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Follow the money! Why dividends overreact to flat-tax reforms

**Laurent Bach
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JEL Codes: G35, H24, O16

Keywords: Dividend tax ; corporate investment ; firm owner-managers



Follow the money!

Why dividends overreact to flat-tax reforms*

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August 2024

Abstract

We estimate behavioral responses to dividend taxation using recent French reforms: a rate hike followed, five years later, by a cut. Exploiting household and firm tax data as well as data linking firms and shareholders, we find very large dividend tax elasticities to both reforms. Individuals who control firms adjust dividend receipts instantaneously, accounting for most of the aggregate dividend reaction. Investment is insensitive to dividend taxation. Dividend adjustments are instead driven by corporate saving, as owner-managers treat firms as low-tax saving vehicles. Our results fit the ‘new view’ of dividend taxation, provided an additional low-tax yet costly payout option is available that offers a tax arbitrage opportunity to entrepreneurs in control of their firms.

Keywords: Dividend tax ; corporate investment; firm owner-managers.

JEL codes: G35, H24, O16.

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1 Introduction

Over the last three decades, many countries have cut dividend taxes.¹ Reforms lowering dividend tax rates were generally motivated by the aim of fostering private investment, stressing the efficiency cost of dividend taxes. The substantial increases in the dividends received by households that followed these tax cuts were initially interpreted as indirect evidence that such measures might have long-run investment effects (Poterba, 1987, 2004). However, while direct empirical evidence has confirmed the great reactivity of dividend to taxes, it has failed to detect systematic investment responses to dividend taxation (Yagan, 2015; Alstadsæter et al., 2017). This discrepancy has raised suspicions that the observed surge in dividends might be due to tax optimization strategies rather than actual changes in the cost of capital (Chetty and Saez, 2005, 2010).

This paper exploits two large French flat-tax reforms, of opposite directions. In 2013, President Hollande abolished a flat-rate withholding tax on capital income, inducing an increase in the top marginal tax rate on dividends from 36.5% to 40.2%. In 2018, President Macron re-introduced a flat-rate withholding tax on capital income whereby the marginal tax rate on dividends decreased from 40.2% to 30%.² We show that both reforms were followed by large variations of total dividends in the national accounts. We seek to understand what underlies these large responses of dividends to taxes, and whether these responses are real or driven by avoidance. We first investigate which households exhibit a large responsiveness, and highlight the distinctive role of owner-managers of privately held firms. We then thoroughly identify the response margins through which these households modify their dividend receipts. We do so by digging into the accounts of the firms they control, building an accounting decomposition to understand which adjustments are made within firms when dividend payments adjust to tax changes.

There are two main challenges in fulfilling this task. First, there is a requirement of observing both firms' payout decisions and household portfolio choices. Faced with higher tax rates, households may choose to divert their savings away from dividend-paying assets, while firms may distribute less dividends to favor other forms of payouts to investors. These choices may be made independently of each other, or they may instead be a joint decision as is the case when the main owner of a business is also its manager. In the latter case, opportunities for income shifting between the company tax base and the personal tax base abound, either between personal and corporate income or between the various ways in which a manager may be remunerated (Gordon and

¹In the nineties, Nordic countries have been forerunners of this trend with the implementation of the so-called dual income taxation, which taxes separately capital income, with a flat rate tax set at a lower rate than top marginal income tax rates (see Sørensen, 1994). Other countries followed this trend: the US in 2003, Spain in 2007, France in 2008 and 2018.

²President Hollande fulfilled a pledge made during his presidential campaign: "I want to restore justice. (...) Capital income will be taxed like labor income." (*Le changement c'est maintenant. Mes 60 engagements pour la France*, pledge 14). President Macron made also clear in its campaign platform that the objective of reducing capital income taxation was to foster investment: "We will support private investment" was the headline used to present the tax reform (*Programme En Marche*, p. 11).

Slemrod, 2000; Kopczuk and Zwick, 2020). Investigating all those potential avoidance mechanisms requires having access to both household-level and firm-level data, and to data granular enough that one can identify the household dimension in corporate data and vice-versa.

To fulfill these data requirements, we exploit the French shareholder register, a new source of data created by our research team jointly with the French tax authority (DGFIP) and the Secured data center (CASD). This data source merges the universe of French personal income tax returns with the universe of corporate income tax returns, both available over the period 2006–2021, through firm ownership links. With these data, we can identify individuals affected by dividend tax reforms at the tax unit level, know which firms they own, the degree of control they can have or not on the decisions of the firm, and assess the responses at the firm level in terms of investment, retained earnings and total payouts.

The second challenge in measuring the tax elasticity of dividends is one of causal identification. Understanding who is exposed to dividend tax reforms is not entirely straightforward, due to the fact that dividend income from firm owners might be, to a certain extent, a latent income affected by the current level of dividend taxation: individuals reporting low levels of income could appear as a natural control group, but may actually have control over substantial retained earnings within the firm, and thus be affected by tax reforms in their decisions to pay out dividends (Alstadsæter et al., 2023). Our data allows us to identify households affected by the change in personal income tax, based on their pre-reform income. We will show that even seemingly unaffected households who have control over firms respond massively to dividend tax reforms. To address this challenge, we will propose to use a “stable income” definition to define treated and control groups, excluding dividend receipts pre-reform so as to capture the effective change in marginal tax rates on dividends for all households, whether or not they control firms that could pay dividends.

Our empirical strategy relies on a difference-in-differences approach that we apply to both the 2013 and 2018 reforms, on our sample of households and then on our sample of firms. At the household level, we can identify adjustments made on other types of income than dividends (e.g., labor income, capital gains), while at the firm level we are interested in adjustments on how firm profits are used (e.g., investment or corporate savings). To make sure the responses we identify are comparable across reforms and units analyzed, we define our treated and control group in exactly the same way across reforms, and strive to make our group of treated households and firms as close as possible. To make sure our groups are comparable, we focus on households liable to the wealth tax, who make up roughly the top 1% of the wealth distribution but receive more than half of overall dividends. We then exploit our matched household-shareholder data to analyze the responses of firm owners, comparing those facing high vs. low tax rates based on a stable income definition, as well as estimating the response of firm owners relative to non-firm owners. At the firm-level, we want to compare firms that are

controlled by households affected by the reforms to firms whose distribution decisions depend little on individual dividend taxation. Therefore, our treated group consists of those firms whose capital is controlled for at least 50% by large individual shareholders (with at least one of them being liable to the wealth tax). Our control group includes independent firms which are not directly or indirectly controlled by large individual shareholders, and hence have no direct incentive to react to the tax reforms we analyze.

Our main findings are as follows. First, in national accounts, we find very large and sharp movements of dividends received by households just after both of the dividend tax reforms. Using aggregated micro data, we show that the bulk of changes in dividend receipts stems from households with substantial control over firms, while changes in aggregate dividend payout originate from closely-held firms with few shareholders. Dividends paid by public firms are very stable around these reforms.

Second, we estimate a strong dividend tax elasticity and show it is driven primarily by those individuals having control over firms. For the 2018 reform (a tax cut), we obtain an implied elasticity to the net-of-tax rate of 2.5 for firm-owners, while it is close to 0 for non-firm owners. We estimate that households who are firm owners saw their dividend receipts increase by 20%. For the 2013 reform, we obtain elasticities of 3.2 for firm owners against 2.4 for non-firm owners. While the measurement of firm ownership is not perfect in 2013, we still find that firm-owners are much more responsive than non-firm owners (who might include firm owners not identified in our data). After the 2013 reform, households that are firm owners reduced their dividends by 20%, compared to 14% for non-firm owners. For both reforms, we find small responses of other types of capital income, suggesting that households do not rebalance their portfolios and substitute away from dividend paying stocks. Following the 2018 tax cut, we find a slight reduction in wage payments among firm-owners, which suggests that these households shift income across tax bases. These changes in the structure of household income are small in magnitude, and overall explain little of the changes in dividend receipts.

Third, at the firm level, we find that neither of the dividend tax reforms has a noticeable causal effect on corporate investment, as firms owned by individuals exposed to the tax reforms remain on the same investment trend as unaffected ones. Specifically, we observe no reduction of investment following the 2013 tax increase, in spite of very large reactions of firms' dividend payouts. Following the 2018 tax cut, we do not observe any significant increase in investment either.

Fourth, motivated by the strength of the payout responses and the absence of detectable effect on investment, we carry out a decomposition of firms' dividend response to identify where the missing dividends may have gone in 2013, and from where the increased dividends have come from in 2018. In 2013, the decrease in dividend payouts can be explained by an increase in corporate saving (retained earnings which are not reinvested), as well as a reduction in taxable corporate income driven by smaller firms. In 2018, we find that the reduction in corporate saving fully explains the increase in dividend payouts.

Our main contribution is to show that the very large dividend tax elasticity measured with these two reforms is driven primarily by firm owner-managers with sufficient control of firms' decisions, but that this high elasticity does not affect investment decisions. We offer a simple explanation to those stylized facts by complementing the workhorse model of dividend taxation with the introduction of an alternative payout option with a lower tax rate than dividends, but available at some cost. This alternative payout option can be thought as saving through the firm with later payout as capital gains or inheritance. In this 'new new view' framework, investment does not react to dividend taxation, nor does total payout. However, as our empirical results show, the share of total payout in the form of dividends is very sensitive to dividend taxation. This result does not require agency problems, nor does it require changes in dividend taxation to be temporary. It therefore matches our results, as well as the behavioral responses documented in the context of dividend tax reforms in the U.S. and Sweden (Yagan, 2015; Alstadsæter et al., 2017) where the bulk of the estimating sample is made of private firms with fairly concentrated ownership, facing little or no agency issues. This corporate structure is widespread in the economy: the firms we study span the whole distribution of firm sizes, including corporate vehicles controlling very important listed firms, and can explain almost all of the variation in dividend aggregates observed in national accounts.

We contribute to a number of strands of the literature. First, we relate to the empirical literature showing that personal dividend taxation has a large impact on dividend payouts (Chetty and Saez, 2005, 2010; Jacob and Michaely, 2017), with no detectable impact on firms' investment on average (Yagan, 2015; Alstadsæter et al., 2017).³ Closely related to our paper, Bilicka et al. (2024) shows that Greek firms adjusted strongly their payout policies to changes in dividend taxes. The authors find an increase in firms' assets which are appropriable by firm owners, but no differential changes in productive corporate investment such as equipment. Our results confirm the strong interactions between corporate decisions and personal financial position. Our analysis goes further as we use two reforms going in opposite directions to estimate the dividend tax elasticity using both firm and household-level data, while previous papers studying both payout and investment only use firm-level data and typically assume a uniform exposure of company shareholders to dividend tax reforms. Our decomposition of the dividend response into all potential response margins at the firm-level is also novel with respect to the existing literature. It shows that corporate savings into non-fixed assets account for most of the reform-induced change in dividends and points to fairly symmetrical responses across a hike and a cut in the same context.

Second, we relate to a theoretical literature on the effects of dividend taxes on firms' dividend payout and investment (Auerbach, 2002). The fact that we find no investment

³Outside the context of dividend taxation, we also relate to the empirical studies estimating investment elasticity with respect to net of tax rate in other tax settings, e.g., in response to CIT (Maffini et al., 2019; Ohn, 2018), investment tax credit (Goolsbee, 1998; House and Shapiro, 2008; Zwick and Mahon, 2017), or capital gains tax (Moon, 2022).

response to the two dividend tax reforms suggests that the ‘old view’ (Poterba and Summers, 1985) is ill-suited in our context. The ‘new view’ of dividend taxation (King, 1977; Auerbach, 1979) has stressed that, if firms fund their investment out of retained earnings, dividend taxation should have no impact on investment. However, the very large response of dividend payout to dividend tax reforms does not fit well with the ‘new view’ either, under which dividend payouts should not react to tax changes. The main explanation provided in the literature has been to introduce agency problems to create a gap between the value of cash in the firm and for investors, with potential intertemporal tax arbitrage (Korinek and Stiglitz, 2009), or with pet projects from managers (Chetty and Saez, 2010). Our results are to some extent congruent with these revised ‘new view’ approaches, with the exception that most of the behavioral responses we document come from very closely held firms, where agency problems are clearly absent.⁴

Third, our results relate to the literature documenting income shifting between personal and corporate tax bases, especially among the self-employed and taxpayers with control over firms (Alstadsæter et al., 2014; Alstadsæter and Jacob, 2016; Pirttilä and Selin, 2011; Harju and Matikka, 2016; Miller et al., 2024). These papers typically investigate avoidance behavior among a very large set of business owners including mostly small business owners. In contrast, our empirical analysis takes place in a setting in which flat rates on dividends were predominantly attractive to the very highest segments of the income distribution. We show that, even in this context in which the businesses owned may no longer be considered small, the usage of corporations as tax shelters around dividend tax reforms accounts for the bulk of the dividend response to taxation.

Finally, this research is to be placed among a series of recent papers evaluating tax reforms that took place in France since 2012. Guillot (2019) studies the impact of the 75% marginal income tax rate, Aghion et al. (2023) exploit tax records to study the factors driving income inequality and Lefebvre et al. (2020, 2024) use household tax data to estimate behavioral responses to changes in capital income taxation in 2013. We depart from them by incorporating owner-managers and firms into the picture and identifying where the missing dividends are going.

Organization of the paper. The rest of the paper is organized as follows. Section 2 presents the institutional setting of the tax reforms we analyze and the data used in the analysis. Section 3 presents aggregate evidence from different time-series and derives implications in terms of identification for the empirical analysis. Section 4 analyzes responses to both reforms at the household level. Section 5 delves into responses observed at the firm level. Section 6 discusses the economic interpretation of our results as well as the public finance implications. Section 7 concludes.

⁴Our results are in line with Jacob and Michaely (2017) who study a Swedish reform that focuses on closely-held firms (whereas our reform applies uniformly across firms).

2 Institutional setting and data sources

In this section, we briefly present dividend taxation in France, how it fits into the personal income taxation system, and the 2013 and 2018 reforms we analyze in this paper. We indicate which parts of French tax registry data we use to precisely track these reforms. A more comprehensive presentation of tax rules and reforms can be found in Appendix A.

2.1 Dividend taxation in France before 2013

Personal income taxation in France. The French income tax, called *Impôt sur le revenu* (IR), is a progressive income tax with joint taxation of members of married couples (or in civil partnership). All types of income should normally be included in the tax base, i.e., wage income, pensions, business income, rents, and other financial incomes. Capital income can however fall into tax-favored or exempted schemes (e.g., tax-favored savings accounts, life insurance, pension saving accounts, etc.). In particular, dividends enjoy a 40% tax rebate. Up to 2012, the tax schedule included four brackets (5.5%, 14%, 30% and 41%), with the top marginal tax rate applying to income above 70,830 euros per tax share.⁵ In 2012, a new tax bracket is introduced at the rate of 45% for income above 150,000 euros per share.

In addition to the income tax, capital incomes are subject to social contributions (CSG and CRDS),⁶ which are flat-rate withholding taxes earmarked to Social Security but providing no individualised benefits. In 2009, these social contributions amounted to 12.1%, and they were increased in steps to 15.5% in 2012. In 2012 an “exceptional contribution on high income”, known by the acronym CEHR, was introduced at the rate of 3% for income above 250,000 euros per adult. The tax base of the CEHR includes all income. Adding social contributions to the income tax, the total marginal tax rate for dividends reached 40.2% for those at the highest income tax bracket (and 44% for those households paying the CEHR).

Optional flat-rate taxation of capital income. Since 1965, France has offered taxpayers the option of a flat-rate withholding tax on some types of capital income, called *prélèvement forfaitaire libératoire* (PFL). From 2008 onwards, dividends were included in the PFL option with a flat-rate of 18%, increased to 19% in 2011 and 21% in 2012. Selecting the PFL option can be done only once a year, before the income is received, and does not remove the mandate to report the income in the tax returns. Simulations show that the PFL option can only be advantageous for households with a very large amount of dividends or taxable income in the top bracket (marginal tax rate of 41% or 45%). Opting for the PFL in 2012 led to a top marginal tax rate on dividends of 36.5% (21% flat-rate

⁵Each household is divided in a given number of tax shares depending on household size and structure.

⁶Respectively the *Contribution sociale généralisée* (CSG) and *Contribution au remboursement de la dette sociale* (CRDS).

and 15.5% social contributions), compared to 40.2% under the default option, for those at the top income tax bracket.

2.2 The 2013 reform: the removal of the flat-tax option

Fulfilling a campaign pledge to remove the preferential tax treatment of capital income, President Hollande's government cancelled the option for dividends to be taxed at the PFL with the 2013 Budget. The reform was thus announced during the presidential campaign in February 2012 and affected capital income earned after January 1, 2013.⁷ Figure 1a presents the evolution of the top marginal tax rate for the income tax and social contributions from 2008 to 2019, comparing the situation if one opts for the flat-rate withholding tax or not.⁸ Before 2013, both tax regimes display a similar increase in rates, while the 2013 reform removes the tax distinction. As a result, households in the top bracket, who used to opt for the PFL, experienced in 2013 a significant increase in their marginal tax rate of 3.7 ppt, from 36.5% to 40.2%.

Concomitant with the abolition of the PFL, an anti-avoidance scheme was introduced in 2013 to subject dividends of majority-owning managers (i.e., managers who also happen to own a majority of the shares of their companies) of limited liability companies (SARL is the French acronym for "*Sociétés à responsabilité limitée avec gérant majoritaire*") to social security contributions. Firms not affected by this anti-avoidance scheme but affected by the main 2013 reform include in majority SAS firms (SAS stands for *Sociétés par actions simplifiées*, i.e., a simplified version of the general limited liability company), as well as few yet large SA firms (SA stands for *Sociétés anonymes*), the legal form which listed firms must take. While our baseline results include SARL firms as they are affected by the removal of the PFL option, we show that all of our results are robust to excluding them from the sample.

2.3 The 2018 reform: re-introduction of a flat-rate tax option

President Macron was elected in 2017 with a markedly pro-business platform aiming to foster private investment. The wealth tax, *impôt sur la fortune* (ISF) is abolished and replaced by a tax on real estate wealth.⁹ The flat-rate taxation of capital income is reinstated in 2018 with the creation of the *prélèvement forfaitaire unique* (PFU) at the rate of 12.8%. Adding social contributions of 17.2% amounts to a total rate of 30%.

This reform is the largest change in dividend taxation since 2010.¹⁰ Figure 1b

⁷While there was an initial hint that it could be applied even retroactively to income earned since 2012, the Constitutional Court censored the retroactivity of the reform in a decision made public on December 29th 2012 (Decision no. 2012-662DC).

⁸In Appendix A, we present changes of marginal tax rates for other income tax brackets, and for the total tax rate on dividends if one incorporates the corporate income tax.

⁹Note that given that the wealth tax did not include business assets in its tax base, it did not affect owner-managers much (see Bach et al., 2023) and is thus likely to have little relevance for explaining aggregate changes in dividend payouts. Bach et al. (2024) show that a subset of wealth tax payers subjected to the ceiling mechanism experience an increase in taxable dividend income, this sub-population accounts for too small a share of overall dividend income to matter much in the aggregate.

¹⁰The anti-avoidance scheme for majority owners of small businesses remained unchanged.

presents the changes in marginal tax rate on dividends around the 2018 reform. The top marginal tax rate fell by 10.2 ppt in 2018, from 40.2% to 30%. The 2018 reform leads to a bigger drop in top marginal tax rates than the 2013 reform, making the flat-rate withholding tax attractive to a much wider number of taxpayers: e.g., taxpayers in the 30% income tax bracket (with taxable income between 27,519 and 73,779 euros per share) also benefit from the flat-rate withholding tax option, albeit with reduced intensity. Compared to the drop of 10.2 ppt for the top marginal tax bracket, households in the 30% income tax bracket experience a drop of 2 ppts, while the 14% income tax bracket sees an increase of 1.5 ppt.¹¹

2.4 Data: administrative tax data matching households to firms

To track the implementation as well as the effect of those tax reforms, this paper relies on a unique source of data, consisting in an exact matching of the universe of individual income tax records to the universe of corporate balance-sheet data, through firms' shareholder information. This is the first time that the French tax authorities have allowed matching these two separate sources of information. We describe in turns each source of data matched while more details on the matching process can be found in [Bach et al. \(2023\)](#).¹² We also provide more details on data sources in [Appendix B](#).

Personal income tax returns (POTE). The French tax authority, the *Direction générale des finances publiques* (DGFIP) at the ministry of finances, produces every year a file called POTE including the complete detail of income tax declarations for each of the 37 million French tax units, i.e., the amount recorded in each of the 3,000 items of the income tax return. We observe income from 2006 to 2021 (i.e., income declared in years 2007 to 2022). DGFIP creates an anonymous unique identifier for each tax unit between years which can therefore be followed over time.

Wealth tax returns (ISF-IFI). The DGFIP also produces a panel from wealth tax returns which can be merged with a common identifier to the income tax returns. Only tax units liable to the wealth tax report their taxable assets—with taxable assets above 1.2 million euros—, providing 350,000 tax units included every year into the panel. Taxable wealth includes all real estate and financial wealth until 2017, and is restricted to real estate wealth from 2018 onward. Taxable wealth excludes professional wealth, i.e., business assets for individuals who play a managerial role in the firm they own.¹³ Some wealth

¹¹The 2018 reform has increased marginal tax rates for lower income group because the flat-rate withholding tax is achieved through two flat-rate taxes, one replacing the standard income tax and another one with social contributions. It is the increase in social contributions from 15.5% to 17.2% which creates this marginal tax increase for lower income groups.

¹²We were granted access from *comité du secret statistique* for household data on June 27th 2019 (M481) and March 6th 2020 (ME1086), and firm data on Oct. 11th 2018 (ME390), Sept 17th 2020 (ME1144) and Dec. 16th 2020 (Point ME1170).

¹³Further details on wealth taxation in France can be found in [Bach et al. \(2021\)](#).

tax items allow us to identify some of the households owning enough shares in a firm to control it (e.g., collective retention commitments for family businesses).

Corporate income tax returns (BIC-RN). The tax data we use corresponds to a matching of three separate files: the tax files of the industrial and commercial profits (BIC-IS, DGFIP); the tax group perimeter files (PERIM, DGFIP) and the file of financial links between group companies (LIFI, DGFIP). The PERIM and LIFI files are used to identify the legal units belonging respectively to a tax group or an economic group. The reforms of interest concern the taxation of individuals. Therefore, it is important to consider companies which are independent and susceptible of paying dividends to individuals. We consider as independent all firms which are not subsidiaries of a fiscal group, and which are not wholly owned by a single legal entity. The BIC-IS file contains a variable related to the dividends distributed for the financial year ended on a given date. We use corporate income information for years 2009 to 2022. Note that balance-sheet data of the firms opting for the simplified regime (the smallest firms) only becomes available in 2010.

Shareholder information. When filing the corporate income tax (CIT) files, firms have the obligation to fill information about each shareholder owning at least 10% of the company's equity.¹⁴ Information for each of these blockholders consist 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. We complement this source with two additional pieces of data containing information on shareholders. First, we use Orbis data (Bureau van Dijk), which compiles information from various sources on the identity of shareholders. It has good coverage for the largest firms, and allows associating natural persons residing in France with French firms owned by foreign vehicles. The second complementary source is a dataset on firms' legal representatives from commercial courts (INPI), and complements shareholder links for the smallest firms. More information on these sources is provided in Appendix B. These data sources are then matched to the personal income tax returns using personal identifying information (name, surname, place and date of birth), and to the corporate balance-sheet data through the firm identifier. Details on the matching procedure and matching rates can be found in [Bach et al. \(2023\)](#).

¹⁴Forms 2059-F for firms filling the detailed CIT returns, and form 2033-F for firms opting for the simplified version.

3 Time-series evidence and implications for the empirical analysis

We provide in this section descriptive evidence of dividend payouts time series. This is useful to get a sense of the potential magnitude of responses to tax reforms, and identifying which types of households and firms might have reacted most strongly has implications for our empirical strategy.

3.1 Aggregate dividend payouts

We start by presenting raw aggregate series of dividend payments in France around the time of both the 2013 tax hike and the 2018 tax cut. Aggregate payout patterns may be suggestive of a causal effect of tax reforms,¹⁵ while analyzing these trends also carries the advantage that one can directly get a sense of the impact of dividend tax reforms on public finances.

