich lists' wealth assessments, we may derive an estimate of dynasties' business income from their reported business wealth and industry affiliation. We proceed as follows. We collect information from the database Compustat Global on the industry affiliation (as defined by Compustat, with 11 distinct business sectors), the pre-tax income and market value of equity of each French listed company during the period 2004-2024. Based on this information, we compute for each company "inverse" valuation multiples defined as the ratio of current pre-tax income to market value of equity as of early June, which is the time of the year when the Challenges list is edited. We aggregate those inverse multiples at the level of each industry and year, using equity-value weights. The last step is in each year to multiply each dynasty's wealth as reported in the rich list with the average inverse multiple corresponding to the dynasty's industry affiliation as reported in the rich list, and define the result as the estimated business income accruing to that dynasty in that year.

Since we then have for each of the 500 dynasties an estimate of their business income, we may rerank the dynasties in terms of their business income rather than their business wealth. In so doing, we assume that the 500 biggest fortunes in terms of wealth also include the 50 biggest fortunes in terms of income, which is indirectly a joint (and unfortunately untestable) assumption on the correlation between income and wealth and the concentration of wealth.

D Additional results

Table A1: Transition matrix across income brackets for taxable and comprehensive income

Panel A: Taxable Income

Percentile	N	$<$ P90	[P90, -,P99)	[P99, -,P99.9)	[P99.9, -,P99.99)	[P99.99, -,P99.999)	Top 0.001%
$<$ P90	26110471	**0.972**	0.028	0.000	0.000	0.000	
[*P*90, *P*99)	3098807	0.182	**0.787**	0.030	0.001	0.000	0.000
[*P*99, *P*99.9)	278416	0.044	0.265	**0.651**	0.037	0.003	0.000
[*P*99.9, *P*99.99)	27743	0.052	0.104	0.317	**0.494**	0.030	0.003
[*P*99.99, *P*99.999)	2752	0.069	0.169	0.150	0.291	**0.299**	0.021
Top 0.001 %	296	0.105	0.226	0.260	0.084	0.176	**0.149**

Panel B: Comprehensive Income

Percentile	N	$<$ P90	[P90, -,P99)	[P99, -,P99.9)	[P99.9, -,P99.99)	[P99.99, -,P99.999)	Top 0.001%
$<$ P90	27634445	**0.972**	0.028	0.000	0.000	0.000	
[*P*90, *P*99)	3104994	0.132	**0.838**	0.030	0.000	0.000	
[*P*99, *P*99.9)	279450	0.042	0.196	**0.723**	0.039	0.001	
[*P*99.9, *P*99.99)	27945	0.040	0.046	0.251	**0.624**	0.039	
[*P*99.99, *P*99.999)	2794	0.039	0.024	0.045	0.274	**0.580**	0.037
Top 0.001 %	310					0.290	**0.635**

NOTES: This table shows the transitions from one income bracket to another between 2013 and 2016 for all households observed in both periods, for taxable income (panel A), and comprehensive income (panel B). For comprehensive income, shareholder links are kept constant across periods (set in 2016).

Table A2: Distribution of comprehensive income vs. dividend-imputed income

Percentile	Nb. hslds above	Dividend-imputed Income			Comprehensive Income			**Ratio inc. sh.**
		Threshold	Mean above	Inc. share	Threshold	Mean above	Inc. share	
P0	37,833,502		32,900	100.00		32,900	100.00	1.00
P10	34,050,091	3,600	36,500	99.85	3,400	36,500	99.85	1.00
P20	30,266,479	9,900	40,200	97.75	9,700	40,200	97.75	1.00
P30	26,483,450	14,700	44,200	94.04	14,500	44,200	94.04	1.00
P40	22,699,895	18,400	48,800	89.00	18,200	48,900	89.18	1.00
P50	18,915,941	22,100	54,500	82.82	21,900	54,600	82.98	1.00
P60	15,133,006	27,200	62,000	75.38	27,000	62,200	75.62	1.00
P70	11,349,720	33,800	72,500	66.11	33,600	72,900	66.47	1.00
P80	7,566,688	44,600	89,400	54.35	44,300	90,100	54.77	1.01
P90	3,783,318	63,400	126,000	38.30	62,900	128,000	38.91	1.01
P95	1,891,637	87,100	178,000	27.05	86,300	183,000	27.81	1.03
P99	378,333	185,000	427,000	12.98	180,000	455,000	13.83	1.07
P99.9	37,833	682,000	1,608,000	4.89	626,000	2,035,000	6.19	1.27
P99.99	3,783	2,592,000	5,966,000	1.81	2,592,000	10,875,000	3.31	1.82
P99.999	378	9,904,000	21,474,000	0.65	14,876,000	64,768,000	1.97	3.03
P99.9998	75	25,432,000	51,829,000	0.31	61,540,000	217,289,000	1.31	4.22

