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

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Follow the money!

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

Laurent Bach Antoine Bozio Brice Fabre
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November 2019

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 equals four and there is no shifting towards other personal income categories. We find instead an increase in companies' spending. After the tax decrease, payouts revert to their initial level, but not enough to offset the amounts received during the high-tax period.

Keywords: Dividend tax ; Intertemporal income shifting ; Firm behavior.

JEL codes: G35, H24, O16.

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1 Introduction

Dividends are one of the main flows of income to households. They are also disproportionately accruing to the wealthy. These two features of dividends could make them a very attractive tax base for redistributive purposes. However, it is well-known that households' dividends react strongly and quickly to dividend tax reforms. As a result, it is not uncommon to observe dividend tax decreases which almost "pay for themselves" and dividend tax increases yielding virtually no additional revenue (Poterba *et al.*, 1987). Yet, it remains to this day unclear which of those behavioral responses carry real implications for public finances and economic welfare and which do not. In this paper, we identify and estimate as comprehensively as possible the margins of reaction of dividends to dividend tax reforms.

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. These two choices may be made independently of each other, or they may instead be a fully joint decision, depending on the ownership and governance structure of companies. In the former case, it is possible to analyze the impact of dividend tax reforms using only household evidence. In the latter case, and in particular when a firm is fully owned by one household, it becomes impossible to understand the evolution of dividends at the level of the household unless one simultaneously follows the evolution of cash flows at the level of the firm.

We fulfill these requirements by using both personal and corporate income tax data from France. The personal income tax files are exhaustive from 2006 to 2017 and allow us to precisely measure the marginal tax rates on dividends faced by households and thus to derive tax elasticities. Corporate tax files cover both listed and unlisted companies from 2000 to 2018 and provide the tax situation as well as the complete balance sheet and profit and loss account of each company. These data also include unique identifiers for each household and each company, and allow us to use panel evidence to identify the effect of tax reforms.

The French context offers a particularly rich set of recent reforms affecting the taxation of dividends. From 2005 to 2018, there were no less than six tax reforms significantly affecting the tax rate on dividends. As of now, we choose to focus our analysis on two of these reforms. Prior to 2013, an optional dual tax system was available to households who received dividends: they could choose to

pay a flat tax (named "Prelevement Forfaitaire Liberaire", henceforth PFL) on those dividend streams and then subtract these from the progressive income tax (named "Impot sur le Revenu des Personnes Physiques", henceforth IR) base, or they could choose to keep those dividends in the progressive income tax base. In 2012, households with top incomes could reduce their marginal tax rate on dividends from 40.2 % to 36.5 % by opting for the PFL. In 2013, the newly elected Hollande government decided to suppress the optional flat tax for dividends, thus forcing all dividends to be taxed under the progressive tax schedule. In 2018, the newly elected Macron government introduced a new version of the flat tax option for dividends (this time named "Prelevement Forfaitaire Unique", henceforth PFU). French households with top incomes may now reduce their marginal tax rate on dividends from 40.2% to 30% by opting for the PFU.

In order to identify the causal effect of those 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 PFL option prior to its suppression in 2013. Provided we find a correct counterfactual for this population post-2013, this feature of the data allows us to estimate a treatment effect for the 2013 reform. In order to build this counterfactual, we define a control group comprising those households who earned significant dividends and yet did not use the PFL when it was available. In our firm sample we are not able to identify as precisely the personal tax situation of the corporate owners. 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 reform 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, despite a relatively modest change in marginal tax rates, households who lost the flat tax option in 2013 reduced their dividends by 40 %. The corresponding tax elasticity of dividends is equal to 4, which suggests that the 2013 reform reduced fiscal revenue from the taxation of dividends.

Second, we do not find significant evidence that households affected by the cancellation of the flat tax substituted their dividends with either higher labor incomes, higher interest payments or higher capital gains.

Third, we find that firms owned by individuals reduced their dividends by 14 % due to the 2013 reform. This point estimate is significantly lower than our estimate from household data likely because we are only able to measure an intent-to-treat effect in our sample of firms.

Fourth, we provide an accounting decomposition of the reduction in dividends among treated firms into six components: the private benefits of the owner-manager (as measured by her wages and declared personal expenses taken care of by the company), the issuance of outside equity, the issuance of financial debt, the profitability of the company, investments in financial assets, and real investments. We find that on top of reducing their dividends, shareholders of treated firms poured additional money into the equity of their companies, possibly in order to shield some capital income from the personal tax base. We do not find that treated firms substituted their distribution of dividends with higher wage payments to their owners. Firms invested approximately a third of these resources into financial assets, and the remaining two thirds into annual expenses reported in the profit and loss account. We do not detect any effect of the reform on real investment.

Fifth, we find that following the reenactment of a flat tax option in 2018, treated firms increased their dividends by approximately the same amount as the reduction caused by the loss of the flat tax option. This suggests that firms that were treated in 2013 did not simply accumulate undistributed earnings passively during five years to then redistribute all of those past earnings once the favorable tax regime was reenacted.

Overall, our results suggest that, in France, there may indeed be shifting responses to the taxation of dividends but that such shifting would be taking place across time through undistributed dividends increasing the value of companies, and therefore the value of future realized capital gains. Since capital gains are usually taxed under a more favorable regime than dividends, such a shifting response cannot fully offset the loss in tax revenue from the dividend base. What is more, additional revenue from future capital gains may take a lot of time to materialize in fiscal revenue. As a result, finitely-lived or financially constrained governments should be particularly afflicted by the loss in dividend taxes.

To our knowledge, this is the first attempt to decompose the response of dividends to tax reforms along both household and firm-level margins, as suggested by [Kopczuk and Slemrod \(2006\)](#). [Yagan \(2015\)](#) estimates a large dividend response to the dividend tax cut of 2003 in the US and does not find any significant change in investment following the reform. Presumably for lack of detailed com-

pany account data, the paper does not however investigate the sources of cash that companies have had to tap into in order to make those generous payouts. It also does not make use of any household-level evidence, which likely leads to underestimating the dividend-to-tax elasticity.

Alstadsæter and Jacob (2016) and Alstadsæter *et al.* (2017) evaluate the impact of the 2006 dividend tax cut in Sweden on households and firms, respectively. They find that households' total income was not affected by the reform, suggesting that 100 % of the response is due to income shifting. On the corporate side, they find that, 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.*, 2018). However, they cannot derive a tax elasticity for dividends because the reform dramatically changed income shifting limits at the same time it reduced dividend tax rates. Neither do they investigate potential shifting between various asset types (for instance, from interest-paying assets, pension funds and life insurance to equities). Finally, because the Swedish reform affected all firms significantly, albeit at varying degrees, the identification of its impact on corporate behavior is potentially more fragile.

Boissel and Matray (2019) use firm-level data to study a large dividend tax rate increase taking place in France in 2013, at the same time as one of the reforms we analyze. The tax reform they study is specific to a category of small businesses ("Sociétés à responsabilité limitée avec gérant majoritaire", henceforth SARLGM), while the reform we study is applicable to all companies including the biggest ones. Contrary to our case, the dividend tax they focus on is also coming with social benefits for the owner-manager, which makes the computation of tax elasticities much more challenging. In order to distinguish our results from theirs, we run all of our firm-level analysis on a sample of firms excluding the SARLGM. In our household-level evidence, we define treatment and control groups so as to make sure both groups may be affected by the reform they analyze but only the treatment group is affected by our reform of interest.