Figure 2 represents different aggregate dividend series over the period 2009–2022. Panel (a) shows data from national accounts on dividends received by French households. After the 2013 tax hike, the aggregate series drops by 13.6 billion euros, or 0.6% of GDP, while the aggregate amount of dividends received by households jumped after the 2018 tax cut from 30.6 billion to 40.1 billion euros, an increase of 0.4% of GDP. The increasing trend continues post-Covid and the dividends received by households reached 61 billion euros in 2022, i.e., an increase of around 30 billion euros or 1.3% of GDP with respect to 2017.

Since the tax registry data at our disposal is exhaustive, it is useful to check whether we are able to reproduce dividend patterns observed in national accounts using the tax-registry-based micro-data. In Figure 2b, we use the tax data to identify the aggregate dividend series directly received by French households in the personal income tax returns (blue squares) and those distributed to households by firms according to corporate tax returns (red diamonds). To be as close as possible to the national account series and the personal income tax series, the corporate tax based sample excludes listed firms (which distribute a significant share of their dividends via life insurance products rather than directly to households). Although the aggregate series are smaller than in the national accounts—National accounts include some of the non-taxable dividends, as well as business income subject to the personal income tax—the drop after 2013 and the increase after 2018 are of the same order of magnitude (a year-to-year variation of 9 billion euros, an increase four years after the 2018 reform of around 20 billion euros).

¹⁵Indeed, while dividends are much less correlated to the business cycle than share repurchases (Covas and Den Haan, 2011; Jermann and Quadrini, 2012), in the period of study such share repurchases were of second-order importance compared to dividends in France.

3.2 The distinctive role of closely-held firms and controlling owners

The aggregate picture overall suggests that there are very sharp changes in dividends received by households right after the tax rate on dividends jumps and right after it declines. Since we are able to reproduce those aggregate trends using tax registries, we may now disaggregate these time series so as to have a sense of which groups of firms and which groups of households contributed most to those possibly tax-motivated reversals in aggregate dividend payouts in France.

Contrary to many tax systems¹⁶ which award reduced dividend tax rates when the ownership structure of the paying firm is concentrated enough, in the French case, dividend taxation is blind to the ownership structure of paying firms. As a result, distinguishing the aggregate dividend payout reaction depending on whether the ownership structure is very concentrated or not can be informative on the reactivity of each subgroups. Figure 2c decomposes aggregate dividends distributed by firms according to the number of physical owners recorded in their corporate tax return. It strikingly shows that the bulk of both the level and the variation of aggregate dividends distributed by unlisted firms originate from firms with either one or two owners, while firms with more than ten owners account for a very small share. In Appendix Figure D1, we show that dividends paid out by listed firms are very stable around both reforms. This suggests that controlling owners have a considerable weight on the dividend policy of their firms even when the tax code does not specifically target them, so much so that the aggregate dividend payout reaction to uniform dividend tax reforms appears to be driven by firms with the simplest ownership structures. This echoes the results of [Jacob and Michaely \(2017\)](#) who find higher dividend tax elasticities for firms with a single owner, albeit in the context a reform that is dependent on ownership structure (focused on closely held firms), unlike here.

Equity ownership is very concentrated and one could suspect that behavioral responses to dividend taxation are primarily led by households with the highest level of taxable income and wealth. If that were the case, it could mean in particular that firms exhibiting substantial controlling blocks react more to dividend tax reforms simply because their shareholders are richer. This is why, in Figure 2d, we show yearly aggregate dividends received by households according to whether they are liable to the wealth tax (ISF) and whether they have control over a firm. We can clearly see that owner-managers, whether they are wealth tax payers or not, account for a large share of total dividends, even though they are a small minority of households. What is more, they account for an even larger share of the aggregate evolution of dividend payouts following both reforms, suggesting that it really is the degree of control over a corporation, rather than the level of taxable personal wealth, which determines the sensitivity of dividends received to dividend taxation.

¹⁶Such reduced tax rates for concentrated ownership can be found in Sweden ([Alstadsæter and Jacob, 2016](#)), Norway before 2006 ([Alstadsæter and Fjærli, 2009](#)), and Germany ([Hillmann, 2023](#)).

3.3 Implications for the empirical design

The combination of these facts observed at the household and at the firm levels carry important implications for the empirical design we wish to implement in what follows. Indeed, the potential response margins of controlling owners and of shareholders without control are very different: the former may hardly sell shares but they control the dividend decision of the firms they own; the latter have absolutely no say over the dividend decision, but they may decide at little cost to liquidate dividend-paying stock. This motivates a separate analysis of the responses to tax changes for each group. Moreover, for the group of controlling shareholders, the personal ability to retain corporate earnings within the firm or not means that the marginal tax rate that households faced pre-reform based on the dividends they were paying themselves previously may be poorly predictive of the actual exposure to the tax change induced by the reforms. This may in some instances make it very difficult to identify tax elasticities within this particular group using the initial position in the distribution of (earnings-retention-sensitive) personal income, and may sometimes instead require to use non-controlling owners as a control group, as if the dividend tax reforms were specifically targeting the former group and not the latter.

While the time-series has provided clear descriptive evidence that most of the aggregate dividend response to uniform dividend tax reforms is driven by very specific ownership configurations, the next two sections will address two yet unanswered questions: First, do shareholders with no control over a firm react by reallocating their portfolio away from dividend-paying shares? Second, if controlling shareholders react so strongly to dividend taxation, does that reflect a real response within firms with implications for investment, or instead simply a decision to shift income away from their personal accounts towards the bank accounts of the controlled firms?

4 Household-level responses to dividend tax reforms

In this section we seek to estimate behavioral responses induced by both tax reforms at the household level. We aim here to measure the magnitude of the dividend response as well as the potential driving mechanisms and in particular to disentangle whether they originate from household portfolio reallocations or are linked to firms' decisions. We first present our identification strategy (section 4.1), before turning to the results (section 4.2).

4.1 Empirical approach

For both reforms, we estimate household-level effects through a dynamic difference-in-differences estimation comparing households differentially affected by the changes in tax incentives. A major identification challenge in estimating the dividend response at the household level arises from the fact that pre-reform marginal tax rates are only

partially informative about which households are affected by the reforms—especially for owner-managers who have considerable discretion in determining their firm’s dividend policy (see Section 3.3). We thus leverage the matched household ownership data to take into account the important role played by firm ownership.

Definition of firm ownership status. Using the matched shareholder-firm tax data, we can link each reference shareholder in individual income tax data to the firm in the corporate income tax files that they invested in. We define a household as a *firm owner* if at least one of the members of the tax unit belongs to the matched shareholder-firm dataset. It is important to note that these data only span the 2014-2021 period. Before 2014, we thus cannot identify past firm owners who might have changed status. Conversely, we might label as firm owner a tax unit that was not one at the time. To try to correct our measure of firm control for the 2013 reform, we also label as *firm owners* those households who benefit from wealth tax exemptions or declare income in some specific business income categories, as both of these items highly suggest that these households are firm owners (see more details in Section B.3). Overall, we expect that some classification errors will remain and affect the quality of the results for the analysis of the 2013 reform, while the measurement quality of firm ownership for the 2018 reform should be very high.

Identification strategy. Our identification strategy involves comparing households that are differentially exposed to the flat-tax reforms based on their initial levels of taxable income. Only households in the two upper tax brackets of the progressive income tax schedule, where the statutory marginal tax rate is 41% and 45%, would benefit from opting for the flat-tax and thus be affected by the introduction or the removal of the flat-tax option.¹⁷ To define treatment exposure in a way that does not directly depend on past dividends received, we classify households into tax brackets based not on their total taxable income but based on the sum of their taxable wages, pensions and real estate income. These categories of income tend to be very stable over time, and were not eligible for either of the flat taxes. We refer to this income as “stable income”. Treated households are households who fell at least once in the period pre-reform in the 41% or 45% tax bracket based on their stable income, such that the introduction or the cancellation of the flat-tax option changes the marginal tax rate they face on dividends, while control households never reached the high tax brackets based on stable income pre-reform, such that flat-tax reforms do not change the tax treatment of the dividends they receive. This approach allows us to estimate dividend responses to changes in the net-of-tax rate and thus a dividend elasticity. We perform the analysis separately on

¹⁷For the 2018 reform, since the new flat-tax introduced is lower than the one that existed before 2013, the range of possibly affected households differs. Taxpayers in the medium tax bracket (30% tax bracket) should also, in principle, benefit from the new flat-tax in 2018. The magnitude of the decrease in their marginal tax rate on dividends is however very small (-2 p.p.t). We thus choose to follow the same strategy for 2013 and for 2018 and compare those in the upper tax brackets (41% or 45%) with those in lower tax brackets (30% and below).

the subsample of firm-owners and on the subsample of non firm-owners, in order to capture possibly heterogeneous responses across these groups.

Sample selection. In the following analysis, we restrict the sample to wealth taxpayers, which corresponds roughly to the top 1% of the wealth distribution.¹⁸ Restricting the sample to households with sizable wealth allows us to construct a panel of taxpayers who can potentially receive large dividends. Importantly, while these taxpayers represent less than 5% of all tax units declaring a positive amount of dividends at least once during the period, they represent about half of the aggregate amount of dividends declared. Moreover, the evolution of aggregate dividend receipts during the 2009-2021 period was similar for the group of wealth taxpayers and for the group of non wealth taxpayers (see Figure 2). Our final samples of analysis are two balanced panels of wealth taxpayers for the periods 2019-2017 and 2013-2021. Additionally, we restrict the samples to those who received at least once pre-reform a substantial amount of dividends, namely more than 1,500 euros. Table 1 presents descriptive statistics of the estimation sample for both reforms and for both subsamples of interest, i.e., the non-firm owners (panels a and c) and the firm-owners (panels b and d). By definition, treated households have a larger stable taxable income (such that they belong to the upper tax brackets) than control households. This also implies that the treated group receives, on average, more income and especially more dividends than the control group. However, there is substantial common support across the two groups.

Estimated regression. We estimate a dynamic specification allowing us to gauge the unfolding of the effect over time and to detect potential differential pre-trends prior to the reforms. It writes as follows:

$$Y_{it} = \sum_{\substack{d=d_0-3 \\ d \neq d_0}}^{d_0+4} [\beta_d \cdot \mathbb{1}\{t = d\} \cdot T_i + \mathbf{x}'_i \cdot \mathbb{1}\{t = d\} \cdot \boldsymbol{\delta}_d] + \mu_i + \lambda_t + \varepsilon_{it}, \quad (1)$$

where Y_{it} is the outcome of interest measured for tax unit i at year t , T_i is a variable indicating household i is in the treatment group, $\mathbb{1}_{t=d}$ a variable indicating year equals d , λ_t is a year fixed-effect, μ_i a household fixed-effect, and $\mathbf{x}'_i \cdot \mathbb{1}\{t = d\}$ a set of time-invariant household characteristics set prior to the reform and interacted with year indicators. In all results presented, standard errors are clustered at the household level. In this specification, the β_d coefficient captures the difference between the treatment group and the control group for a given year d relative to the baseline year d_0 (2011 for the 2013 reform, 2016 for the 2018 reform). In our main specification, we control for fractiles of taxable wealth (20 categories), taxpayer's age (20 categories) and number of fiscal shares (4 categories) interacted with year fixed effects.

¹⁸Taxable wealth included both financial and non-financial assets up to 2018, but did not include business assets (i.e., most shares in unlisted companies).

Our main outcome variable is the ratio of dividends to the pre-reform taxable wealth. We also look at this ratio for other types of income, namely non-dividend capital income, wages and pensions. Additionally, for outcomes whose distribution is very skewed to the right (e.g. capital gains), we use the probability of receiving income above a certain threshold as our outcome of interest.

4.2 Results

Figure 3 displays the results of the estimations for two separate subsamples, non firm-owners and firm-owners. We present raw averages (panels a and c) and difference-in-differences estimates (panels b and d) on dividends for the treatment effect associated to belonging to the upper tax brackets pre-reform, following the specification in Equation (1). We present the results for the 2013 reform (tax increase) and for the 2018 tax reform (tax decrease). Treated households are those who face a variation in their marginal tax rate on dividend income because they belong to the upper tax brackets of the progressive income tax schedule (based on their stable income). For non firm-owners, the dividend response to the tax increase in 2013 is negative and significant, representing a 14% cut in dividends.¹⁹ However, these households do not exhibit any significant response to the 2018 tax decrease. For firm owners, we find large responses to both tax reforms as their dividends dropped by 20% in 2013 and increased by 20% in 2018. As discussed above, measurement error on firm ownership for the 2013 reform is likely leading to an overestimation of the non firm-owners' response and to an underestimation of the firm-owners' response. Moreover, raw data show that dividends received by firm-owners assigned to the control group also see important variations around the reforms (although smaller than for the treated group). This suggests that our empirical strategy remains imperfect in assigning treatment exposure and that it leads us to under-estimate the true magnitude of dividend responses among firm-owners. Overall, the empirical results unambiguously show that dividend income is much more sensitive to tax changes among households who do have control over a firm.

Elasticities. To estimate the elasticity of dividend income, we need to adjust our intent-to-treat estimate by the differential change in the marginal tax rate caused by the reform between treated and control groups. To do so, we first simulate the marginal net-of-tax rate of each household in the estimation sample, using information about their income and tax unit size. We use the same definition of income as for the definition of the treatment status (i.e., stable income made of taxable wages, pensions and rental income). Since this measure of tax incentives is endogenous to behavioral income responses, we simulate the evolution of the tax rate keeping income and tax unit size constant at their pre-reform levels, to isolate the mechanical effect of the reforms. Finally, because

¹⁹As shown in panel A, the average dividend over taxable wealth pre-reform of the treated non firm-owners is about 0.08. The estimated treatment effect for this group is -0.0011 in 2013. Therefore, the estimated percentage decrease in dividends is $0.0011/0.08 \simeq 0.14$.

opting for the flat-tax is endogenous to the level of dividends one receives, we assign households to their optimal choice between the flat-tax and the progressive income tax schedule. We then regress the marginal net-of-tax rate of households on their treatment status, using the specification described by Equation 1.

Treated households see a 6% decrease in their net-of-tax rate after the 2013 reform, regardless of their firm ownership status. In 2018, treated non firm owners households see an 8.5% increase and treated firm owners see a 7.5% increase in their net-of-tax rate after the reform. Therefore, firm-owners' dividend tax elasticity is 2.5 in 2018, while that of non firm-owners is insignificantly different from 0. In 2013, when the status of firm owner is not perfectly well measured, the elasticity of firm-owners is 3.2, while that of non firm-owners is 2.4. Because of the measurement error in firm ownership status for the 2013 reform, we consider the results for the 2018 reform as the most informative ones. Households who have control over a firm are thus, as hypothesized, much more sensitive to changes in tax incentives. This result is likely reflecting a heterogeneous capacity in adjusting dividend income to tax reforms (via changing firms' payout policy) rather than heterogeneous preferences across firm owners and non firm owners.

Other income responses. The large dividend responses caused by the tax reforms may be rationalized by portfolio rebalancing responses or income-shifting strategies. If households engage in such behaviors, we should observe a concomitant response, of a similar magnitude but opposite sign, in terms of other incomes received by households. To test this hypothesis, Table 2 presents the result of our estimation of behavioral responses in terms of dividend and non-dividend income. The empirical estimates reported in the table are static diff-in-diffs estimates that compare all post-reform periods to all pre-reform periods. We show both the effects in the short-run (focusing on the first two years post-reform) and the overall effect (using the five post-reform years we observe).

In Panel A, we estimate behavioral responses in terms of dividends, other non-dividend capital income and capital gains. We use the same estimation strategy as the one described above and focus on the subsample of firm-owners as our estimation has shown that the bulk of the dividend responses emanates from this population. In line with our dynamic estimates presented before, dividend income responses are large and significant around both reforms for firm-owners. Looking at the estimates for other capital income (which includes mostly fixed interest income), we find no evidence that households substituted away from dividend toward non-dividend capital income. The estimated response for this category of income is not significantly different from zero in 2013, and is small and has the same sign as the dividend response in 2018. We can therefore reject the portfolio reallocation hypothesis. Our evidence suggests instead that households responded to the 2018 global capital income tax cut by increasing dividends as well as other non-dividend capital income. Another possible strategy for households is to sell their stocks and thus substitute dividend income with capital gains income,

which are typically taxed at a lower rate than dividends under the progressive income tax schedule. Because capital gains are lumpy by nature²⁰, we present distributional regressions for this outcome, studying the probability that they exceed various thresholds.²¹ Following the 2013 tax hike, the probability of receiving a large amount of capital gains increased, which could suggest that households strategically sold some assets to receive income in terms of capital gains rather than dividends. The magnitude of the effect is however four times smaller for capital gains than for dividends. For the 2018 tax cut, we also observe a *positive* response in terms of capital gains, i.e., a response of the same sign as dividends which rejects the hypothesis that households engaged in substitution strategies between capital gains and dividend income.

Finally, in panel B, we also test for the possibility that households engage in an income-shifting strategy, substituting labor and capital income.²² To estimate labor income responses, we cannot use our main empirical strategy comparing households in upper tax brackets with households in lower tax brackets, as labor income is used to define the treatment (see Section 4.1). Since most of the dividend responses come from firm-owners, we instead test for the income-shifting strategy by comparing directly firm-owners and non firm-owners response in terms of labor income. In 2013, we detect only a small and weakly statistically significant labor income response. In 2018, we find a significant labor income response, though still much smaller than the dividend response and that only starts in 2019 as shown by Figure D5.²³ Given the small magnitude of the response in terms of other income and its delayed timing, income shifting from wage to dividend income can, at best, only partially explain the observed dividend response. Overall, our results reject the hypothesis that the household-level responses purely reflect a portfolio reallocation or an income-shifting strategy.

Dividend responses by firm-owner status. We now present results comparing households who could react directly to the dividend tax reforms by adjusting the dividend policies of the firm they control to other households who could not, because they were not firm owners. Figure D2 presents the difference-in-differences estimates for the tax hike (Panel A) and the tax cut (Panel B). To ensure that this comparison is not merely reflecting a difference in composition of these two groups (especially a difference in terms of income and thus of exposure to the reform), we restrict the sample to households in the top 1% of the stable taxable income distribution pre-reform. This threshold is high

²⁰As shown in Table 1, the median amount of capital gains in all of our sample is zero, while their distribution is highly skewed, such that only a small share of households receive a positive amount of net capital gains in a given year.

²¹For simplicity, we present the results using a threshold of 100,000 euros in Table 1. Results are robust to using other thresholds (see Figure D4).

²²Note however that during this time period, labor income in France was always taxed at a higher rate when accounting for non-contributory social contributions (see Appendix A).

²³In 2019, France moved to a withholding tax which meant that in 2019, taxes were paid on 2019 income instead of 2018 income. This created incentives for intertemporal income shifting as 2018 incomes were *de facto* not taxed. To avoid this, an anti-avoidance scheme was introduced (see Appendix A for more details). This scheme can explain why wages could not react in 2018.

enough to guarantee that all households in the sample belong to the upper tax brackets and are thus affected by the flat-tax reform. Accordingly, divergences between the two groups after the reform are likely to reflect a differential in tax sensitivities as opposed to a differential degree of exposure to the reforms.

The results do show significant pre-trends for the 2013 reform, as the firm owners were before the reform on an upward trend in terms of dividend receipts. We observe nevertheless a very sharp drop in dividends received by firm owners that is very large compared to the other households and coincides with the timing of the reform. We estimate that top 1% households who are firm owners reduced their dividends by 28% compared to those without control over a firm. For the 2018 reform, there are no differential pre-trends as both groups had a relatively flat trend in dividend receipts. Our estimate points to a positive dividend response of 33% of pre-reform level.

Taken together, our results provide direct evidence that the behavioral responses to dividend tax changes are concentrated within the group of households who have ownership and control of a dividend-paying firm. In this specific group of the population, the elasticity of dividend income with respect to the net-of-tax rate is around 2.5. These large responses are not explained by a change in the composition of households' income as we observe some responses of other capital income and wages but of a much smaller magnitude than that of dividends. To understand what underlies these changes, one therefore needs to turn to firms' accounts and track movements concomitant to responses of firms' dividend policies.

5 Firm-level responses to dividend tax reforms

Given the first-order role of firms' owner-managers in explaining the massive changes in dividends received by households following both tax reforms, we naturally turn to firm-level responses to develop a better understanding of how these cuts and rises in dividend payments translate into firms' accounts. In particular, we want to disentangle real responses, which would primarily consist of changes in firms' investment, from shifting responses, which would affect reported income or lead to changes in firms' savings.

5.1 Empirical approach

Treatment and control groups. Since the reforms we analyze concern the taxation of natural persons, the exposure of firms to tax changes depends on their ownership structure at the time of the reform. Using the registry linking firms to their main owners and their personal income and wealth situations, we are able to classify firms as exposed or not the reform depending on the personal fiscal situation of its main owners.²⁴

²⁴In the spirit of [Jacob and Michaely \(2017\)](#) who measure precisely, like us, the tax status of each shareholders.

The choice of our control group deserves a thorough discussion, since several groups of firms are potentially unaffected by the reform. For instance, French listed companies have little sensitivity to the French personal income tax on dividends in their distribution policy, and as such constitute an interesting control group with respect to the dividend payment policy (see appendix Figure D1). However, their very large size makes them potentially less comparable to the treatment group in terms of real variables such as investment. In contrast, companies owned largely by legal entities constitute a particularly interesting control group, insofar as they are numerous and of varying sizes, but a priori not directly or indirectly affected by the personal income tax reform, provided that the personal owners together control only a minority of the share capital.

We build our treatment and control groups in the following way. We select all legal units with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights each), at least one of which liable to the personal wealth tax, as our treatment group. The wealth tax liability restriction makes it much more likely that the corporation's decisions will be taken with the view of maximizing the welfare of individual shareholders likely benefiting from the wealth tax, consistently with our estimations at the households level. Conversely, we include in our control group all legal units without an individual with substantial control (i.e., more than 10% direct or indirect ownership). We further require that firms in our control group are not fiscal subsidiaries nor owned by a single legal entity, in order to avoid mechanical transfers of profits as dividends to the parent company. These restrictions ensure that, in the event of a joint filing of their corporate tax along with other legal units in the same business group, only the business group's parent company will be included.

Note that we do not consolidate accounting outcomes across the entire downstream spectrum of each business group. This approach indeed makes it easier to trace the distribution of dividends to ultimate individual owners, which can only happen at parent-level. One important consequence of this choice is that the relevant size metric will be the company's assets rather than its employment level (most of which may be located in subsidiaries).²⁵ Another implication of this approach is that we include as investments not only investments in tangible and intangible assets within the parent company but also equity injections made by the parent company into subsidiaries, therefore reflecting downstream investments.

Assessing the channels: an accounting-based decomposition. Standard models of dividend taxation consider solely investment, dividend and equity issuance responses and abstract away from other margins of adjustment, such as cash or debt. In practice however, most firms hold some debt (for instance) and it is accordingly important to account for these potential responses when interpreting corporate responses to dividend

²⁵We however present summary statistics on the consolidated level of employment of these companies, so as to give an alternative reliable size metric.

taxation. To track the corporate responses implemented together with the change in dividend payments, we construct an accounting decomposition to assess which elements were affected as a consequence of the tax reform. Thus, denoting t the reference year and $\Delta_{t-1,t}$ the yearly changes between $t - 1$ and t , this decomposition writes:

$$\text{Dividends}_t = C_t - I_t - S_t. \quad (2)$$

The elements of this decomposition are defined as follows. After-tax income (C_t) includes profits net of corporate taxes, representing total profits considered by the tax code available to the company's owners, net of the corporate tax payment. I_t denotes capital expenditures, i.e., investment in tangible and intangible fixed assets, as well as financial investment, which reflects downstream tangible or intangible investment in parent companies' accounts. Finally S_t is what is left of profits after corporate tax is paid, dividends are paid out and capital expenditures are made, i.e., the increase in cash holdings less the increase in external financing. The sum of S_t and I_t is equal to retained earnings so we refer to S_t as uninvested retained earnings.

