Follow the money! Combining household and firm-level evidence to unravel the tax elasticity of dividends *

Laurent Bach Antoine Bozio Brice Fabre
Arthur Guillouzouic Claire Leroy Clément Malgouyres

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Abstract

We estimate the tax elasticity of dividends using two recent French reforms: a hike in the dividend tax rate followed, five years later, by a cut. To follow the cash movements within the balance sheets of households and firms caused by these reforms, we use newly-accessible personal and corporate tax registries. Following the tax increase, the elasticity of dividends is very large and there is no shifting towards other personal income categories. With firm data we confirm that firms owned by individuals have reacted by cutting dividend payouts, increased financial assets but did not respond in terms of investment. We find suggesting evidence of an increase in firms' spending. After the tax decrease, payouts revert to their initial level, financial asset within firms decrease, and investment is equally not affected. In both tax reforms, we find strong evidence that owner-managers are driving the very large dividend tax elasticity by using their firm as tax shelter from personal taxation.

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*Bach: ESSEC Business School and Institut des politiques publiques (IPP). Bozio: Paris School of Economics (PSE), EHESS, IPP. Fabre: IPP. Guillouzouic: IPP. Leroy: CREST. Malgouyres: PSE and IPP. We thank Rachel Griffith, İrem Güçeri, Thomas Piketty and Nora Strecker for helpful comments, as well as seminar participants at the Paris School of Economics, St. Gallen University, and Beta Nancy/Strasbourg University. The authors acknowledge the financial support of the EUR grant ANR-17-EURE-0001. Malgouyres acknowledges also financial support from the ANR through project ANR-19-CE26-0004. We thank the French ministry of finance-DGFiP for providing access to the data, as well as the CASD for secured data access (ANR-10-EQPX-17).

1 Introduction

The taxation of capital income, and most notably dividend taxation, has become one of the most debated policy issues. A flurry of reforms aiming to reduce taxation of capital income has taken place over the past two decades, prompted by the idea that reduction in the cost of capital would entail higher investment, hence higher growth and income.[1] Evidence that households' dividends react strongly and quickly to dividend tax reforms have reinforced this point of view, suggesting that dividend tax decreases could almost "pay for themselves" (Poterba, 1987, 2004). On the other hand, evidence that income inequalities were widening since the early 1980s, combined with the fact that capital income disproportionately accrues to top income individuals, have made equity concerns more salient, highlighting that preferential capital income tax treatment disproportionately benefits the most wealthy households.[2] This issue exhibits all the attributes of an extreme equity-efficiency trade-off, whereby very large elasticities of dividend taxation would push for lower tax rates, while high concentration of business income would push for higher rates.

However, optimal policy depends not only on dividend tax elasticities, but also on the margins of behavioral responses, notably the extent of real responses—carrying impacts on real economic activities—versus mere avoidance behaviors (Saez *et al.*, 2012). Business income at the top of the income distribution is particularly sensitive to income shifting, either between personal and corporate income, between capital and labor income, or between other forms of compensation (Gordon and Slemrod, 2000; Kopczuk and Zwick, 2020). The main challenge one faces in answering this question is that dividends are the result of decisions made simultaneously by firms and households. Faced with higher tax rates, households may choose to divert their savings away from dividend-paying assets, while firms may distribute fewer 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, depending on the ownership and governance structure of companies.

[1] 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, at lower level than top marginal income tax rates. Sweden introduced it in 1991, Norway in 1992, Finland in 1993, Denmark in 1994 (see Sørensen, 1994, 2005). Other countries followed this trend, for instance the United States with the 2003 reform which reduced taxation of dividends, Spain in 2007, France in 2008 and 2018.

[2] See most prominently Piketty (2014) and Saez and Zucman (2019) for scholars advocating higher capital income taxes.

This paper aims at unveiling the various margins of behavioral responses to dividend taxation, from households and firms, exploiting two large reforms, of opposite directions, introduced in France in 2013 and 2018. In 2013, President Hollande decided to abolish a flat-rate withholding tax for dividends, thus forcing all dividends to be taxed under the progressive tax schedule. Top marginal tax rate on dividend increased from 36.5% to 40.2%. In 2018, President Macron re-introduced a flat-rate withholding tax for capital income whereby top incomes may now reduce their marginal tax rate on dividends from 40.2% to 30%.[3]

To analyse these reforms, we exploit two newly-available administrative tax data. First, we have access to the universe of French personal income tax returns—37 million tax units—matched with wealth tax files—360,000 tax units—from 2006 to 2018. We obtain information not only on income and wealth, but also on whether individuals are firm managers or not. Second, we have access to the universe of French corporate income tax returns, covering both listed and unlisted firms from 2000 to 2019, and providing the tax situation as well as the complete balance sheet, and profit and loss account of each firm. Both of these data also include unique identifiers for each household and each firm, allowing us to use panel evidence to identify the effect of tax reforms.

In order to identify the causal impact of these two reforms, we implement two distinct difference-in-differences strategies on our sample of households and on our sample of firms. In our household sample, we can precisely pinpoint those households who were exercising the flat-tax option prior to its suppression in 2013—the treated households—and those who were not—our control group. In order to find comparable households, we focus on the subsample of wealth taxpayers, which only includes household with large net wealth. We carry out a second strategy within the same sample of households, comparing households with control over a firm (managers) with households without any identified firm manager. With firm data, we define an intent-to-treat group of firms as those for which 100% of the shares are directly-held by individuals. Our control group includes firms for which less than 50% of the shares are directly-held by individuals and less than 95% of the shares are held by a single mother company. Using this research design, we are able to estimate a treatment effect of the 2013 and 2018

[3]President 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).

reforms using household-level data and an intent-to-treat effect of the 2013 and 2018 reforms using firm-level data.

Our main findings are as follows. First, we find evidence of very large dividend tax elasticities, both as a response to the 2013 tax increase and to the 2018 tax decrease. Using household data, we estimate that households who lost the flat tax option in 2013 reduced their dividends by 50%. Using firm data, and our intent-to-treat estimate we find that firms owned by individuals reduced their dividends by 14% compared to firms widely held. The 2018 reform led to marked increases in dividend payments by these firms, reversing almost all the decrease which happened in 2013, which can be found in individual tax data with a significant increase in dividend income for treated households.

Second, we find that the very large dividend tax elasticity is driven primarily by individuals having some control over firms, either by their ownership or their management of these firms. Dividend tax elasticity for firms managers is significantly higher than the one found for non-managers. Using personal income tax data, we do not find significant evidence that households affected by the 2013 reform substituted their dividends with either higher labor incomes, higher interest payments or higher capital gains.

Third, firms affected by the reforms exhibit no behavioral responses in terms of investment, neither a reduction following the 2013 tax increase, nor an upsurge following the substantial 2018 tax decrease, despite very large reactions in terms of dividend payouts.

Fourth, using accounting details of corporate income tax returns, we attempt to identify where the missing dividends may have gone. We find that firms invested approximately a third of the reduction in payouts into financial assets (accumulating undistributed profits). We find no evidence that treated firms substituted their distribution of dividends with additional private benefits to the owner-manager (as measured by wages and declared personal expenses). However, the remaining two-thirds of reductions in dividend payouts are accounted by increased annual expenses reported in the profit and loss account. With the 2018 reform, we estimate that almost all the increased in dividend payments can be accounted by the decrease in financial assets hold within the firm.

Our results are valid for firms that are large and which represent a large share of aggregate dividends received by physical persons. Our treated firms span from the 60th to 98th percentile of the size distribution of French firms, leaving out small businesses and very large public corporations. Together our estimating sample represent a third of all dividends paid to individuals. This stands in

contrast with previous literature in other countries where, because of data limitations, focus has been more on either self-employed and very small businesses (Harju and Matikka, 2016; Miller *et al.*, 2019), or very large public firms with diverse ownership (Chetty and Saez, 2005), but this fits well with the middle/large firms studied by Yagan (2015) in the U.S. context.

Our main contribution to the literature 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. We decompose thoroughly firms's accounts to estimate where increased or decreased dividend income in individuals tax data can be found in firms's accounts. Disappearing dividends from personal income tax returns (and from national accounts) reappear partly (for one-third) within firm as undistributed profits. But for the most part, two-thirds of the total, disappearing dividends seem to be absorbed by additional firm expenses, which are classified neither as investment, nor as reported manager's compensation. When dividend taxation is decreased, five years later, households with owner-managers experienced a very large increase in dividend income which can be traced to a reduction within firms of accumulated assets. Overall, our results suggest that, in France, dividend tax elasticities are mostly about income shifting, and the use of firms as tax shelter from personal income taxation.

Related literature. These results complement previous literature showing that personal dividend taxation can have large impact on dividend payouts (Chetty and Saez, 2005, 2010; Jacob and Michaely, 2017), while having no impact on firms' investment. Exploiting the 2003 dividend tax cut in the U.S., Yagan (2015) estimates, using corporate tax data, a large dividend response and finds a precisely estimated zero impact on investment. Alstadsæter *et al.* (2017) evaluate the impact of the 2006 dividend tax cut in Sweden, and find that no aggregate impact on investment from firms affected, but, as dividends were reinvested, the reform led to a reallocation of cash from cash-rich firms to cash-constrained firms (in line with Egger *et al.*, 2020).

Secondly, our results relates to the literature documenting income shifting from personal to corporate tax base. Using household data, Alstadsæter and Jacob (2016) find that households' total income was not affected by the 2006 Swedish reform, suggesting that 100% of the response is due to income shifting. Exploiting the introduction of dual income tax in Finland, Pirttilä and Selin (2011) documents large shifting from self-employed or taxpayers with control

over firms. Harju and Matikka (2016) exploit data linking personal and corporate tax records to document further large shifting behavior. Miller *et al.* (2019) exploit similar matched data on UK firms and personal tax records to highlight intertemporal shifting using retained earnings within firms as means to avoid increased personal taxation. This relates to the studies highlighting that firms can be used as tax shelter from personal income tax base (Alstadsæter *et al.*, 2014, 2019).

Third, our paper is related to the discussion about the appropriate model accounting for dividend taxation. Previous results have highlighted that the lack of response from investment is hard to reconcile with the traditional model of the user cost of capital (Yagan, 2015). Alternative models of corporate taxation have pointed to the role of principal-agents relationship—between shareholders and managers—to rationalize the empirical impact of dividend taxation (Chetty and Saez, 2010). Our results point to a simple rationale for low or null response from investment to changes in the apparent cost of capital: that the cost of capital is in reality not affected by changes in dividend taxation because income shifting reduces dramatically the effective impact on payouts. Owner-managers of firms have no agency conflict, and with control over firm payouts, can integrate their personal finances with those of the firm.

This research is also to be placed among a series of recent papers evaluating tax reforms that took place in France since 2012 using newly-available administrative data. Guillot (2019) studies the impact on the top of income distribution of the 75% income tax introduced in 2013, Aghion *et al.* (2019) exploit panel income tax records to estimate taxable income elasticity and Lefebvre *et al.* (2019) is closest to our paper in exploiting household tax data to estimate behavioral responses to changes in capital income taxation in 2013. We depart from them by incorporating firms into the picture and identifying where the missing dividends can be found. Boissel and Matray (2019) use firm-level data to study an anti-avoidance scheme implemented also in 2013 for small businesses ("*Sociétés à responsabilité limitée avec gérant majoritaire*", henceforth SARL_GM). Dividends received by owner-managers of SARL_GM were submitted to social security contributions, to align them with the tax treatment of labor earnings. By contrast, the reform we study is applicable to all firms, including the biggest ones, thus affecting the largest part of aggregate dividends. In order to distinguish our results from theirs, we run all of our firm-level analysis on a sample of firms excluding the SARL_GM firms, and in our household-level evidence, we exclude owners of SARL_GM. By exploiting the 2018 reform, we also have another variation in the tax treatment of dividend, while anti-avoidance schemes are left unchanged.

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. Section 3 describes the data and main variables. Section 4 develops our empirical strategy. Section 5 provides the main results of our analysis of the 2013 tax increase. Section 6 extends our analysis to the case of the 2018 tax decrease. Section 7 concludes.

2 Institutional setting

In this section, we briefly present the capital income taxation in France, and the 2013 and 2018 reforms we analyze in this paper. A more comprehensive presentation of tax rules and reforms can be found in Appendix A.

2.1 Capital income 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). Although the design is fairly standard, the French specificity is that the progressive schedule applies to the total income of the tax unit divided by the number of shares of the tax unit ("*part fiscale*"), i.e., the number of adults and children.[4] All types of income should normally be included in the tax base, i.e., wage income, pensions, business income, rents, and other financial incomes, but capital income can fall into tax-favored or exempted schemes (e.g., tax-favored savings accounts, life insurance, pension saving accounts, etc.). 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 share. In 2012, a new tax bracket is introduced at the rate of 45% for income above 150,000 euros per share.

Capital incomes have a separate treatment within the tax base with specific allowances for life insurance products and dividends. In addition, dividends enjoy a 40% tax reduction. This reduction has been introduced in replacement of dividend imputation which was in place in France until 2004 to avoid double taxation at the corporate and personal income tax levels. This means that top marginal income tax rate for dividends is 27% (60% of 45%).

Optional flat-rate taxation of capital income. Since 1965, France has offered taxpayers the option of a flat-rate withholding tax on some capital income, called

[4] Each adult counts for 1, the first two children for 0.5 each, and the third and all subsequent children count for 1.

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. The choice to opt for the PFL rather than the standard schedule for dividends is not obvious. It depends on the amount of dividends, of other taxable income, number of children and amounts of other tax credits and reductions. Simulations show that the PFL option is only advantageous for households with very large amount of dividends or taxable income in the top bracket (marginal tax rate of 41% or 45%).

Additional contributions on capital income. In addition to the income tax or PFL, capital incomes are subject to social contributions, i.e., the *Contribution sociale généralisée* (CSG) and *Contribution au remboursement de la dette sociale* (CRDS). CSG and CRDS are two flat-rate withholding tax, earmarked to Social Security, but non-contributory by nature, i.e., providing no individualised benefits. In 2009, these social contributions amounted to 12.1%, and they were increased in steps to 15.5% in 2012. One needs also to mention that 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, whether taxed at the standard income tax or at the PFL.

2.2 The 2013 reform

The removal of the PFL option. Fulfilling a campaign pledge to remove the preferential tax treatment of capital income, President Holland'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 of 2012, and voted by Parliament in October 2012 for a first application on January 1, 2013. Table 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.[5] Before 2013, the two tax alternatives are parallel, both experiencing increases in tax 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,

[5] In 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.

from 36.5% to 40.2%, while households who did not opt for the PFL pre-2013 remained unaffected by the reform.