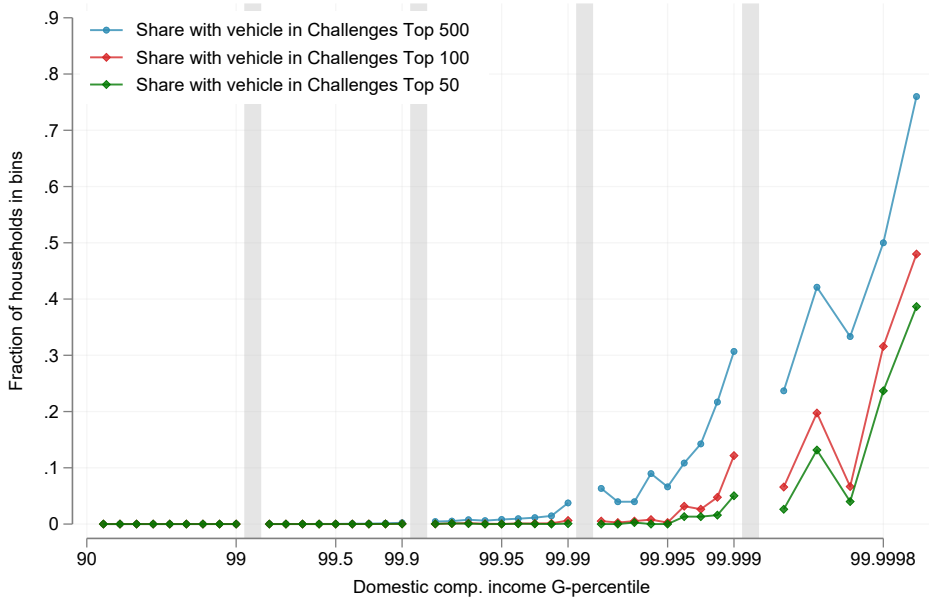
NOTES: This table details the percentiles of the distribution of dividend-imputed income and comprehensive income. P90 refers to the 90th percentile, which is the income threshold above which one belongs to the top 10% of income earners. P99.9 corresponds to the 99.9 percentile, i.e. the income needed to be in the top 0.1 percent of income earners.

Table A3: Income brackets of households present in Challenges rich list

Income Bracket	Taxable Income	Comprehensive Income
Share in		
Bottom 90%	32.2	8.7
P90–P99	22.8	5.6
P99–P99.9	21.3	11.8
P99.9–P99.99	14.5	25.6
P99.99–P99.999	7.3	32.4
Top 0.001%	1.9	15.8