To estimate the elements of the accounting-based decomposition, we estimate a difference-in-differences which allows us to summarize more concisely the several margins of adjustment firms might resort to in response to a change in dividend taxation. It writes as follows:

$$Y_{it} = \beta \times \mathbb{1}\{t \geq 2013\} \times T_i + \mathbf{x}'_i \boldsymbol{\delta}_t + \mu_i + \lambda_t + \varepsilon_{it}, \quad (3)$$

where notation is the same as in Equation (1) except that now i refers to firms instead of households.²⁶

We scale the variables in the decomposition by firms' assets normalized two years prior to the reform (that is, 2011 for the PFL/2013 reform, and 2016 for the PFU/2018 reform) and then winsorize ratios in the following way: we replace strictly positive values above the 99th percentile of the distribution of non-zero values, and similarly replace all strictly negative values below the 1st percentile of the distribution of non-zero values. This method posits that zeros are not candidates for being outliers. It avoids winsorizing in very different ways variables with different shares of zeros.²⁷ Moreover, because the ownership at the individual level is measured in 2016, hence at the end of the study period for reform 2013, we balance the sample of firms for the analysis of this reform. For the 2018 reform, we need not make such restriction, and only impose that firms are observed at least once before and once after the reform, thus making sure that they contribute to the estimation of our coefficients of interest. An important point to note is that we use firms' accounts from both the normal and the simplified CIT regimes:

²⁶We also estimate dynamic versions, as in Equation (1), where year-specific β coefficients are obtained, normalizing to zero the coefficient corresponding to the reference year (2011 or 2016 depending on the reform we analyze).

²⁷This is mostly useful to obtain summable point estimates in the accounting decomposition, when our main variable—dividends—takes value 0 for more than half of the observations.

since the latter became available from 2010 onward, the coefficients associated to year 2009 are shown in the graphs for transparency, but this year is not included in the static diff-in-diff estimation to avoid the sample change to bias our results.

Descriptive statistics. We run our analyses separately on two distinct samples of firm observations, one for the 2013 reform and the other for the 2018 reform. Table 3 provides descriptive statistics for each sample, each time for observations belonging to the treated group alongside those belonging to the control group, measured in the penultimate observable year before the reform for each corporation. The number of firms in the 2018 sample is substantially larger than in the 2013 sample, in part because our ownership registry data de facto restricts the analysis of the 2013 reform to companies with ownership still being reported to tax authorities by 2016. There is imbalance in firm size across our groups: control firms have around 3 times more gross assets at the median in the 2013 sample and 2.5 times more in the 2018 sample. Nevertheless, for both reforms and in both groups firms' median age is around 12 years old just prior to the reform, which suggests that on this key dimension of dividend policy which is corporate maturity the two groups are alike, and not so old that investment opportunities would be limited in nature. Figures D6 and D7 displayed in Appendix D also show that the industry distribution is similar across groups and representative of the overall firm population, and that the investment rate in our estimation sample is also close to the firm population average. On all the outcome variables we consider, there are important differences in averages but also substantial common support along the distribution. This means the credibility of our diff-in-diff design is strong provided one carefully assesses the behavior of key outcomes prior to the reforms in the treatment and control group.

5.2 Results

Dividend policy. We first present regression results using yearly dividends scaled by assets two years prior to the reform as our dependent variable, consistently with the variable we later use in the accounting decomposition. Figure 4 plots both the raw yearly averages by group and the yearly coefficients and 95% confidence intervals of the dynamic differences-in-differences estimates. Panels (a) and (c) represent the evolution of raw outcomes for treated and control groups around each reform. Panels (b) and (d) present the DiD estimates of the impact of the PFL/2013 tax hike and the PFU/2018 tax cut, respectively. As expected, the effects of each reform have opposite signs. The co-evolution of dividends in the two groups is usually smooth before each reform²⁸ and very quickly reacts to the reform. The 2013 reform led to a decrease in dividends by 1 percentage point of assets, while the 2018 reform led to an increase by 1 percentage point of assets. Given the average dividend to assets ratios in the treated group according to our descriptive statistics, this corresponds to a -25% decrease in 2013 and a +38%

²⁸There is a slight anticipation effect in 2012, leading treated firms to temporarily distribute more dividends in year 2012 as they expect the favorable tax regime not to last.

increase in 2018. Given that the net-of-tax rate on dividends declined by 6% in 2013 and increased by 16% in 2018, this corresponds to an elasticity of 4.2 for the hike versus 2.8 for the tax cut.

Investment responses. Turning to investment, we present regression results using yearly investment scaled by assets two years prior to the reform as our dependent variable. Figure 5 plots yearly coefficients and 95% confidence intervals of the dynamic differences-in-differences estimates. Panels (b) and (d) present the impact of the PFL/2013 reform and the PFU/2018 reform respectively. Panels (a) to (c) represent the evolution of raw outcomes for each group over the period around the corresponding reform. To relate the magnitude of the effect with the underlying distribution of investment, we follow Yagan (2015) and use a scale going from -0.25 to +0.25 standard deviations of the variable. We do not detect any significant (either statistically or economically) investment reaction to the dividend tax hike in 2013 nor to the dividend tax cut in 2018. Our results are therefore in line with those found on the 2003 US reform (Yagan, 2015) and the 2006 Swedish reform (Alstadsæter et al., 2017), with no impact of dividend tax reforms on investment found in either case.

Accounting decomposition. We now delve into the adjustments made by firms jointly with their dividend policy response. Table 4 presents the coefficient associated with a variable ‘Treatment \times Post-reform period’ in equation (3) of each of the variables of the accounting breakdown presented in equation (2), for each reform and differentiating the effect in the short-run, versus the medium-run versus the entire post-reform period.²⁹ The table confirms the previous findings. Following the 2013 tax hike, corporate investment did not react so the margin of adjustment is initially via increased corporate savings, followed over time by a reduction in profits. Following the 2018 tax cut, the entire reaction comes from reduced corporate savings.

To check that the main margins of reaction we observe in the static difference in differences do not show differential pre-trends and study how the effect unfolds over time, we plot jointly the coefficients of a dynamics DiD in Appendix Figure D12.³⁰ We see that following the tax hike, treated companies first react by retaining earnings (but not reinvesting them), but as years go by their profits gradually decline. By the end of the period, most of the dividend drop is compensated by a drop in profits rather than an increase in retained earnings. Following the tax cut, treated companies react entirely

²⁹Incidentally, this table allows checking the validity of the accounting breakdown presented above: the sum of the coefficients associated with each of the decomposition variables (combined with the sign associated with each variable in the decomposition) should be equal to (or at least close to) the coefficient associated with the dividends paid. They may not fully correspond due to the impact of winsorizing each of the decomposition outcomes separately.

³⁰This shows the joint reaction of dividends, profits and retained earnings (investment plus uninvested retained earnings) over time in the treated group compared with the control group for the 2013 reform (as both profits and retained earnings seem to react), and the joint reaction of dividends and retained earnings for the 2018 reform (as the whole reaction seems to originate from retained earnings).

by reducing retained earnings and we do not detect a clear pattern of a simultaneous increase in profits.

These results suggest two main margins of adjustment for firms as they cut their dividends. First, firm owners use corporate saving as a way to shift intertemporally the income they receive. Foregone dividends are stashed in firms' cash balance, and can be distributed either in the form of tax-favored donations and capital gains or once dividend taxes go down again. The decrease in profits following the tax hike points to an additional reaction margin: firm owners either reduced productive but not capitalizable investments or they shifted part of their consumption expenses to their firm, thus leading to lower profits. This is difficult to document further with the data at our disposal because consumption at the benefit of the owner is by design indistinguishable from regular corporate expenses, which correlate a lot with the firm's activity, and is precisely why it is also difficult for tax authorities to track. [Alstadsæter et al. \(2014\)](#) find a similar pattern among closely-held firms in Norway, and also put forward the hypothesis that firm owners are using their firm at their personal benefit. [Leite \(2023\)](#) shows that consumption through the firm by entrepreneurs is a widespread and large phenomenon in Portugal. We do not observe profits going up again after the 2018 reform, which suggests a permanent change of behavior from these entrepreneurs, in which consumption through the firm could have become a long-term substitute to dividends.

In order to assess the quantitative importance of these two adjustment margins, we estimate a size-weighted version of the regression presented in [Table 4](#). Weighted regressions capture an asset-weighted average treatment effect, and accordingly the corresponding estimates can be more readily mapped into aggregate or fiscal outcomes. The results are presented in [Table 5](#), and show fairly similar effects on payout policies for both reforms as for the unweighted version. An important result however is that the effect on after-tax income becomes insignificant and the point estimates are close to zero. These results are consistent with the fact that small firms were driving the negative effect on taxable income found in the unweighted analysis of the 2013 reform. Overall they suggest that, while potentially common among firm owners, the reduction in after-tax income in response to the dividend tax hike is unlikely to matter much in terms of aggregate outcomes, such as the allocation of capital or fiscal revenues, while changes in corporate savings appear to be much more quantitatively important.³¹

Mediating role of internal financing constraints. The evidence so far suggests that dividend payout responses to dividend tax changes are largely offset by internal cash holdings movements. However, this mapping between dividends and corporate cash holdings may only work inasmuch as treated firms naturally keep some slack on their cash balance. Many firms do not benefit from such slack: every single euro of free cash flow may serve an operational purpose and for this reason carry a much greater

³¹Dynamic coefficients for relevant margins of adjustment when weighting by assets are presented in [Appendix Figure D13](#).

marginal benefit being reinvested in real operations of the firm regardless of taxes. The cash balance of these firms is kept at a minimum and should therefore react much less to dividend taxation. They may reduce their dividends but only in the medium to long-run, because their cost of external equity capital has suddenly increased and they invest less in profitable projects. This suggests one should test whether firms with structurally low cash balances react to dividend tax reforms differently from firms with structurally high cash balances.

There are empirical challenges to the design of such an heterogeneity test. One is that the cash balance of a firm may simply reflect the idiosyncrasy of its own recent performance. As a result, the fortunes of individual firms with high cash balances just prior to the reforms are likely to trend upward on the pre-reform period, and then to revert to the mean. Our approach is to define the intensity of the slack in corporate cash balances at the level of each 4-digit industry prior to each reform. We distinguish “cash-rich” firms as those whose industry-level cash-to-assets ratio prior to the reform is above the top quartile of the cross-sectional distribution of that sectoral ratio, and “cash-poor” firms as those whose industry-level cash-to-assets ratio prior to the reform is below the bottom quartile of the cross-sectional distribution.

The results are displayed in Table 6. There is a dividend response to tax reforms in both cash-rich and cash-poor firms, but it is more than three times larger in the former than in the latter. This is consistent with the idea that it is much easier for firms to readjust their liquidity management following dividend tax reforms when their cash constraint is initially slack. Going further, there is a negative net income response following the 2013 tax increase only among cash-rich firms, which can better afford to consume their liquidity within the firm. One potential, and more costly, reaction to dividend tax reforms for cash-poor firms is to readjust their real investments. However, the evidence does not go in this direction: there is no significant negative reaction of investment to a dividend tax hike in that specific group of firms. One reason their investment may not react to an apparent increase in the external cost of capital is that they potentially suffer from limited access to external finance at the same time that their level of internal financial slack is limited.

6 Discussion

6.1 Economic interpretation

To rationalize firms’ behavior with respect to dividend taxation, many theories have been put forward (see for a survey [Farre-Mensa et al., 2014](#)), which differ in their prediction of the impact of dividend taxation on dividend payouts and investment. In this section, we discuss our results in light of these theories.

Signaling or agency models. Both signaling (e.g., [Bernheim and Wantz, 1995](#); [Gordon and Dietz, 2008](#)) and agency (e.g., [Chetty and Saez, 2010](#)) models rely on a distinction

between managers' interest and external shareholders. In these models, dividend payouts are set so as to send a signal about the firm's profitability or to reduce options for managers to engage in wasteful investments. However, this is expected to happen in large public companies or among private firms with fairly dispersed ownership. We find instead that the corporate response to the two reforms we study is driven primarily by private firms with concentrated ownership and that among them, firms with few shareholders appear to respond more strongly to the reform (see Figure 2c). Given our estimating sample is overwhelmingly composed of private firms—as in (Yagan, 2015)—, agency models seem unlikely to play a major role in explaining our findings.

Traditional view vs “new view”. Like others (e.g., Yagan, 2015; Alstadsæter et al., 2017), we rule out even modest investment responses to the changes in dividend taxes among the firms that account for the bulk of investment, which is at odds with predictions of “traditional” neoclassical models where firms finance investment out of newly issued equity (Poterba and Summers, 1985).

This weak investment response is however consistent with the “new view” (King, 1977), which considers a neoclassical firm financing investment out of retained earnings. In this setting, the relative cost of investment across periods is unaffected by permanent changes in dividend taxes. The new view may not be fully compatible with our results in that it predicts no response of dividend payouts to *permanent changes* in dividend taxes, while we find substantial effects on dividend payments, both at extensive and intensive margins. However, under that view, a *temporary increase* in the dividend tax rate can cause dividend payments to decline without affecting incentives to invest, if investments are expected to pay off after the policy reversal. Our results point to adjustments in corporate net savings which are consistent with inter-temporal shifting (see Table 4) by agents expecting a policy reversal (Korinek and Stiglitz, 2009).³² Nevertheless, it remains unclear why the French reform of 2013 would have been considered temporary rather than permanent: this reform did not come with any sunset clauses and it was simply reverting to a dividend taxation system which had been in place for four decades prior to 2008. This is why we present below a simple amendment to the standard theory which allows to rationalize our results without relying on the change being perceived as temporary.

Change in the cost of capital vs change in relative payout taxation. Our results could indeed be consistent with an alternative explanation, which is that dividend taxation may not affect the cost of capital, but only the relative taxation of alternative ways of liquidating an investment. We present a formal model making this point in Appendix C. We start from a standard neoclassical framework of investment and payout policy and add the possibility for managers to compensate owners through perks (Gordon and

³²Several papers have emphasized that each view might apply to different firm types (Alstadsæter et al., 2017), or different stages of the firm's life cycle (Sinn, 1991), and a decrease in payout taxes may decrease the investment rate of large, mature and cash-rich firms relative to smaller, younger, equity-dependent firms (Becker et al., 2013).

Slemrod, 2000; Sarada, 2011; Leite, 2023) or by saving through the firm in tax advantaged vehicles. To the extent that such consumption or saving through the firm is a close substitute to dividend-funded consumption/savings, dividends are expected to be extremely reactive to taxes. For a class of cash-rich (new-view) firms, we show that, under a set of plausible conditions, if perks are used and dividends remain the marginal payout mode, dividend tax hikes will generate large changes in dividend payouts. These changes are however unrelated to investment decisions. The dividend tax does not enter the cost of capital, thus leaving the investment policy insensitive to changes in dividend taxes. Instead, while total payout is fixed (like under the new view), the share of payout paid through dividends goes down. The simple extension to the neoclassical model therefore allows us to rationalize easily our results, in a sample of firms where prevailing theories relying on agency costs (Gordon and Dietz, 2008; Chetty and Saez, 2010) appear unlikely to be relevant.

6.2 Implications for fiscal revenues

Our results point to tax elasticities of dividends way in excess of 1 for both reforms. This implies that the tax hike actually increased fiscal revenues, while the tax cut decreased them. Naturally, the overall impact of tax reforms on fiscal revenues will depend on how strong fiscal externalities are.

The main fiscal externality in our setting is that dividends are paid in part at the expense of future capital gains. In that context, short-run revenue implications may be different from long-run ones, and it could take years if not decades before we can measure the comprehensive effect of the two reforms on tax revenues. However, future capital gains are closely related to net corporate saving, which we measure in our decomposition exercise. Table 4 shows that the 2013 reform boosted corporate saving and that the 2018 reform reduced it. Given that the rate at which capital gains are taxed is significantly lower than dividend taxes, the fiscal externality of dividend taxation is by construction lower than its direct effect on dividend tax revenue *keeping all tax rates as they were before the reforms*. The fiscal externality may however be big enough to make the negative (resp. positive) revenue impact of behavioral responses to the 2013 tax increase (resp. 2018 tax decrease) smaller than the positive (resp. negative) impact of the rate increase (resp. decrease) taking all tax bases as given. As a result, the 2013 reform has certainly decreased dividend tax revenues but it may still have increased overall tax revenue in present value terms via increased capital gains tax revenue.

7 Conclusion

This paper uses newly-accessible tax registry data on French firms, households, and firm ownership linkages to shed new light on the old question of whether and how dividends react to changes in tax rates. We exploit two reforms which affected dividend tax rates: one tax hike which occurred in 2013, and a tax cut implemented in 2018. At the

household level, we compute a large tax elasticity of dividends and show that this large elasticity stems from individuals having direct control over the dividend payout policy of firms they own. With firm data, we confirm that firms owned by individuals have reacted by cutting dividend payouts when taxes increased, increased financial assets but did not respond in terms of investment in fixed assets. After the tax decrease, payouts revert to their initial level, financial assets within firms decrease, and investment remains unaffected. In both tax reforms, we find strong evidence that owner-managers are driving the very large dividend tax elasticity, effectively using their firm as tax shelter from personal taxation.

References

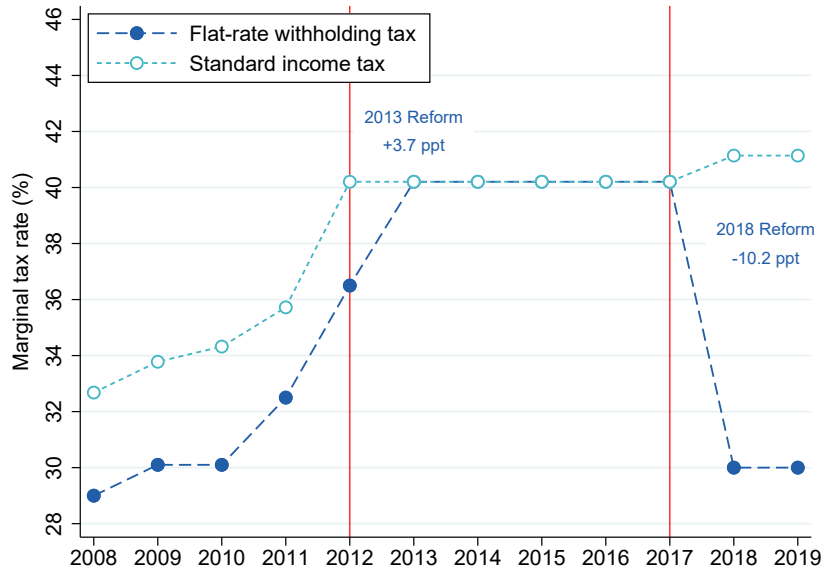
- Aghion, Philippe, Vlad Ciornohuz, Maxime Gravouelle, and Stefanie Stantcheva, "Reforms and Dynamics of Income: Evidence Using New Panel Data," *Working Paper*, 2023.
- Alstadsæter, Annette and Erik Fjærli, "Neutral taxation of shareholder income? Corporate responses to an announced dividend tax," *International Tax and Public Finance*, 2009, 16, 571–604.
- and Martin Jacob, "Dividend Taxes and Income Shifting," *The Scandinavian Journal of Economics*, 2016, 118 (4), 693–717.
- , – , and Roni Michaely, "Do dividend taxes affect corporate investment?," *Journal of Public Economics*, 2017, 151, 74–83.
- , – , Wojciech Kopczuk, and Kjetil Telle, "Accounting for business income in measuring top income shares: Integrated accrual approach using individual and firm data from Norway," Technical Report, National Bureau of Economic Research 2023.
- , Wojciech Kopczuk, and Kjetil Telle, "Are Closely Held Firms Tax Shelters?," in Jeffrey R. Brown, ed., *Tax Policy and the Economy*, university of chicago press ed., Vol. 28 2014, pp. 1–32.
- Auerbach, Alan J., "Wealth Maximization and the Cost of Capital," *The Quarterly Journal of Economics*, 1979, 93 (3), 433–446. Publisher: Oxford University Press.
- , "Taxation and Corporate Financial Policy," in Alan Auerbach and Martin Feldstein, eds., *Handbook of Public Economics*, Vol. 3 2002, pp. 1251–1292.
- Bach, Laurent, Antoine Bozio, Arthur Guillouzoic, and Clément Malgouyres, "Évaluer les effets de l'impôt sur la fortune et de sa suppression sur le tissu productif," Rapport IPP n°36, Institut des politiques publiques 2021.
- , – , – , and Clément Malgouyres, "Do Billionaires Pay Taxes?," *PSE working paper*, 2023.
- , Arthur Guillouzoic, and Clément Malgouyres, "Taxing Wealth in the Presence of Liquidity Constraints: Evidence from France," *PSE working paper*, 2024.
- Becker, Bo, Marcus Jacob, and Martin Jacob, "Payout taxes and the allocation of investment," *Journal of Financial Economics*, 2013, 107 (1), 1–24.
- Bernheim, B Douglas and Adam Wantz, "A Tax-Based Test of the Dividend Signaling Hypothesis," *American Economic Review*, 1995, 85 (3), 532–51.
- Bilicka, Katarzyna A, Irem Guceri, and Evangelos Koumanakos, "Dividend taxation and firm performance with heterogeneous payout responses," *American Economic Journal: Economic Policy* (forthcoming), 2024.
- Chetty, Raj and Emmanuel Saez, "Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut," *The Quarterly Journal of Economics*, 2005, 120 (3), 791–833.
- and – , "Dividend and Corporate Taxation in an Agency Model of the Firm," *American Economic Journal: Economic Policy*, 2010, 2 (3), 1–31.
- Covas, Francisco and Wouter J. Den Haan, "The cyclical behavior of debt and equity finance," *American economic review*, 2011, 101 (2), 877–899.
- Farre-Mensa, Joan, Roni Michaely, and Martin Schmalz, "Payout policy," *Annu. Rev. Financ. Econ.*, 2014, 6 (1), 75–134.

- Goolsbee, Austan**, "Investment Tax Incentives, Prices, and the Supply of Capital Goods," *The Quarterly Journal of Economics*, 1998, 113 (1), 121–148.
- Gordon, Roger and Joel Slemrod**, "Are "Real" Responses to Taxes Simply Income Shifting Between Corporate and Personal Tax Bases?," in Joel Slemrod, ed., *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*, russell sage foundation ed. 2000, pp. 240–280.
- **and Martin Dietz**, "Dividends and Taxes," *Institutional Foundations of Public Finance: Economic and Legal Perspectives*, 2008, p. 204.
- Guillot, Malka**, "Tax Incidence Among the Working Superrich. Evidence From the French 75% Tax on Millionaires," 2019. mimeo ETH Zürich.
- Harju, Jarkko and Tuomas Matikka**, "The elasticity of taxable income and income-shifting: what is "real" and what is not?," *International Tax and Public Finance*, August 2016, 23 (4), 640–669.
- Hillmann, Lisa**, "Dividend taxation and the ownership structure of private firms," *Journal of Corporate Finance*, 2023, 79, 102380.
- House, Christopher L. and Matthew D. Shapiro**, "Temporary Investment Tax Incentives: Theory with Evidence from Bonus Depreciation," *The American Economic Review*, 2008, 98 (3), 737–768.
- Jacob, Martin and Roni Michaely**, "Taxation and dividend policy: the muting effect of agency issues and shareholder conflicts," *The Review of Financial Studies*, 2017, 30 (9), 3176–3222.
- Jermann, Urban and Vincenzo Quadrini**, "Macroeconomic effects of financial shocks," *American Economic Review*, 2012, 102 (1), 238–271.
- King, Mervyn**, *Public Policy and the Corporation*, London: Chapman, Hall, 1977.
- Kopczuk, Wojciech and Eric Zwick**, "Business Incomes at the Top," *Journal of Economic Perspectives*, 2020, 34 (4), 25.
- Korinek, Anton and Joseph E. Stiglitz**, "Dividend taxation and intertemporal tax arbitrage," *Journal of Public Economics*, 2009, 93 (1-2), 142–159.
- Lefebvre, Marie-Noëlle, Etienne Lehmann, and Michaël Sicsic**, "Estimating the Laffer Tax Rate on Capital Income: Cross-Base Responses Matter!," *Scandinavian Journal of Economics*, 2024. forthcoming.
- Lefebvre, Marie-Noëlle, Etienne Lehmann, Michaël Sicsic, and Eddy Zanoutene**, "Évaluation de la mise au barème des revenus du capital," TEPP Research Report 2020-04, TEPP 2020.
- Leite, David**, "The Firm as Tax Shelter: Using Business Resources for Final Consumption," *PSE working papers*, 2023.
- Maffini, Giorgia, Jing Xing, and Michael P. Devereux**, "The Impact of Investment Incentives: Evidence from UK Corporation Tax Returns," *American Economic Journal: Economic Policy*, 2019, 11 (3), 361–389.
- Miller, Helen, Thomas Pope, and Kate Smith**, "Intertemporal Income Shifting and the Taxation of Business Owner-Managers," *The Review of Economics and Statistics*, 2024, 106 (1), 184–201.
- Moon, Terry S.**, "Capital Gains Taxes and Real Corporate Investment: Evidence from Korea," *American Economic Review*, August 2022, 112 (8), 2669–2700.