Anti-avoidance scheme for LLC managers. Concomitant with the abolition of the PFL, an anti-avoidance scheme is introduced in 2013 to subject parts of the dividends of the majority managers (i.e., managers who also happen to own a majority of the shares of their companies) of limited liability companies (so-called SARL) into the scope of social security contributions.[6]

2.3 The 2018 reform

President Macron is 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. 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.[7] Table 1b presents compares the changes in marginal tax rate on dividends around the 2018 reform. The top marginal tax rate thus 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) benefit also 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 (45%) households in the 30% income tax bracket experienced a drop of 2 ppts, while the 14% income tax bracket saw an increase of 1.5 ppt.[8]

[6] See Boissel and Matray (2019) for a recent analysis of this reform. As will be made clear in the data section, we apply a set of criteria when defining units (households or firms) included in our estimating sample so as to remove majority managers of SARL to identify the impact of the removal of the PFL separately from the impact of this scheme.

[7] The anti-avoidance scheme for majority owners of small businesses remained unchanged.

[8] The 2018 reform has increased marginal tax rates for lower income group because the flat-rate withholding tax is achieved through two flat-rate tax, 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.

3 Data

Administrative tax data have recently been made available in France following a legislative change allowing access for scientific research. Given the confidential nature of the data, our access is provided under secure remote access by CASD.[9] Household-level analysis relies on the exhaustive personal income tax returns, and wealth tax returns. The firm-level analysis relies on exhaustive corporate income tax returns, Social Security record for self-employed and wage earners.

Panel of income tax returns (POTE). The French tax authority, the *Direction générale des finances publiques* (DGFiP) at the ministry of finance, produce every year a file called POTE including the complete information of income tax record 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 have this information at our disposal for income from 2006 to 2018 (i.e., for income declared in years 2007 to 2019). DGFiP creates an anonymous unique identifier for each tax unit between years which can therefore be followed over time.

Panel of 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, as the 2018 reform abolished the wealth tax for financial assets. Taxable wealth excludes professional wealth, i.e., business assets for individuals who play a managerial role in the firm they own.[10]

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 under the normal regime (BIC-RN, 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

[9] We 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).

[10] Further details on wealth taxation in France can be found in Bach *et al.* (2020).

which are independent and susceptible of paying dividends to individuals. From the matching of BIC-RN with LIFI, we define as independent companies the ones with more than 50% of the shares belonging to natural persons if this ratio is entered in the tax returns or, if this ratio is not entered, as companies not reported as a subsidiary of a group for tax purposes (PERIM) or economic (LIFI). The BRN-RN file contains a variable related to the dividends distributed for the financial year ended on a given date.[11]

Social security returns for wage earners (DADS). In order to measure total compensation to employees, we exploit Social Security records for wage earners, the *Déclarations annuelles de données sociales* (DADS). The French Statistical office INSEE produces a file of the universe of all wage earners, called DADS Postes, matched to each firm with a common identifier to firm-level data. Detailed information on each job, occupation, and earnings is provided in a given year at the job-spell level. We can identify managers within the firm, and thus measure total wage compensation for firm managers.[12] The data is currently available from 1993 to 2017.

Social security returns for self-employed (BNS). Insee produces also a separate database on income from self-employed, *base non-salariés* (BNS). Using that information we can determine which firms have been managed between 2006 and 2017 by a majority manager and under which legal category.

4 Empirical approach

4.1 Household-level estimation with tax-treatment effect

Identification strategy for the 2013 reform. We estimate the effect of the 2013 reform at the household level through a dynamic difference-in-differences estimation. We define treatment at the tax unit level pre-reform: our treated group is composed of households which had opted for the flat-rate withholding tax (PFL) at least once before 2012, while our control group includes households which had never opted for the withholding tax before the reform.

[11] Results in the process of being allocated and withdrawals from the reserves can be allocated to a reserve (legal or other), to retained earnings, to the payment of dividends to shareholders, or to a distribution among shareholders other than a dividend distribution. These two types of partner remuneration are taken into account.

[12] We identify salary income but also other forms of compensation like employer sponsored savings plans (PERCO, *intéressement*, etc.).

The choice of our treatment and control groups follows directly from the reform which abolish the option of the withholding tax: tax units using the PFL before 2013 are the exact population being affected by the reform; the ones receiving comparable amounts of dividends but not using it provide a natural control group since they are both unaffected by the reform and yet receive enough dividends so as to compare them with our treatment group both *pre* and *post* reform. Choosing the withholding tax before 2013 is determined by the amount of income and dividends but also by a series of factors not related directly to the potential amount of dividends (e.g., number of children, tax credits, and attention to tax optimization).[13]

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

$$Y_{it} = \sum_{\substack{d=-2008 \\ d\neq 2012}}^{d=2016} \beta_d \times \mathbb{1}\{t = d\} \times T_i + \mathbf{x}_i' \mathbb{1}\{t = d\}\boldsymbol{\delta}_d + \mu_i + \lambda_t + \varepsilon_{it} \tag{1}$$

where Y_{it} is our variable of interest measured for tax unit i and year t, T_i is a variable indicating firm i is in the treatment group, $\mathbb{1}_{\text{year}=t}$ a variable indicating year equals t, λ_t is a year fixed-effect, μ_i a household fixed-effect, and $\mathbf{x}_i'\mathbb{1}\{t = d\}$ a set of time-invariant household characteristics set prior to the reform and interacted with year indicators. In this specification, the β_d capture the deviation between of the treatment group relative to the control group for a given year d relative to the baseline year 2011.

Identification strategy for the 2018 reform. For the 2018 reform, the choice of the flat-rate withholding tax before 2013 does not predict the treatment of the 2018 reform. Households affected are those with income level before 2018 that put them in the top brackets (with income tax brackets of at least 30%). As a result we present estimation based on comparing households with income pre-2018 that falls at the 14% marginal tax bracket (non affected) versus household with higher income tax brackets before the reform. We follow the same specification as for the 2013 reform, except that we take 2017 as baseline year.

[13] It must be noted that households opting for the PFL before 2013 could be more active optimizers than the control group, hence our empirical strategy could provide upper bounds on elasticity as the treated group has presumably a higher elasticity to taxation than the control group.

Differential response: Manager vs non-manager For both the 2013 and 2018 reform, we will provide a differential estimate for manager and non-managers, i.e., for individuals who have some control over firms' decisions or not. The idea is to identify the mechanism of the behavioral response uncovered, whether originating from household portfolio reallocation or linked firms' decisions. In the case of the 2018 reform, the empirical strategy comparing the intensity of the reform according to pre-reform income is complicated by the fact that "true income" is unobserved for those households which have control over firms, and could have undistributed earnings within their firm. Thus comparing the behavioral responses of managers vs non-managers post 2018 will provide an estimate of differential behavioral responses between those two groups, but not an absolute estimate of dividend tax elasticity.

Sample restrictions. We aim to restrict the sample to households with sufficiently high income pre-reform to make both treatment and control group comparable. We thus select households paying the wealth tax, and which have at least once in the pre-reform years received more than 1,500 euros in dividend income. In order to base our estimates on a sample of fiscal households which we observe over the whole period surrounding the reform, we keep only those households present in the tax files over the whole 2008 to 2018 period. We provide robustness analysis focusing on each reform with fewer years around the reform as so reduce the constraints that a balanced panel involves. We exclude also households with managers of SARL_GM as to identify the impact of the reform separately from the anti-avoidance scheme implemented at the same time.

Table 1 presents descriptive statistics of the sample, comparing the treated and control groups in terms of pre-reform characteristics, for the 2013 reform estimating sample, while Table 2 presents similar statistics for the 2018 reform estimating sample.

4.2 Firm-level estimation

Construction of control and treatment groups. As the reform analysed concerns the taxation of natural persons, the exposure of firms to this reform depends on their ownership structure at the time of the reform. Firms owned by legal entities are not affected, nor are multinationals owned mostly by non-French-residents. We thus define as a treatment group all firms wholly owned by individuals before the reform and as a control group all firms whose individual

shareholders own less than 50 % of the capital and in which no corporate shareholder owns more than 95% of the shares.

Companies owned by legal entities constitute a particularly interesting control group, insofar as they are numerous and of varying sizes, but *a priori* not directly affected by the personal income tax reform, provided that the individual owners together only hold a minority share. In order to consider a group of firms whose decision to pay is not the result of a unilateral decision by the group head, we exclude firms owned by more than 95% by institutional shareholders. This case where the capital of a company is shared between several shareholders, including at least one legal person (as in the case of joint ventures owned in common by two distinct companies) makes it possible to consider firms that do not have a single group head. They should therefore apply a dividend distribution policy that is relatively independent of physical shareholders who hold it only very indirectly.

Sample restrictions. We restrict the studied sample as follows. First, we retain in the sample only those firms that could have been subject to the reform, i.e., that are present in the sample in both years preceding the reforms.[14] In addition, in order to be able to precisely define our treatment and control groups, we only retain firms for which variables describing ownership composition are correctly defined in the data in 2011. We also exclude small businesses, i.e., with a workforce of less than 10 people, and a turnover or total assets of less than €2 million. In addition, we exclude from the control group firms that are present or whose group leaders are present in the treatment group.

In order to exclude from the scope of the analysis the effects of the concomitant anti-avoidance scheme for majority managers of LLCs, we exclude all legal units for which there is at least one year of a majority manager in the file "non wage earners database" (*Base non salarié* in French) over the period 2006 - 2015. Thus, we exclude all companies that paid at least once a compensation to their majority manager between 2006 and 2015, or dividends between 2013 and 2015. This restriction makes it possible to exclude in a precise way firms exposed to the reform analysed in Boissel and Matray (2019), without depriving our sample of all the limited liability companies (SARL), since many of them are likely to be wholly owned by physical shareholders (and therefore to enter our treatment group) without being managed by a majority shareholder.

[14] For the 2013 reform, we condition on firms being present in 2011 and 2012, and respectively 2016 and 2017 for the 2018 reform.

Descriptive statistics. Table 5 presents statistics on the respective characteristics of the treatment and control groups measured in 2012, before the 2013 reform. The majority of firms in both groups are SMEs. They are larger than the median French firms, but do not include the very large firms. Mean turnover is €4.5 million for treated firms and €10.7 million for the control group, while the average number of employees is 25 in the treatment group and 43 in the control group. Only a very small number (less than 10%) of firms have more than 100 employees. Finally, these are companies for which the choice of executive compensation is likely to have a significant impact on dividends since executive compensation represents 9% of payroll in the treatment group and 5% in the control group.

The table also provides information on the comparability of the two groups prior to the reform we are trying to assess. Unsurprisingly, since their shareholder base is more diversified, companies in the control group are on average about twice as large as companies in the treatment group. Nevertheless, given the very high concentration of the distribution of firm size distribution, this gap remains contained and most members of each group have their equivalent size in the other group, which is a better indicator of the quality of the treatment and control groups. Moreover, with regard to dividend policy, the two groups are very similar since the proportion of companies paying dividends is 41% in the treatment group and 35% in the control group, while the average dividend to equity ratio is 8% in the first group compared to 10% in the second.

Estimating equation. We estimate both a dynamic and a static specification. The dynamic specification allows us to gauge the unfolding of the effect overtime and to detect potential differential pre-trends prior to the reforms. It writes as follows:

$$Y_{it} = \sum_{\substack{d=-2008 \\ d\neq 2011}}^{d=2016} \beta_d \times \mathbb{1}\{t = d\} \times T_i + \mathbf{x}_i' \mathbb{1}\{t = d\}\boldsymbol{\delta}_d + \mu_i + \lambda_t + \varepsilon_{it} \tag{2}$$

where Y_{it} is our variable of interest measured for firm i and year t, T_i is a variable indicating firm i is in the treatment group, $\mathbb{1}_{\text{year}=t}$ a variable indicating year equals t, λ_t is a year fixed-effect, μ_i a firm fixed-effect, and $\mathbf{x}_i'\mathbb{1}\{t = d\}$ a set of time-invariant firm characteristics set prior to the reform and interacted with year indicators. In this specification, β_d capture the deviation between treatment and control group for a given year d relative to the baseline year (2011 for the 2013 reform, 2016 for the 2018 reform).

Assessing the channels: an accounting-based decomposition. In order to track precisely the responses of firms decided jointly to the reduction of dividend payments, we construct an accounting decomposition which allows assessing 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:

$$\text{Dividends}_t = E_t + \Delta D_t - B_t - \Delta A_t - I_t + P_t \tag{3}$$

The elements of this decomposition are defined as follows. E_t denotes "outside equity issuance", which consists of increases in shareholders' equity excluding reserves, i.e., changes in share capital and issues of residual liabilities (provisions, subsidies, translation differences). The change in financial debts (ΔD_t) contains the change in the outstanding amount of bonds and debts with credit institutions. B_t denotes discretionary benefits for the manager, including the salaries of executives and other personal benefits recorded in the company's tax return.[15] ΔA_t denotes other assets, including cash, net current assets and financial assets. I_t denotes 'investment", i.e., the change in tangible and intangible fixed assets. Finally the "augmented profits" (P_t) are equal to the accounting net income plus depreciation charges and discretionary expenses, in order to represent the total profit available to the company's owners.

To estimate the elements of the accounting-based decomposition, we estimate a static specification 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:

$$Y_{it} = \beta \times \mathbb{1}\{t \geq 2013\} \times T_i + \mathbf{x}_i' \mathbb{1}\{t = d\}\boldsymbol{\delta}_d + \mu_i + \lambda_t + \varepsilon_{it} \tag{4}$$

where notation is the same in Equation (2).

5 Baseline results from the 2013 reform

5.1 Household-level estimation

Descriptive statistics of the reform. The first fact is to notice the evolution of aggregate dividends received by French resident in national accounts. Figure 2

[15] It includes so-called "extravagant expenditures" (*dépenses somptuaires* in French) and tax-favored savings plans for managers.

presents this aggregate series over the period 2000–2019: total dividends received by households increased steadily until 2012 amounting to 40 billion euros. In 2013, a massive drop is clearly visible, of the order of 14 billion euros. Between 2017 and 2018, dividends received by French residents increased again markedly by 10 billion euros. The timing of these sudden aggregate changes—shortly after a major tax reform—provides the first indications that behavioral responses to dividend tax reforms are likely to be significant.

In Figure 3 we present the evolution of dividends received by French tax units as recorded by the income tax returns. It gives a glimpse at the raw data underlying the difference-in-differences setting. Our sample consists of household paying the wealth tax, but we make no restriction at this stage. We plot the evolution of the ratio of dividends to the mean estimate of pre-reform (2009-2011) years. We compare households in the control group (at the standard income tax before 2013), with treated households, i.e., which had opted for the flat-rate withholding tax before the reform. We separate households with an owner-manager identified within the tax units, from households with no owner-manager. Both treated groups experienced a significant drop in dividends received after 2012, and an increase in 2018, while the control group does not seem to react much to the 2013 reform.

Difference-in-differences estimation. We present in Figure 4 the estimates from equation (1) for dividend income received by households, wage income and other capital income. The estimated sample includes tax units paying the wealth tax and which were liable to the top income tax brackets before 2013. These condition guarantee that we compare sufficiently rich households around the reform. We obtain a sizeable negative coefficient for dividend income received (Fig. 4a), suggesting that household affected by the 2013 reform has seen their dividend income reduced by more than 50%.