The results from our paper also stand in contrast to the existing literature. We confirm that dividends strongly react to taxes but estimate a far bigger elasticity than in the recent literature. The typical estimate, from Chetty and Saez (2005), Yagan (2015) and Boissel and Matray (2019) is around 0.5, while we find an elasticity of 4. Part of the explanation for the gap comes from the fact that all of these papers use firm-level evidence rather than household-level evidence. Since many firms have shareholders unaffected by the reform, firm-level estimates are by design lower bounds: our own firm-level estimate of the elasticity is 70 % lower

than our household-level estimate. Compared to the Swedish evidence, we find no evidence of income shifting towards labor income following a dividend tax increase. Here, one possible explanation is that we focus on firms and households which are much richer, so the potential for income shifting may be more limited.

This research is also to be placed among a series of recent papers evaluating the numerous tax reforms that took place in France since 2012 using newly-available administrative data (Aghion *et al.*, 2019; Guillot, 2019; Lefebvre *et al.*, 2019). Our work provides further evidence that behavioral responses to taxes can be very large in France and that French tax reforms deserve closer scrutiny.

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 and includes further robustness checks. Section 7 concludes.

2 Institutional setting

Capital income, and dividends in particular, are subject to a special treatment within the French tax system. From 2008 to 2012,¹ taxpayers receiving dividends have the choice between progressive income tax and a flat-rate withholding tax – called *Prélèvement forfaitaire obligatoire* or PFL in France. Since 2008, two major reforms have changed the taxation of dividends. The 2013 reform abolishes the PFL and reintroduces dividends into the progressive income tax schedule, leading to a potential increase in the level of taxation for some (well-off) taxpayers. In 2018, the introduction of the single flat-rate tax (PFU) optionally re-establishes a system of flat-rate taxation of capital income and in particular dividends. Finally, a 2013 reform, concomitant with the abolition of the PFL, brings part 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 – see Boissel and Matray (2019) for a recent analysis of this reform. As will be made clear in the data section and the section detailing our empirical approach, we will apply a set of criteria when defining units (households or firms) included in our estimating sample so as to minimize

¹In this section, the taxation of income for a year N refers to the taxation of income received during that year N . Before 2019, the year of the transition to withholding tax, income received in the year N was taxed in $N + 1$ as income tax.

the chance that they are directly treated by the simultaneous reform affecting the dividends of majority owners.

In this section, we briefly present the fiscal environment before the 2013 reform, the 2013 reform itself and conclude by presenting the 2018 reform. A more comprehensive presentation of the tax reforms can be found in section B of the Appendix.

- The period from 2010 to 2012 is characterized by an increase in the taxation of dividends, with the increase in social security contributions, the introduction of the exceptional contribution on high incomes and the increase in the flat-rate withholding tax. The top marginal tax rate on dividends increases by 4.2 percentage points over this period.
- The 2013 reform abolishes the 21 % flat-rate withholding tax on dividends. It makes it mandatory to tax dividends at the progressive scale of income tax with an upper bracket of 45 %, resulting in a 2.5 percentage point increase in the marginal tax rate.
- The flat-rate taxation of dividends is reinstated in 2018 with the creation of the PFU at 12.8 %, which is in addition to the social security contributions of 17.2 % to obtain a rate of 30 %. This reform is the largest change in dividend taxation since 2010. The top marginal tax rate thus fell by 6.8 points in 2018.

3 Data

Household level data. The household-level analysis relies on the POTE (DG-FiP) panel data, which have been made available to researchers very recently. POTE files are the personal income tax exhaustive administrative files. They provide complete information for each of the 37 million French tax households in their tax return, i.e. the amount recorded in each of the 3,000 boxes of the IR return. We have this information at our disposal for income from 2006 to 2017 (i.e., for income declared in years 2007 to 2018). These files are a panel: a given tax household has a unique and unchanged identifier between years and can be followed over time.

Firm level data. The firm-level analysis relies on three main data sources: company tax returns, which correspond to the data collected by the tax administration in the purpose of income tax collection; data from the clerk's offices of the

commercial courts; and finally information on manager wages, contained in a database on non-wage earners (INSEE) and data on standard labor income from DADS Postes (INSEE). The administrative tax data have the advantage of being more reliable and much more complete but are only available until 2016, whereas data from the commercial courts allows to measure effects for the 2018 accounts.

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 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.²

In order to measure dividends for the financial years ending in 2017 and 2018, we complement the administrative tax data with the yearly accounts filed by firms with the clerks of the commercial courts.³ The data are complete for the financial years ended in 2017 and partial for the financial years ended in 2018. In particular, not all companies that closed their accounts on 31 December 2018 had yet filed their annual accounts by the beginning of September 2019. Unlike administrative tax files, these data do not directly provide information on dividends paid by companies. However, they contain sufficient information on the corporate income of each financial year and the changes in reserves between financial years to allow the amount of dividends to be deducted by an indirect method.

Finally, we use information contained in the non-wage earners database. This data file is based on the declarations of self-employed people. It is useful for the purpose of our study because it makes it possible to determine which companies

²Results 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.

³These data are made available online by the National Institute of Intellectual Property (INPI) on the website <https://www.inpi.fr> and then centralized in the National Corporate Register (RNCS). The site is updated daily and our last extraction used for this paper was on September 6, 2019.

have been managed at a given time between 2006 and 2015 by a majority manager and under which legal category. We complement this database with information on wages given to firm managers from the French employment database DADS Postes (INSEE). This database contains exhaustive information on all employees in a given year at the job-spell level: for our purposes, we simply use manager wage amounts at the firm-year level.

4 Empirical approach

4.1 Household-level estimation

Identification strategy. The panel on household tax filings allows us to estimate behavioral responses from households receiving dividends around the 2013 reform. More specifically, our sample is composed of fiscal households receiving at least 1,000 € in dividends in 2012. This threshold allows excluding fiscal households for which the marginal tax rate on dividends is likely to have a tiny impact on their effective overall tax rate, while keeping a large share of the total of received dividends. 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 2017 period.

To estimate the behavioral responses to the reform, we define a treatment and a control group, and estimate the effect of the reform through dynamic difference-in-differences estimations. In order to estimate the impact of the scaling on dividends, the analysis focuses on tax households that received dividends in 2012, i.e. in the year preceding the 2013 reform. These tax households are defined as "treated" when they use the PFL in 2012 for at least part of their dividends, and as "control" if they have opted for the progressive scale for all their dividends. Thus, we assign each tax household in our sample a constant treatment status over time, as defined according to their decision in 2012 only.

Simply put, opting for the PFL in 2012 is profitable for a household tax only from taxable income in the 41% bracket of the scale progressive, with an entry threshold of 70,830 euros per year per tax share. Even above this threshold, the choice for the PFL is not automatically profitable. In order to have treatment and control groups with relatively homogeneous income levels, and in which the choice of PFL is relatively homogeneous, we restrict our estimation sample to tax households whose "increased taxable income"⁴ per unit is above 120,000 eu-

⁴We define "increased taxable income" as taxable income to which is added the amount of dividends declared to the PFL, net of deductions to which these dividends would have been

ros. While only 22% of tax households with increased taxable income per unit between 70,830 and 120,000 euros choose the PFL, this proportion rises to 50% among the tax households with the same income measure exceeding 120,000 euros. To avoid mean-reversion issues, we impose that this income-level condition be respected in each of the four years preceding the reform, that is between 2009 and 2012, for households to enter our estimation sample.

In 2013 also occurred a reform related to dividend taxation for majority managers of LLCs (see sub-section B.3). These managers can subscribe to specific supplementary pension systems ("contrats Madelin"). As contributions to these schemes are subject to income tax deductions, these contributions have to be reported in the income tax records. The income tax form includes boxes in which contributions to several kinds of pension schemes, including "contrats Madelin", have to be reported.⁵ In order to drop households suspected to be subject to this concomitant reform, we exclude from the sample every tax unit for which these boxes are filled with a positive amount, for at least one year between 2009 and 2012. Table 1 provide descriptive statistics of the sample of treated and non-treated households, after all our restrictions.