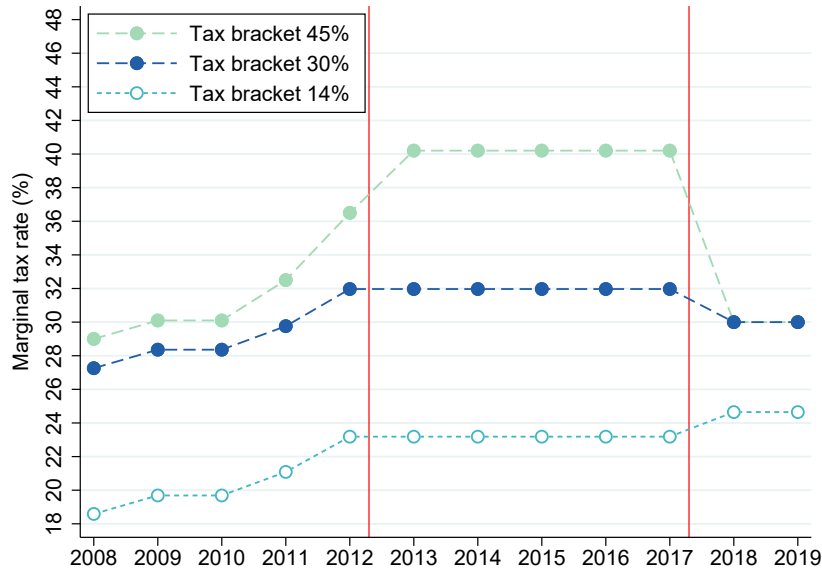
- Ohrn, Eric**, "The effect of corporate taxation on investment and financial policy: evidence from the DPAD," *American Economic Journal: Economic Policy*, 2018, 10 (2), 272–301.
- Pirttilä, Jukka and Håkan Selin**, "Income Shifting within a Dual Income Tax System: Evidence from the Finnish Tax Reform of 1993," *The Scandinavian Journal of Economics*, 2011, 113 (1), 120–144.
- Poterba, James**, "Taxation and corporate payout policy," *American Economic Review*, 2004, 94 (2), 171–175.
- **and Lawrence H Summers**, "The Economic Effects of Dividend Taxation," in Edward Altman and Marti Subrahmanyam, eds., *Recent Advances in Corporate Finance*, Richard D. Irwin Publishers, 1985, pp. 227–284.
- Poterba, James M**, "Tax policy and corporate saving," *Brookings Papers on Economic Activity*, 1987, 1987 (2), 455–515.
- Sarada, Sarada**, "Essays in Entrepreneurship." PhD dissertation, UC San Diego 2011.
- Sinn, Hans-Werner**, "Taxation and the cost of capital: The " old" view, the " new" view, and another view," *Tax policy and the economy*, 1991, 5, 25–54.
- Sørensen, Peter Birch**, "From the global income tax to the dual income tax: Recent tax reforms in the Nordic countries," *International Tax and Public Finance*, February 1994, 1 (1), 57–79.
- Yagan, Danny**, "Capital tax reform and the real economy: The effects of the 2003 dividend tax cut," *American Economic Review*, 2015, 105 (12), 3531–63.
- Zwick, Eric and James Mahon**, "Tax Policy and Heterogeneous Investment Behavior," *American Economic Review*, January 2017, 107 (1), 217–248.

Figure 1: Top marginal tax rates on dividends (2008–2019)

(a) Top marginal income tax (45%) vs flat-rate withholding tax



(b) Lowest marginal tax rate for income tax brackets 45%, 30% and 14%

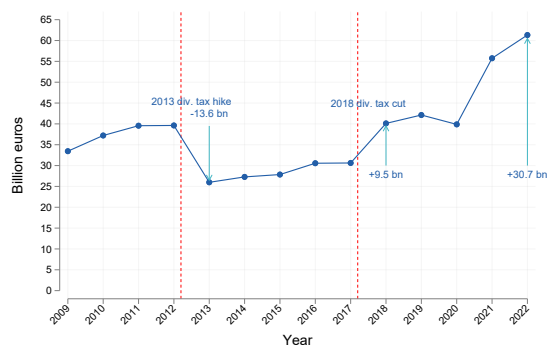


NOTES: Panel (a) shows for each year the top marginal tax rate applicable to dividend income when households opt for the flat-rate withholding tax (PFL/PFU) and when they choose to be taxed under the standard progressive tax schedule. Panel (b) compares the lowest marginal tax rate (i.e., when choosing the best available option between the flat-rate withholding tax and the standard income tax schedule each year) of households in different tax brackets.

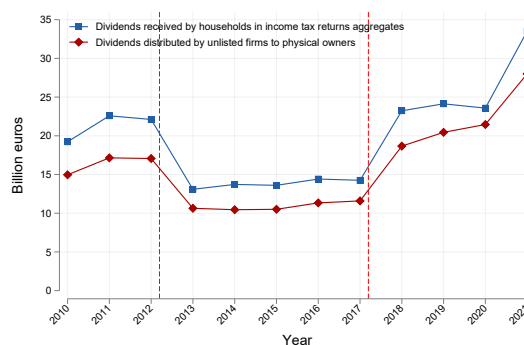
SOURCES: IPP Tax and Benefit Tables.

Figure 2: Aggregate dividends received by households and distributed by firms (France, 2009–2022)

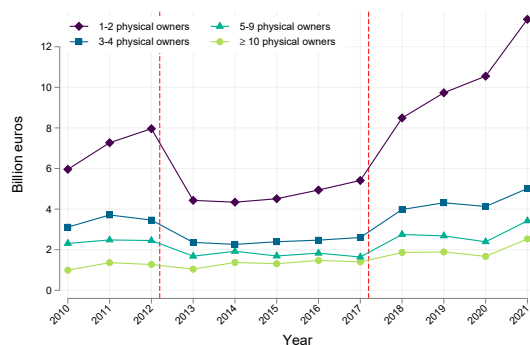
(a) Dividends received by households (National Accounts)



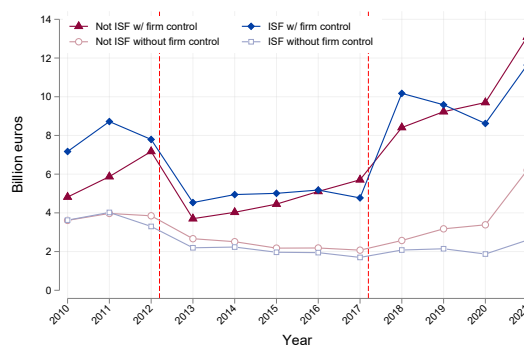
(b) Dividends received by households (Tax Data)



(c) Dividends distributed by unlisted firms, by number of physical owners



(d) Dividends received by households, by wealth and firm control

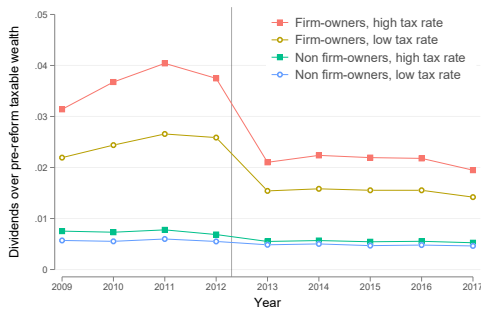


NOTES: Panel (a) represents the evolution of dividends received by households in national accounts; Panel (b) represents the amount of dividends declared by households in the income tax returns (blue circles) and distributed by unlisted firms according to corporate income tax data (red diamonds). It excludes also firms at the simplified corporate income tax regime. The dividends series from the National accounts differs from the administrative income tax data because it includes non-taxable dividends from tax-favored savings plans (*Plan d'Epargne en Actions*, PEA) and business income from corporations taxed at the personal income tax. Panel (c) decomposes yearly dividends distributed by unlisted firms according to their number of physical owners. Panel (d) decomposes yearly aggregate dividends received by households according to whether they are wealth tax (ISF) payers at least once over the period, and whether they have control over a firm.

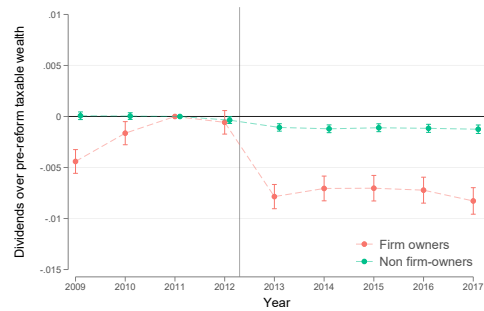
SOURCES: Insee, National Accounts, 2022; Panel POTE-ISF (DGFIP) 2010-2021 and BIC-IS 2010-2019.

Figure 3: Dividends received by households – high vs low marginal rates

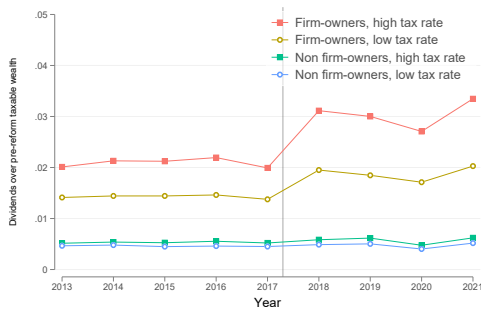
(a) 2013 tax hike – Yearly Averages



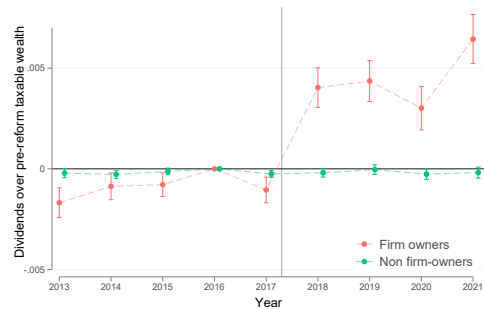
(b) 2013 tax hike – DiD Estimates



(c) 2018 tax cut – Yearly Averages



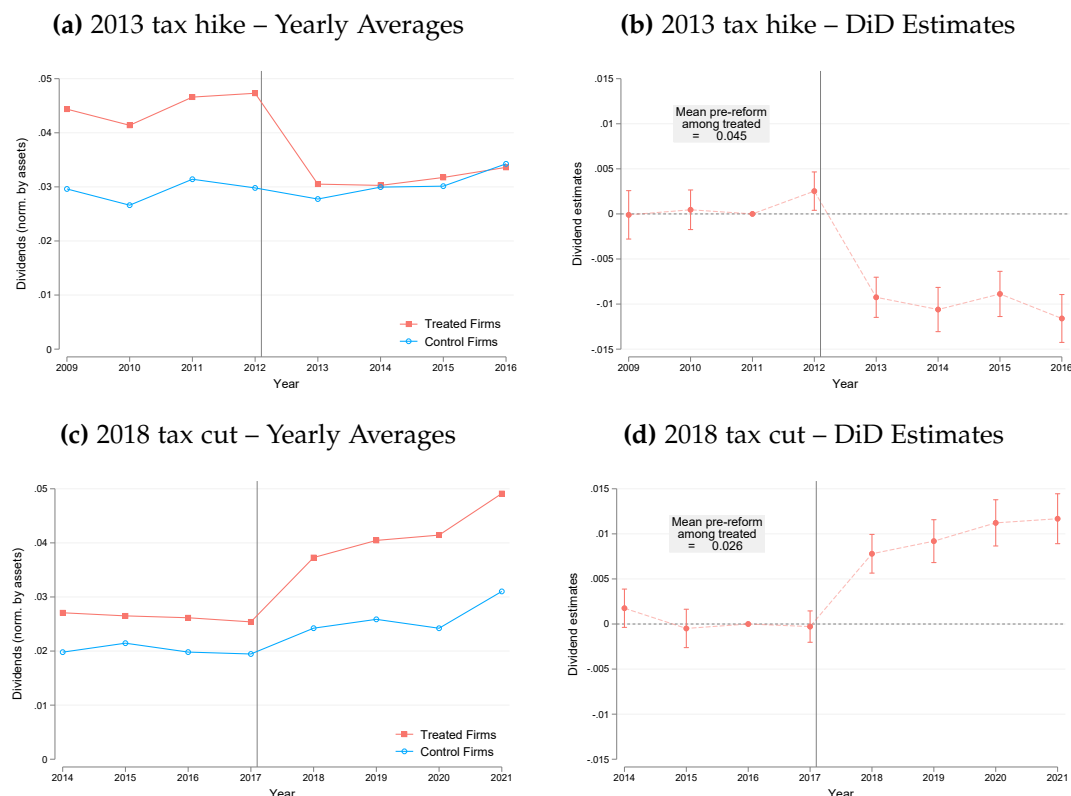
(d) 2018 tax cut – DiD Estimates



NOTES: The sample is a balanced sample of households having received more than €1,500 of dividends at least once pre-reform and paying the wealth tax every year pre-reform. Treatment status is defined based on households' pre-reform non-capital taxable income (i.e., the sum of their wage, pensions and real estate income). Treated households are those who have a sufficiently large income to fall in the upper tax brackets (i.e., 41% or above) at least once pre-reform. Panels (a) and (c) represent the evolution of the average dividend over pre-reform taxable wealth (defined as the individual's maximum taxable wealth pre-reform) for each group. Panels (b) and (d) represent the treatment effect estimates (i.e., the effect of belonging to the upper tax brackets which are affected by the dividend tax reforms) using the controls described in Section 4. The regression is run separately on two sub-samples, firm owners and non-firm owners (see Section 4 for details about how firm ownership is defined). In each graph, the dashed gray line indicates the timing of the reform considered.

SOURCE: Panel POTE-ISF (DGFiP) 2009-2021.

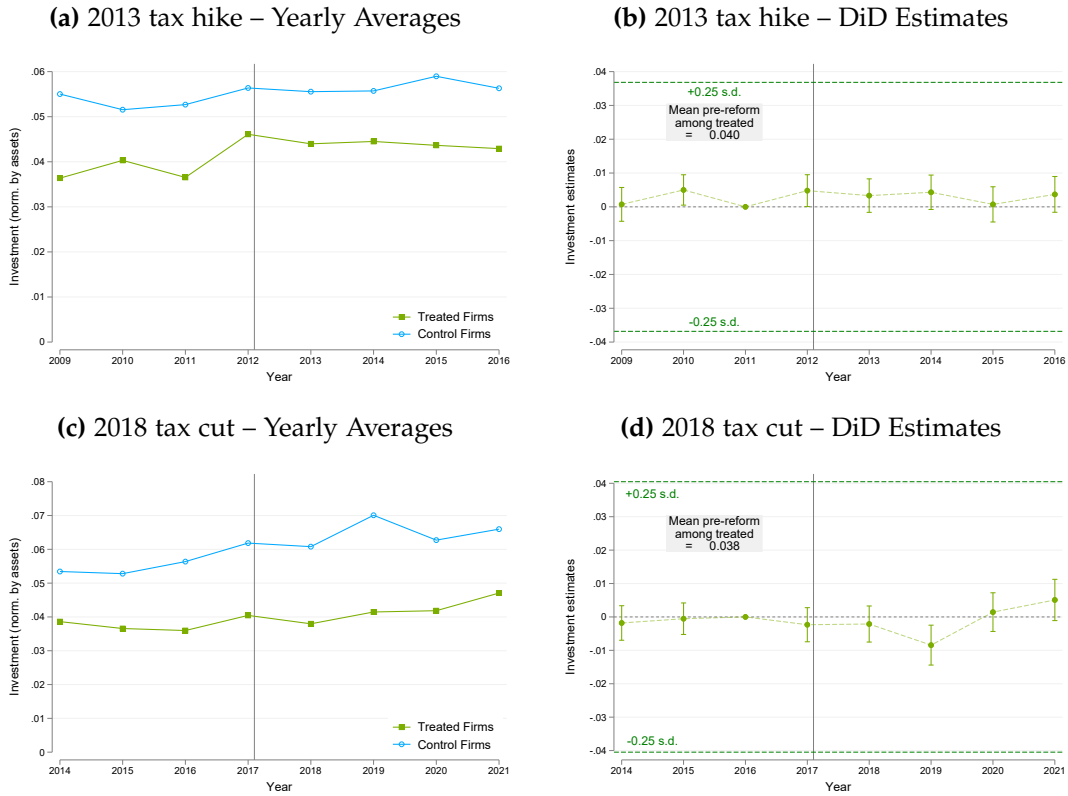
Figure 4: Firm-level impact on distributed dividends (normalized by pre-reform assets) of both tax reforms



NOTES: The variable studied is the amount of dividends paid to shareholders each year, normalized by assets in the reference year. Panels (a) and (c) represent annual averages of this variable in treated and control groups around the 2013 PFL reform, while panel (b) and (d) show the corresponding difference-in-differences estimates. Regressions include 2-digits industry (88 categories) \times year, month of accounts closure \times year, age group (10 categories) \times year, legal form (9 categories) \times year, and headquarter region (27 categories) \times year fixed-effects. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Additional details and restrictions on the sample are outlined in Section 5.

SOURCES : Files BIC-IS, FDG, PERIM, LIFI, BADS, POTE-ISF.

Figure 5: Firm-level impact on investment of both tax reforms



NOTES: The variable studied is investment ($\Delta_{t-1,t}$ assets) scaled by overall assets measured 2 years prior to the reform. Panel (a) represents regression coefficients obtained by dynamic difference-in-differences for the 2013 reform, while Panel (b) represents analogous estimates for the 2018 reform. Robust standard errors clustered at the firm level are used to build the confidence intervals (95%). The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Regressions include 2-digits industry (88 categories) \times year, month of accounts closure \times year, age group (10 categories) \times year, legal form (9 categories) \times year, and headquarter region (27 categories) \times year fixed-effects.

SOURCES : Files BIC-IS, FDG, PERIM, LIFI, BADS, POTE-ISF.

Table 1: Summary statistics of household data

A. 2013 reform sample – Non firm owners								
	<i>Treated (upper tax bracket)</i>				<i>Control (lower tax bracket)</i>			
	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>
Age (main respondent)	67.900	67.00	53.00	84.00	70.402	71.00	55.00	85.00
Size of tax unit (fiscal shares)	1.898	2.00	1.00	2.50	2.016	2.00	1.00	2.50
Dividends (per tax unit)	24694.151	3074.15	213.95	38545.00	10192.253	2237.00	333.20	19801.00
Wages and pensions (per tax unit)	74083.085	58383.25	13391.83	134537.38	25600.115	24377.50	5463.50	47209.75
Capital gains (per tax unit)	17298.225	0.00	0.00	10925.25	4932.916	0.00	0.00	6438.40
Other capital income (per tax unit)	6817.287	2053.17	83.00	14652.50	4492.274	1589.00	49.75	9895.50
Stable taxable income (per tax unit)	107224.439	83274.50	53334.50	170172.30	31164.849	30366.67	10791.47	53179.40
Taxable wealth	3903215.998	2659615.00	1609704.50	6765072.00	2486121.377	1955116.00	1460747.00	3586026.00
Share of flat-tax users (in %)		24.1				9.6		
Number of observations		6,170				29,055		

B. 2013 reform sample – Firm owners								
	<i>Treated (upper tax bracket)</i>				<i>Control (lower tax bracket)</i>			
	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>
Age (main respondent)	59.727	60.00	48.00	72.00	58.891	59.00	46.00	72.00
Size of tax unit (fiscal shares)	2.219	2.00	1.50	3.00	2.535	2.00	1.50	4.00
Dividends (per tax unit)	107972.023	13725.50	53.00	212500.00	36541.872	6400.00	32.00	80000.00
Wages and pensions (per tax unit)	93551.958	70507.20	20480.00	174981.50	26114.545	24634.40	1446.50	51312.50
Capital gains (per tax unit)	29625.517	0.00	0.00	14711.00	11645.514	0.00	0.00	6496.25
Other capital income (per tax unit)	12520.392	2586.50	35.60	25343.33	6451.076	1503.00	14.50	13177.75
Stable taxable income (per tax unit)	122941.771	91609.28	53182.68	209904.06	32206.545	32035.33	7835.60	56280.80
Taxable wealth	4711694.057	2884535.00	1675021.00	8173252.00	3136568.383	2190853.00	1505609.00	4887553.00
Share of flat-tax users (in %)		55.9				28.1		
Number of observations		13,093				21,691		

C. 2018 reform sample – Non firm owners								
	<i>Treated (upper tax bracket)</i>				<i>Control (lower tax bracket)</i>			
	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>
Age (main respondent)	68.864	68.00	54.00	86.00	71.803	72.00	57.00	86.00
Size of tax unit (fiscal shares)	1.802	2.00	1.00	2.50	1.945	2.00	1.00	2.50
Dividends (per tax unit)	18116.509	2928.00	52.50	30741.50	10251.898	2072.50	118.00	19558.00
Wages and pensions (per tax unit)	83649.952	67920.00	18201.00	150276.58	28899.108	28107.53	6578.00	51952.50
Capital gains (per tax unit)	14495.634	0.00	0.00	13118.00	5611.466	0.00	0.00	7721.50
Other capital income (per tax unit)	3947.358	559.00	1.00	7544.50	2648.378	665.75	0.80	6107.00
Stable taxable income (per tax unit)	111125.659	86410.05	54146.60	182221.50	34064.110	33828.75	12200.30	56668.00
Taxable wealth	4183367.234	2568838.00	1780065.00	7021699.00	2803941.505	2202096.00	1586126.00	4182837.00
Number of observations		8,435				26,922		

D. 2018 reform sample – Firm owners								
	<i>Treated (upper tax bracket)</i>				<i>Control (lower tax bracket)</i>			
	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>
Age (main respondent)	63.056	63.00	51.00	75.00	62.556	63.00	49.00	76.00
Size of tax unit (fiscal shares)	2.067	2.00	1.00	3.00	2.331	2.00	1.50	4.00
Dividends (per tax unit)	60100.721	7200.00	0.80	133868.00	23412.276	3770.25	0.40	53693.33
Wages and pensions (per tax unit)	100146.685	73630.50	23137.50	182440.50	28421.917	27287.17	3830.00	53504.50
Capital gains (per tax unit)	95166.886	0.00	0.00	29289.33	20228.576	0.00	0.00	9175.00
Other capital income (per tax unit)	5586.799	652.00	0.33	10728.50	2820.139	455.00	0.00	6099.00
Stable taxable income (per tax unit)	129038.896	94041.60	54000.00	220538.00	34917.898	35046.20	10632.00	58663.00
Taxable wealth	5663330.911	3401449.00	1877148.00	9677819.00	3685313.968	2453024.00	1642779.00	5779246.00
Number of observations		14,971				20,006		

NOTES: The table presents descriptive statistics on the characteristics of the households belonging to the samples used to estimate the impact of the 2013 and 2018 reforms. These characteristics are measured pre-reform (in 2011 and 2016 respectively). In each panel, the sample is a balanced panel of all households paying the wealth tax every year pre-reform and having received at least once a significant amount (more than €1,500) of dividends pre-reform. In Panel A and C, the sample is restricted to households without firm control. In Panel B and D, the sample is restricted to households with firm control (see Section 4 for the definition used for this variable). Treated households have large enough pre-reform stable taxable income (defined as the sum of wage, pensions and real estate taxable income) to belong to the top brackets (41% and above) at least once pre-reform. In contrast, control households have pre-reform stable taxable income that puts them in lower tax brackets. Size of tax unit corresponds to the number of “fiscal shares” (i.e., 1 for each adult, and 0.5 for each child up to two, and 1 for each additional child above two). The share of flat-tax users corresponds to the share of households who opted at least once for the flat-tax option before 2013. Taxable wealth corresponds to the maximal amount of taxable wealth declared by households pre-reform.