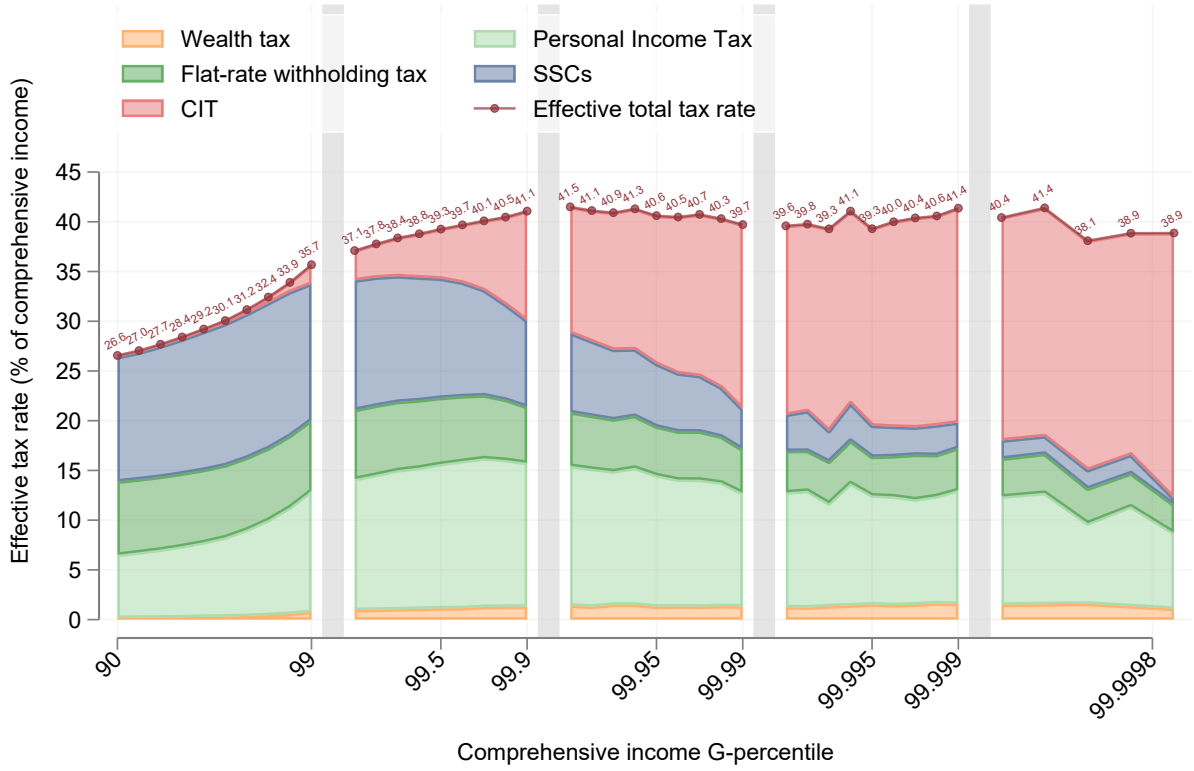
NOTES: This table shows the distribution of income brackets of households tagged as linked to the Challenges top 500 rich list, in terms of their 2016 taxable income (first column) or comprehensive income (second column).

Figure A1: Share of households with a link to a firm associated to the Challenges rich list along the domestic comprehensive income