The choice of our treatment and control groups is quite natural: the fiscal households using the PFL in 2012 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.

Estimating equation. We estimate a dynamic 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:

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

subject if they had been subject to the progressive scale. This measure of taxable income provides information for the portion of the progressive scale in which the tax household would have been located by opting for the scale for all its dividends. It therefore constitutes the relevant measure of income to assess the arbitrage a household faces in the choice of a tax regime for its dividends.

⁵These are the boxes 6QS, 6QT and 6QU of the income tax form labelled "2042", downloadable at <https://www.impots.gouv.fr/portail/formulaire/2042/declaration-des-revenus>.

Table 1: Descriptive statistics – estimation sample observed in 2012

	Treatment group	Control group
Reference fiscal income per fiscal share	560,432	338,760
Dividends per fiscal share	276,756	53,755
Salaries per fiscal share	110,129	92,824
Nbr of fiscal households	4,009	3,839

NOTE : This table displays the mean of some variables across groups for year 2012, as well as number of households in each group.

SOURCE : POTE panel files, 2008-2017.

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 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.

4.2 Firm-level estimation

Construction of control and treatment groups. As the reform analysed concerns the taxation of natural persons, the exposure of companies to this reform depends considerably on their shareholding structure at the time of the reform. Indeed, while companies owned largely by individuals seem likely to reduce their dividend payments, companies held to a large extent by legal entities appear to be less exposed and therefore less likely to react to changes in the taxation of individuals.

The construction of our treatment and control groups follows this intuition. We use as a treatment group all companies wholly owned by individuals in 2011, and as a control group all companies whose potential individual shareholders together own less than 50 % of the capital and in which no corporate shareholder owns more than 95% of the shares.

The choice of our control group deserves a thorough discussion, since other groups of companies potentially unaffected by the reform could have been set up. On the one hand, listed companies seem to have little sensitivity to personal income tax on dividends in their distribution policy, and as such constitute an interesting control group. However, their very large size makes them potentially

less comparable, in terms of real variables such as investment or employment, to the treatment group. A second natural control group consists of all companies with a foreign group head, which are therefore not affected by changes in the taxation of dividends received in France. However, this group is composed mainly of subsidiaries of large multinational groups, and therefore suffers from the same shortcoming as listed companies.

Companies owned by legal entities, on the other hand, constitute a particularly interesting group, insofar as they are numerous and of varying sizes, but *a priori* not directly affected by the inclusion in the IR dividend scale provided that the physical shareholders taken together directly hold only a minority share. Nevertheless, this group needs to be refined: first of all, many of these companies are tax consolidated, i.e. they file their corporate tax returns together. In this case, the relevant decision-making unit is more likely to be the head of the tax group. In order to consider a group of firms whose decision to pay is not the result of a unilateral decision by a group leader who fully owns it, we therefore consider as a control group the sub-population of firms held by one or more companies, none of which owns more than 95% of the capital. 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 companies 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.

4.3 Construction of the estimation sample

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 reform (2011 and 2012). In addition, in order to be able to precisely define our treatment and control groups, we only retain firms whose shareholding composition variables are correctly defined in the data in 2011. We also exclude firms whose size (consolidated at the level of the group to which they belong if they are not independent) makes them a microenterprise.⁶ In addition, we exclude from the control group firms that are present or whose group leaders are present in the treatment group.

Secondly, in order to exclude from the scope of the analysis the effects of the concomitant reform involving the submission to social security contributions of

⁶In the legal sense of the French 2008 Economic Modernisation Law, i. e. with a workforce of less than 10 people, and a turnover or total assets of less than €2 million)

dividends paid by majority managers of LLCs, we exclude all legal units (SIREN) 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 the companies 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.

Descriptive statistics. Table 2 presents statistics on the respective characteristics of the treatment and control groups measured in 2011, before the dividend scale reform. The majority of companies in both groups are SMEs: the median number of employees is 17 in the treatment group and 20 in the control group, and only a very small number (less than 10 %) of companies have more than 100 employees. Nevertheless, as indicated by the median turnover (€2.3 million for the companies treated and €3.9 million in the control group), they are important organisations in their economic and geographical environment. 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.

In summary, the composition of our sample allows us to draw conclusions on the impact of the taxation of dividends which are both causal (internal validity) and representative of a significant part of the French economy (external validity).

Table 2: Descriptive statistics for treatment and control groups in 2012

	Mean	Median	1st decile	9th decile	Mean	Median	1st decile	9th decile
Employees	25.24	17.00	8.00	45.00	43.54	20.00	4.00	105.00
Turnover – k€	4501.38	2321.52	739.40	9171.61	10736.89	3939.47	438.78	26492.81
Value-added – k€	1382.42	872.62	359.37	2612.44	2595.46	1119.56	54.32	6246.33
EBITDA – k€	251.61	102.35	-53.93	651.24	519.15	152.65	-282.52	1602.65
Wagebill – k€	781.86	512.63	241.00	1434.88	1391.74	638.69	41.45	3430.28
Sh. dir. earnings	0.09	0.04	0.00	0.24	0.05	0.00	0.00	0.16
Operating income – k€	163.75	58.70	-44.57	425.54	303.92	78.88	-239.46	1013.19
Equity – k€	1533.77	560.64	58.74	3088.96	3754.33	768.82	-30.29	8380.34
Capital social – k€	328.28	80.00	7.70	576.00	1127.72	180.00	15.20	2704.62
Investment – k€	94.09	11.82	-17.85	193.59	279.64	19.43	-20.31	641.01
Sh. phys. shareholders	1.00	1.00	1.00	1.00	0.11	0.00	0.00	0.37
Nbr phys. shareholders	3.95	3.00	1.00	7.00	2.61	1.00	0.00	7.00
Dividends – k€	80.39	0.00	0.00	200.00	179.39	0.00	0.00	475.00
Sh. firms w/ dividends > 0	0.41	0.00	0.00	1.00	0.35	0.00	0.00	1.00
Div by € of equity	0.08	0.00	0.00	0.25	0.10	0.00	0.00	0.33
Observations			16609				9861	

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.

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:

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

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.

We further estimate static/canonical 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 (see 5.2 for a detailed presentation how we decompose such margins based on an accounting identity). It writes as

follows:

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

where notation is the same in Equation (2).

5 Baseline results

5.1 Household-level estimation

Figure 1 provides a picture of the first stage of the estimation strategy on households. For each year, it shows the average “counterfactual” marginal tax rate on dividends in the treatment and in the control group. These rates are counterfactual, in the sense that they are computed under the assumption that each household does not revise its decisions compared to 2012. The marginal tax rate of each household is computed by applying the microsimulation model TAXIPP to the POTE database.⁷

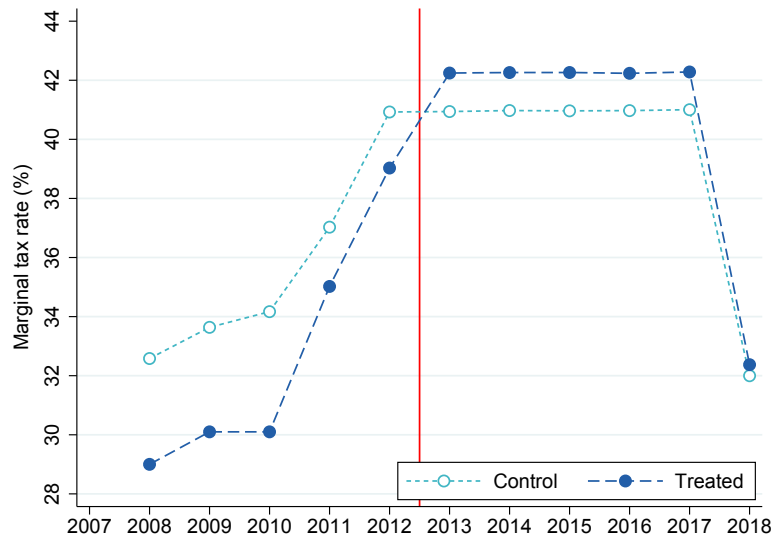
This figure shows a clear divergence in 2013 in the evolution of the marginal tax rates between the treatment and the control groups. While the average marginal tax rate on dividends remains approximately constant for the control group, it increases by 3 percentage points for the treatment group, as a result of the 2013 reform. After that, the curve of the average marginal tax rate remains approximately flat for both groups after 2013, until the 2018 reform. The difference-in-differences setting aims at estimating the impact of the differential change in marginal tax rates in 2013 across groups.