We also check the impact of the 2013 reform on other household income to check whether the drop in dividend income is replaced by other forms of compensation. We find no evidence of shifting to labor income, as the coefficient on wage income is not significantly different from zero (Fig. 4b). This result is not surprising given that the 2013 reform—an increase in taxation of dividend income—has not made wage income more attractive in terms of tax treatment. We have estimated the effective tax burden on dividend and labor income, including the deferred pension benefits that Social Security contributions provide,

and at best the two forms of income have after 2013 a similar tax treatment (see Appendix A).

Equally, we do not find evidence of shifting to other capital income (Fig. 4c). The possible options for shifting to other forms of capital income do not provide clear-cut optimization opportunities: share buy-backs are treated in France as dividend income for tax purposes; and capital gains were included into the standard income tax schedule with the 2013 reform.[16]

Owner-manager vs non-owner managers. In Figure 4, we separate the interact the treatment group with a dummy variable indicating that an owner-manager is identified in the tax unit. We find that among treated households, owner-managers react more strongly to the 2013 reform, and experienced a much more pronounced drop in dividend income. We thus test more directly the differential behavioral response of owner-manager compared to similar households with no identified owner-manager. Results are presented in Figure 5. With similar sample restriction as before (being a wealth tax payer, and in the top bracket pre-reform), tax unit with or without owner managers have very similar experience of dividend receipt pre 2013. But owner-managers react sharply and experienced a very significant drop in dividend income.

This result provides direct evidence at the household-level that the key driver of the behavioral response to dividend taxation is the ownership and control of a dividend-paying firm. With this result in mind, we now turn to firm-level data to estimate impact of the reform on firms's decisions.

5.2 Firm-level estimation

In what follows, we systematically present our results obtained with three different specifications. The 'no controls' difference-in-differences estimates are obtained simply with firm and year fixed-effects, therefore leaving the set of variables $\mathbf{x}_i$ of equation (2) empty. An intermediate specification introduces a vector of size (as measured with turnover in 2011) quartiles in $\mathbf{x}_i$. Finally, a version controlling for potentially multiple dimensions of heterogeneity introduces size quartiles interacted with age brackets[17] and sector indicators[18] in $\mathbf{x}_i$.

[16] One should note however that the government changed the tax treatment of capital gains in 2013, with a more favorable tax treatment conditioning on holding onto shares for more than 8 years.

[17] For firms less than 4 years old, between 4 and 10 years old, and older than 10.

[18] Using 18 categories of the aggregated definition of sectors of the NAF rev.2 classification

Dividend policy. Figure 6 shows the effects of the 2013 reform on the probability of paying dividends. Panel (a) shows the evolution of the share of dividend-paying companies in the control and treatment groups. The solid vertical red line corresponds to the year of the reform. It can be seen that the treatment group has a higher propensity to distribute dividends before 2013 than the control group. Despite differences in *level*, it can be seen that the *evolution* of the two groups is largely parallel before the reform. Between 2012 and 2013, the proportion of companies distributing dividends fell sharply within the treatment group, while it was relatively stable within the control group. This shows a very clear effect of the reform. Panel (b) presents the coefficients from the regressions and confirms the presence of a significant and economically important effect. The probability of paying dividends decreases by about 7 percentage points within the treatment group, which is 17% of the pre-reform average.

Figure 7 describes the effects of the same 2013 reform on the ratio between dividends and assets (the latter being set to its 2011 level). Panel (a) shows the evolution of the average of this variable within the control and treatment groups. It shows that the control group pays on average a higher level of dividends relative to their equity. Despite differences in *level*, we observe that the *evolution* of the two groups is largely parallel before the reform. Between 2012 and 2013, the average equity dividend fell sharply within the treatment group, in contrast to the relative stability of the control group average. Panel (b) presents the coefficients from the regressions and confirms a significant and economically important effect caused by the reform. The dividend to equity ratio decreases by approximately 1 cent per euro of equity within the treatment group, which is 12.5% of the pre-reform average (8 cents per euro of equity). Once again, the absence of coefficients significantly different from 0 before the reform supports a causal interpretation of the *post*-reform coefficients.

It is important to note that these measured effects necessarily provide a lower bound of the reform's effect on affected companies. Indeed, the reform affects individuals benefiting from the PFL, and the fact that a company is 100% owned by natural persons is only an indirect proxy for such exposure. It can thus be expected that a large number of the physical shareholders selected in our treatment group through the company they own were not benefiting from the PFL, and are therefore unaffected by the reform. Thus, the firm-level estimates provide a measure of the effects of the intent-to-treat rather than the treatment actually received. This reconciles the magnitude of the effects measured at the company level (12.5% decrease in the pre-reform average of the dividend level) with that

of the household level coefficients (dividends decreasing by around 50% of their pre-reform average).

Impact on investment. Figure 7 plots the estimated effect of the 2013 reform on the investment behavior of firms, where investment is measured as non-financial investment scaled by the value of the assets as of 2011. The point estimate with no control are not significant from zero. We note that, while never significantly different from 0, the coefficients vary greatly across specifications. This may be due to substantial heterogeneity of the treatment effect on investment, for instance between cash-constrained and cash-rich firms (Alstadsæter *et al.*, 2017; Egger *et al.*, 2018).

Accounting decomposition. Table 6 presents regression coefficients obtained from a static difference-in-differences method, i.e., estimating the coefficient associated with a variable 'Treatment × Post-reform period' of each of the variables of the accounting breakdown presented in equation (3). Column (1) presents the estimates for the 2013 reform, using a data spanning from 2008 to 2016.[19] The coefficients presented correspond to an average intent-to-treat effect of the reform on the dependent variable considered for the period 2013–2016, including at least firm and year fixed effects. Incidentally, this table allows checking the validity of the accounting breakdown presented above: the sum of the coefficients associated with each of the decomposition variables (respecting the sign associated with each variable in the decomposition) should be equal to the coefficient associated with the dividends paid.

On the resources side, we find two opposite effects on changes in liabilities with a negative impact on changes of financial debts (reduction of debt liabilities), and an increase in issuance of outside equity. The order of magnitude (respectively +0.21 vs -0.23) is similar. Coefficient on the owner-manager personal benefits points to a small negative effects. This rejects the hypothesis of income shifting, as discretionary expenditures, composed of salaries and items reported to the tax administration, do not seem to have been used as alternatives to dividend income.

On the uses side, we find a positive (not significant) coefficient for other assets suggesting that part of the reduction in dividend payments have led to an accumulation of liquid reserves or less liquid financial assets in the firm. This is in line

[19]The variables of augmented net income and owner-manager personal benefits are not available in 2017, therefore the period considered in these regressions is 2008–2016, and the post-reform period is 2013–2016.

with intertemporal shifting using firms' assets, with the objective of distributing them in a future more favourable fiscal context. As mentioned earlier investment spending has not been affected. And finally, the biggest effect can be found with a significant decrease in augmented profit. This suggests that the reform caused a decrease in the profits reported by treated companies through increased intermediate consumption. At this stage we cannot dig further to estimate the precise source of these increased intermediate consumption, whether they are personal consumption for owner-manager, as replacement of dividends, or firm-related expenses.

6 Results from the 2018 reform

6.1 Household level estimation

Difference-in-differences estimates. The identification strategy used for uncovering the 2013 reform is not adequate for the 2018 reform, as a much larger group of taxpayers benefits from the introduction of the new flat-rate withholding tax. As is evidence from Figure 1b, after the 2018 top income households experienced a large drop in marginal tax rates on dividends, while lower tax brackets are not affected. We use this differential treatment to estimate in a dynamic difference-in-differences comparing tax unit in the top income tax brackets with those on lower brackets excluding owner-managers in the control group (Fig. 9). Sample restrictions are similar to the earlier estimation for the 2013 reform: we keep households who were paying the wealth tax before the reform, and who had at least once received dividend income in the pre-reform years over 1,500 euros. Table 2 presents the summary statistics of the estimating sample. Our treated households have on average higher income and specifically higher dividend income. Panel a) presents the raw data, and panel b) the difference-in-differences estimates.

The results suggest a modest response from treated non-owner-manager households with a small increase in dividend income. By contrast, treated owner-manager households experience a very significant increase in dividends after the 2018 reform, close to a 50% increase compared to non-treated households.

Owner-managers vs non-owner-managers. This result is reinforced when we compare owner-manager to non-owner managers. We present similar estimates for the 2018 reform as we had done for the 2013 reform in Figure 10. We obtain marked increase in 2018 of dividend income from owner-managers, with close to

30% increase relative to non-managers. The 2018 reform suggests an even more pronounced owner-manager effect than the one highlighted in 2013.

6.2 Firm-level estimations

Here, we select the same treatment and control groups as in the section 5.2, requiring that companies still comply with the constraints imposed on the shareholder structure in 2016, the last year for which we have the data to establish this element. We also force companies to be present in 2016 and 2017, similar to the presence requirement in 2011 and 2012 imposed to be part of the estimation sample for the 2013 reform.

Impact on dividends paid by firms. The regression coefficients presented in the Figure B5 show that firms owned by individuals in 2011 and 2016 react strongly to the introduction of the PFU in 2018, with a significant increase in dividends paid over assets. The amount of dividends paid per euro of equity capital increases by approximately 0.4 cent compared to the control group, compared to 2017. These elements strongly suggest an upward causal effect of the 2018 reform on dividend payments by affected firms.

Impact investment. We present the impact of the 2018 reform on investment in Figure 11b. No effect can be detected—in line with the results after 2013—albeit with only two years post-treatment.

Accounting decomposition. We test likewise the impact of the reform on other items of the firms' accounts following the accounting decomposition described earlier at equation (3). We present the results in column (2) of Table 6, where we can compare the impact of the tax decrease with 2018 reform with the impact of the tax increase with the 2013 reform. The sample includes years from 2016 to 2019, with reference assets evaluated in 2016. As for the 2013 reform, we observe an increase in outside equity matched by decrease in financial debts (+0.15 vs 0.13). Neither investment, nor augmented profits show statistically significant impact. The main action comes from a reduction in other assets of 0.3 cent of the euro of asset, a magnitude which matches closely the increase in dividend payments (0.3 cent). This suggests that increases in dividends in 2018 have come mainly from a reduction in financial assets of firms controlled by individuals that could benefit from the 2018 reform.

7 Conclusion

This paper uses newly-accessible tax registry data on French firms and households to shed new light on the old question of whether and how dividends react to changes in tax rates. At the household level, we compute a large tax elasticity of dividends but rule out that such a strong dividend reaction corresponds to income shifting across personal income categories. Using firm-level data, and in particular data from unlisted firms, turns out to be crucial in order to understand where the disappearing dividends went following the tax increase in 2013. However, it is still to be determined how much of this inflow of income from households to the firms they own eventually leads to income creation rather than just intertemporal income shifting. More detailed analysis of the consequences of the reenactment in 2018 of a low tax rate on dividends should be particularly useful here. The authors are currently collecting high quality fiscal data for the years 2017 and 2018 to replace the current analysis which based on less precise business registry data.

In its current form, the paper also abstracts from analyzing the distributional consequences of those dividend tax reforms. Our results suggest it is crucial in this regard to consider a broader measure of income accruing to households than is traditionally the case, especially among households at the top of the income distribution since they are more likely to include entrepreneurs. One should develop further the construction of joint firm and household data in order to fulfil this objective.

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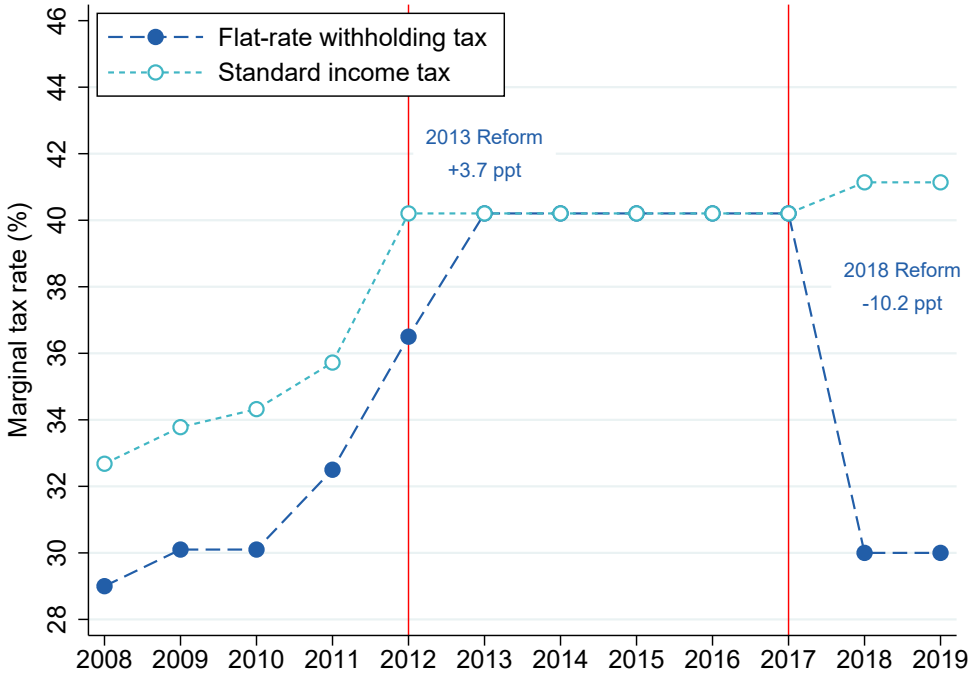
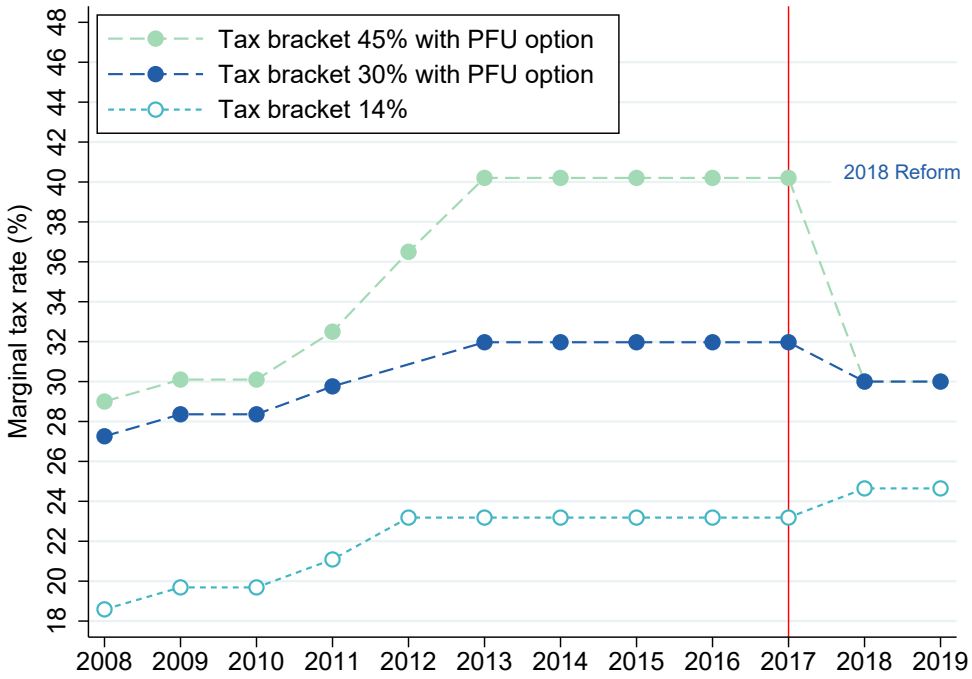
Figure 1: Top marginal tax rates on dividends (2008–2019)