SOURCES: POTE, 2011; ISF-IFI 2011; BADS 2014-2019.

Table 2: Household-level estimation

A. Capital income & capital gains				
Strategy: upper tax bracket vs lower tax bracket				
Sample: firm-owners, top 1%				
	2013 reform (tax hike)		2018 reform (tax cut)	
	Short-run (1)	All (2)	Short-run (3)	All (4)
Dividends	-0.00580*** (0.00042)	-0.00583*** (0.00042)	0.00507*** (0.00041)	0.00534*** (0.00039)
Other capital income	0.00008 (0.00005)	0.00006 (0.00005)	0.00017*** (0.00003)	0.00021*** (0.00003)
P(Dividends > 100K)	-0.03923*** (0.00343)	-0.04185*** (0.00331)	0.02073*** (0.00324)	0.01895*** (0.00310)
P(Capital gain > 100K)	0.00717*** (0.00202)	0.01249*** (0.00170)	0.00607** (0.00231)	0.00583** (0.00190)
Observations	208,704	313,056	244,839	314,793
# households	34,784	34,784	34,977	34,977
B. Wages and pensions				
Strategy: firm-owners vs non firm-owners				
Sample: top 1%				
	2013 reform (tax hike)		2018 reform (tax cut)	
	Short-run (1)	All (2)	Short-run (3)	All (4)
Dividends	-0.00673*** (0.00018)	-0.00709*** (0.00018)	0.00351*** (0.00016)	0.00324*** (0.00015)
Wages and pensions	0.00033** (0.00012)	-0.00002 (0.00014)	-0.00046*** (0.00012)	-0.00100*** (0.00013)
Observations	500,772	751,158	538,335	692,145
# households	83,462	83,462	76,905	76,905

NOTES: This table presents regression coefficients of a static diff-in-diff estimation, with each line representing the coefficients for a different dependent variable. In each panel, the sample is a balanced panel of all households paying the wealth tax every year pre-reform and having received at least once a significant amount (more than €1,500) of dividends pre-reform. Panel A presents results using the standard estimation strategy described in Section 4.1 which uses households in upper tax brackets as the treated group and households in lower tax brackets as the control group. Column (1) presents the estimates comparing years 1 and 2 to the pre-reform period, while column (2) presents the results comparing all the post-reform period to the pre-reform period. Standard errors are clustered at the household-level and indicated in parentheses. Panel B presents results comparing firm-owner to non-firm owner households among wealth tax payers.

Table 3: Summary statistics of firm-level estimation samples (both reforms)

A. 2013 reform sample (2011 baseline)								
	<i>Treatment group</i>				<i>Control group</i>			
	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>
Sh. equity shareholders	0.954	1	0.900	1	0.0926	0	0	0.389
Nbr phys. shareholders	3.272	2	1	5	80.89	0	0	7
Nbr corp. shareholders	2.630	0	0	1	26.22	2	2	8
Year creation	1996.0	1999	1980	2008	1993.0	1998	1971	2008
Workforce	21.90	2.09	0	28.50	204.73	5	0	142.88
Assets (k€)	2646.8	556.3	77.5	3806.2	179028.4	1586.3	122.6	54709.5
Turnover (k€)	1421.5	228.9	0	2527.3	19593.9	722.8	0	20388.2
Value added (k€)	397.9	111.2	-3.3	951.5	3287.7	208.7	-28.2	5089.1
After tax income (k€)	64.9	16.0	-21.1	168.3	-209.0	2.7	-192.8	507.0
P(Div. > 0)	0.333	0	0	1	0.240	0	0	1
Norm. by 2011 assets:								
Dividends	0.0453	0	0	0.146	0.0301	0	0	0.0821
After tax income	0.0598	0.0411	-0.0513	0.224	0.0124	0.0136	-0.109	0.158
Retained earnings	0.0115	0.0173	-0.112	0.147	-0.0216	0.00432	-0.162	0.108
↔ incl. Investment	0.0375	0.00270	0	0.128	0.0522	0.00532	0	0.169
Observations	63831				13401			
B. 2018 reform sample (2016 baseline)								
	<i>Treatment group</i>				<i>Control group</i>			
	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>	<i>Mean</i>	<i>Median</i>	<i>1st decile</i>	<i>9th decile</i>
Sh. equity shareholders	0.927	1	0.7	1	0.0879	0	0	0.4
Nbr phys. shareholders	3.695	2	1	5	303.6	0	0	8
Nbr corp. shareholders	0.259	0	0	1	2319.2	2	2	10
Year creation	2000.7	2004	1985	2013	1998.8	2004	1976	2014
Workforce	279.0	1	0	26	255.8	1	0	112.6
Assets (k€)	3540.9	614.8	65.4	4836.1	168636.3	1519.6	60.8	60632.3
Turnover (k€)	1331.5	129.6	0	2116.9	15490.4	291.5	0	16099.2
Value added (k€)	389.5	63.9	-7.2	838.7	2935.1	83.5	-44.5	4286.4
After-tax income (k€)	63.0	5.4	-31.6	153.2	-238.2	0	-267.6	344.2
P(Div. > 0)	0.195	0	0	1	0.164	0	0	1
Norm. by 2011 assets:								
Dividends	0.0262	0	0	0.0621	0.0198	0	0	0.0319
After tax income	0.0376	0.0288	-0.0708	0.194	-0.0122	0.00637	-0.146	0.138
Retained earnings	0.0094	0.0172	-0.102	0.148	-0.0356	0.00166	-0.177	0.106
↔ incl. Investment	0.0360	0.00046	0	0.126	0.0564	0.00188	0	0.180
Observations	99309				15493			

NOTES: These tables present statistics (mean, median, 1st and last decile) on the characteristics of the companies in the treatment and control groups, for the 2013 and the 2018 reforms respectively. The variables are winsorized at percentiles 1 and 99 according to the methodology defined in the data section. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section.

SOURCES: Files BIC-IS, FDG, PERIM, LIFI, BADS, POTE-ISF.

Table 4: Firm-level results on the accounting decomposition (both reforms)

A. 2013 reform (tax hike)			
	Short-run (1)	Long-run (2)	All (3)
Dividends	-0.0109*** (0.000789)	-0.0112*** (0.000954)	-0.0111*** (0.000777)
After-tax income	-0.00353** (0.00162)	-0.00748*** (0.00190)	-0.00550*** (0.00157)
Retained earnings	0.00739*** (0.00170)	0.00364* (0.00193)	0.00550*** (0.00160)
↔ incl. Investment	0.000862 (0.00178)	-0.00124 (0.00195)	-0.000156 (0.00158)
Observations	372993	373163	522451
# firms	74611	74702	74711
# treated firms	63831	63831	63831
B. 2018 reform (tax cut)			
	Short-run (1)	Long-run (2)	All (3)
Dividends	0.00817*** (0.000805)	0.0114*** (0.00105)	0.00968*** (0.000784)
After-tax income	0.000356 (0.00186)	0.00278 (0.00227)	0.00147 (0.00175)
Retained earnings	-0.00774*** (0.00194)	-0.00726*** (0.00230)	-0.00756*** (0.00177)
↔ incl. Investment	-0.00392** (0.00198)	0.00395* (0.00224)	-0.0000630 (0.00173)
Observations	636194	622439	837277
# firms	111181	111179	111226
# treated firms	99309	99309	99309

NOTES: This table presents regression coefficients of a static diff-in-diff estimation, using as our dependent variable each variable of the accounting breakdown presented in equation (2), as covariate of interest an interaction 'treatment \times post reform period'. Panel A presents results for the 2013 reform (tax hike), Panel B for the 2018 reform (tax cut). Coefficients should be interpreted per euro of pre-reform assets. Column (1) presents the estimates comparing years 1 and 2 to the pre-reform period, while column (2) presents the results comparing years 3 and 4 to the pre-reform period, and column (3) presents the results comparing all the post-reform period to the pre-reform period. Standard-errors are clustered at the firm-level and indicated in parentheses. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Regressions include 2-digits industry (88 categories) \times year, month of accounts closure \times year, age group (10 categories) \times year, legal form (9 categories) \times year, and headquarter region (27 categories) \times year fixed-effects.

Table 5: Firm-level results on the accounting decomposition for the weighted sample, 2013 and 2018 reforms – static difference-in-differences

	2013 Reform (tax hike) (1)	2018 Reform (tax cut) (2)
Dividends	-0.00716*** (0.00135)	0.00997*** (0.00127)
After-tax income	0.000369 (0.00189)	0.00250 (0.00182)
Retained earnings	0.00754*** (0.00247)	-0.00734*** (0.00199)
↔ incl. Investment	-0.00344 (0.0433)	0.0106 (0.0186)
Observations	158676	312567
# firms	22668	40701
# treated firms	15834	32496

NOTES: This table presents regression coefficients of a static diff-in-diff, using as our dependent variable each variable of the accounting breakdown presented in equation (2), as covariate of interest an interaction ‘treatment \times post reform period’, and including different sets of fixed-effects. Regressions are weighted by assets, and the sample trims firms below the 1st and last percentiles of the assets-weighted distribution. Coefficients should be interpreted per euro of assets. Column (1) presents the estimates for the 2013 reform, while column (2) presents the results for the 2018 reform. Standard-errors are clustered at the firm-level and indicated in parentheses. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Regressions include firm and year fixed-effects.

Table 6: Firm-level results on the accounting decomposition, cash-rich vs. cash-poor (both reforms)

A. 2013 reform (tax hike)			
	All (1)	Cash-poor (2)	Cash-rich (3)
Dividends	-0.0111*** (0.000777)	-0.00582*** (0.00126)	-0.0195*** (0.00192)
After-tax income	-0.00550*** (0.00157)	-0.00284 (0.00252)	-0.0110*** (0.00405)
Retained earnings	0.00550*** (0.00160)	0.00296 (0.00265)	0.00815** (0.00397)
↔ incl. Investment	-0.000156 (0.00158)	0.00137 (0.00329)	-0.00395 (0.00325)
Observations	522451	142330	133727
# firms	74711	20353	19129
# treated firms	63831	16272	16396
B. 2018 reform (tax cut)			
	All (1)	Cash-poor (2)	Cash-rich (3)
Dividends	0.00968*** (0.000784)	0.00390*** (0.00148)	0.0145*** (0.00197)
After-tax income	0.00147 (0.00175)	0.00351 (0.00287)	-0.00648 (0.00483)
Retained earnings	-0.00756*** (0.00177)	-0.000170 (0.00294)	-0.0200*** (0.00490)
↔ incl. Investment	-0.0000630 (0.00173)	-0.00219 (0.00389)	0.00327 (0.00376)
Observations	837277	216223	196530
# firms	111226	28498	26410
# treated firms	99309	24759	23344

NOTES: This table presents regression coefficients of a static diff-in-diff estimation, using as our dependent variable each variable of the accounting breakdown presented in equation (2), as covariate of interest an interaction 'treatment × post reform period'. Panel A presents results for the 2013 reform (tax hike), panel B for the 2018 reform (tax cut). Coefficients should be interpreted per euro of pre-reform assets. Column (1) presents our baseline estimates, while column (2) presents the results in the subsample of cash-poor firms, and column (3) presents the results in the subsample of cash-rich firms. Cash-poor firms are defined as those belonging to the bottom quartile of industry-level cash to assets ratio, cash-rich firms are those in the top quartile of the same distribution. Standard-errors are clustered at the firm-level and indicated in parentheses. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Regressions include 2-digits industry (88 categories) × year, month of accounts closure × year, age group (10 categories) × year, legal form (9 categories) × year, and headquarter region (27 categories) × year fixed-effects.

(For Online Publication)

Appendix to

Follow the money!

Why dividends overreact to flat-tax reforms

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This appendix presents further details about the taxation of capital income in France over the period of study (Appendix [A](#)), on the administrative tax data used in the paper (Appendix [B](#)), on modified ‘new view’ model of dividend taxation (Appendix [C](#)) and also presents additional results (Appendix [D](#)).

A Capital income taxation in France (2008–2022)

A.1 Income taxation in France before 2013

From 2008 to 2012, capital income is subject to a dual tax system. Such income can either be included in the calculation of the global net taxable income in order to be taxed at the progressive income tax schedule or be taxed at a flat rate. Whatever the tax option, the level of taxation of dividends has generally increased during this period as a result of several reforms described later in this section.

Progressive personal income tax. From 2008 to 2012, several legislative changes led to an increase in the taxation of dividends subject to the progressive income tax schedule. Dividends subject to this schedule are eligible for a 40% deduction and a lump-sum allowance to correct in part for the problem of double taxation of dividends—associated with the coexistence of income tax and corporation tax. In 2010, a specific tax credit to which dividends were entitled was abolished. This tax credit was 50% of the amount declared, and capped at a relatively small amount of 115 euros (230 euros for a couple). Also in 2010, the marginal tax rate of the upper tax bracket of the progressive income tax schedule increased from 40 to 41%. In 2012, a new upper tax bracket was introduced, increasing the top marginal tax rate to 45% for households whose net taxable income per tax share exceeds 150 000 euros. For taxpayers affected by these two reforms, these changes also imply an increase in the level of taxation of dividends under the progressive tax schedule.

Optional flat-rate taxation of dividends. The 2008 Finance Act created an optional flat-rate withholding tax applicable to dividends called “*prélèvement forfaitaire libérateur*” (PFL). A flat-rate withholding tax in full discharge already existed before 2008 for other types of capital income such as income from fixed-interest investment products. Under the flat-tax schedule, dividends are taxed at 18%. This rate increased from 18% to 19% in 2011 and from 19% to 21% in 2012 (24% for capital income other than dividends, i.e., interest on bonds and debt securities in particular).

Social contributions. In addition to the income tax (whether flat-rate or progressive), capital income is subject to *Contribution sociale généralisée* (CSG) and *Contribution au remboursement de la dette sociale* (CRDS), which are flat-rate withholding taxes earmarked to Social Security. In 2008, these social contributions amounted to 11%, and they were increased in steps to 15.5% in 2012 (see table A1).

Other tax reforms. A series of reforms also affected the taxation of dividends from 2008 to 2012, regardless of taxpayers’ choice between the progressive or the flat-tax option. In 2011, an extra tax on high income was created (*Contribution exceptionnelle sur les hauts revenus* or CEHR). This contribution represents a 3% tax on global income between 250,000 and 500,000 euros (500,000 and 1,000,000 euros for a couple) and 4% on income above 500,000 euros (1,000,000 euros for a couple). Since the tax base of

Table A1: Tax parameters related to dividend taxation in France (2008–2012)

	Standard allowance	Proportional allowance for dividends	Tax credit on dividends	Optional flat-rate tax (PFL)	Social contributions
2008	1 525 €	40%	50%	18%	11.0%
2009	1 525 €	40%	50%	18%	12.1%
2010	1 525 €	40%		18%	12.1%
2011	1 525 €	40%		19%	13.5%
2012		40%		21%	15.5%

NOTE : The standard allowance is doubled in the case of a couple. The dividend tax credit is capped at 115 euros for a single person and 230 euros for a couple. The rate of social security contributions indicated in the table corresponds to the rate on December 31st. The social security tax rate indicated for 2013 corresponds to the general case and does not reflect the case of the SARL's owner-managers subject to social security contributions (see sections A.3).

SOURCE : IPP tax and benefit table, [\[link to webpage\]](#).

this contribution is the global income (*revenu fiscal de référence*), it includes all dividends regardless of the chosen tax schedule.

A.2 The 2013 reform

To understand the effects of the dividend flat-tax removal in 2013, it is important to detail the two option for taxation that existed before this reform, i.e., the global progressive income tax schedule and the flat-tax schedule.

- **Option 1 : flat-tax schedule (PFL)**

When opting for the flat-tax schedule, dividends are taxed at a uniform tax rate, independently of the household's level of resources. The flat-tax is a withholding tax that is deducted by the remitting institution (firm or finance institution) when dividends are received. Dividends taxed at the flat-tax schedule must nonetheless be declared when filing the annual income tax return, in order to be included in the calculation of the reference fiscal income (*revenu fiscal de référence*). Only persons whose tax residence is established in France can opt for the flat-tax schedule. In addition, certain distributed incomes are not eligible for the flat-tax schedule.^{A.1}

- **Option 2 : progressive income tax schedule**

If opting for the progressive income tax schedule, dividends are taxed at a progressive rate jointly with other types of income (labor income, business income, replacement income etc.). Progressive taxation means that the *marginal* tax rate increases with the household's total taxable income (dividend plus other taxable income). With this option, and depending on the legislation in force, it is possible to benefit from tax deductions and credits. It is also possible to deduct certain

^{A.1}This includes dividends from exempt profits distributed by listed real estate investment companies (SIICs) and by investment companies with a preponderance of real estate with variable capital (SPPICAV) since 2011, taxable income from unlisted securities held in a PEA, distributed income taken into account in determining the taxable profit of an industrial, commercial, craft or agricultural company or a liberal profession and taxable distributed income following a correction by the tax authorities.

expenses, such as collection fees. The payment of tax on dividends is then made the year following their collection, after having filed the annual income tax return.

Choice of schedule for dividend taxation. Each taxpayer receiving dividend income is free to choose between the two tax schedules. The option is exercised upstream with the financial institution. The choice of taxation method cannot be changed during the year. However, it is possible to change the option from one year to the next. The option may also be partial: the taxpayer may choose to tax part of his dividends within the progressive tax schedule and part within the flat-tax schedule (in the case of a partial option, the taxpayer however loses the benefit of the allowances). Due to the optional nature of the flat-tax, not all taxpayers were affected by the removal of the flat-tax following the 2013 tax reform.

Optimal dividend tax schedule choice. The most financially beneficial tax schedule may vary across households depending on (i) the amount of dividends declared by a household, (ii) the level of its non-dividend taxable income and (iii) other parameters such as the amount of tax credits or reductions for which that household is eligible, or the nature of the dividends received. Equations A.1 and A.2 represent schematically the tax arbitrage faced by a taxpayer in the case of the 2012 legislation.^{A.2} If choosing the flat-tax schedule, dividends are taxed at a 21% tax rate (τ^{PFL}) for the income tax and at 15.5% for social security contributions (τ^{PS}), i.e., at an overall effective rate of 36.5%. By choosing the progressive tax schedule, dividends are taxed at a rate (τ^{BAR}) that varies according to the bracket in which the taxable income is located, and at 15.5% for social security contributions (τ^{PS}). Assuming that dividends are eligible for the 40 % allowance, the effective overall marginal tax rate varies from 15.5 % (in the case of the 0% bottom tax bracket that only pays social security contributions) to 41.1% (in the case of the 45% upper tax bracket). In this simplified illustration, opting for the flat-tax is only financially attractive for tax households whose total income puts them in the 41 or 45% bracket. In more complex cases (e.g. presence of tax reductions), the progressive tax schedule may remain tax-efficient for some high-income households. In theory, the flat-tax schedule should therefore concern few taxpayers because only 1.2% of tax households have a net taxable income per unit that places them in the last two brackets of the income tax scale in 2012 (see table A2). Moreover, not all of these taxpayers receive dividends.

$$T(D) = (\tau^{PFL} + \tau^{PS}) \times D \quad (A.1)$$

$$T(D) = \tau^{BAR}(Y) \times \max(0, (1 - \delta^p) \times D - \gamma \times D - \delta^f) + \tau^{PS} \times D \quad (A.2)$$

^{A.2}The CEHR extra tax is ignored in this illustration. Note that it affects the dividend tax rate in the same way regardless of the option chosen.

where τ^{PFL} , is the flat-tax rate

where τ^{PS} , is the overall level of social security contributions

where δ^f , is the lump-sum rebate

where δ^p , is the proportional rebate

where γ , is the rate of deductible social contributions

Table A2: Distribution of tax units in 2012 across brackets of the progressive income tax schedule

	Number of tax units	% of total
Non subject to income tax	8 741 670	23.8%
5,5% bracket	8 866 253	24.1%
14% bracket	14 827 094	40.4%
30% bracket	3 877 237	10.6%
41% bracket	350 123	1.0%
45% bracket	57 659	0.2%
Total	36 720 036	100.0%

SOURCE : Annuaire Statistique 2013, Tableau 219, DGFIP; FELIN 2012, DGFIP.

NOTE : The brackets indicate the theoretical maximal marginal tax rate faced by tax units. In practice, there are many other features of the income tax system that impact tax rates. This results in almost half of the households not paying the income tax.

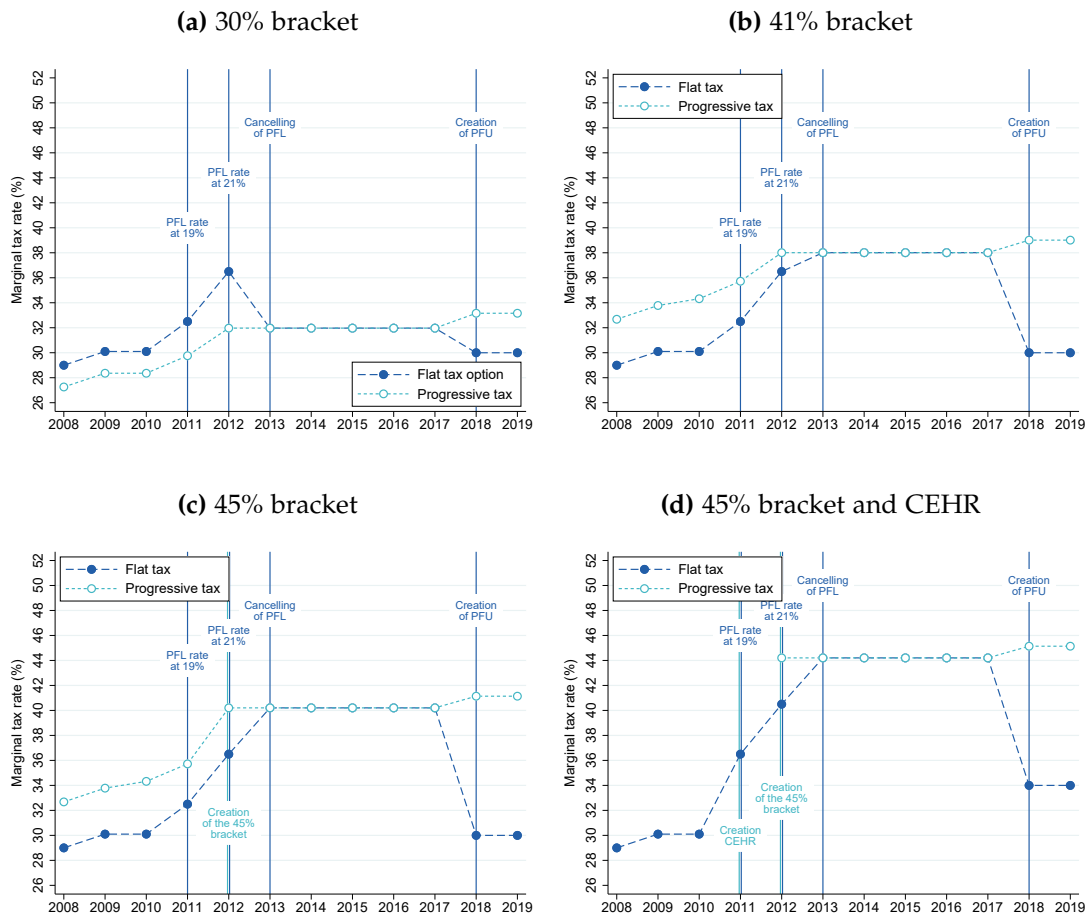
Details of the 2013 flat-tax cancellation. The 2013 Finance Act removes the flat-tax option for dividends paid as of January 1st, 2013. This applies also to the vast majority of capital income although some fixed-income investment products and life insurance products can still be subject to a 24% flat-tax under specific conditions. After the reform, dividends are taxed in two stages. First of all, they are still subject to a flat-rate withholding tax of 21%. Maintaining a withholding tax avoids a cash hole for public finances. Then, dividends are taxed within the progressive income tax schedule when the annual income tax return is filed the following year. The non-dischargeable flat-rate withholding tax (also referred to as the PFLN for *prélèvement forfaitaire non libératoire* in French) paid is deducted from the final amount of income tax. If the amount paid is too high compared to the tax due, the excess tax paid is returned to the taxpayer in the form of a tax credit. In total, the reform increases the level of dividend taxation for taxpayers who previously opted for the flat-tax and who were in the top income tax brackets (see Figure A1).