Several other minor reforms occurred over the period of analysis, with a milder impact on the first stage. Figure A1 in Appendix provides, for different cases, a depiction of all these reforms. Beyond this figure, the appendix provides a detailed description of all the reforms that could affected dividend taxation as well as other channels of profits distribution over the period of investigation.

Figures 2a to 2c give a glimpse at the raw data underlying the difference-in-differences setting. They show average changes of different types of income for the treatment and the control groups. Figure 2a shows a clear gap between the dynamics of the treatment and the control group occurring specifically in 2013, while no difference in dynamics is observed before this reform. It is therefore suggestive of a negative and significant impact of the 2013 reform on dividends.

⁷A description of this microsimulation model can be found here: <https://www.ipp.eu/en/methods/taxipp-micro-simulation/>.

Figure 1: Counterfactual marginal tax rates in the control and in the treatment groups



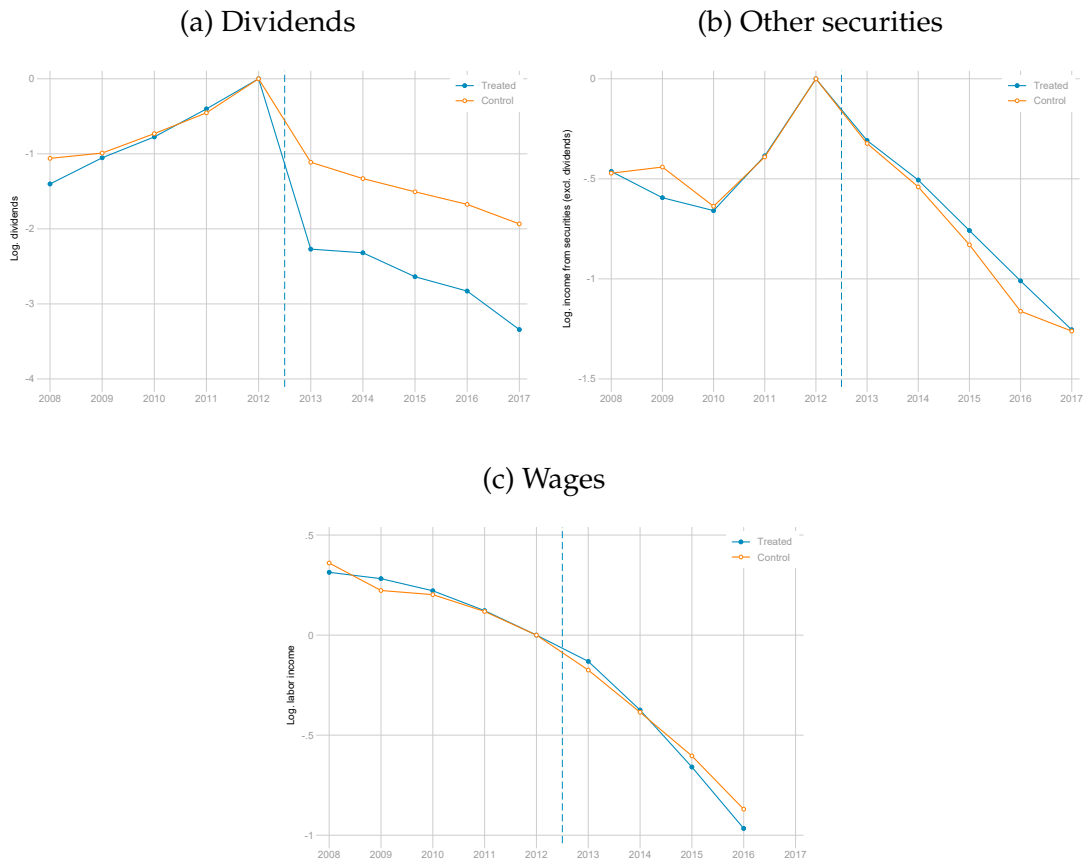
NOTES: This figure shows for each year the average “counterfactual” marginal tax rate in the treatment and the control group. These marginal tax rates are counterfactual in the sense that we assume households taking for each year the same decisions as in 2012. More precisely, we compute for each household in year N the marginal tax rate considering the French tax rules of year N . We apply these rules to households’ 2012 incomes, corrected by the ratio between the value of the first income tax bracket of the progressive schedule in year N and this value in 2012. These marginal tax rates are computed using the TAXIPP microsimulation model.

SOURCES: TAXIPP 1.0, panel POTE.

Despite this result, we also observe a persistent decrease in the control group’s dividends from 2013 on. This decrease for households qualified as unaffected could be interpreted as the result of dividend flows being a firm-level rather than a household-level decision. Hence, some unaffected households could be shareholders of firms in which the majority of shareholders are affected. In this sense, our difference-in-differences setting would underestimate the impact of the 2013 reform. In parallel, with this negative impact, Figures 2b to 2c suggest no effect on other categories of income, such as wages and securities (other than dividends).

Figure 3 shows point estimates with confidence intervals, coming from the estimation of Equation 1, taking the amount of dividends as the dependent variable. First, these results are in line with the common trend assumption, coefficients before 2013 being non-significantly different from zero. Second, there is a drop in the coefficient in 2013, which is persistent over the whole remaining period. This shock in 2013, followed by this persistence, comforts the fact that this effect is driven by the 2013 reform. All these post-2013 coefficients are neg-

Figure 2: Evolution of income in the treatment and the control groups



NOTES: This figure shows, for different categories of revenues, the evolution of the mean of the log of income in the treatment and the control group. These amounts are normalized to 2012. Other securities mainly include interests from bonds and from life-insurance assets.

SOURCE: Panel POTE, 2008-2017.

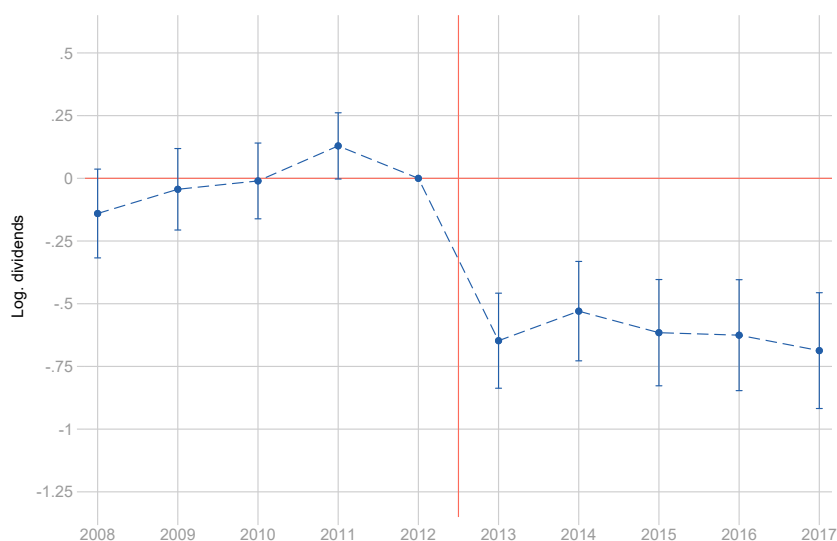
ative and significant. The lowest one, applied to the log of dividends, is 0.5, corresponding to a drop in dividends by 40%. Given that the treatment group decreases on average by 10% of the marginal net-of-tax rate,⁸ this result gives an elasticity of 4.