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

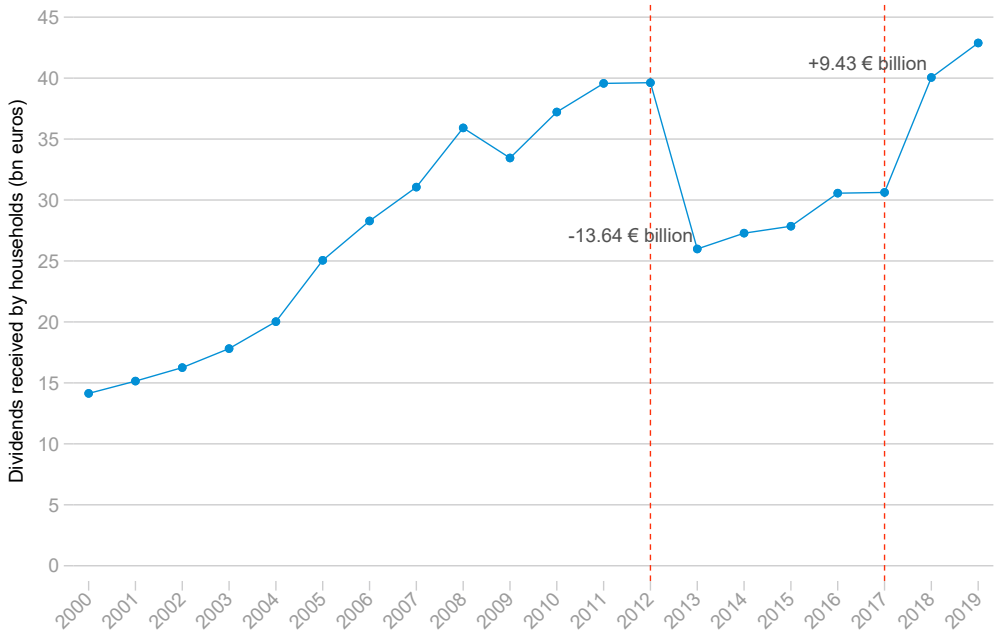


(b) Lowest marginal tax rate for income tax brackets 45%, 30% and 14%



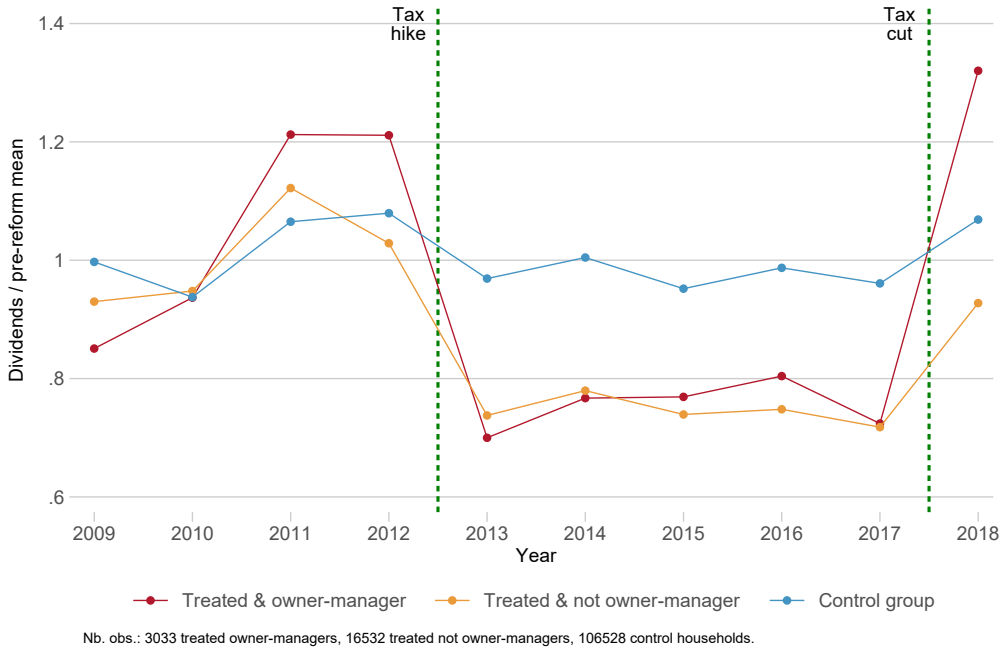
NOTES: Panel (a) shows for each year the top marginal tax rate (45%) applied to dividend income whether individuals opt for the flat-rate withholding tax (PFL) or whether they choose to be taxed under the standard schedule. Panel (b) compares the lowest marginal tax rate (i.e., either the flat-rate withholding tax PFL before 2013 and PFU after 2018, or the standard income tax schedule. Three cases are presented depending on the income tax bracket at 45%, 30% and 14%.
SOURCES: IPP Tax and Benefit Tables.

Figure 2: Aggregate dividends received by households (France, 2000–2019)



SOURCE: Insee, National accounts.

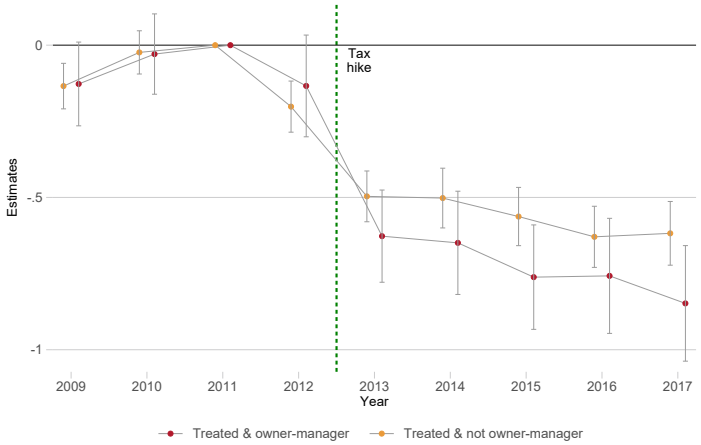
Figure 3: Dividends received by households – control vs treated



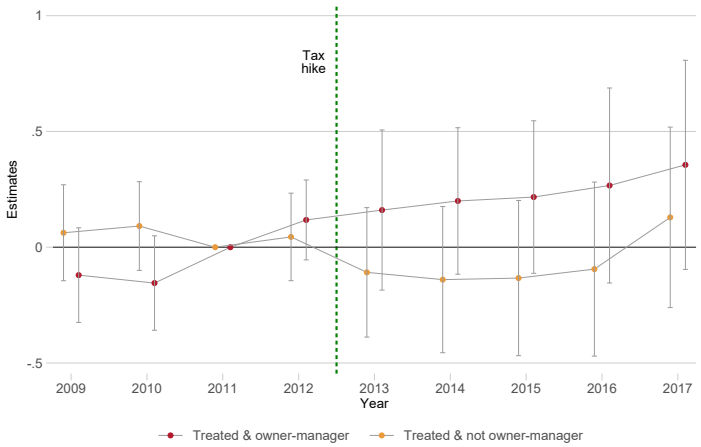
NOTES: The sample includes all households paying the wealth tax in 2011, without any other condition of income. It excludes households with majority owners of SARL. Treated households are defined based on pre-2013 reform, i.e., having opted for the flat-rate withholding tax.
SOURCE: Panel POTE (DGFiP) 2008-2018.

Figure 4: Difference-in-differences estimates

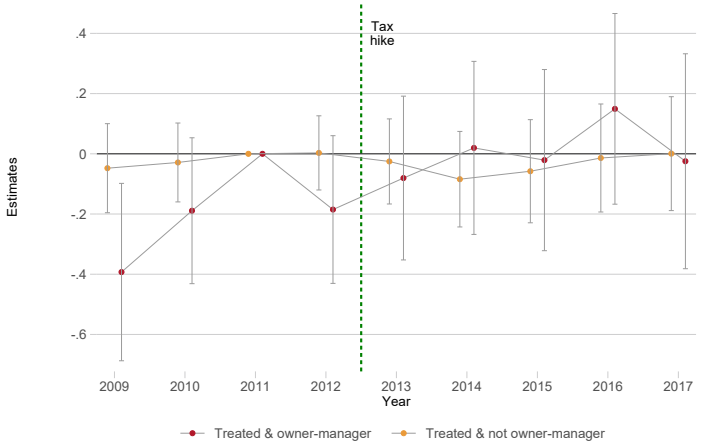
(a) Dividend income received



(b) Wage income



(c) Other capital income



NOTES: The estimating sample includes households paying the wealth tax, having received dividend income at least once in the pre-reform years (2009-2011), and having non-dividend income pre-reform at the level of the top income tax brackets. It excludes households with majority owners of SARL. Treated households are defined based on pre-2013 reform, i.e., having opted for the flat-rate withholding tax.

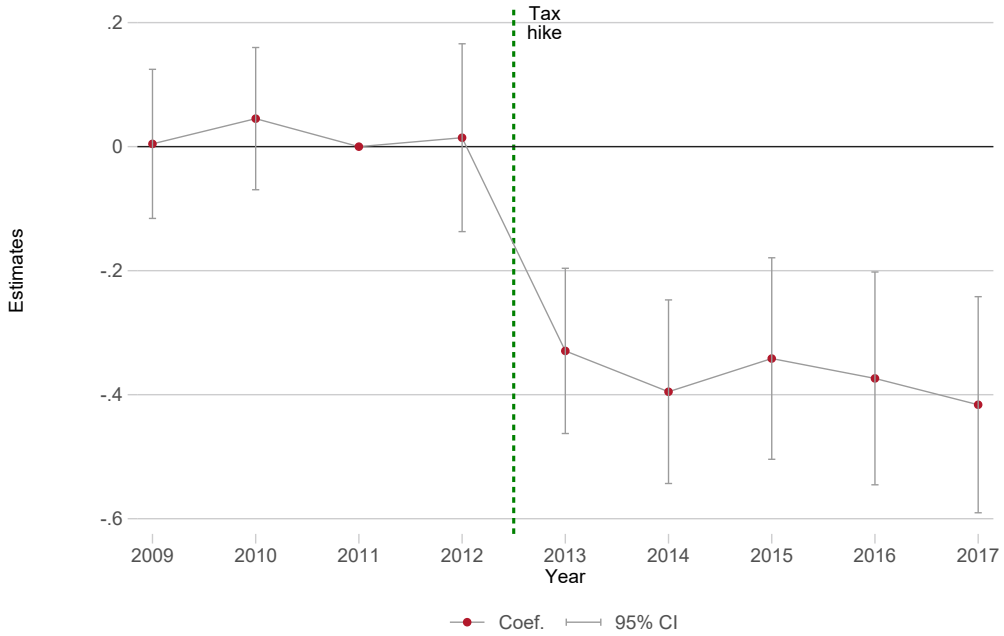
SOURCE: Panel POTE (DGFiP) 2009-2017.

Figure 5: Managers vs non-managers

(a) Dividend income received by manager vs non-manager

Nb. obs.: 589 owner-managers, 5047 not owner-managers.

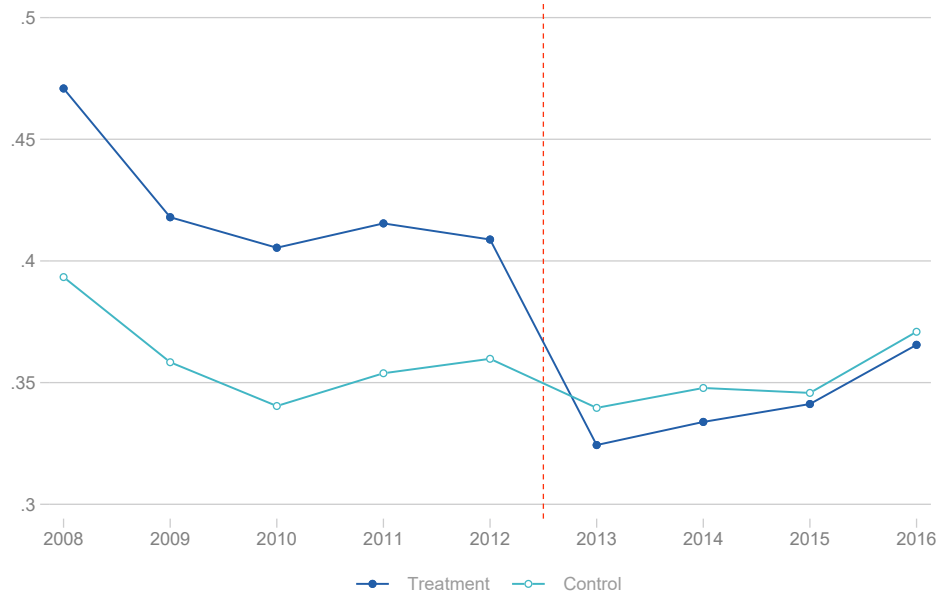
(b) Difference-in-differences estimates



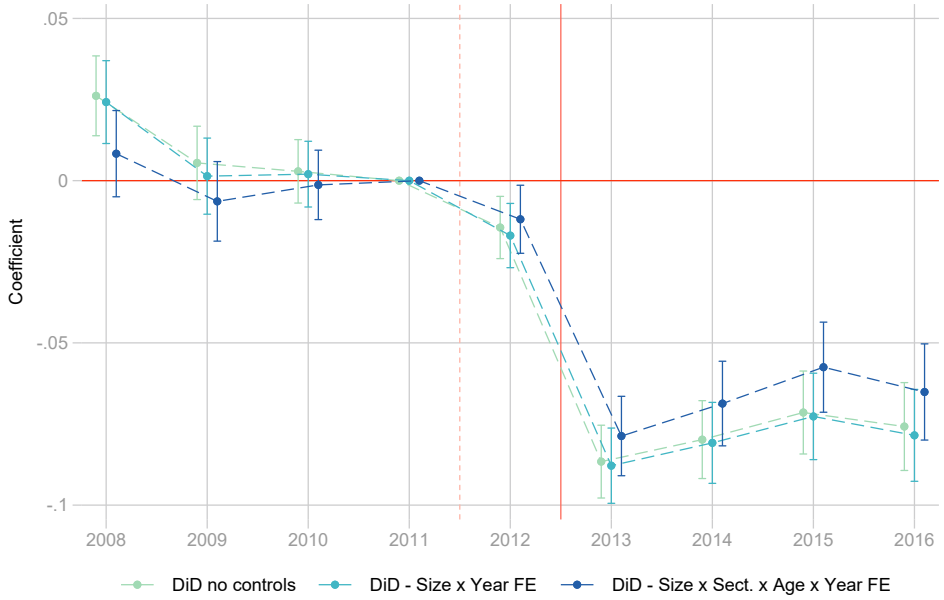
NOTES: The estimating sample includes households paying the wealth tax, having received dividend income at least once in the pre-reform years (2009-2011), and having non-dividend income pre-reform at the level of the top income tax brackets. It excludes households with majority owners of SARL. Treated households are defined based on pre-2013 reform, i.e., having opted for the flat-rate withholding tax.
SOURCE: Panel POTE (DGFiP) 2009-2017.