A.3 Anti-avoidance scheme for SARL managers (2013)

Until 2012, dividends are subject to income tax and social security contributions on financial income. However, dividends are not subject to social security contributions because they are not considered as business income. Social security contributions on financial income are non-contributory contributions.

The table A1 shows the evolution of the social security tax rates to which dividends are subject from 2009 to 2013. In 2012, dividends are subject to the CSG at a rate of

Figure A1: The evolution of marginal tax rates on dividends (2008–2019)



NOTES: Each sub-figure shows, for a specific case of household, the evolution of the marginal tax rate for the two options: the progressive income tax schedule and the flat tax option (for the years such an option exists). These rates are computed by considering households with no tax credits or tax reductions, and assuming there is no SARL manager in the household. These marginal tax rates are computed using the TAXIPP microsimulation model.

Figure A1b shows the case of a household whose total fiscal income, after all tax deductions, is in the 41% bracket of the progressive income tax schedule (between 70,830 and 150,000 euros in 2012 for instance). Figure A1c shows the case of a household whose total fiscal income, after all tax deductions, is in the 45% bracket of the progressive income tax schedule (higher than 150,000 euros in 2012 for instance). Figure A1d shows the case of a household whose total fiscal income, after all tax deductions, is in the 45% bracket of the progressive income tax schedule, and also in the scope of the CEHR.

SOURCE: TAXIPP 1.0.

8.2%, the CRDS at a rate of 0.5%, the social levy at a rate of 5.4%, the additional social levy contribution (CAPS) at a rate of 0.3% and the additional contribution to finance the RSA (CAPS-RSA) at a rate of 1.1%. The overall rate of social security contributions on dividends is thus 15.5% in 2012. Social security contributions on dividends are withheld at the time of payment of the dividend. In the event of taxation of dividends on the progressive income tax scale, part of the CSG is deductible from the tax.

From 2013, dividends received by the majority managers of limited liability companies (SARL which are the French equivalent of LLCs) are also subject to social security contributions for the amount exceeding the threshold of 10% of the company's share

capital. This reform is specific, in that it only applies to certain taxpayers and certain types of companies. The legal framework of SARL does not require the majority manager to be an employee of the company. Before 2013, the majority manager can therefore choose to be remunerated only in dividends rather than in salary, thus avoiding the payment of social security contributions.

A.4 Tax treatment of share buybacks

The taxation of income distributed by a company to its shareholders depends on how it is distributed. A company may choose to pay dividends to shareholders but also to buy back its own shares. Prior to 2015, gains from share repurchases are taxed under a system known as hybrid. The taxable base of this income corresponds to the difference between the repurchase price of the shares and the initial purchase price. Initially, the difference between the amount of the contributions included in the nominal value of the repurchased securities and the initial acquisition price is treated as a capital gain and taxed accordingly. Then, the difference between the repurchase price of the shares and the amount of these contributions is treated as distributed income and therefore taxed in the same way as a dividend.

When asked about a priority constitutionality issue (QPC No. 2014-404) on the subject, the Constitutional Council ruled in June 2014 that the gains from a share buyback are in reality entirely comparable to gains on disposal. Article 88 of the Amending Finance Act No. 2014-1655 of 29 December 2014 for 2014 amends the General Tax Code accordingly. Share repurchases made since January 2015 are taxed according to the capital gains tax system, i.e., the progressive income tax scale, as are dividends. However, income treated as capital gains benefits from a deduction that varies according to the length of the holding period. In 2015, the deduction for the duration of the ordinary holding period is 50% for a security held for at least two years and less than eight years, and 65% for a security held for at least eight years. The enhanced holding period allowance, which applies under conditions in the case of SME securities, is 50% for securities held for at least one year and less than four years, 65% for securities held for at least four years and less than eight years, and 85% for securities held for at least eight years. This allowance is generally more advantageous than the 40 % allowance for dividends. The 2015 reform could therefore encourage companies to remunerate their shareholders in the form of share buybacks rather than dividends.

A.5 The 2018 reform to capital income taxation

The 2018 Finance Act reintroduces the possibility of flat-rate taxation of capital income with the creation of a unified flat-rate capital income tax (PFU).

A.5.1 The unified flat-rate capital income tax (PFU)

Like the PFL that preceded it from 2008 to 2013, the unified flat-rate capital income tax (PFU, for *prélèvement forfaitaire unique*) allows, on option, to be taxed at a flat-rate of 12.8%, in full discharge of the progressive scale tax. In addition to this flat-rate tax, social security contributions are maintained at the level of 17.2% since 2018. In total,

dividends are then taxed at 30%. The tax rate of the PFU (12.8%) is much lower than the rate of the PFL (which has varied between 18% and 21% during its existence). The PFU should thus be the most financially advantageous option for a larger fraction of taxpayers than the PFL was.

In practical terms, dividends were subject to a mandatory 21% non-dischargeable flat-rate withholding tax (NTFP) since 2013. This levy is maintained and its rate is now 12.8%. Dividends must then be declared at the time of the annual income tax return in order to be taxed, at the choice of a flat rate of 12.8% or the progressive income tax schedule. Unlike the PFL, all taxpayers are subject to a flat-rate withholding tax and the option between the progressive and flat-rate schedules is only exercised at the time of the annual income tax return. In order to opt for the schedule, the taxpayer must check the *2OP* box on Form 2042. The flat-rate tax is therefore designed as the default option for the taxation of capital income from 2018 onwards. In the event of an option for the scale, taxpayers benefit from the 40% allowance and the deductibility of part of the CSG.

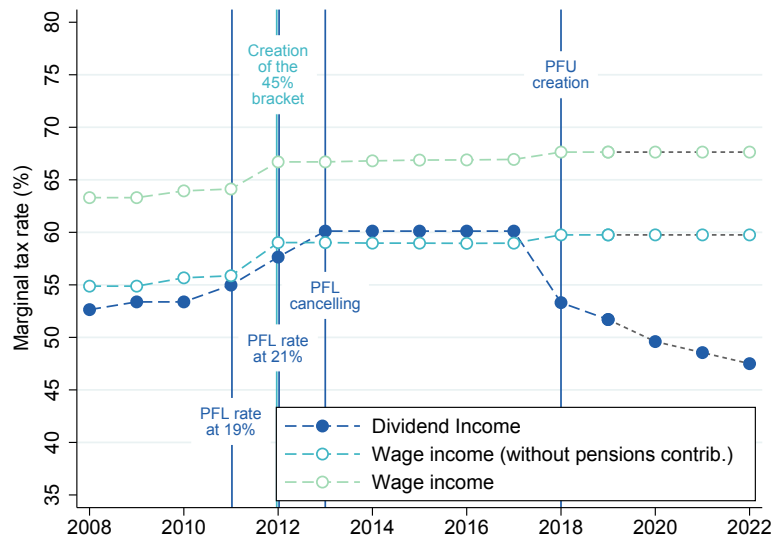
While the reform of the PFU may seem symmetrical to the 2013 reform that abolished the PFL, several factors put this into perspective. The magnitude of the 2018 tax shock (- 7.4 percentage points of marginal tax rate) is almost twice as high as that of 2013 (+ 3.0 percentage points). Moreover, as indicated above, the number of taxpayers affected by the PFU-related tax reduction in 2018 could be much higher than the number of taxpayers affected by the 2013 reform. Only about 115,000 tax households declared a positive amount of dividends taxed to the PFL in 2012, i.e., 0.3% of tax households. Sources: National declarations 2042, 2012.

A.5.2 The possibilities of income shifting in 2018

The introduction of the flat-rate capital income tax (PFU) widens the gap in the level of taxation between wage income and dividends. The higher the gap between the taxation of wages and the taxation of dividends, the more it is in the interest of executives and employees of companies with room for manoeuvre in allocating their income between these two categories to remunerate themselves in the form of the least taxed income (the so-called “ income shifting ” phenomenon). The graph [A2](#) represents the evolution of the maximum marginal tax rates applicable to wages and dividends, taking into account social and income taxes, but also social contributions and corporation tax. With regard to wages, the graph represents the total marginal tax rate as well as the marginal tax rate excluding pension contributions, which can be considered as savings rather than a tax.

The 2013 reform reduced the gap between marginal taxation of wages and dividends. Excluding pension contributions, the marginal tax rate on dividends becomes even higher than that on wages. This creates an incentive for executives with this power to pay themselves more in salaries than in dividends. However, the tax gap remains small before and after the reform. The 2018 reform, on the other hand, has a significant effect on incentives to be paid in dividends rather than wages. The tax gap between wages and dividends falls from - 1.7 to + 6.4 percentage points. This gap is expected to widen until 2022 due to the gradual reduction in the corporate tax rate from 33.33% in 2018 to 25% in 2022.

Figure A2: Changes in taxes on dividends and wage income (2008–2022)



NOTES: The marginal rates represented are marginal rates applied to super gross income (gross income plus employer contributions, if any). They correspond to the case of a single person without children, employee, manager, contributor to the general social security system, not benefiting from any credit or tax reduction, and having annual taxable income between four and eight times the social security ceiling. The marginal dividend rate includes corporate income tax, social security contributions and income tax (assuming that the individual opts for the flat-rate tax in the years when this option is possible, i.e., from 2008 to 2012 and from 2018 onwards). The marginal rate on wages includes social contributions, social contributions and income tax (the amount of income in this case being high, the 10% deduction on wages is capped in his case and the individual is in the last bracket of the scale). The marginal rate on wages excluding pension contributions corresponds to the same marginal rate as that described above minus the amount of social contributions financing pensions. This rate is the same for an individual with incomes between 4 and 8 times the Social Security ceiling as for an individual with incomes above 8 times the Social Security ceiling. Projections from 2019 to 2022 are based on announced corporate tax rates and assuming no change in the rest of the tax base.

Based on the Swedish model, an amendment to the finance bill for 2018 was introduced by Senator Albéric de Montgolfier (No. I-625 of 24 November 2017) in an attempt to limit these optimisation behaviors. This anti-abuse amendment consisted, in the case of senior executives holding more than 10% of the voting rights, in capping the benefit of the flat-rate option to the portion of income not exceeding 10% of the share capital and the shareholder’s current account. The amendment was voted in the Senate but abolished by the National Assembly’s Finance Committee, on the grounds that this measure would undermine companies’ flexibility in setting the timing of dividend payments. Unlike the Swedish system, this amendment did not allow shareholders to register future dividend rights when the annual amount of dividends was below the ceiling. The effect of the 2018 reform on the gap between dividend and wage taxation, and the absence of anti-abuse measures, suggest that the 2018 reform could have more income displacement effects than the 2013 reform.

However, it is important to note that the potential incentives to shift income to dividends can be reduced by the introduction of withholding for personal income tax in

2019. Dividends were already subject to withholding tax and were not affected by this reform. Salary incomes have been deducted at source since 2019. In order to avoid income taxation in 2019 for 2019 (as a withholding tax) and 2018 (under the old tax system), wage income in 2018 is not taxed. In practice, the 2019 income tax on 2018 income is calculated according to the usual methods. Then, the tax fraction associated with the income in the new withholding tax field is returned in the form of the tax credit modernisation of the recovery (CIMR). Thus, the introduction of withholding tax may provide, for 2018 only, more incentives to receive wages rather than dividends, in the opposite direction to the shift that can be expected from the SFP. Nevertheless, this possibility should be put into perspective, insofar as only so-called non-exceptional income is eligible for the White Year and the assessment of the exceptional nature of the remuneration of company directors is reinforced. Any portion of 2018 income exceeding the maximum of 2015, 2016 and 2017 income shall be considered exceptional, unless it is established retrospectively that 2019 income is higher than 2018 income.

B Additional details on data

This section provides additional details on the administrative data used for the empirical analysis.

B.1 Household-level data

At the household level, the analysis relies on French administrative data coming from two exhaustive files: the panel of all personal income tax returns (POTE) and the panel of all wealth tax returns (ISF-IFI). In this section, we describe in detail the two data sources exploited as well as how we used it to define the variables of interest and to identify the main sub-groups for the analysis.

B.1.1 Description of the panel of income tax returns (POTE)

The POTE is an administrative database containing the information of all households' personal income tax returns which is produced by the French tax authority (*Direction générale des finances publiques*, DGFIP) and available to researchers through secured data access after a request at *comité du secret statistique*.

Population coverage. In France, nearly all households need to fill in an income tax return and provide it to the fiscal authority on a yearly basis. Tax filling is mandatory for individuals who either live in France, have their main professional activity located in France, live abroad but receive French income or turned 18 and are not part of their parents' household anymore. Since 2018, the income tax is withheld in France but households still have to fill in a tax return and correct or complete information if needed. Note that tax filling is mandatory even if households are not taxable. In fact, since 2013, more than half of the households who fill in a tax return data end up not paying any income tax. The data are therefore almost exhaustive of any household receiving dividends in France. Overall, in 2018, the POTE file has 38,487,937 observations.

Data production. The POTE files are produced on a yearly basis by the administration. The POTE of year N contains information on households situation as of 12/31/ N with income earned during year N . Households fill in the tax return data each year, between May and June, and send it to the fiscal administration, either by paper or digitally. Therefore the information of POTE N is only available to the administration in May or June of $N + 1$. The income tax return is composed of several forms, each of them containing different boxes that must be filled if relevant. The main form is the tax return form n°2042 where households declare their personal information (name, address, birthdate, contact information, marital status, family composition) as well as the main income earned (e.g., wages, pensions, unemployment benefits, etc.).^{A.3} There are other specific forms to fill in for households in specific situations (e.g., self-employed, eligible to some specific tax deductions, with specific types of capital income or capital gains).

^{A.3}The forms change every year according to changes in the fiscal legislation. They are available on the website of the tax authority: <https://www.impots.gouv.fr/portail/formulaire/2042/declaration-des-revenus>.

Once the tax return data are received by the tax authority, they are treated in order to produce the POTE. In the end, the POTE file contains one variable for each box of the income tax forms (e.g., income, family situation, etc.) as well as some intermediate variables computed by the administration (e.g., income tax, taxable income, etc.). Overall, in 2018, there were 3,880 variables in the POTE.

Observation unit. The observation unit is the fiscal household (or tax unit), which is composed of an individual, its spouse (as defined by a marriage or a civil union) and its dependent persons (children or persons with disabilities living under the same roof). Children are counted as dependents persons if they are below 18 or if they have disabilities, whatever their age. For children below 21 (or below 25 if they are enrolled students), they can choose whether to be counted as dependents within their parents' household or to become a separate fiscal household. Even though households make a single tax declaration, the POTE file provides some information at the individual level too as some types of individual income (e.g., wages, self-employed incomes, pensions, etc.) have to be declared separately in the tax return form. Households are identified by a unique *ad hoc* tax unit identifier.

Panelization of the data. There is one POTE file by year. Using the household identifier, it is possible to follow households over time and to build a panel for years 2006 to 2019. In some very specific cases, households cannot be tracked down the whole period. This can happen when a new household is created during the period, because a child is not anymore considered as a dependent person and has to fill its own tax return. In this case, a new household identifier is attributed to this new household. Conversely, when the last member of a household dies, the household disappears from the tax return file. Each household appears each year only once, except in some very specific cases (when one member of a couple dies during the year but the other is still alive, when one of the children turns 18 during the year). In most of our analysis, we restrict our attention to a balanced panel of households.

Confidentiality of the data. Researchers have access to an anonymized version of these data, where all mentions of first and last name has been removed, as well as of the precise address of households. The household identifier is built in such way that it does not enable to identify households. Given the confidential nature of the data, the access to the data by researchers is restricted. Researchers must send a detailed application to the *Comité du secret statistique* (Committee for Statistical Confidentiality) explaining the specific research project they are planning to work on, which data they plan to use and how. Researchers must obtain the approval of the data producers as well as of the Committee. Once access is approved, researchers will only have access to the data through a secure remote access process developed and managed by the Secure Access Data Center (CASD). The process includes connecting on a specific device, named SD-box, which identifies researchers by fingerprints identification. Then, data are accessed within a specific project which is confined in a secure environment with its own server allowing the user to access and process the data but without any possibility to connect to the Internet and to import or export files without a thorough check by the CASD team.

In particular, the law forbids any export of the raw data or of outputs (e.g., means, regressions etc.) made using less than 11 tax units.

B.1.2 Description of the Panel of Wealth tax returns (ISF-IFI)

The ISF-IFI file is an administrative database containing the information of households' wealth tax returns which is produced by the French tax authority (*Direction générale des finances publiques*, DGFIP) and available to researchers upon request.

Population coverage. In France, households possessing significant wealth are subject to a wealth tax since 1982^{A.4}. Tax filling is mandatory for households with a wealth above a given threshold and who either are French fiscal residents^{A.5} or have wealth located in France. In that latter case, the taxable wealth will only be constituted of the wealth located in France. The wealth threshold to declare at the wealth tax have varied during the period following changes in the tax schedule. This means that the population covered by the ISF-IFI file has not been constant over the period. In 2010, the threshold was 790,000 euros and all households above that threshold had to fill in a detailed declaration (form n°2725). As described in Table B3, there were about 590,000 households filling the return in 2010. As of 2011, households with taxable wealth below 1.3 billion euros were not taxable anymore and thus did not fill in the wealth tax return anymore. In 2011, the number of households drop to about 290,000 due to this change in the tax schedule. The second main change in the population covered by the ISF-IFI file is due to the 2018 reform which canceled the global wealth tax (ISF) and replaced it by a wealth tax only on real estate, making financial assets non-taxable. As a result, the number of households filling a wealth tax return decreased from about 350,000 in 2017 to about 130,000 in 2018.

Table B3: Number of observations per year in the ISF-IFI file

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
ISF detailed tax return (form n°2725)	454,565	526,376	564,104	558,464	590,339	63,499	55,925	82,771	90,646	95,126	98,993	101,191	.	.	.
ISF simplified tax return (form n°2042)	.	.	.	.	.	223,825	233,351	228,994	240,073	247,661	251,898	255,122	.	.	.
IFI tax return (form n°2042-IFI)	.	.	.	.	.	.	.	.	.	.	.	.	132,722	139,149	143,337
Total	454,565	526,376	564,104	558,464	590,339	287,324	233,351	311,765	330,719	342,787	350,891	356,313	132,722	139,149	143,337

NOTES: This table presents the number of households filling the wealth tax return by year and by types of tax return forms used.

SOURCES : ISF-IFI 2006-2020.

Data production. The ISF-IFI file is a large panel file updated annually with the information of the wealth tax return of a given year. For a given year N , households

^{A.4}The wealth tax was called *Impôt sur les Grandes Fortunes* (IGF) from 1982 to 1986, then *Impôt de Solidarité sur la Fortune* (ISF) from 1989 to 2017 and is now called the *Impôt sur la Fortune Immobilière* (IFI) since 2018.

^{A.5}The tax authority considers as a French fiscal resident any household, whatever the nationality of its member, who belong to one of the following categories; households whose permanent address is in France, households who have a non-auxiliary professional activity in France, households having its main economic interests in France, households working for the public sector abroad and not paying personal income tax there.

declare their taxable wealth as of 1/1/ N between May and June of year N by filling the wealth tax return. The declared information includes taxable wealth split in different asset categories (e.g. housing, lands, stocks, cash etc.) as well as some other information necessary to perform the wealth tax computation (e.g., total amount of taxes paid and income earned during the previous year, deductible expenses like charitable donations, etc.). However, as of 2011, households with taxable wealth below 3 billion euros are allowed to declare in a “simplified” tax return which requires less detailed information than the detailed form.^{A.6} In particular, for households filling the simplified tax return we observe their total taxable wealth but we cannot know the share of this wealth that comes from financial wealth (e.g., stocks). In the end, the ISF-IFI file contains one variable for each box of the wealth tax forms.

Observation unit. The observation unit for the ISF-IFI file differs from the one in POTE. Indeed, the wealth tax legislation defines the tax unit for the wealth tax as a unit composed of an individual, its partner (including couples who are not married or in a civil union) and children below 18. This definition differs from the one used by the personal income tax legislation (see above). Households are identified by a unique *ad hoc* household identifier (the *FIP18_c*).

Panelization of the data & Merge with POTE. The ISF-IFI file contains panel data as it has one observation per yearly tax return. The household identifier in the ISF-IFI file is supposed to allow merging the wealth tax return data with the personal income tax return data (POTE). Due to difference in population coverage (e.g., foreigners owning assets located in France), as well as differences in the definition of the tax unit, the merge is not complete. In 2018, out of the 132,722 households filling a wealth tax return, 96% of them could be linked to their personal income tax return using the common household identifier.

Confidentiality of the data. The process to access the ISF-IFI confidential data is the same as the one described above for the POTE file.

B.1.3 Description of the main variables used

At the household level, the main outcomes of interest are the following:

- **Dividend**

Dividend income are declared yearly by households on the main tax form n°2042, whether they are taxed at the progressive income tax schedule or at the flat-tax, and even when they have already been subject to a withholding tax. For years 2006 to 2012, we define dividend income as the sum of all equity and dividend income subject to the flat-rate withholding tax (“*revenus des actions et parts soumis*

^{A.6}From 2013 to 2017, the criteria to fill in the simplified tax return was to have a taxable wealth lower than 2.7 billion euros. For a year, in 2011, the simplified tax return was a separate form (form n°2725-A). In 2012, the form was replaced by a specific set of boxes in the personal income tax return form n°2042. Forms since 2011 are available on the tax authority’s website: <https://www.impots.gouv.fr/portail/formulaire/2725/impot-de-solidarite-sur-la-fortune>.

au prélèvement libératoire” declared in box 2DA of the form n°2042) and the other equity and dividend income (*“revenus des actions et parts”* declared in box 2DC of the form n°2042). For years 2013 to 2019, we define dividend income as simply the equity and dividend income declared in the 2DC box, as the form does not distinguish between the two types anymore. Declared dividends are raw dividends, without deduction of any tax deductions or taxes already paid on these income.

- **Other capital income**

Other capital income include revenues from life-insurance contracts and from fixed interests products whether French or foreign (*“produits d’assurance-vie et de capitalisation soumis au prélèvement libératoire de 7,5%”* declared in box 2DH, *“produits de placement soumis aux prélèvements libératoires autres que ceux indiqués lignes 2DA et 2DH”* declared in box 2EE, *Intérêts et autres revenus assimilés* declared in box 2TR and *“Produits des contrats d’assurance-vie et de capitalisation d’une durée d’au moins 6 ou 8 ans”* declared in box 2CH, *“produits de placement à revenu fixe inférieurs à 2 000 euros taxables sur option à 24%”* declared in box 2FA of the form n°2042) as well as the taxable share of income from stock savings plan (PEA) (box 2FU). It also includes capital income distributed by firms located in low-tax foreign jurisdictions (i.e., jurisdictions where the corporate income tax liability is lower than the third of what it would be in France) declared in box 2GO. Most of the other income are taxed at a progressive rate before and after 2013 and some of them (e.g., box 2FA) are eligible to a flat-tax even after 2013.

- **Capital gains**

Capital gains are declared to the tax authority by households once they have been realized (box 3VG of the form n°2042). The outcome of interest is the net taxable capital gain. In particular, we account for any pas losses that can deducted (declared in box 3VH of the form n°2042). We also account for gains of self-employed individuals (declared in the specific form n°2042 C PRO).

- **Wage income**

We define wage income as the total net income of the household which includes the income of both spouses (boxes 1AJ and 1BJ of the form n°2042) as well as the income of SARL owner-manager and of other controlling owner-managers (see Section B.3).

B.2 Shareholder data

We here provide more details on the complementary sources used to build the shareholder register.

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: Forms 2059-F for firms filling the detailed CIT returns, and form 2033-F for firms opting for the simplified version. Information for each of these “reference shareholder” consist 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. 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.^{A.7}

B.3 Identification of households with suspected control over a firm

While the matched shareholder-firm tax data allows to identify households with control over a firm after 2014, it only provides a proxy of firm control for years before 2014. In particular, it might mislabel individuals whose status changed at least once between 2009 and 2014. We thus use some additional information contained in the wealth and income tax data to identify “suspected” firm owners.