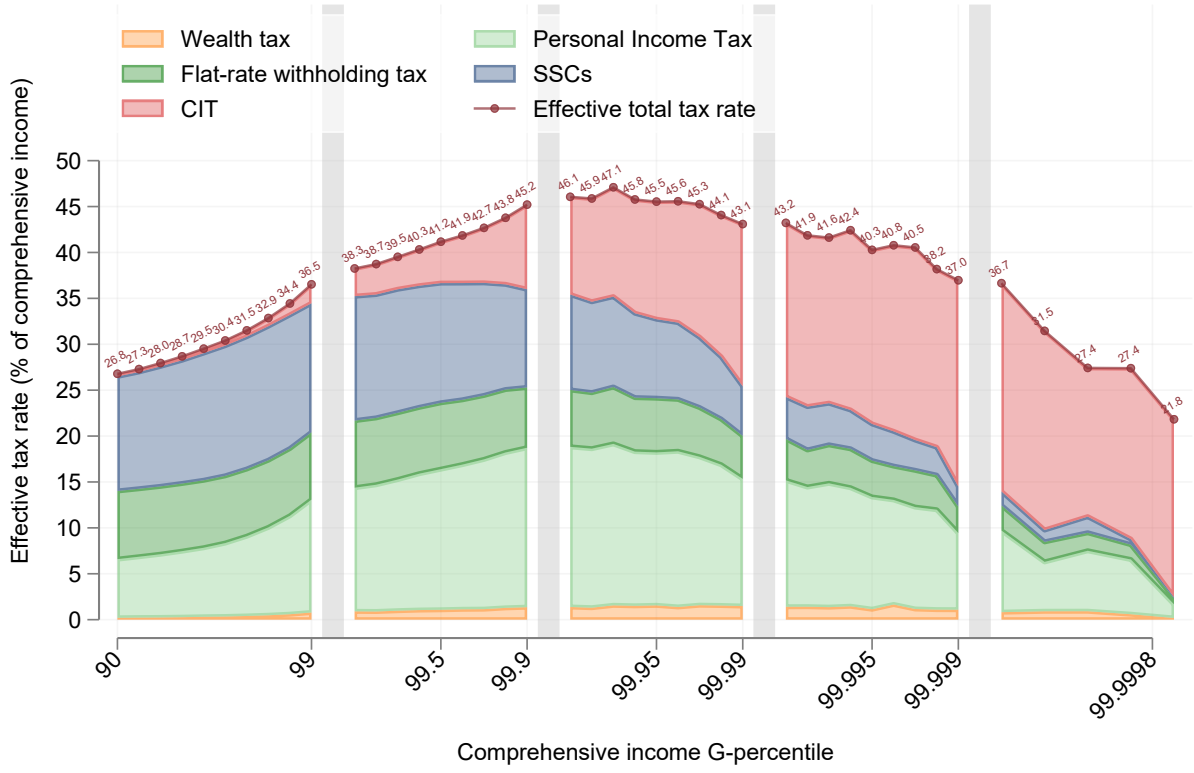
NOTES: This graphs shows the probability to be found in the Challenges rich list data, at different brackets (top 500 in blue, top 100 in red, top 50 in green), along the distribution of an alternative definition of comprehensive income, where only retained earnings corresponding to domestic corporate profits are accounted for. The graph is displayed in G-percentiles (division of the last quantile into ten quantiles) at the tax household level, sorted by domestic comprehensive income, within the top 10% of this variable.

Figure A2: Effective tax rates as a share of dividend-imputed income



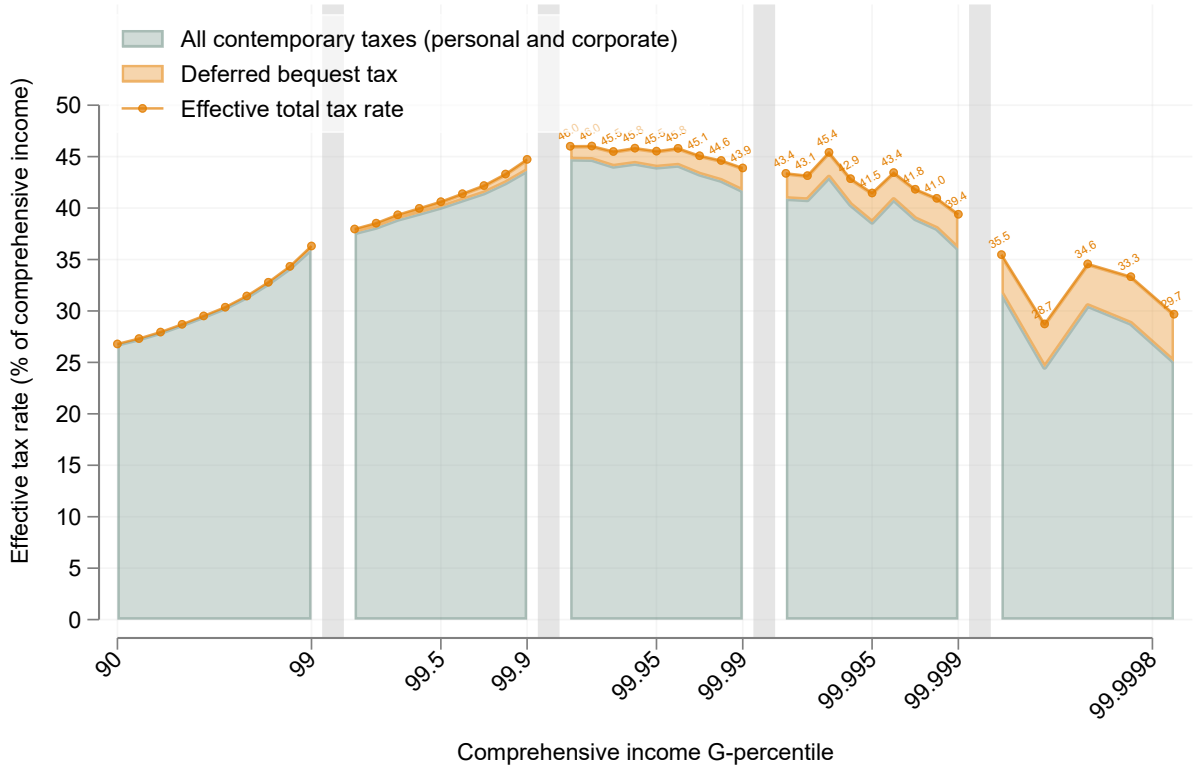
NOTES: This graph represents the distribution of effective income tax rate on dividend-imputed income, in G-percentiles (division of the last quantile into ten quantiles) at the tax household level, sorted by dividend-imputed income, within the top 10% of this variable. Both the masses of retained earnings and CIT are attributed proportionally to the share of national dividends received by each household.