Figure 6: Impact on the probability to distribute dividends

(a) Annual average by treatment status



(b) Dynamic DiD coefficients

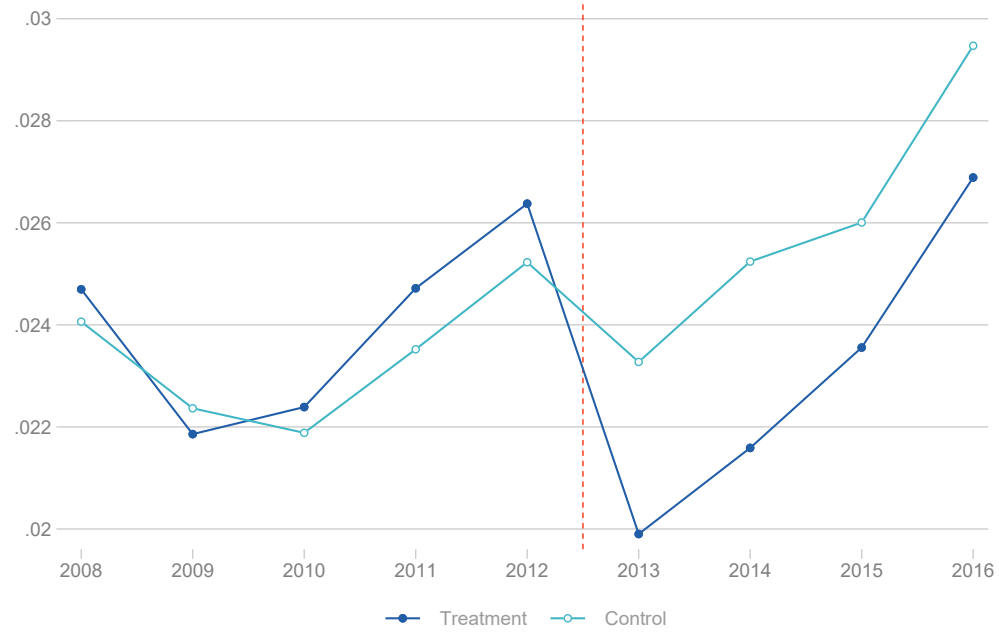


NOTES: The variable studied is the amount of dividends paid divided by the level of shareholders' equity set in 2011. Panel (a) represents annual changes in the mean of this variable, while panel (b) represents regression coefficients obtained by dynamic difference-differences using this variable as a dependent variable, with grouped standard deviations at the enterprise level. The values are winsorized at percentiles 1 and 99. In panel (a), each point represents an average. In panel (b), the points represent the estimated coefficients, the lines the confidence interval measured at the risk threshold of 5%. The treatment group is composed of companies 100% owned by natural persons, the control group is composed of companies not wholly owned by a legal person. Additional details and restrictions on the sample are outlined in section 4.2.

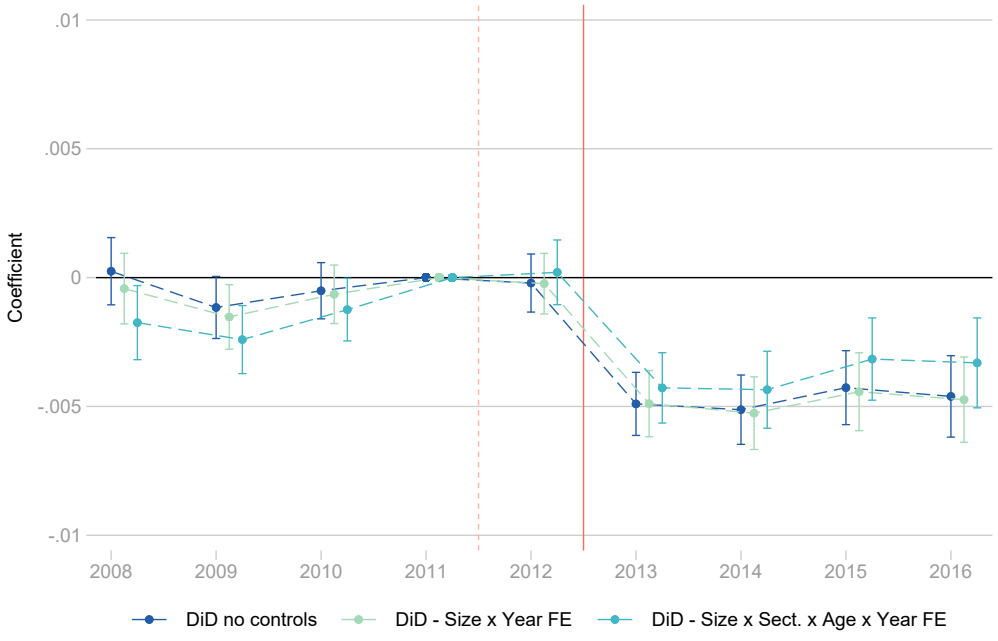
SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes, Base non salariés.

Figure 7: Impact on dividend to assets ratio

(a) Annual average by treatment status



(b) Dynamic DiD coefficients

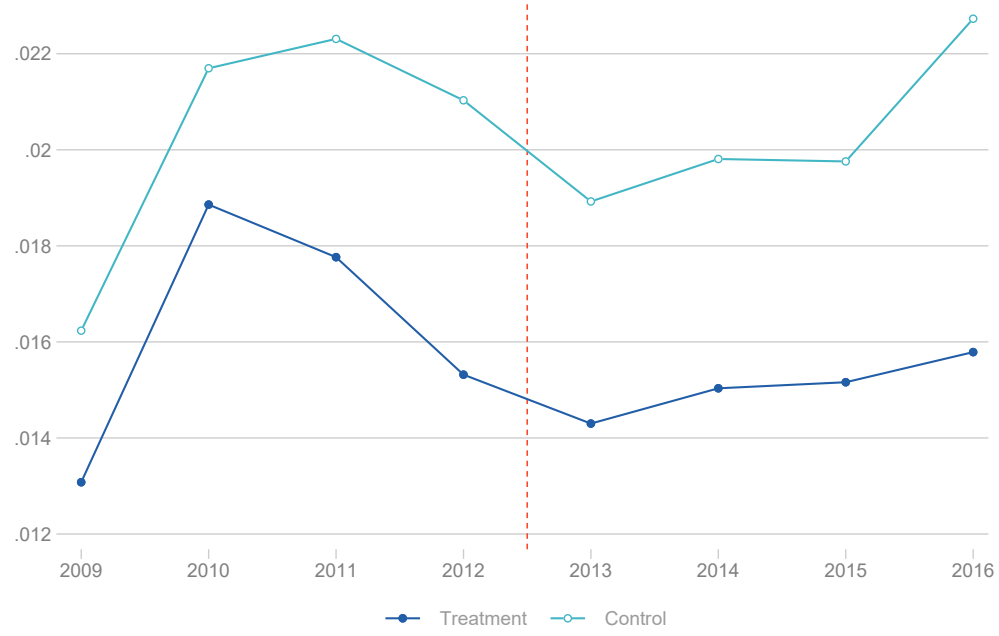


NOTES: The variable studied is the ratio of dividendes to assets (2011). Panel (a) represents annual mean for this variable, while panel (b) represents regression coefficients obtained by dynamic difference-differences using this variable as a dependent variable, with robust standard errors clustered at the firm level. In panel (a), each point represents an average. In panel (b), the points represent the estimated coefficients, the confidence interval lines measured at the risk threshold of 5% and with standard deviations grouped at the enterprise level. The treatment group is composed of companies 100% owned by natural persons, the control group is composed of companies not wholly owned by a legal person. Additional details and restrictions on the sample are outlined in section 4.2.

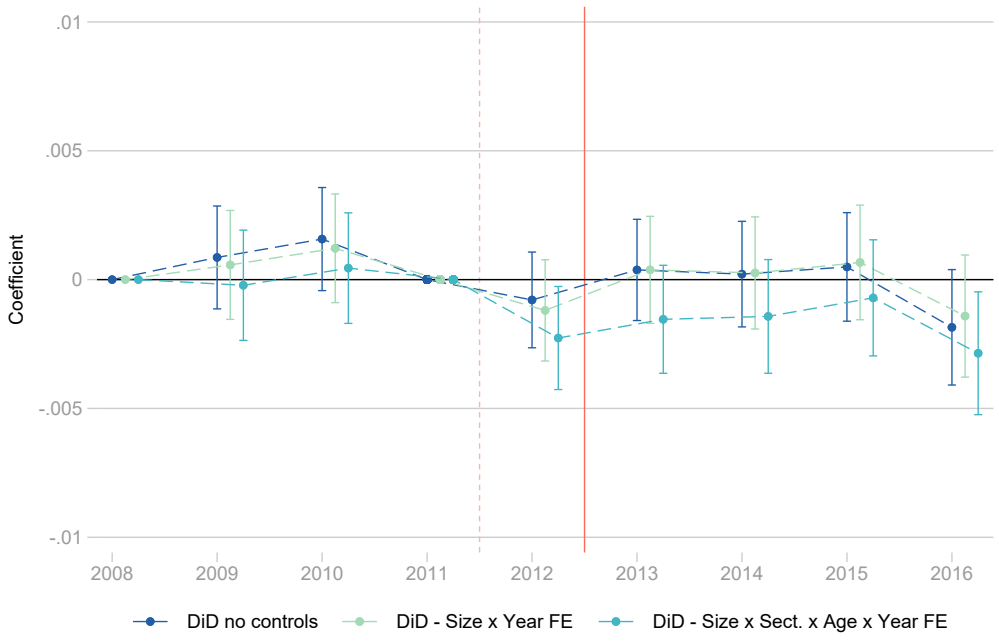
SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Base non salariés.

Figure 8: Impact on investment (over assets)

(a) Annual average by treatment status



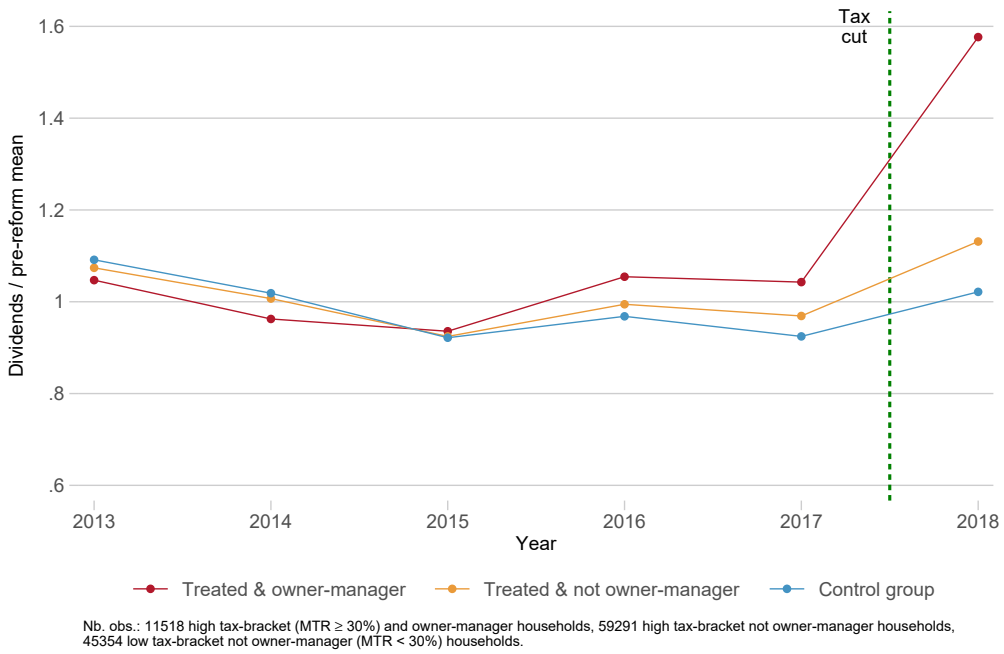
(b) Dynamic DiD coefficients



NOTES: The variable studied is non-financial investment scaled by assets evaluated in 2011. Panel (a) represents annual changes in the mean of this variable, while panel (b) represents regression coefficients obtained by dynamic difference-differences using this variable as a dependent variable, with robust standard errors clustered at the firm level. In panel (a), each point represents an average. In panel (b), the points represent the estimated coefficients, the confidence interval lines measured at the risk threshold of 5% and with standard deviations grouped at the enterprise level. The treatment group is composed of companies 100% owned by natural persons, the control group is composed of companies not wholly owned by a legal person. Additional details and restrictions on the sample are outlined in section 4.2.
SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Base non salariés.

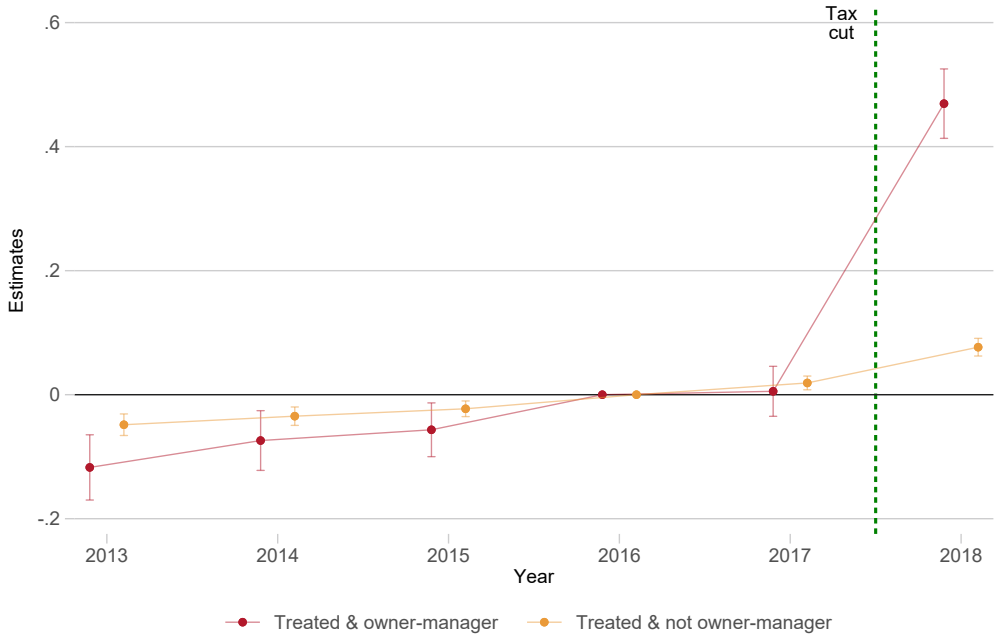
Figure 9: 2018 Reform: household estimates

(a) Dividend income received: high tax bracket vs low tax bracket



Nb. obs.: 11518 high tax-bracket (MTR ≥ 30%) and owner-manager households, 59291 high tax-bracket not owner-manager households, 45354 low tax-bracket not owner-manager (MTR < 30%) households.