Figures 4a to 4c show point estimates for three other categories of income, and suggest for each of these categories no effect of the 2013 reform. We observe no effect on wages. This result is not in line with firms managers affected by the reform shifting income from dividends to wages.

Similarly, we also observe no effect on capital gains. This is a very important result, as it allows rejecting the hypothesis that the effects of the 2013 reform

⁸This number comes from the relative difference between the average marginal net-of-tax rate among treated households during years of treatment, and the average over the remaining observations. As in Figure 1, households marginal tax rates are computed using the TAXIPP model.

Figure 3: The impact of the 2013 reform on households' dividends



NOTES: This figure shows point estimates from the difference-in-differences setting, with 95% confidence intervals. These coefficients correspond to the estimations of the terms β_d in Equation 1.

SOURCE: panel POTE, 2008-2017.

we observe on dividends were channelled by portfolio adjustments. Indeed, one may formulate the hypothesis that, following the reform, households substituted dividend paying assets for other types of assets, and therefore sold these assets. Similarly, we observe no effect according to our results on securities other than dividends: while some of them were out of the scope of the 2013 reform (life-insurances in particular), other were affected, and could have led households to discard these assets. This results suggests that affected households kept holding formerly dividend-paying stocks, and that the firms which used to pay dividends stopped doing so when the tax rate increased. The next subsection therefore examines firm-level responses to the 2013 reform.

The baseline sample excludes households suspected to be subject to the concomitant reform of dividend taxation for LLCs managers (see sub-section 4.1). As a robustness check, we run the same estimation on the sample restricted to households in which the main adult of the household (as well as the partner, if any) is retired, when retirement is defined as the fact of perceiving pensions and no wages during the year. This restriction relies on the assumption that such individuals are less likely to be LLCs managers. Figure A2 in Appendix shows the results from this alternative sample. The findings remain relatively unchanged,

Figure 4: The impact of the 2013 reform on households - other categories of income



NOTES: This figure shows point estimates from the difference-in-differences setting, with 95% confidence intervals. These coefficients correspond to the estimations of the terms β_d in Equation 1. Results on capital gains are obtained without the inclusion of the terms $\mathbf{x}_i' \mathbb{1}\{t = d\}$ in the estimated equation. By including them, the coefficients are negative and significantly different from zero, but all coefficients are not significantly different from each other. This result reveals mean-reversion, which is indeed more likely with capital gains, which are more volatile. We do not include all controls for this specific high-demanding specification.

SOURCE: panel POTE, 2008-2017.

which comforts the ability of our setting to capture the specific impact of the end of the PFL in 2013.

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 x_i of equation (2) empty. An intermediate specification introduces a vector of size (as measured with turnover in 2011) quartiles in x_i . Finally, a version controlling for potentially multiple dimensions of heterogeneity introduces size quartiles interacted with age brackets⁹ and sector indicators¹⁰ in x_i .

Dividend policy. Figure 5 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 6 describes the effects of the same 2013 reform on the ratio between dividends and equity (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

⁹For firms less than 4 years old, between 4 and 10 years old, and older than 10.

¹⁰Using 18 categories of the aggregated definition of sectors of the NAF rev.2 classification

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 40 % of their pre-reform average).

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:

$$\begin{aligned} \text{Dividends}_t = & \text{Augmented profits}_t - \text{Owner-manager personal benefits}_t \\ & + \Delta_{t-1;t} \text{Financial debts} + \text{Outside equity issuance}_t \\ & - \text{Investment}_t - \Delta_{t-1;t} \text{Other assets} \quad (4) \end{aligned}$$

The elements of this decomposition are defined as follows. The “augmented profits” 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. “Discretionary expenditures” include the salaries of executives, as well as so-called “extravagant expenditures” (*dépenses somptuaires* in French) and other personal benefits recorded in the company's tax return. The change in financial debts ($\Delta_{t-1;t}$ Financial debts) contains the change in the outstanding amount of bonds and debts with credit institutions. “Outside equity issuance” consists of increases in shareholders' equity excluding reserves, i.e. changes in share capital and issues of residual liabilities (provisions, subsidies, translation

differences). “Investment” corresponds to the change in tangible and intangible fixed assets. Other assets include cash, net current assets and financial assets.

Results based on the decomposition. Table 3 presents regression coefficients obtained from a static difference-in-differences method, i.e. estimating the coefficient associated with a variable ‘Treatment \times Post-reform period’ of each of the variables of the accounting breakdown. The variables of augmented net income and owner-manager personal benefits are not available in 2016, therefore the period considered in these regressions is 2008 - 2015, and the post-reform period is 2013 - 2015. The coefficients presented correspond to an average intent-to-treat effect of the reform on the dependent variable considered for the period 2013 - 2015, 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. The line showing the ratio between calculated dividends (sum of the elements of the decomposition) and the dividends actually paid proves this validity by showing a very moderate error rate on the coefficient associated to calculated dividends relative to actual ones.

Effects on augmented profit and discretionary expenses. The first element on which the breakdown presented above provides some answers is the effect of the reform on net income, as well as on discretionary expenses. Table 3 shows a significant decrease in the augmented profits following the reform, whose magnitude oscillates around 2 cents per euro of equity in 2011 and is statistically significant, whereas the evolution of the variable was comparable to that of the control group before the reform. This suggests that the reform caused a decrease in the profits reported by treated companies. This is consistent with the fact that discretionary expenditures composed of salaries and items reported to the tax administration as having been used for personal purposes do not increase during the period as shown in table 3. This therefore rejects the assumption of *income shifting*, according to which executives subject to a dividend tax increase decide to grant themselves wage increases, and even suggests opposite effects to this assumption.

Effects on financial debts and equity issues. The accounting decomposition of dividends then makes it possible to study the effects of the reform on the behavior of treated firms on changes in liabilities occurring either through changes in financial debts (bank or bond) or through the issue of equity capital excluding reserves (share capital or residual liabilities). Table 3 displays the estimated effects

Table 3: Regression coefficients on the accounting decomposition variables
– static diff-in-diff

Dep. Var.		Coefficients		
	Dividends (actual)	- 1.671*** (0.197)	- 1.619*** (0.208)	- 1.057*** (0.213)
	Dividends (calculated)	- 1.756*** (0.220)	- 1.693*** (0.232)	- 1.219*** (0.240)
Resources	Issuance of outside equity (+)	1.284*** (0.194)	1.356*** (0.200)	1.070*** (0.198)
	Owner-manager personal benefits (-)	- 0.239 (0.151)	- 0.199 (0.157)	- 0.0357 (0.164)
	$\Delta_{t-1;t}$ Financial debt (+)	0.438 (0.702)	0.262 (0.740)	-0.342 (0.730)
Uses	Augmented profits (+)	- 2.521*** (0.788)	- 2.656*** (0.831)	- 1.459* (0.837)
	$\Delta_{t-1;t}$ Other assets (-)	1.183 (0.862)	0.923 (0.896)	1.317 (0.893)
	Investment (-)	0.0027 (0.433)	0.0848 (0.456)	-0.630 (0.452)
Firm FE		Yes	Yes	Yes
Year FE		Yes	Yes	Yes
Size \times Year FE		No	Yes	No
Size \times Age \times Sector \times Year FE		No	No	Yes
Nbr firms		24 214	24 214	24 212
Nbr obs.		176 974	176 974	176 921
Error calc. div. / actual div.		+ 5.1 %	+ 4.6 %	+ 15.3 %

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 (4), as covariate of interest an interaction ‘treatment \times post reform period’, and including different sets of fixed-effects. Coefficients should be interpreted as cents per euro of equity in 2011. 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.