Figure A3: Effective tax rates attributing retained earnings only to majority shareholders



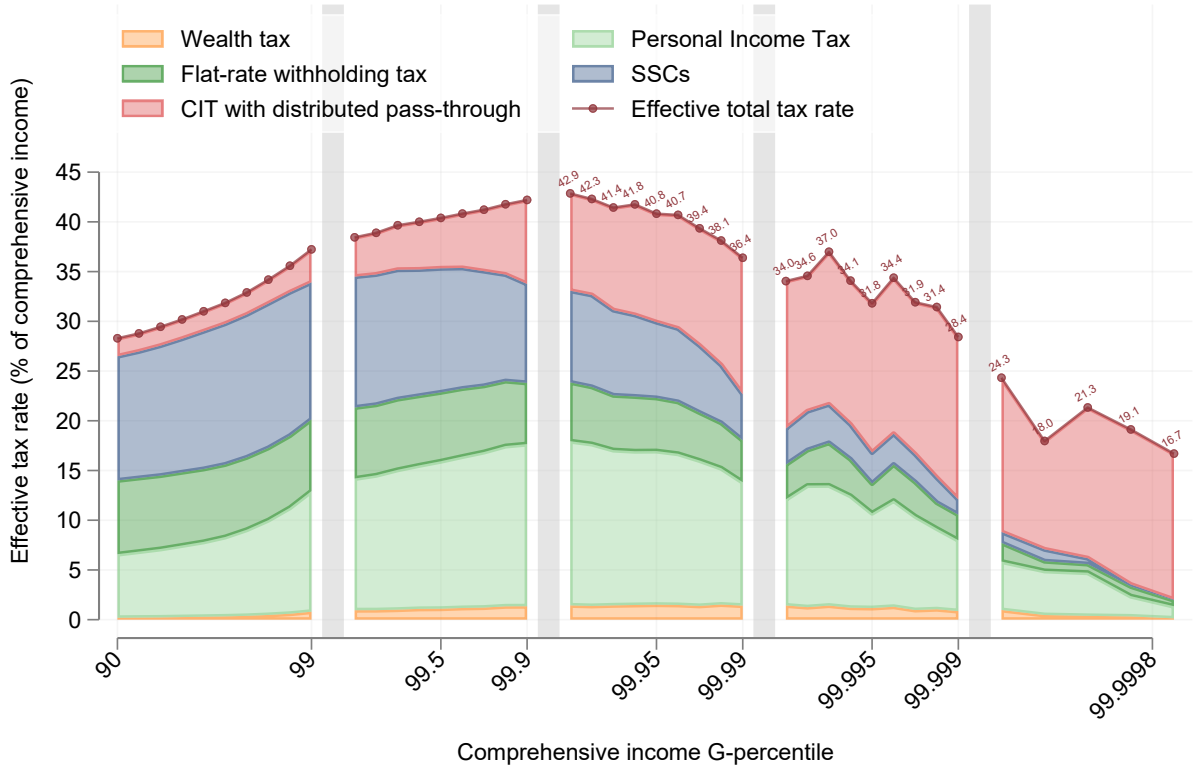
NOTES: This graph represents the distribution of effective income tax rate on an alternative definition of comprehensive income, where retained earnings are attributed only to majority shareholders (share $\geq$ 50%), in G-percentiles (division of the last quantile into ten quantiles) at the tax household level, within the top 10% of this variable.