(b) Difference-in-differences estimates

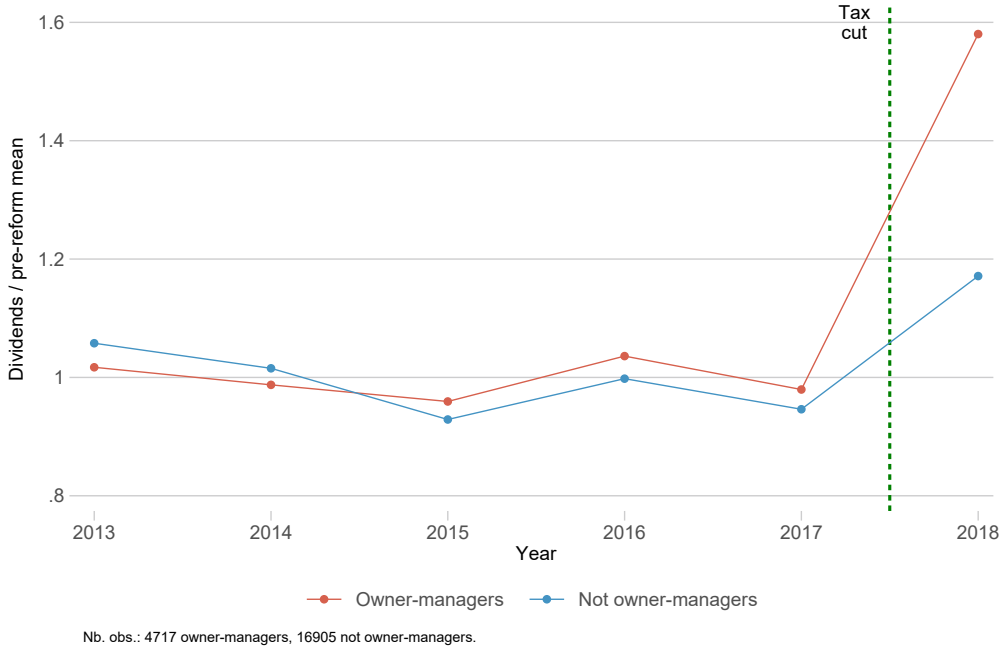


NOTES: The estimating sample includes households paying the wealth tax, and having received dividend income at least once in the pre-reform years (2013-2016). It excludes households with majority owners of SARL. Treated households are defined based on pre-2018 reform, i.e., having non-dividend income higher placing them in the top income tax brackets (above 30%).

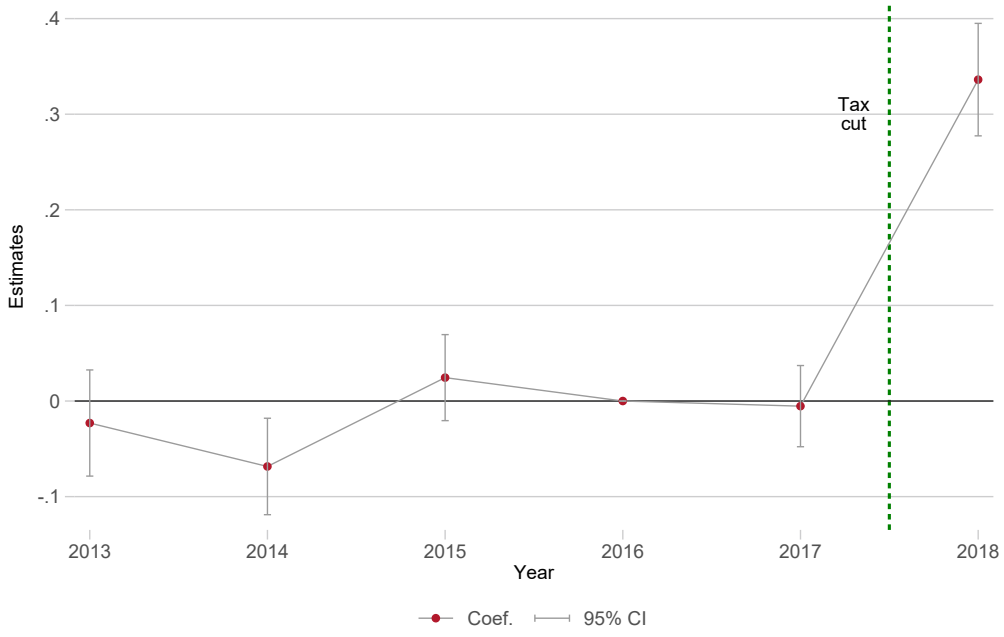
SOURCE: Panel POTE (DGFiP) 2013-2018.

Figure 10: 2018 Reform: Managers vs Non-Managers

(a) Dividend income received by manager vs non-manager



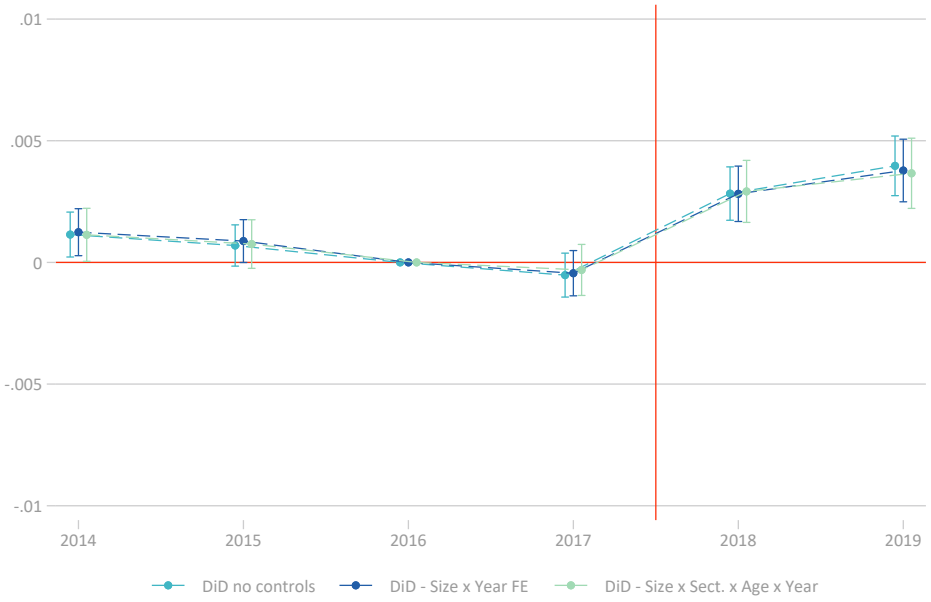
(b) Difference-in-differences estimates



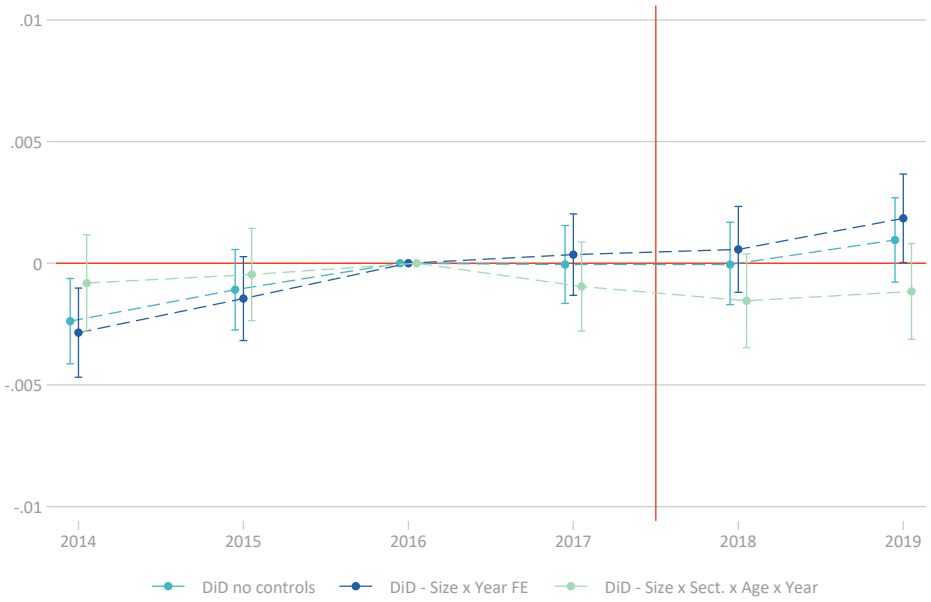
NOTES: The estimating sample includes households paying the wealth tax, and having received dividend income at least once in the pre-reform years (2013-2016). It excludes households with majority owners of SARL. Treated households are defined based on pre-2018 reform, i.e., having non-dividend income higher placing them in the top income tax brackets (above 30%).
SOURCE: Panel POTE (DGFiP) 2013-2018.

Figure 11: Impact of the 2018 reform on investment and dividends payout: Dynamic DiD coefficients

(a) Dividends over lagged assets



(b) Investment over lagged assets



NOTES: Each figure represents regression coefficients obtained by dynamic difference-differences using dividend distribution variables as the dependent variable, with standard errors grouped at the company level. The panels represent the effects on (a) dividends paid per euro of lagged assets, (b) investment over of lagged assets. The points represent the estimated coefficients, the lines the confidence interval measured at the risk threshold of 5%. All companies in the treatment or control group are companies present in 2016 and 2017, and closing their financial year on 31 December. The companies included in the treatment group are fully owned by natural persons in 2016. Additional details and restrictions on the sample are outlined in section 4.2.

SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Base non salariés, commercial court registries data.

Table 1: Summary statistics of household data (2013 reform, 2011 baseline)

	Treated owner-managers			
	Mean	Median	1st decile	9th decile
Main registrant age	*53.89*	53	44	65
Nbr of fiscal shares	*2.56*	2.5	1.5	4
Reference tax income (k€)	*505.8*	284.5	114.0	904.4
Dividends p/ fiscal sh. (k€)	*213.5*	66.0	0.1	422.0
Wages p/ fiscal sh. (k€)	*77.4*	56.0	17.6	143.7
Other cap. inc. p/ fiscal sh. (k€)	*11.0*	1.7	0.0	20.1
Number of observations			3,033	
	Treated non owner-managers			
	Mean	Median	1st decile	9th decile
Main registrant age	*61.9*	62	48	76
Nbr of fiscal shares	*2.21*	2	1.5	3
Reference tax income (k€)	*264.9*	134.5	63.7	452.6
Dividends p/ fiscal sh. (k€)	*99.7*	20.7	0.0	212.9
Wages p/ fiscal sh. (k€)	*41.9*	18.3	.0.	101.4
Other cap. inc. p/ fiscal sh. (k€)	*9.8*	2.1	0.0	20.4
Number of observations			16,532	
	Control group			
	Mean	Median	1st decile	9th decile
Main registrant age	*66.21*	66	51	82
Nbr of fiscal shares	*2.10*	2	1	3
Reference tax income (k€)	*129.9*	77.1	29.3	237.1
Dividends p/ fiscal sh. (k€)	*10.2*	2.3	0.2	22.6
Wages p/ fiscal sh. (k€)	*15.1*	0.0	0.0	45.0
Other cap. inc. p/ fiscal sh. (k€)	*4.1*	1.1	0.0	8.7
Number of observations			106,528	

NOTES: These summary statistics correspond to the sample used to estimate the impact of the 2013 reform. The reference year pre-reform is 2011. The sample includes all households paying the wealth tax in 2011, and having reported at least once dividend income in the pre-reform years (2009-2011) above 1,500 euros. Treated households are defined as having opted pre-reform for the flat-rate withholding tax, while non-treated households were taxed with the standard income tax schedule.

SOURCES: POTE panel files, 2011; ISF-IFI 2011.

Table 2: Summary statistics of household data (2018 reform, 2016 baseline)

	Treated owner-managers			
	Mean	Median	1st decile	9th decile
Main registrant age	*58.69*	58	47	70
Nbr of fiscal shares	*2.25*	2	1	3
Reference tax income (k€)	*505.8*	284.5	114.0	904.4
Dividends p/ fiscal sh. (k€)	*92.8*	20.1	0.0	202.5
Wages p/ fiscal sh. (k€)	*88.7*	62.0	19.9	165.5
Other cap. inc. p/ fiscal sh. (k€)	*4.6*	0.5	0.0	8.7
Number of observations			4,634	
	Treated non owner-managers			
	Mean	Median	1st decile	9th decile
Main registrant age	*68.89*	69	53	86
Nbr of fiscal shares	*1.96*	2	1	2.5
Reference tax income (k€)	*264.9*	134.5	63.7	452.6
Dividends p/ fiscal sh. (k€)	*25.2*	3.1	0.0	47.5
Wages p/ fiscal sh. (k€)	*36.7*	0.0	0.0	97.0
Other cap. inc. p/ fiscal sh. (k€)	*3.8*	0.5	0.0	7.0
Number of observations			59,042	
	Control group			
	Mean	Median	1st decile	9th decile
Main registrant age	*68.60*	68	51	87
Nbr of fiscal shares	*2.04*	2	1	3
Reference tax income (k€)	*129.9*	77.1	29.3	237.1
Dividends p/ fiscal sh. (k€)	*16.3*	2.4	0.0	31.5
Wages p/ fiscal sh. (k€)	*3.7*	0.0	0.0	16.6
Other cap. inc. p/ fiscal sh. (k€)	*2.8*	0.6	0.0	6.3
Number of observations			46,609	

NOTES: These summary statistics correspond to the sample used to estimate the impact of the 2018 reform. The reference year pre-reform is 2016. The sample includes all households paying the wealth tax in 2016. Treated households have pre-reform taxable income in the top brackets (30% and above), while control households have taxable income that puts them in the lower 14% bracket. To be included in the sample all households need to report at least once dividend income in the pre-reform years (2013-2016) above 1,500 euros.
SOURCES: POTE panel files, 2016; ISF-IFI 2016.

Table 3: Locating where the estimating sample fits in the overall distribution of firm size

	Treated firms				Control firms			
Quantiles (1000)	250th	500th	750th	990th	250th	500th	750th	990th
Turnover	683	801	888	985	748	883	949	998
Value-added	741	827	896	985	715	873	946	997
Assets	611	756	858	978	732	862	937	996
Number of employees	768	826	894	987	713	865	942	998
Number of observations	16,609				9,861			

NOTES: This table presents where the estimating sample (control and treated firms) are located with respect to the overall distribution of firm size. To that end, we compute 1000 quantiles in the *overall* firm population in 2011 with respect to several measure of firm size (value-added, turnover, assets and employment). We then report the distribution of these quantiles among treated and control group. By definition the distribution of quantiles in the overall population is uniform. In case the distribution of the treated group is similar to the overall population, the x-th quantile among treated firms will be equal to x (i.e., uniform distributed). In case the x-th quantile is superior (resp. inferior) to x, it means the distribution of the variable described is shifted to the right (resp. left) among treated firms with respect to the overall population of firms, i.e., that treated firms tend to be larger (resp. smaller). The treatment group is composed of companies 100% owned by natural persons, the control group is composed of companies not wholly owned by a legal person.
SOURCES: Industrial and commercial benefits file – normal regime (BIC-RN), group declaration file (FDG), tax group perimeters (PERIM), financial link surveys and files (LIFI), annual social data declarations (DADS Postes), self-employed database (BNS).