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

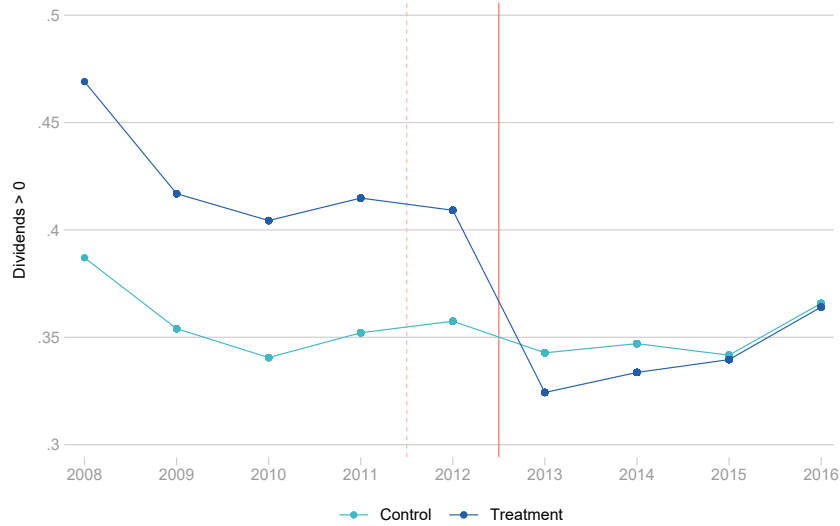
on changes in financial debts for firms in the treated group. The estimated effect after the reform is not significantly different from zero in any of the estimated specifications. We see however that equity capital increases very significantly after the reform among treated firms. According to the displayed coefficients, the effect amounts to slightly more than 1 cent per euro of equity in 2011. It therefore constitutes a force going in the same direction as the dividend decrease (*i.e.* towards an increase in equity) and of the same magnitude as the latter.

Effects on investment and changes in other assets. Finally, the accounting breakdown includes changes in the company's assets, i.e. investment (changes in tangible and intangible assets) and changes in other assets (cash, net current assets including, for example, inventories or the difference between receivables and non-financial liabilities, and changes in financial assets). This part of the decomposition therefore makes it possible to study possible behaviors of stashing the cancelled dividends by accumulation of liquid reserves or less liquid financial assets in the company, with the objective of distributing them in a future more favourable fiscal context.

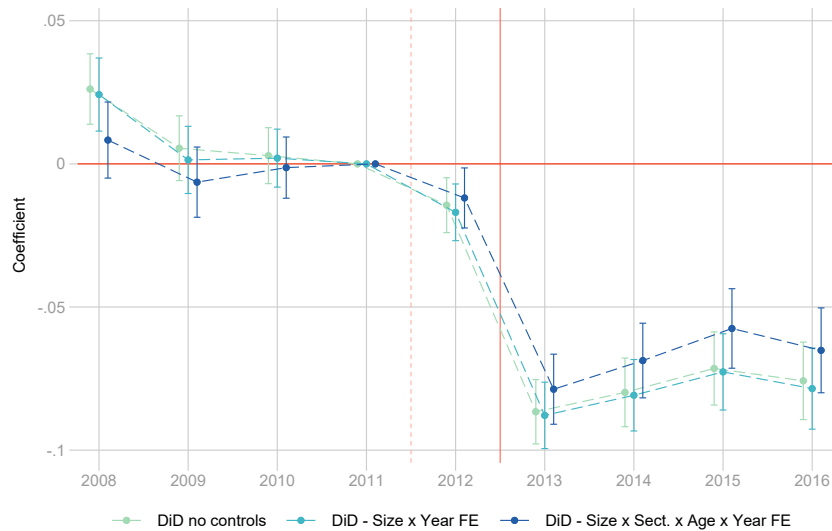
The decomposition also makes it possible to study the effect of the reform on investment. Is the increase in dividend taxation harmful to investment decisions (*old view*), does the reform have no effect on investment (*new view*), or is the postponement of dividend payments likely to stimulate investment decided by the company (Korinek and Stiglitz, 2009)? Table 3 confirms this perspective, since the average effects during the *post*-reform period measured on investment are insignificant and very close to zero. We see however that the point estimate, while never significantly different from 0, varies 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).

Figure 5: Impact on the probability to distribute dividends

(a) Annual average by treatment status



(b) Dynamic DiD coefficients

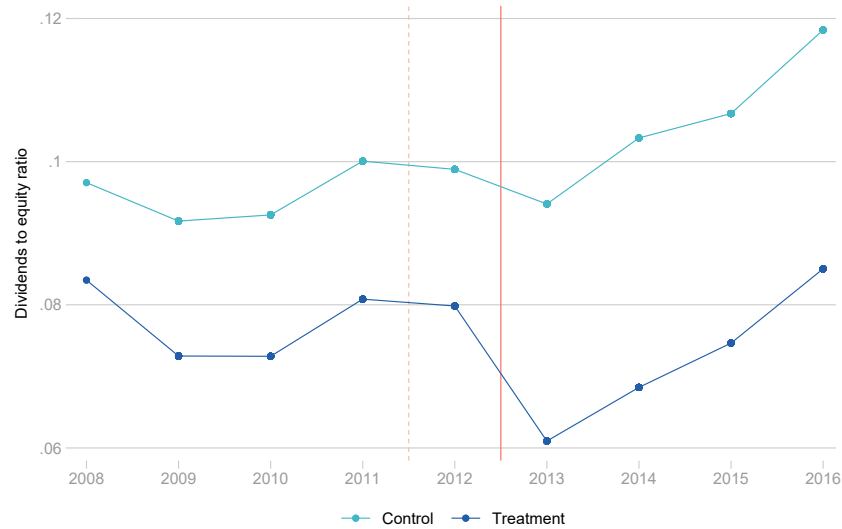


NOTES: The variable studied is the amount of dividends paid divided by the level of shareholders' equity set in 2011. Panel (a) represents annual changes in the mean of this variable, while panel (b) represents regression coefficients obtained by dynamic difference-differences using this variable as 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.

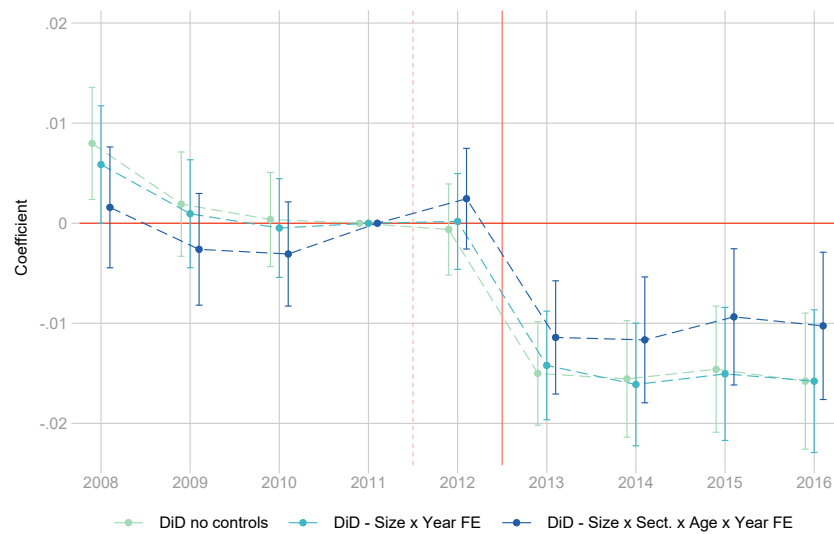
SOURCES : Files BIC-RN, FDG, PERIM, LIFI, DADS Postes, Base non salariés.