^{A.7}This figure is computed from firms with non-zero value wholly owned by natural persons and which register their shareholders in the tax records.

Identification of SARL owner-manager. We use information from the 2010 tax income data to identify a specific subset of firm owners. We label as households with some control over a firm the ones that declare that year some income in the following boxes; *5TJ, 5TK, 5TL, 5TM, 5UJ, 5UK, 5UL* and *5UM*. These are households affiliated to the self-employed workers regime (“*régime social des indépendants*”). This information is only available for 2010.

Identification of households with some control over a firm. We use information from the wealth tax files (ISF-IFI) to identify households that do not include a firm’s owner-manager but have, to a lesser extent, some degree of control over a firm. Households subject to the wealth tax can benefit from several tax exemptions—whether total or partial—on specific types of assets and thus have to declare these assets separately from the rest of their wealth. This information is only available for households filling the detailed wealth tax return and thus, for a significant share of households, we cannot observe this information. We label as households with some control over a firm the ones that declare, at least once pre-reform, holding assets in at least one of the following categories:

- Shares of firms in which individuals pursue their main professional activity which do not qualify for the business assets exemption (box *CD*)
- Shares held by employees or corporate officer of a firm (box *1CL*)
- Shares of family firms with a collective retention commitment (“*pacte Dutreil*”) of at least 6 years (box *1CB*)
- Shares held following the takeover of a firm by its employees (box *1CH*)
- Shares held in a holding that owns a firm qualifying for the business assets exemption^{A.8} (box *1CI*)
- Shares representing more than 50% of total wealth (box *1CJ*)
- Shares of SMBs (box *1CK*)

^{A.8}Assets held that relates to the main professional activity of taxpayers are fully exonerated from the wealth tax. In some cases, it also applies to individuals using a holding scheme for their personal business.

C A new ‘new view’ model of dividend taxation

A theory of dividend taxation in entrepreneurial firms. In this section, we develop a simple model of theory of dividend taxation in entrepreneurial firms. To do so, we build on the two-period version of the neoclassical model of investment and payout policy as developed in [Chetty and Saez \(2010\)](#). The approach is neoclassical in the sense that it assumes a perfect alignment between the objective of the manager and that of the shareholders. This assumption is warranted by the fact in our estimation sample most firms we study have concentrated ownership with a substantial share being owned by the manager (who is in this case an entrepreneur, hence the term entrepreneurial firm).

Basic setup and notation. There are two periods, indexed 0 and 1. We consider a firm that has initial cash holdings of X at the beginning of period 0. These could represent accumulated, non-invested profits from past periods.

At time 0, the firm can issue equity E . In the baseline version of the model, the manager can either pay out dividends D to shareholders or invest I in a project. This project yields revenue in the next period at time 1. We note I denote the level of investment. It can be defined as a residual of cash holding minus dividend payouts: $I = X + E - D$ where D refers to the firm’s dividend payment in period 0. In period 1, the project generates net profits of $f(I)$. The firm then shuts down and returns its net-of-tax profits as well as the (untaxed) principal to shareholders.

We consider an environment with double taxation of corporate profits, first at rate t_c when profits are realized by the firm and then at rate t_d when they are returned to shareholders. This environment gives rise to the following equation for the value of the firm (which closely follows equation (1) of [Chetty and Saez \(2010\)](#)):

$$V = (1 - t_d)D - E + \frac{(1 - t_d)[(1 - t_c)f(X + E - D) + X - D] + E}{1 + r}, \quad (\text{A.3})$$

where r is the after-tax return on a risk free asset.^{A.9} As mentioned above, we consider that payout and investment policies aim at maximizing the value of the firm. Following the literature, it is useful to distinguish firms depending on whether they are cash-rich $(1 - t_c)f'(X) \leq r$ or cash-poor $(1 - t_c)f'(X) > r$.

—*Cash-rich firms* finance their investment out of retained earnings X and face relatively little investment opportunities, as such even if they didn’t raise any funds through equity issuance and invested all of their retained earnings, they would obtain a return below the risk-free interest rate r . It is therefore optimal to return cash to shareholders until the return on investment equate r . The optimal choice of dividends satisfies the following first order condition: $(1 - t_c)f'(X - D^*) = r$ which shows that the dividend tax rate t_d does not affect payout decision for these firms. As investment is defined as $I = X - D$, we see that I is also unaffected by t_d .

^{A.9}Note that a firm which maximizes value will never set $E > 0$ and $D > 0$ simultaneously, because a firm which issued equity and paid dividends at the same time could strictly increase its value V by reducing both E and D by \$1 and lowering its tax bill by $t_d r / (1 + r)$.

—*Cash-poor firms* finance their investment out of equity and can be in either of two situations. Either a medium level of cash-constraint, $(1 - t_d)(1 - t_c)f'(X) < r$, in which case it is optimal for the firm to set both E and D to 0 (a corner solution explained by the tax wedge), or a high-level of cash constraint, $(1 - t_d)(1 - t_c)f'(X) \geq r$, which case it is optimal for the firm to issue equity E^* until post-tax return equals the bond rate: $(1 - t_d)(1 - t_c)f'(X + E^*) = r$. In the last case, equity issuance and investment respond negatively to an increase in t_d . Dividend payouts are null in period 0 and they go down in period 1 as t_d increases. So following a dividend tax change, investment and equity issues respond immediately (period 0), and while dividends change only when the additional investment pays off (period 1).

Extension: Saving and/or consumption through the firm. We now suppose that the entrepreneur obtains benefits from the firm through another channel than dividends. We suppose that this channel payoff S , is taxed at rate t_s and is associated with an additional cost $c(S)$ which is increasing and convex.

A first interpretation of S is savings through the firm, by using saving deferred to period 1 which generate a rate of return r but is more lightly taxed than if the cash was paid out as dividends and subsequently invested in a bond. This interpretation is in line with the evidence presented in the paper for the two dividend tax reforms, with retained earnings explaining a large fraction of the dividend variations. Another interpretation of S could be consumption through the firm, that is the notion that entrepreneurs' compensation occurs in part through perks. This consumption through the firm, has the advantage of being taxed more lightly than dividends at rate $t_s < t_d$, especially if it is associated with deductible cost, but is associated with convex cost. The level and convexity of the cost function is likely to be increasing in the dispersion of ownership. This interpretation would be in line with empirical evidence on the consumption of entrepreneurs (Sarada, 2011; Leite, 2023), and with the impact of the 2013 reform on after-tax income for small firms. The convexity of cost of consumption and saving through the firm can be justified for instance by the fact that some forms of consumption and saving through the firm are illegal, and that the legal ones are restricted in terms of eligible items and in terms of the shareholders who can legally benefit.

The objective function is now amended as follows:

$$V = (1 - t_d)D + (1 - t_s)S - c(S) - E + \frac{(1 - t_d)[(1 - t_c)f(X + E - D - S) + X - D - S] + E}{1 + r}, \quad (\text{A.4})$$

where the new terms are highlighted in red. Here too it useful to distinguish cash-rich and cash-poor firms.

—*Cash-rich firms* are such that $(1 - t_c)f'(X) < r$. It remains suboptimal to have E and D strictly positive at the same time and the firm sets $E^* = 0$ and choose D , S in order to maximize the value of the firm as described in equation A.4. The first order

conditions can be rearranged as follows:

$$(1 - t_c)f'(X - D^* - S^*) = r \quad (\text{A.5})$$

$$c'(S^*) = t_d - t_s. \quad (\text{A.6})$$

The first line shows that, as before, overall investment $I^* = X - D^* - S^*$ is unaffected by dividend tax as the term t_d drop down from the first order condition on D^* . This also implies that total payout P defined as $P = D + S$ remains constant. The second line show that S^* goes up as t_d increases as the function $c(\cdot)$ is assumed to be convex ($dS = dt_d/c''(S)$). Accordingly, as total compensation remains constant $dP = 0$, we have $dD = -dS < 0$. Equation A.5 shows that the cost of capital, i.e., the before-tax required return on an asset (Sinn, 1991), is not affected by the dividend tax rate t_d .

This simple extension provides a natural setting to rationalize our results. Cash-rich firms decrease dividends and use alternative ways of compensating shareholders to maintain the compensation of shareholders. Total compensation remains constant due to this substitution and accordingly, investment is not affected by the change in t_d .

—*Cash-poor firms* issue equity and pay no dividends in period 0. The first order condition with respect to equity writes as:

$$(1 - t_d)(1 - t_c)f'(X + E^* - S^*) = r. \quad (\text{A.7})$$

The optimal value for S will depend on the shape of the cost function $c(\cdot)$, in particular on whether $c'(0) > t_d/(1 + r) - t_s$. To see this, consider the derivative of V with respect to S at $S = 0$ and where E is set to satisfy equation A.7.

$$\begin{aligned} \left. \frac{\partial V}{\partial S} \right|_{\substack{S=0 \\ E=E^*}} &= 1 - t_s - c'(S) - \frac{(1 - t_d)(1 - t_c)f'(X + E - S) + (1 - t_d)}{1 + r} \\ &= 1 - t_s - \frac{1 - t_d}{1 + r} - c'(S) - \frac{(1 - t_d)(1 - t_c)f'(X + E - S)}{1 + r} \\ (\text{using A.7}) &= 1 - t_s - \frac{1 - t_d}{1 + r} - c'(S) - \frac{r}{1 + r} = \frac{t_d}{1 + r} - t_s - c'(S). \end{aligned} \quad (\text{A.8})$$

Equation (A.8) shows that firms will be in a corner solution with no consumption/saving through the firm if $c'(0) \geq \frac{t_d}{1+r} - t_s$. On the contrary, if $c'(0) < \frac{t_d}{1+r} - t_s$, then managers will decide to set a positive value for S^* . Overall, we can summarize the FOC for S^* as:

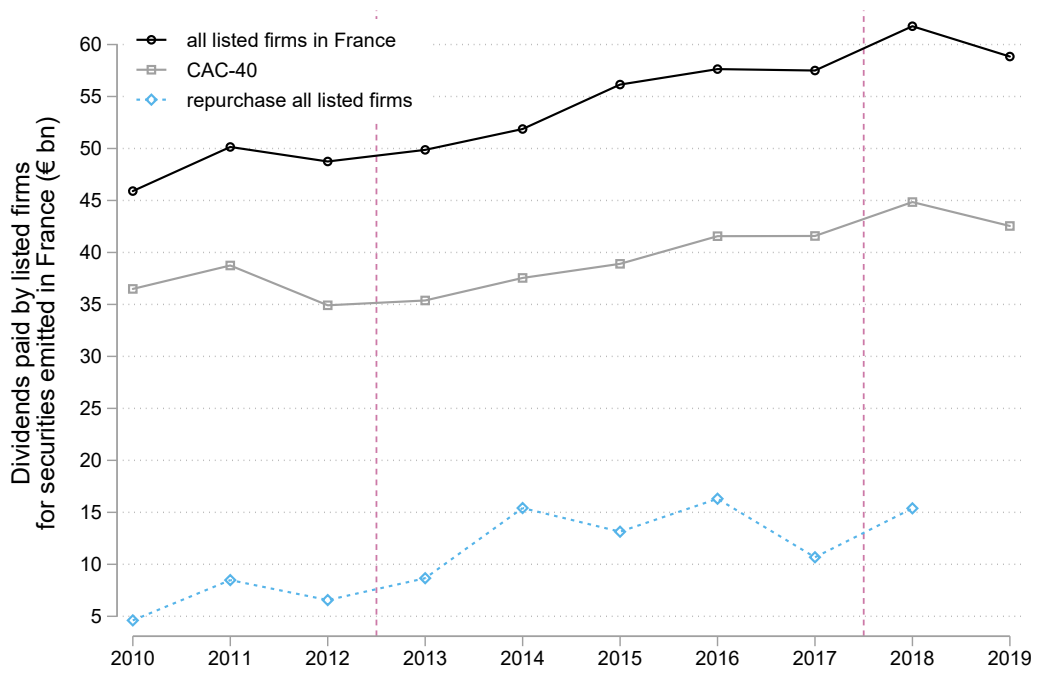
$$c'(S^*) \geq \frac{t_d}{1 + r} - t_s, \quad \text{with equality if } S^* > 0. \quad (\text{A.9})$$

We now can see that investment $I^* = X + E^* - S^*$ and dividends period 1 react as in the standard neoclassical case with high-level of cash constraint. The only difference is that payout in period 0 might not be 0 if S^* is positive. In that case, an additional reaction is that S^* goes up following an increase in t_d .

D Additional results

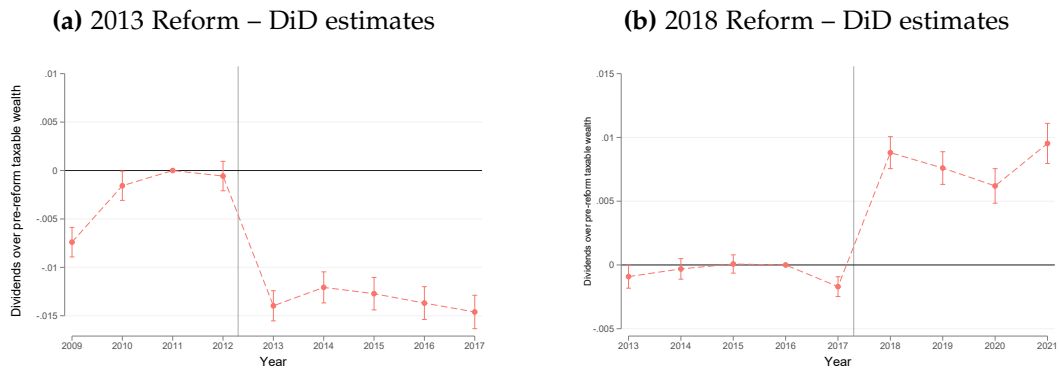
In this section, we present additional results not included in the main text.

Figure D1: Dividends and share repurchases by French listed firms



NOTES: The figure displays payouts in current billion euros. Source: Compustat.

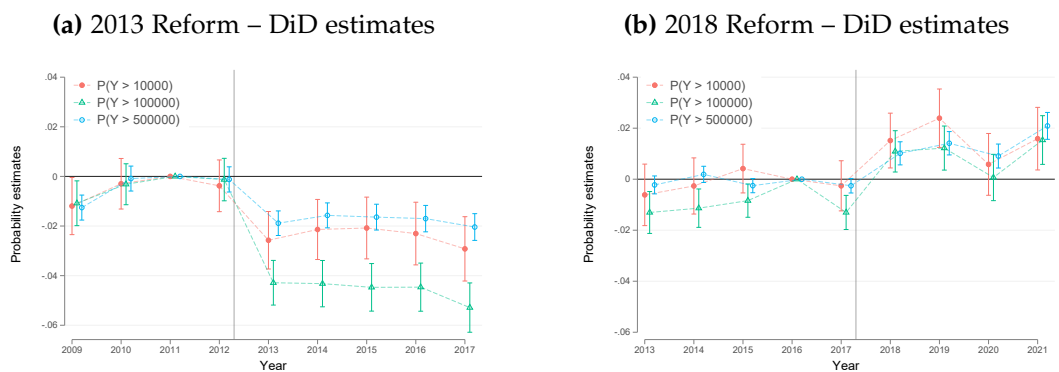
Figure D2: Dividends received by households – firms owner vs non firm owners (top 1%)



NOTES: The sample is a balanced sample of all households having received more than €1,500 and paying the wealth tax every year pre-reform. Additionally, the sample is restricted to households belonging to the top 1% of the taxable income distribution (defined as wages and pensions income only). The figures represent the treatment effect estimates using the comparison of firm owners versus non-firm owners. The outcome is the amount of dividends received by households over their maximal pre-reform taxable wealth.

SOURCE: Panel POTE-ISF (DGFIP) 2009-2021.

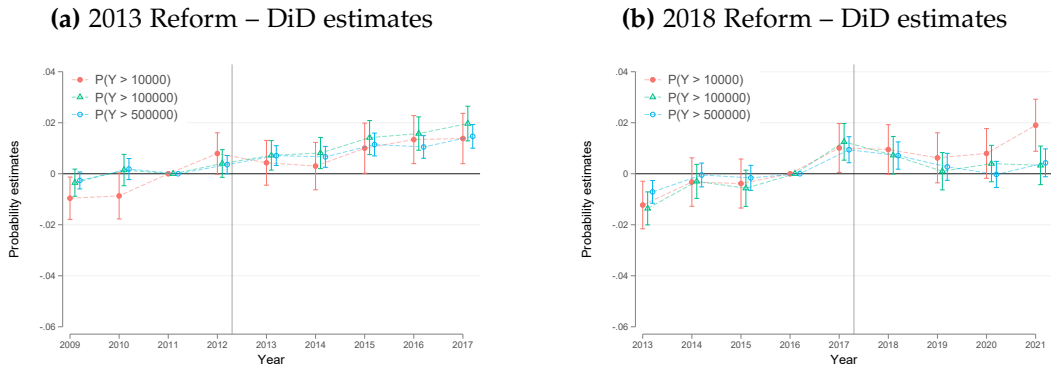
Figure D3: Dividends received by households – extensive margin responses



NOTES: The sample is a balanced sample of all households having received more than €1,500 and paying the wealth tax every year pre-reform. The figures represent the treatment effect estimates using the specification described in Section 4. The outcome is the probability of receiving an amount of dividend greater or equal than a certain threshold.

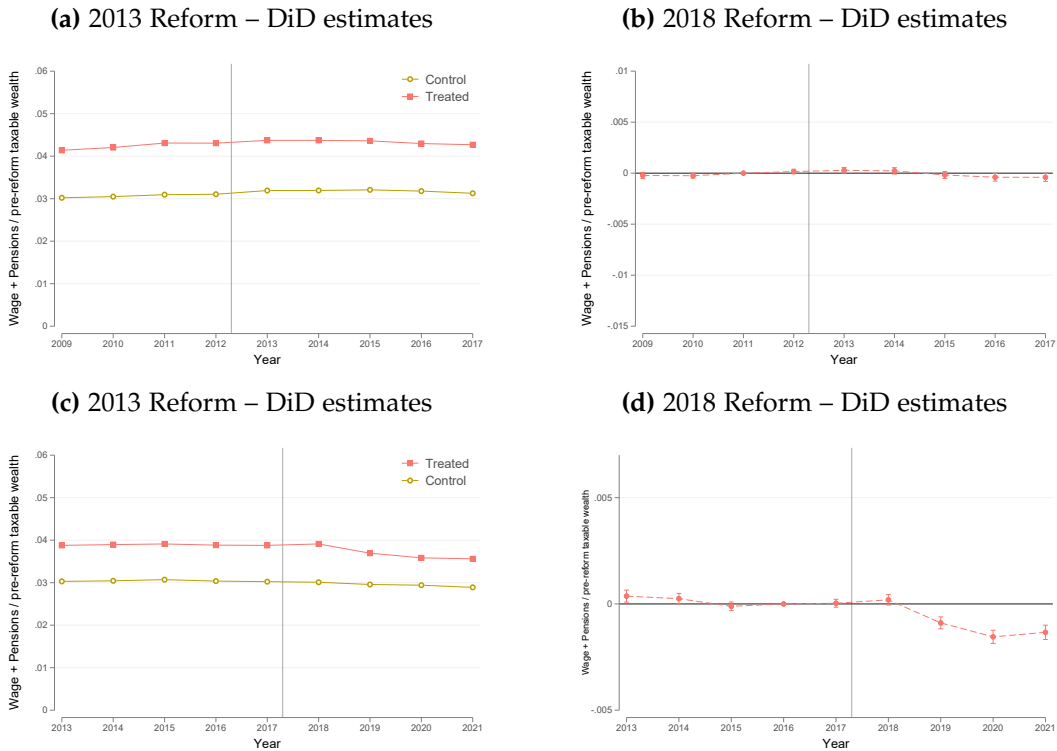
SOURCE: Panel POTE-ISF (DGFIP) 2009-2021.

Figure D4: Capital gains received by households – extensive margin responses



NOTES: The sample is a balanced sample of all households having received more than €1,500 and paying the wealth tax every year pre-reform. The figures represent the treatment effect estimates using the specification described in Section 4. The outcome is the probability of receiving an amount of capital gains greater or equal than a certain threshold. SOURCE: Panel POTE-ISF (DGFIP) 2009-2021.

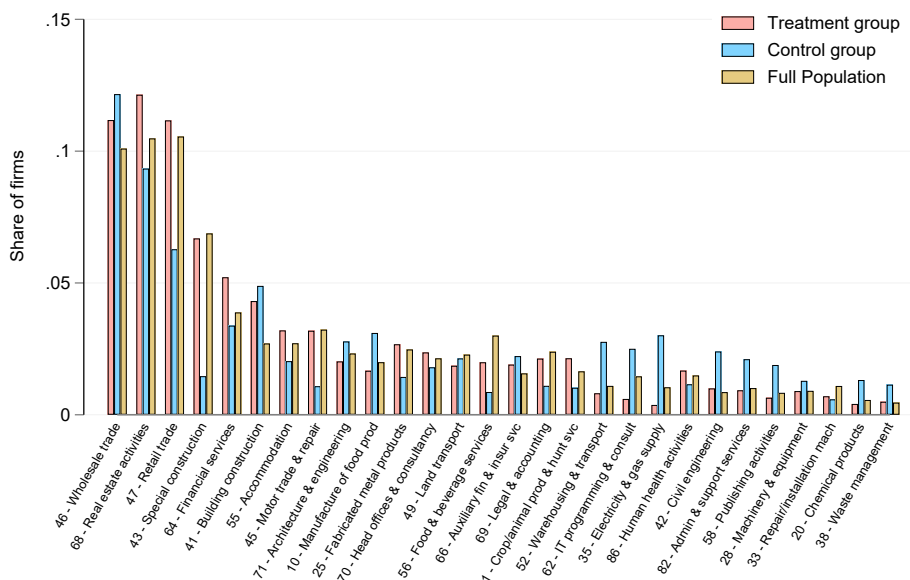
Figure D5: Wages and pensions received by households – firm-owners vs non firm owners



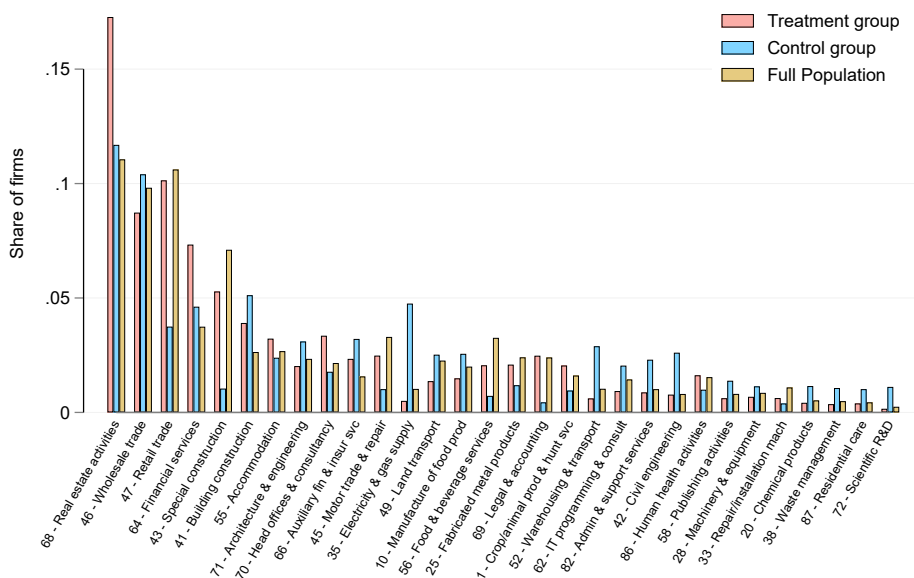
NOTES: The sample is a balanced sample of all households having received more than €1,500 and paying the wealth tax every year pre-reform. The figures represent the treatment effect estimates using as firm-owners as our treated group and non firm-owners as our control group. The outcome is the amount of wages and pensions received by households over their pre-reform taxable wealth. SOURCE: Panel POTE-ISF (DGFIP) 2009-2021.