Table 4: Share of the estimating sample in overall aggregates as of 2011

	Estimation sample (%)	Treated (%)	Controls (%)
Turnover	0.15	0.048	0.11
Value-added	0.14	0.049	0.090
Workforce	0.18	0.074	0.11
EBITDA	0.080	0.025	0.055
Dividends	0.15	0.019	0.13
Dividends paid to individuals	0.30	0.12	0.18

NOTES: This table presents descriptive statistics regarding the weight of the estimating sample with respect to the overall French private sector as measured by the sum across corporate income tax returns for year 2011.
SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Base non salariés.

Table 5: Descriptive statistics for treatment and control groups in 2011

	Treated firms			
	Mean	Median	1st decile	9th decile
Turnover (k€)	4,501	2,322	739	9,172
Value-added (k€)	1,382	873	359	2,612
EBITDA (k€)	252	102	-54	651
Number of employees	25	17	8	45
Total wage bill (k€)	782	513	241	1435
Executive compensation (share of total)	0.09	0.04	0.00	0.24
Operating income (k€)	164	59	-45	426
Equity (k€)	1534	561	59	3089
Capital social (k€)	328	80	8	576
Investment (k€)	94	12	-18	194
Share phys. shareholders	1.00	1.00	1.00	1.00
Number of phys. shareholders	3.95	3.00	1.00	7.00
Dividends (k€)	80	0.00	0.00	200
Sh. firms w/ dividends > 0	0.41	0.00	0.00	1.00
Dividends over equity	0.08	0.00	0.00	0.25
Number of observations		16,609		
	Control firms			
	Mean	Median	1st decile	9th decile
Turnover (k€)	10,737	3,939	439	26,493
Value-added (k€)	2,595	1,120	54	6,246
EBITDA (k€)	519	153	-283	1,603
Number of employees	44	20	4	105
Total wage bill (k€)	1,392	639	41	3,430
Executive compensation (share of total)	0.05	0.00	0.00	0.16
Operating income (k€)	304	79	-239	1,013
Equity (k€)	3,754	769	-30	8,380
Capital social (k€)	1,128	180	15	2,705
Investment (k€)	280	19	-20	641
Share phys. shareholders	0.11	0.00	0.00	0.37
Number of phys. shareholders	2.61	1.00	0.00	7.00
Dividends (k€)	179	0	0	475
Sh. firms w/ dividends > 0	0.35	0.00	0.00	1.00
Dividends over equity	0.10	0.00	0.00	0.33
Number of observations		9,861		

NOTES: This table presents statistics (mean, median, 1st and last decile) on the characteristics of the companies in the treatment and control groups respectively. The variables are winsorized at percentiles 1 and 99. The treatment group is composed of companies 100% owned by natural persons, the control group is composed of companies not wholly owned by a legal person.

SOURCES: Industrial and commercial benefits file - normal regime (BIC-RN), group declaration file (FDG), tax group perimeters (PERIM), financial link surveys and files (LIFI), annual social data declarations (DADS Postes), self-employed database (BNS).

Table 6: Regression coefficients on the accounting decomposition – static difference-in-differences

Dep. Var.		2013 Reform (1)	2018 Reform (2)
Dividends		-0.454***	0.328***
		(0.047)	(0.058)
Resources			
Issuance of outside equity	(+)	0.207***	0.153***
		(0.034)	(0.038)
$\Delta_{t-1;t}$ Financial debt	(+)	-0.231***	-0.132
		(0.083)	(0.112)
Owner-manager personal benefits	(-)	-0.078***	NA
		(0.025)	NA
Uses			
$\Delta_{t-1;t}$ Other assets	(-)	0.162	-0.314**
		(0.113)	(0.153)
Investment	(-)	-0.067	-0.107
		(0.059)	(0.068)
Augmented profits	(+)	-0.439***	-0.112
		(0.105)	(0.113)
Number of firms		27,256	29,830
Number of observations		171,762	112,949

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 (3), as covariate of interest an interaction 'treatment × post reform period', and including different sets of fixed-effects. Coefficients should be interpreted as cents per euro of assets. Column (1) presents the estimates exploiting the 2013 reform (with 2011 as baseline year), while column (2) presents the results for the 2018 reform (with 2016 the baseline year). Standard-errors are clustered at the firm-level and indicated in parentheses. The treatment group is composed of companies 100% owned by natural persons, the control group is composed of companies not wholly owned by a legal person. Additional details and restrictions on the sample are outlined in section 4.2. The Social Security data for 2018 and 2019 are not yet available, hence the impact of the 2018 reform on owner-manager personal benefits cannot be estimated.

SOURCES: Files BIC-RN, FDG, LIFI, DADS Postes, Base non salariés.

(For Online Publication)

Appendix to

Follow the money!
Combining household and firm-level evidence to unravel the tax elasticity of dividends

Laurent Bach Antoine Bozio Brice Fabre

Arthur Guillouzouic Claire Leroy Clément Malgouyres

March 2021

This appendix presents further details for the taxation of capital income in France over the period of study (Appendix A), and additional results (Appendix B).

A Capital income taxation in France (2008–2020)

A.1 Income taxation in France before 2013

From 2008 to 2012, capital income is subject to a dual tax system in France. Such income can either be included in the calculation of net taxable income in order to be taxed on the progressive income tax scale or be taxed on the PFL 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.

Personal income tax. During the period 2008 to 2012, several legislative changes led to an increase in the taxation of dividends taxed on the progressive scale. Dividends subject to the scale are eligible for deductions (a lump-sum allowance and a proportional allowance), in particular to correct the problem of double taxation of dividends – associated with the coexistence of income tax and corporation tax. In 2010, a tax credit to which dividends were entitled was abolished. This tax credit was 50 % of the amount declared, and capped at 115 euros (230 euros for a couple). Also in 2010, the marginal tax rate on the last bracket of the scale increased from 40 to 41%. In 2012, a new tranche is added, increasing the marginal tax rate to 45% for tax 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 scale.

Optional flat-rate taxation of dividends. The Finance Act for 2008 [A.1] establishes an optional flat-rate withholding tax applicable to dividends. A flat-rate withholding tax in full discharge already existed before 2008 for other types of capital income such as income from fixed-income investment products. The PLF rate applicable to dividends is 18% at its inception and gradually increases between 2008 and 2012. The PLF rate increases from 18% to 19% in 2011 and to 21% in 2012 (24% for capital income other than dividends, i.e. interest on bonds and debt securities in particular). Apart from these parametric reforms, the taxation of the PFL has not undergone any major changes.

Other tax reforms. A series of reforms also affect the taxation of dividends from 2008 to 2012, regardless of taxpayers' choice between the scale and the PLF. The 2011 Finance Act creates an Exceptional Contribution on High Income (CEHR). This contribution is progressive and based on the benchmark tax income. Its rate is 3% on 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).

[A.1] Law No. 2007-1822 of 24 December 2007 on the Finance for 2008, article 10.

Table A1: Evolution of 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 at 31 December of the year, in the event of changes during the year. From 1^{er} January 2011 to 1^{st} November 2011, social security contributions amount to 12.3%. The increase in social security contributions to 15.5% will take effect from 1^{st} July 2012. The social security tax rate indicated for 2013 corresponds to the general case and does not include the case of the majority managers of LLCs subject to social security contributions (see sections A.3).
SOURCE : IPP tax and benefit table, [link to webpage].

Since the tax base of this contribution is the reference tax income, it includes all dividends, whether they are taxed on the scale or on the PFL.

Social security contributions on capital income also increase from 2009 to 2012. The overall tax rate applicable to dividends increases from 11% in 2009 to 15.5% in 2012 (see table A1).

A.2 The 2013 reform

In order to understand the effects of the abolition of the PFL in 2013 and the introduction of the dividend scale, it is important to understand the two systems that existed before this reform and the arbitration that was available to taxpayers.

- **Option 1 : the PFL**
  In the event of a PFL election, dividends are taxed in a *flat-rate* manner, i.e. the rate applied is unique and does not depend on the household's level of resources. The PFL is also *liberative* of income tax, as it replaces the payment of this tax. The PFL is deducted at source by the banking institution when the dividends are received. However, dividends taxed on the PFL must be declared when filing the annual income tax return, in order to be included in the calculation of the reference tax income. Only persons whose tax residence is established in France can opt for the PFL. In addition, certain distributed income is subject to mandatory taxation on the scale[A.2].

[A.2]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

- **Option 2 : the progressive tax scale**
  In the event of an option for the scale, dividends are taxed at a progressive rate with other types of income (labor income, business income, replacement income etc.). Progressive taxation means that the *marginal* tax rate (the rate applied to an additional euro) increases with the household's total income. With this option, and depending on the legislation in force, it is possible to benefit from deductions, the marital and family quotient, tax credits and reductions (see table A1). It is also possible to deduct certain expenses, such as collection fees. The payment of tax on dividends is then made the year following their collection, after having filed the tax return.

It is important to underline the optional nature of the PFL: each taxpayer is free to choose this method of taxation or not, under the constraint of the rules mentioned above. The option is exercised upstream with the banking institution. It is final, in the sense that 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 on the scale and part on the PFL (in the case of a partial option, the taxpayer loses the benefit of the allowances). Due to the optional nature of the PFL, not all taxpayers are affected by the mandatory dividend scale in 2013.

Between the PLF and the scale, the most financially advantageous option may vary depending on the amount of dividends declared by a household, the level of its taxable income and other parameters (such as the amount of tax credits or reductions for which that household is eligible, or the nature of the dividends it receives). The equations A.1 and A.2 represent in a simplified way the arbitration faced by a taxpayer. We illustrate this arbitrage in the case of 2012 income and related legislation. The CEHR is ignored in this illustration, which affects the dividend tax rate in the same way regardless of the option chosen. By choosing the PFL, dividends are taxed at 21 % for the PFL and 15.5 % for social security contributions, i.e. at an overall effective rate of 36.5 %. By choosing the scale, dividends are taxed at a rate that varies according to the bracket in which the taxable income is located and at 15.5 % for social security contributions. 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 % tranche that only pays social security contributions) to 41.1 % (in the case of the 45 % tranche). According to this simplified calculation, the option for the PFL 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 scale may remain tax-efficient for some tax households. In theory, the PFL should therefore concern few taxpayers because only 1.2 % of tax households have a net taxable income per unit that

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.

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.

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

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

where τ^{PFL} , is the PFL rate

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

where δ^f, is the lump-sum abatement

where δ^p, is the proportional abatement

where γ, is the rate of deductible social contributions (CSG)

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%

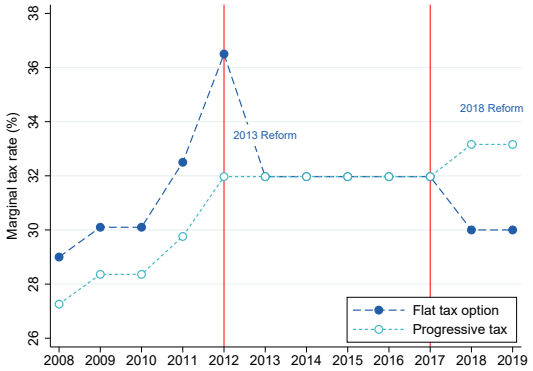
SOURCE : Annuaire Statistique 2013, Tableau 219, DGFiP; FELIN 2012, DGFiP.
NOTE : The brackets indicate the theoretical maximal marginal tax rate faced by tax units. In practice, there are many other features of the income tax system that impact tax rates. This results in almost half of the households not paying the income tax.

The 2013 Finance Act removes the PFL option for dividends paid on or after January 1, 2013. This applies also for the vast majority of capital income although some fixed income investment products can still be subject to a 24% PFL under conditions. In addition, life insurance products can also always be subject to a PFL, on option. Finally, certain fixed-income investment products are subject to a mandatory flat-rate withholding tax. 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 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 in relation to the tax

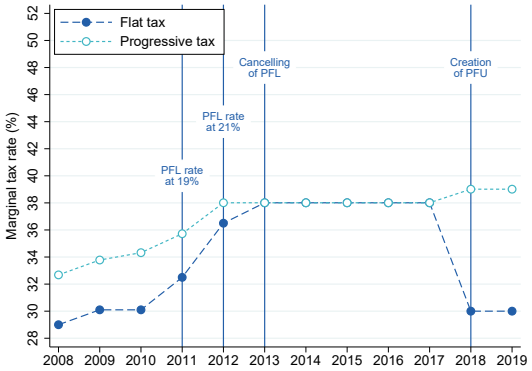
due, the excess tax paid is returned to the taxpayer in the form of a tax credit. In total, the reform increases the level of dividend taxation for taxpayers who previously opted for the LFP and who were in the top income tax brackets.

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

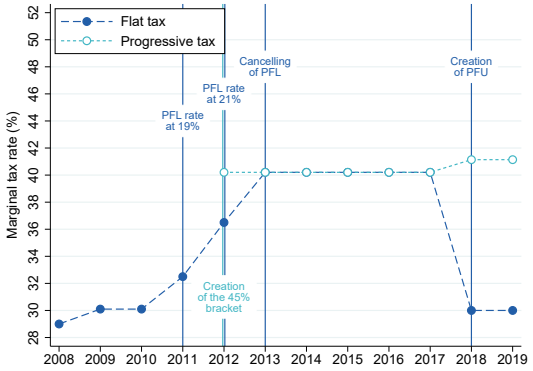
(a) 30% bracket



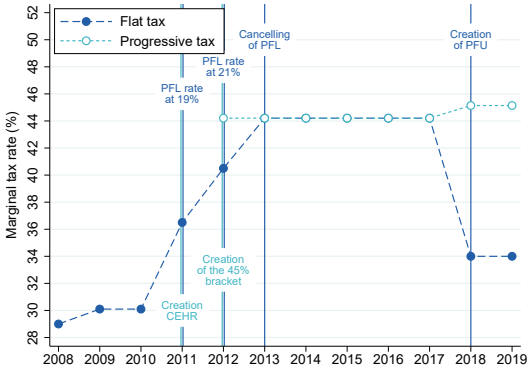
(b) 41% bracket



(c) 45% bracket



(d) 45% bracket and CEHR



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 LLC manager in the household. These marginal tax rates are computed using the TAXIPP microsimulation model.
The 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). The 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). The 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.

A.3 Anti-avoidance scheme for LLC 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 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 deducted at the time of payment of the dividend, from its gross amount (*à la source* in French). 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. In fact, the SARL is the most frequently chosen status: 77 % of French companies take the form of a SARL in 2012 (Boissel and Matray, 2019). The legal framework of LLCs 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. Boissel and Matray (2019) note that in 2012, a manager is taxed at 15.5 % in terms of overall social security contributions if he chooses to receive dividends, while he is taxed at around 46 % if he receives salaries. The 2013 reform aims to reduce this arbitrage opportunity by harmonising the tax rates of the various options.