Figure 6: Impact on dividend to equity ratio

(a) Annual average by treatment status



(b) Dynamic DiD coefficients



NOTES: The variable studied is a dummy variable taking the value 1 when the dividends paid by the company in the year are strictly positive. 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.

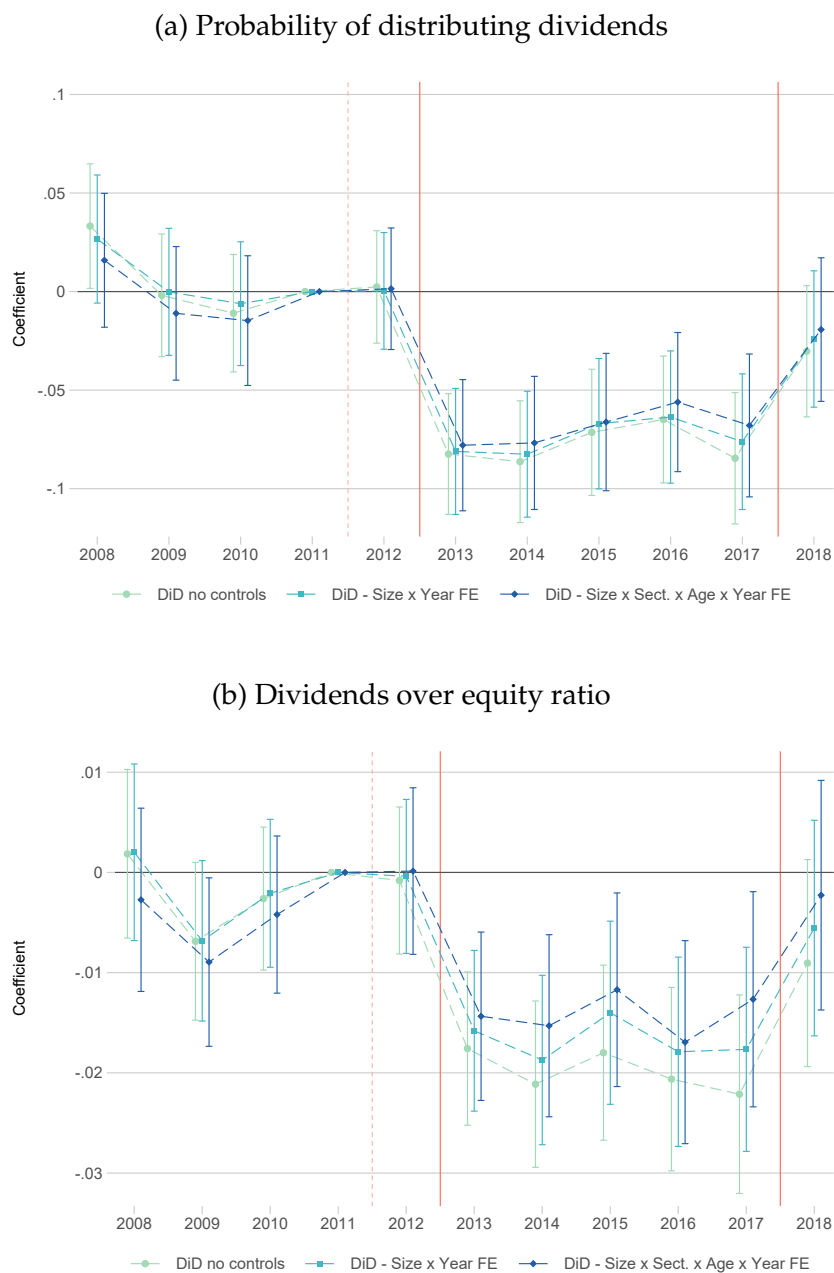
6 Extension and robustness checks

6.1 Assessing the symmetry of the effect of dividend taxation: 2013 versus 2018.

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.

The regression coefficients presented in the Figure 7 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, both at the extensive margin (panel a) and in relation to equity (panel b). Indeed, the probability of paying dividends in 2018 increases by about 5 percentage points in the treatment group compared to the control group compared to 2017. Similarly, the amount of dividends paid per euro of equity capital increases by approximately 1 cent compared to the control group, compared to 2017. For these two variables, the level of dividends paid in 2018 is no longer significantly different from that paid in 2012, whereas it was still paid in 2017. These elements strongly suggest an upward causal effect of the 2018 reform on dividend payments by affected firms.

Figure 7: Comparing reaction to the tax hikes (2013) and cuts (2018): Dynamic DiD coefficients



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.

6.2 Further results of on the firm-level effect of the 2018 reform

[TO BE COMPLETED]

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.

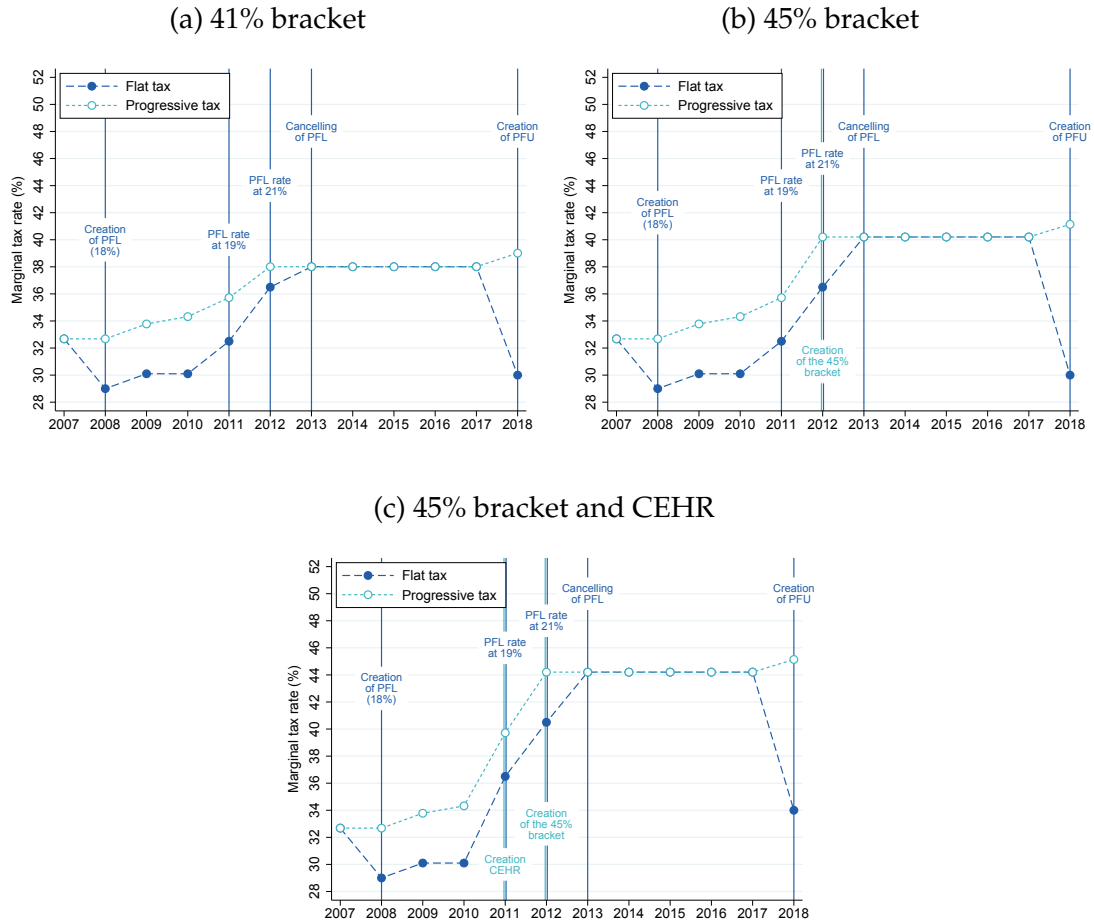
In its current form, the paper also abstracts from analyzing the distributional consequences of those dividend tax reforms. Our results suggest it is crucial in this regard to consider a broader measure of income accruing to households than is traditionally the case, especially among households at the 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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A Tables and figures