Figure A4: Simulation of the bequest tax on corporate shares



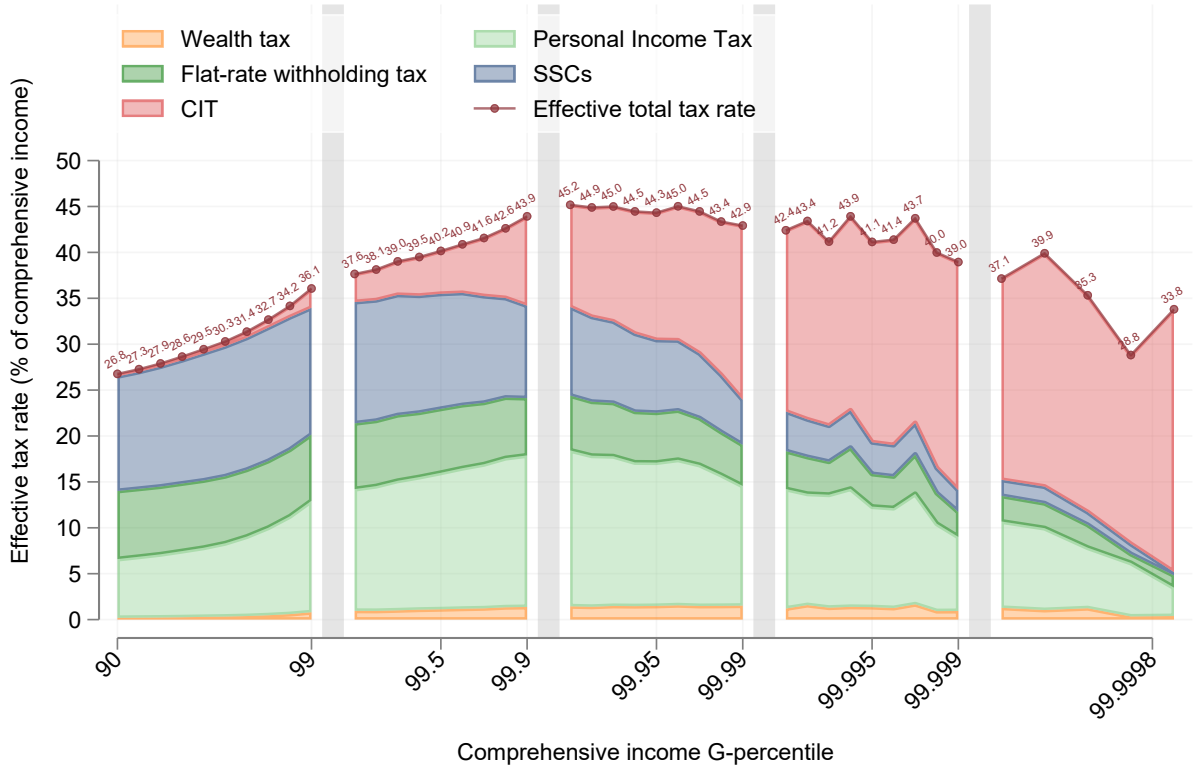
NOTES: This graph represents personal (income and wealth) tax rates as well as corporate income tax rate and add a simulated value for the bequest taxes, using the assumption that retained earnings will be donated using the most favorable fiscal instrument (shareholder "Dutreil" pact before age 70), without accounting for additional rebates.