Figure D6: Industry composition of the regression sample and of the firm population, weighted by assets

(a) 2013 reform

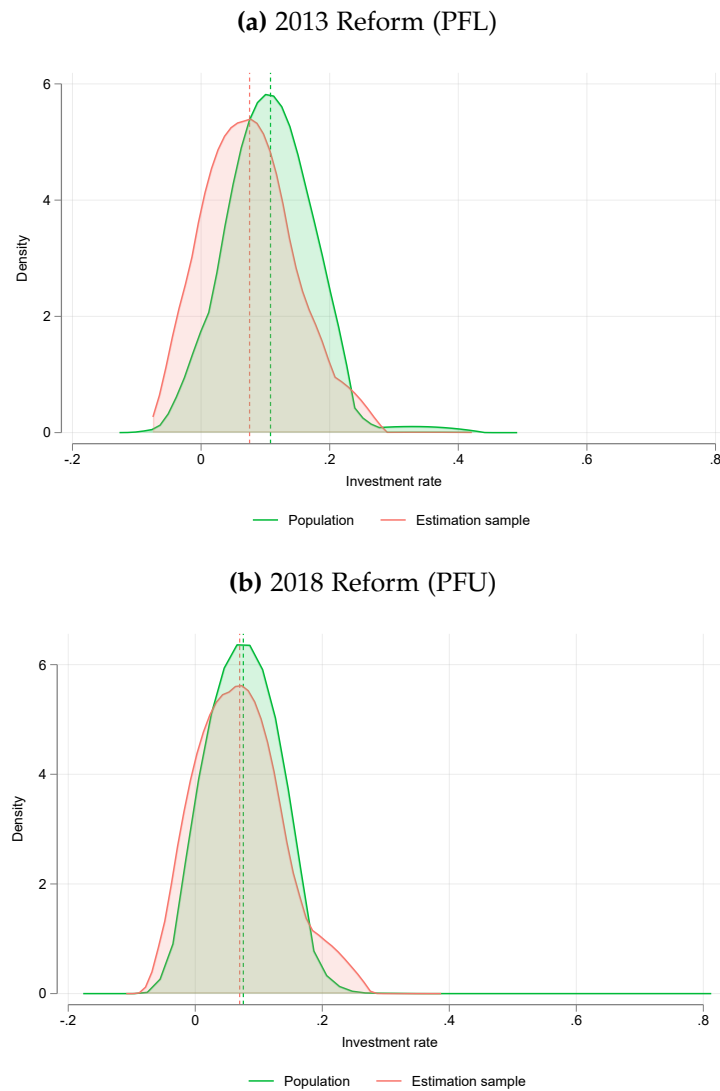


(b) 2018 reform



NOTES: This figure presents the share of each industry in our treatment group, control group, and in the full population (liasses fiscales), weighted by assets. Panel a displays this composition for the 2013 reform (using 2011 as reference year), panel b displays the composition for the 2018 reform (using 2016 as reference year).

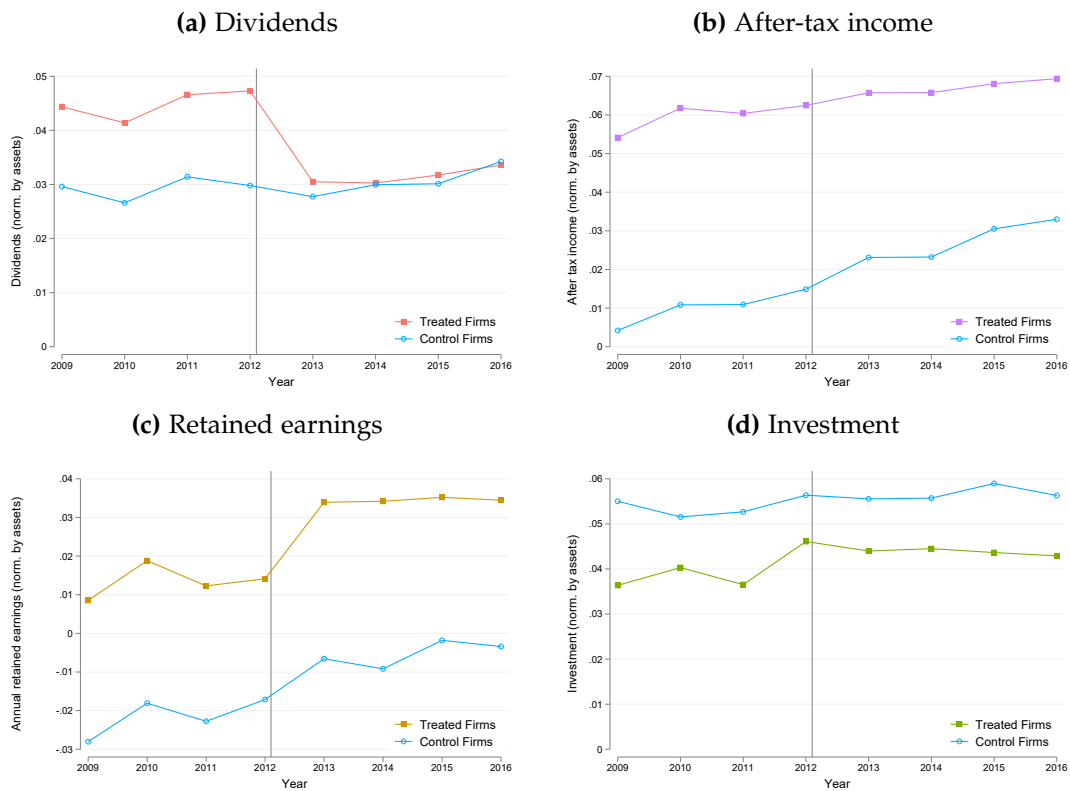
Figure D7: Assets-weighted sectoral distribution of investment rates, full population versus estimation sample



NOTES: This figure represents the distribution of the average investment rates by industry code, weighting industries by total assets. Panel a refers to the 2013 reform (PFL), panel b to the 2018 reform (PFU). The distributions shown in green are the distribution observed in the full population of firms (BIC-IS), the ones shown in red are the distribution observed in our estimation samples. Investment rates are winsorized at percentiles 1 and 99.

SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes.

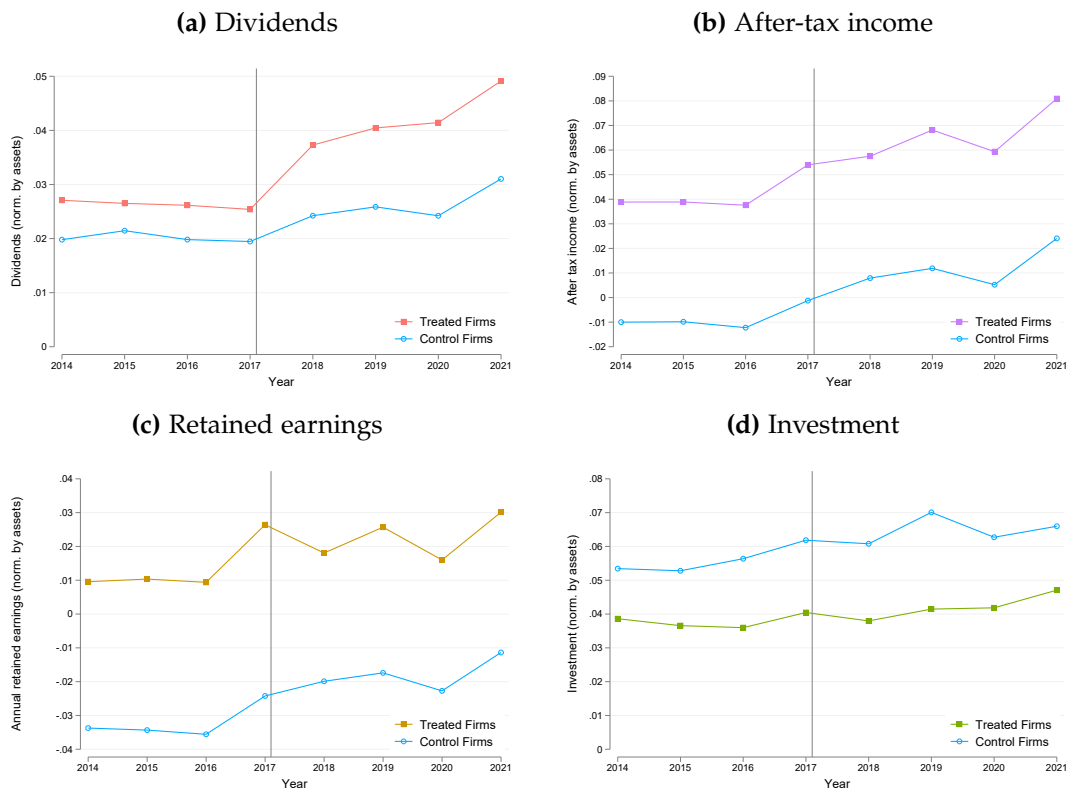
Figure D8: Impact of the 2013 tax hike (PFL) on the accounting decomposition variables: annual averages



NOTES: Panels (a) to (d) represent averages of each of the variables in the accounting decomposition, each year between 2009 (year -3 w.r.t the PFL reform) and 2016 (year +3 w.r.t the PFL reform). Panel (a) represents dividends over assets, panel (b) investment over assets, panel (c) profits over assets and panel (d) net corporate savings over assets. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section.

SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes.

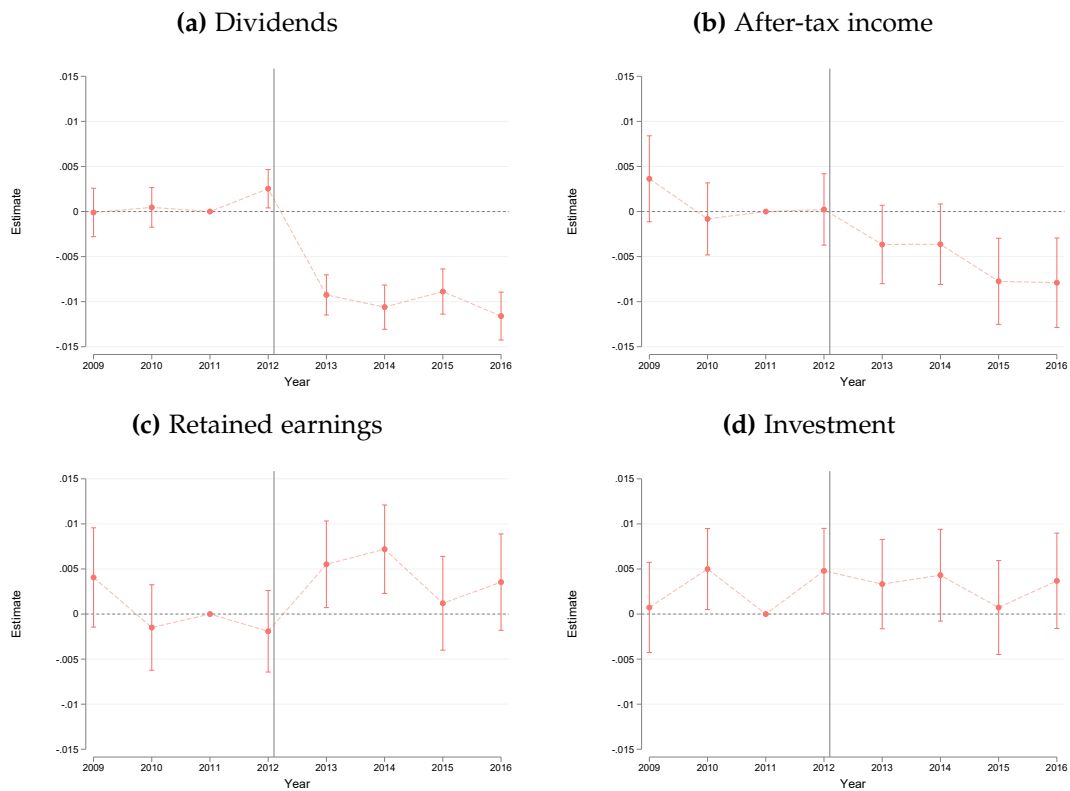
Figure D9: Impact of the 2018 tax cut (PFU) on the accounting decomposition variables: annual averages



NOTES: Panels (a) to (d) represent averages of each of the variables in the accounting decomposition, each year between 2014 (year -3 w.r.t the PFU reform) and 2021 (year +3 w.r.t the PFU reform). Panel (a) represents dividends over assets, panel (b) investment over assets, panel (c) profits over assets and panel (d) net corporate savings over assets. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section.

SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes.

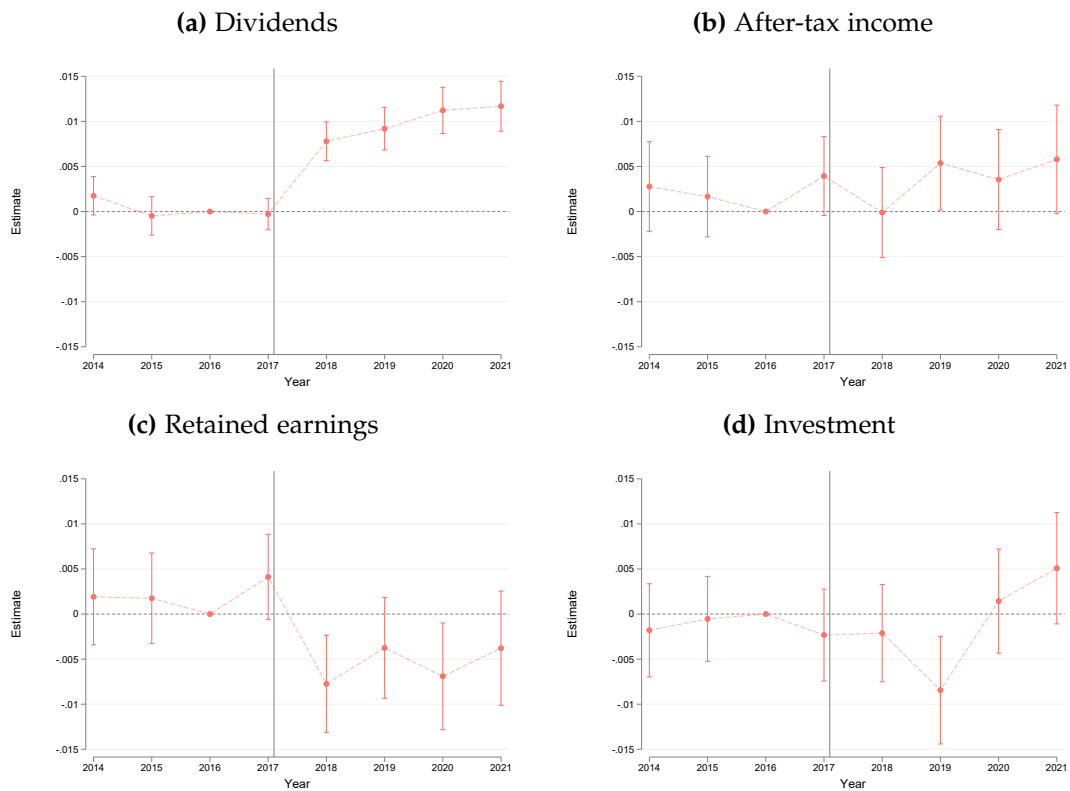
Figure D10: Impact of the 2013 tax hike (PFL) on the accounting decomposition variables: annual averages



NOTES: Panels (a) to (d) represent averages of each of the variables in the accounting decomposition, each year between 2009 (year -3 w.r.t the PFL reform) and 2016 (year +3 w.r.t the PFL reform). Panel (a) represents dividends over assets, panel (b) investment over assets, panel (c) profits over assets and panel (d) net corporate savings over assets. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section.

SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes.

Figure D11: Impact of the 2018 tax cut (PFU) on the accounting decomposition variables: annual averages

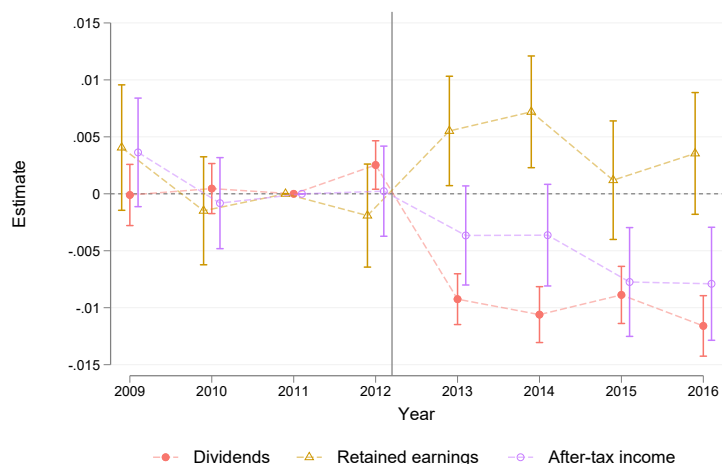


NOTES: Panels (a) to (d) represent averages of each of the variables in the accounting decomposition, each year between 2014 (year -3 w.r.t the PFU reform) and 2021 (year +3 w.r.t the PFU reform). Panel (a) represents dividends over assets, panel (b) investment over assets, panel (c) profits over assets and panel (d) net corporate savings over assets. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section.

SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes.

Figure D12: Firm-level reaction margins for both tax reforms

(a) DiD coefficients, 2013 reform



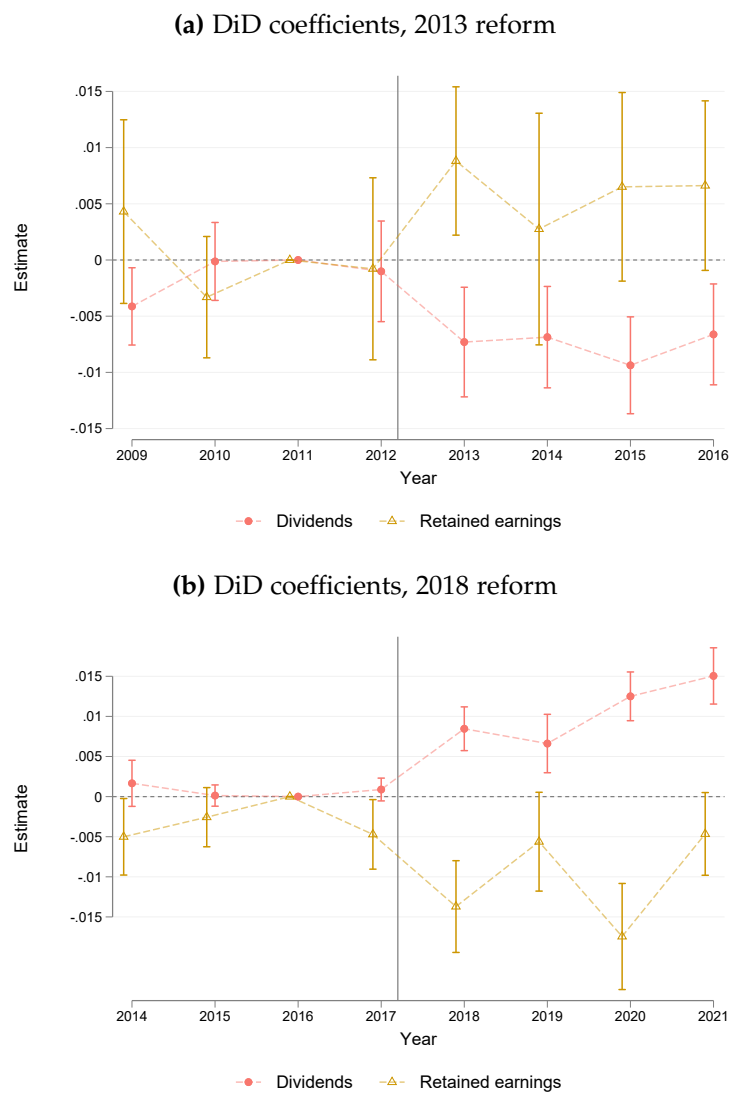
(b) DiD coefficients, 2018 reform



NOTES: The variables studied are the variables showing significant reactions in the accounting decomposition. Panel (a) represents regression coefficients obtained by dynamic difference-differences for the 2013 reform, while panel (b) represents analogous estimates for the 2018 reform. Robust standard errors clustered at the firm level are used to build the confidence intervals (95%). Year 0 is the last pre-reform year (2012 for the 2013 reform, 2017 for the 2018 reform). The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Regressions include 2-digits industry (88 categories) \times year, month of accounts closure \times year, age group (10 categories) \times year, legal form (9 categories) \times year, and headquarter region (27 categories) \times year fixed-effects.

SOURCES : Files BIC-IS, FDG, PERIM, LIFI, BADS, POTE-ISF.

Figure D13: Firm-level reaction margins for both tax reforms, regressions weighted by assets



NOTES: The variables studied are the variables showing significant reactions in the accounting decomposition. Panel (a) represents regression coefficients obtained by dynamic difference-differences for the 2013 reform, while panel (b) represents analogous estimates for the 2018 reform. Regressions are weighted by firms' assets in the reference year. Robust standard errors clustered at the firm level are used to build the confidence intervals (95%). Year 0 is the last pre-reform year (2012 for the 2013 reform, 2017 for the 2018 reform). The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. SOURCES : Files BIC-IS, FDG, PERIM, LIFI, BADS, POTE-ISF.

Table D1: Firm-level results on the accounting decomposition, restricted to subsamples (both reforms)

A. 2013 reform (tax hike)				
	All	No finance	No fin. or bus. services	No SARL
	(1)	(2)	(3)	(4)
Dividends	-0.0111*** (0.000777)	-0.0126*** (0.000850)	-0.0119*** (0.000882)	-0.00824*** (0.000949)
After-tax income	-0.00550*** (0.00157)	-0.00682*** (0.00180)	-0.00640*** (0.00188)	-0.00370** (0.00177)
Retained earnings	0.00550*** (0.00160)	0.00556*** (0.00183)	0.00521*** (0.00191)	0.00476*** (0.00183)
↔ incl. Investment	-0.000156 (0.00158)	-0.00171 (0.00178)	-0.00151 (0.00187)	-0.000187 (0.00212)
Observations	522451	352061	325808	242197
# firms	74711	50319	46544	34665
# treated firms	63831	42414	37479	22605
B. 2018 reform (tax cut)				
	All	No finance	No fin. or bus. services	No SARL
	(1)	(2)	(3)	(4)
Dividends	0.00968*** (0.000784)	0.0100*** (0.000923)	0.00944*** (0.000953)	0.0104*** (0.000935)
After-tax income	0.00147 (0.00175)	0.00297 (0.00217)	0.00248 (0.00227)	0.000621 (0.00201)
Retained earnings	-0.00756*** (0.00177)	-0.00685*** (0.00220)	-0.00675*** (0.00230)	-0.00896*** (0.00204)
↔ incl. Investment	-0.0000630 (0.00173)	-0.00255 (0.00199)	-0.00361* (0.00208)	0.000478 (0.00211)
Observations	837277	493617	453815	481308
# firms	111226	65580	60293	64754
# treated firms	99309	58036	51286	58066

NOTES: This table presents regression coefficients of a static diff-in-diff estimation, using as our dependent variable each variable of the accounting breakdown presented in equation (2), as covariate of interest an interaction ‘treatment × post reform period’. Panel A presents results for the 2013 reform (tax hike), panel B for the 2018 reform (tax cut). Coefficients should be interpreted per euro of pre-reform assets. Column (1) presents the estimates on the full sample. Column (2) presents the results without firms in the finance industry or headquarters (we remove NAF A88 codes from 64 to 68, 70 and 77), and column (3) presents the results removing firms in the finance industry, headquarters, as well as business services (we remove NAF A88 codes from 64 to 70, from 76 to 78, and 82). Column (4) presents the results on a subsample removing treated firms with a SARL legal form. Standard-errors are clustered at the firm-level and indicated in parentheses. The treatment group is composed of companies with at least 50% direct or indirect ownership by individuals with substantial control (more than 10% of cash flow rights), at least one of which liable to the personal wealth tax as; the control group is composed of companies with less than 10% direct or indirect ownership by individuals with substantial control, and neither fiscally integrated nor wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the data section. Regressions include 2-digits industry (88 categories) × year, month of accounts closure × year, age group (10 categories) × year, legal form (9 categories) × year, and headquarter region (27 categories) × year fixed-effects.