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 1 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 revisits the 2013 reform of mandatory dividend taxation on the scale, and reintroduces the possibility of flat-rate taxation of capital income with the creation of the single flat-rate tax (PFU).

A.5.1 The one-time flat-rate levy

Like the PFL that preceded it from 2008 to 2013, the PFU 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 tax, there are social security contributions, which have been taxed at 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 SFP should thus be the most financially advantageous option for a larger fraction of taxpayers than the LFP 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 LFP, all taxpayers are subject to a flat-rate withholding tax and the option between the scale and the SOP 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 SOP 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 SFP may seem symmetrical to the 2013 reform that abolished the LFP, 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.

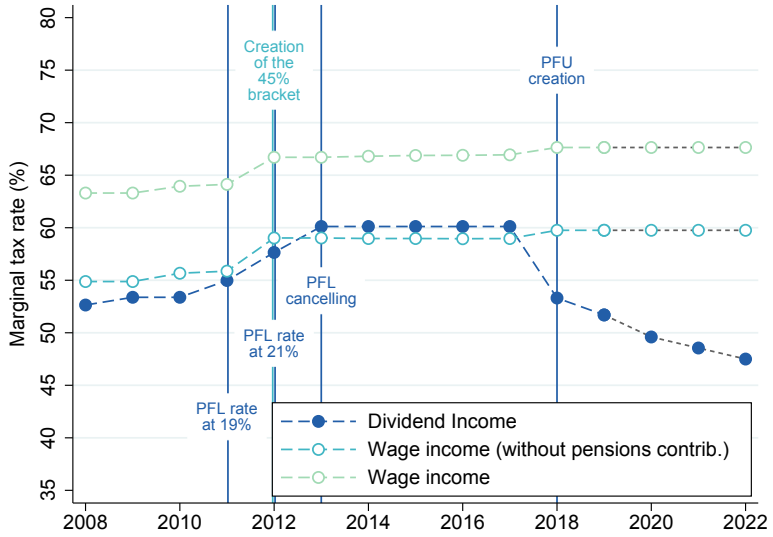
A.5.2 The possibilities of income shifting in 2018

The introduction of the SOP widens the gap in the level of taxation between different types of income, in particular 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.

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 behaviours. This anti-abuse amendment consisted, in the case of senior executives holding more than 10 % of the voting rights, in capping the UFP's profit 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 deleted by the National Assembly's Finance Committee,

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 2088 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 Social Security ceilings as for an individual with incomes above 8 Social Security ceilings. Projections from 2019 to 2022 are based on announced corporate tax rates and assuming no change in the rest of the tax base.

in particular 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 dividend scale.

However, the potential incentives to shift income to dividends can be reduced by the introduction of withholding tax in 2019. Dividends were already subject to withholding tax and are not affected by this reform. Salary incomes have been deducted at source since 2019. In order to avoid income taxation in 2019 for 2019

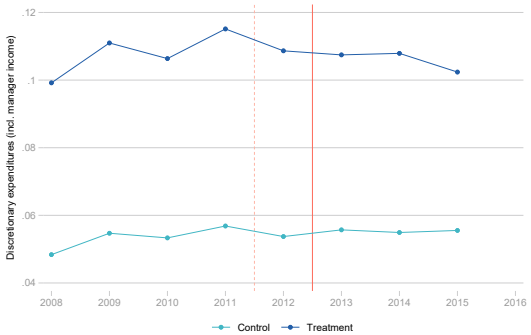
(as a withholding tax) and 2018 (under the old tax system), wage income in 2018 is not taxed. In practice, the 2019 income tax on 2018 income is calculated according to the usual methods. Then, the tax fraction associated with the income in the new withholding tax field is returned in the form of the 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 results

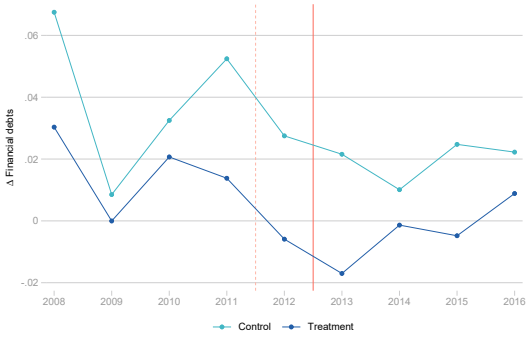
Figure B3: Average evolutions of the accounting decomposition variables around the 2013 tax reform

(a) Augmented profits

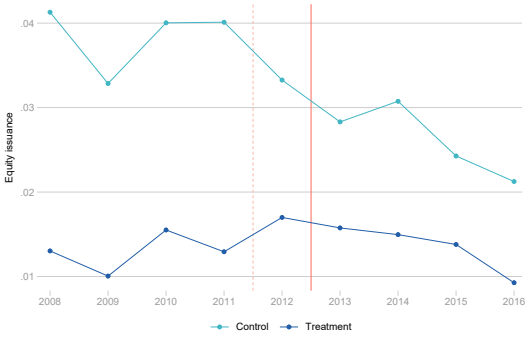
(b) Private benefits of owner-manager (incl. wage)



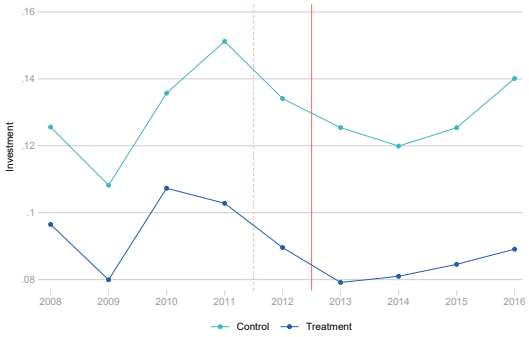
(c) Financial debt issuance



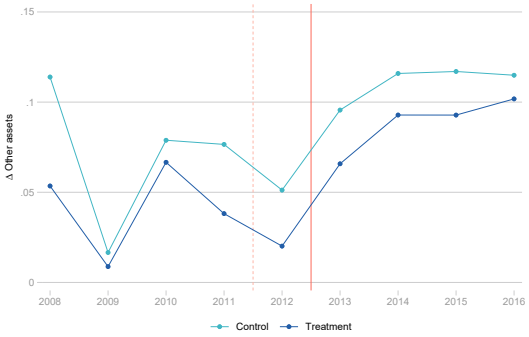
(d) Issuance of outside equity



(e) Investment



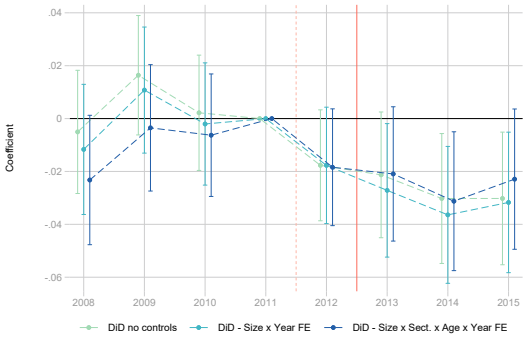
(f) Changes in other assets



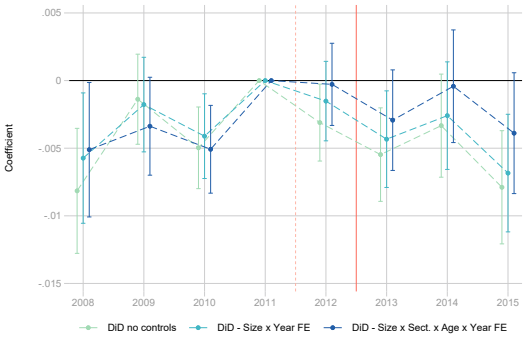
NOTES: Each figure represents the yearly average across groups of a variable taken from the accounting decomposition. The panels represent the effects on (a) augmented profits; (b) personal benefits of owner-managers; (c) changes in financial debt; (d) equity issuance; (e) investment; (f) changes in other assets. The values of each of the variables are winsorized at percentiles 1 and 99. The points represent the estimated coefficients, the lines the confidence interval measured at the risk threshold of 5 %. The treatment group is composed of companies fully owned by natural persons, the control group is composed of companies not wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the section **??**.
SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Non-wage earners database.

Figure B4: Effects of the 2013 tax reform on the accounting decomposition

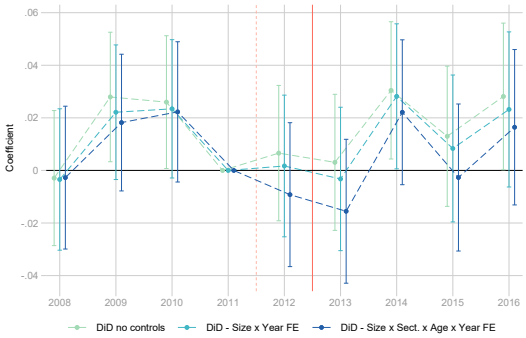
(a) Augmented profits



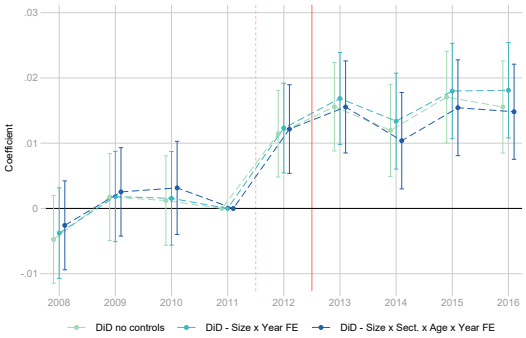
(b) Private benefits of owner-manager (incl. wage)



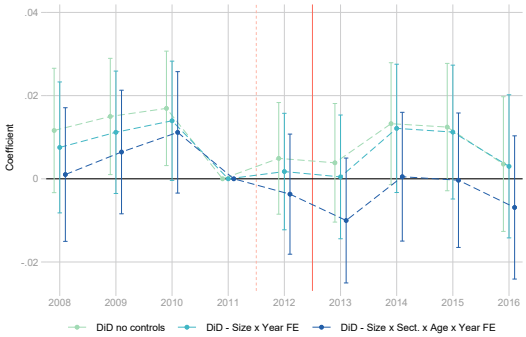
(c) Financial debt issuance



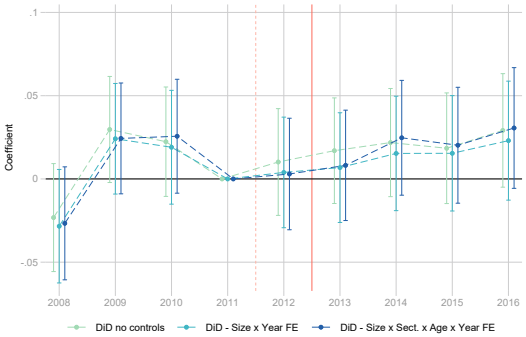
(d) Issuance of outside equity



(e) Investment



(f) Changes in other assets

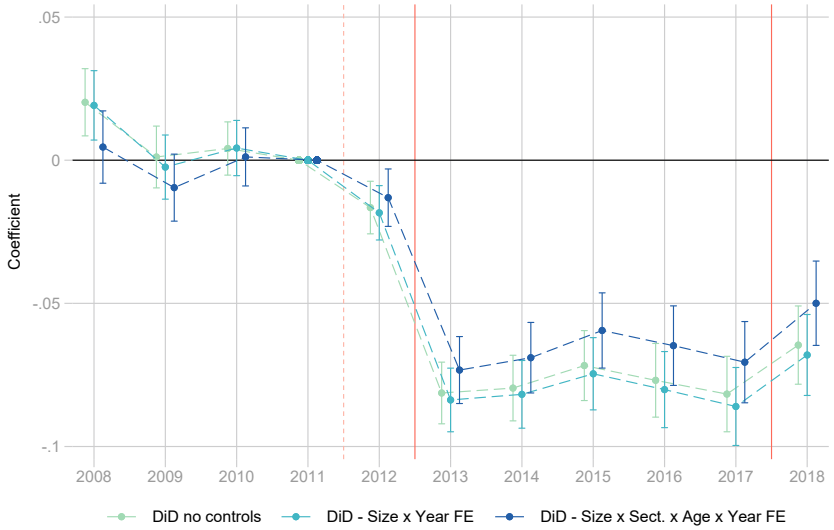


NOTES: Each figure represents regression coefficients of a dynamic difference-in-differences estimator using a different variable from the accounting decomposition of dividends as the dependent variable, with standard deviations clustered at the firm level. The panels represent the effects on (a) augmented profits; (b) personal benefits of owner-managers; (c) changes in financial debt; (d) equity issuance; (e) investment; (f) changes in other assets. The values of each of the variables are winsorized at percentiles 1 and 99. The points represent the estimated coefficients, the lines the confidence interval measured at the risk threshold of 5 %. The treatment group is composed of companies fully owned by natural persons, the control group is composed of companies not wholly owned by a legal person. Additional details and restrictions on the sample are outlined in the section **??**.

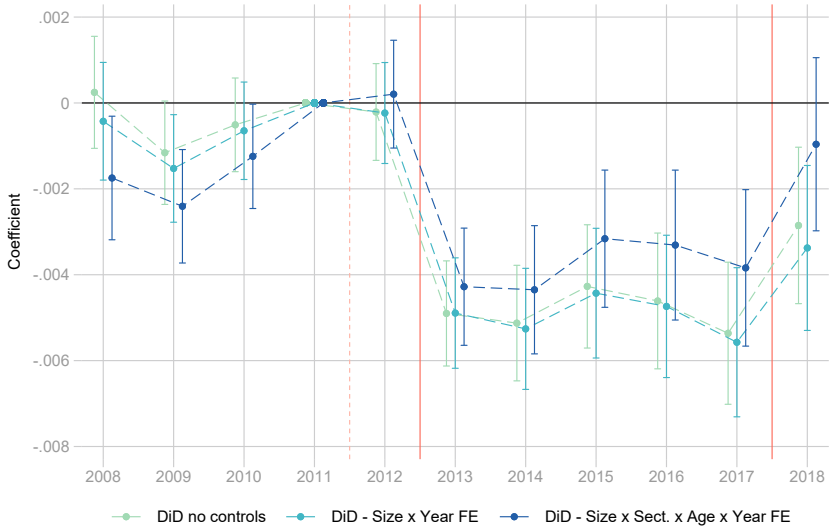
SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Non-wage earners database.

Figure B5: Comparing reaction to the tax hikes (2013) and cuts (2018): Dynamic DiD coefficients

(a) Probability of distributing dividends



(b) Dividends over assets ratio



NOTES: Each figure represents regression coefficients obtained by dynamic difference-differences using dividend distribution variables as the dependent variable, with standard errors grouped at the company level. The panels represent the effects on (a) the extensive margin (positive dividends paid); (b) the dividends paid per euro of equity fixed in 2011. The points represent the estimated coefficients, the lines the confidence interval measured at the risk threshold of 5 %. All companies in the treatment or control group are companies present in 2011 and 2012, and closing their financial year on 31 December. The companies included in the treatment group are fully owned by natural persons in 2011 and 2016. Additional details and restrictions on the sample are outlined in section 4.2.
SOURCES : Files BIC-RN, FDG, LIFI, DADS Postes, Base non salariés, commercial court registries data.