Figure A5: Effective tax rates as a share of comprehensive income, with incomplete pass-through of CIT to shareholders



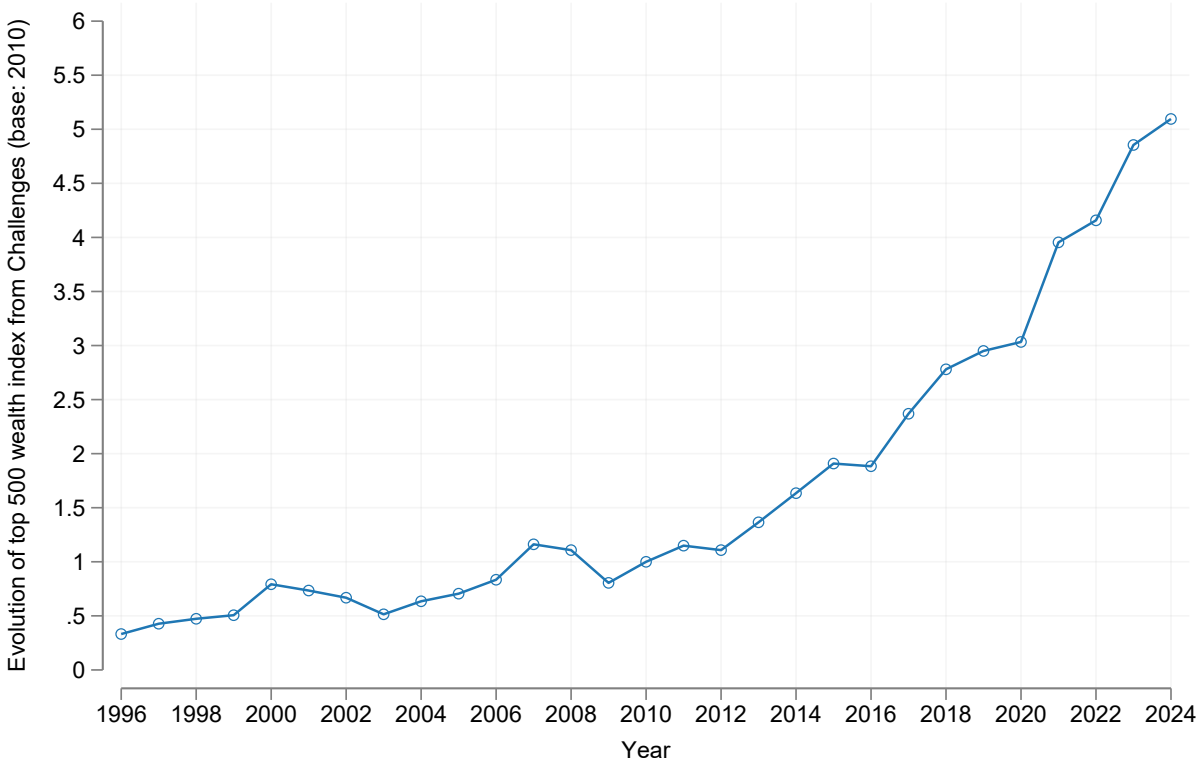
NOTES: This graph represents the distribution of effective income tax rate on comprehensive income, in G-percentiles (division of the last quantile into ten quantiles) at the tax household level, sorted by comprehensive income, within the top 10% of this variable. The corporate income tax is attributed at 60% to shareholders, 20% to wage earners, and 20% to taxable capital income earners.

Figure A6: Effective tax rates as a share of domestic comprehensive income



NOTES: This graph represents the distribution of effective income tax rate on an alternative definition of comprehensive income, where only retained earnings corresponding to domestic profits are accounted for, in G-percentiles (division of the last quantile into ten quantiles) at the tax household level, sorted by comprehensive income, within the top 10% of this variable.

Figure A7: Time series evolution of wealth in French rich list (base 2010)



NOTES: This graph represents the evolution of total wealth estimated from the Challenge top 500 rich list, normalized to 1 in 2010.