Figure A1: The evolution of marginal tax rates on dividends (2007–2018)

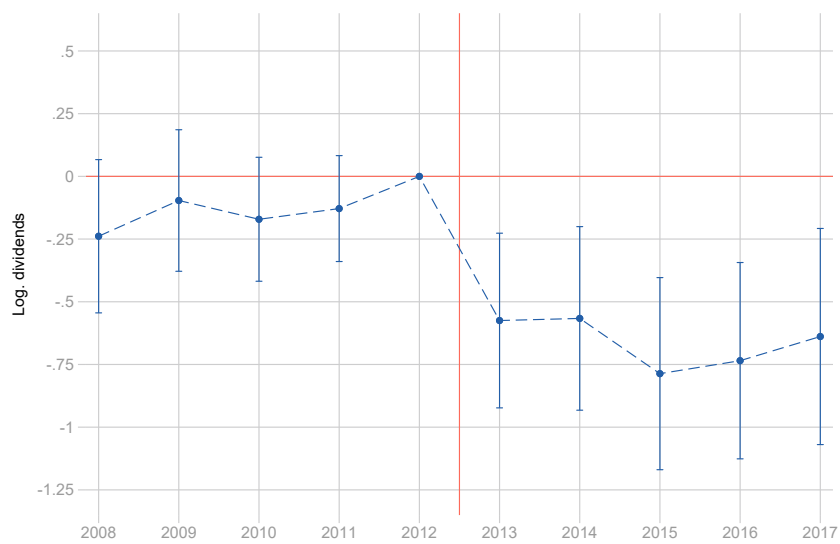


NOTES: Each sub-figure shows, for a specific case of household, the evolution of the marginal tax rate for the two options: the progressive income tax schedule and the flat tax option (for the years such an option exists). These rates are computed by considering households with no tax credits or tax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

The Figure A1a 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 A1b 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 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, and also in the scope of the CEHR.

SOURCE: TAXIPP 1.0.

Figure A2: The impact of the 2013 reform on households' dividends - alternative sample



NOTES: This figure shows point estimates from the difference-in-differences setting, with 95% confidence intervals. These coefficients correspond to the estimations of the terms β_a in Equation 1. These results come from an alternative sample, restricted to “retired households” (see the text for more details).

SOURCE: panel POTE, 2008-2017.

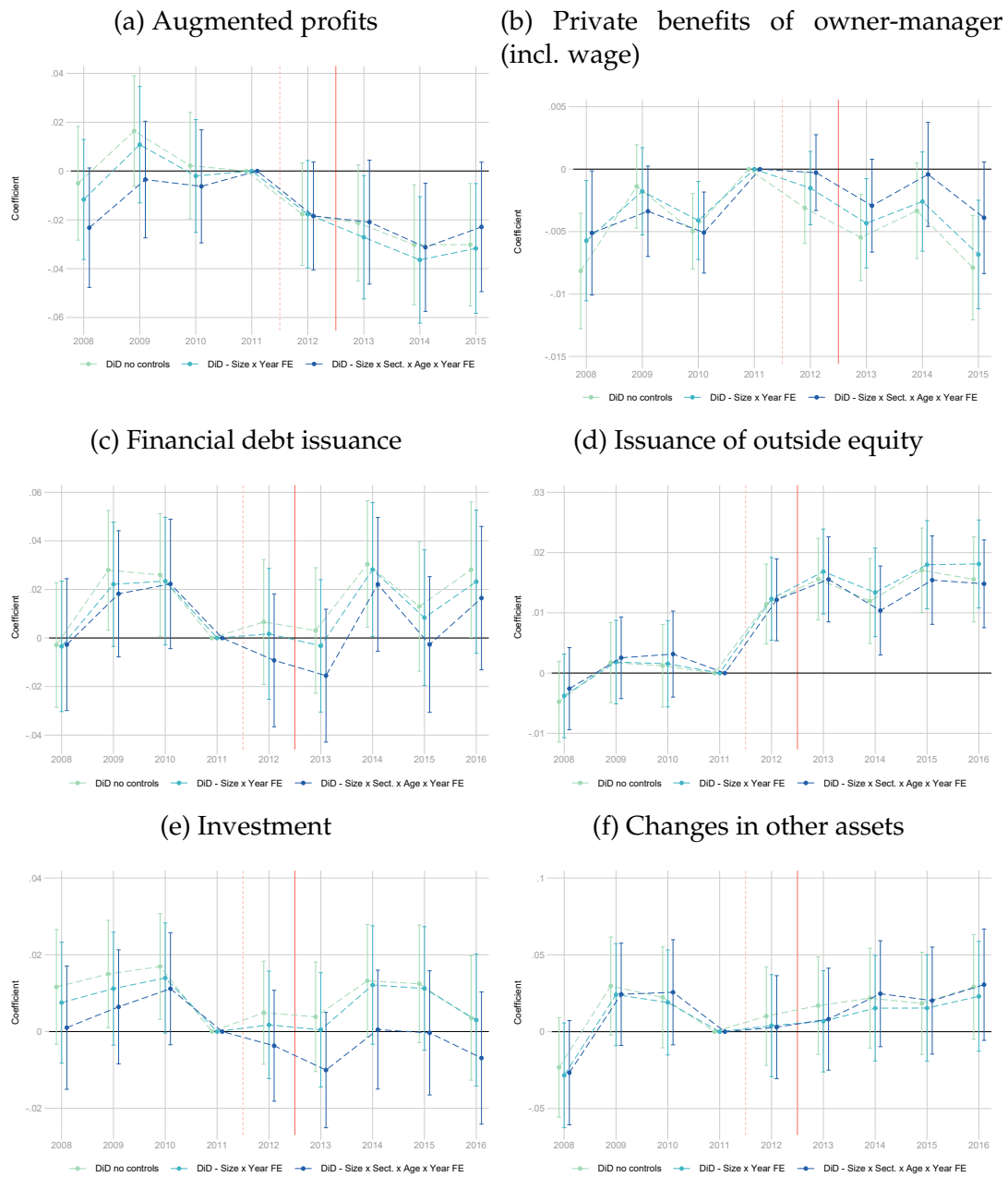
Figure A3: Average evolutions of the accounting decomposition variables around the 2013 tax reform



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 4.3.

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

Figure A4: Effects of the 2013 tax reform on the accounting decomposition



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 4.3.

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

B Changes in the taxation of dividends and other distributions of profits

B.1 Detailed Exposition of Tax reforms affecting dividends between 2008 and 2012

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.

B.1.1 Reforms of the flat-rate taxation of dividends

The Finance Act for 2008 ¹¹ 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.

B.1.2 Reforms of progressive dividend taxation

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 was reduced 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

¹¹Law No. 2007-1822 of 24 December 2007 on the Finance for 2008, article 10.

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.

Table A1: Evolution of legislative parameters related to dividend taxation over 2008 – 2013

	Deduction lump sum	Deduction proportional	Tax credit on dividends	PFL rates	Levy rates social
2008	1 525 €	40 %	50 %	18 %	11 %
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 %
2013		40 %			15,5 %

NOTE : The amount of the lump-sum 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 1st November 2011, social security contributions amount to 12.3 %. The increase in social security contributions to 15.5 % will take effect from 1st 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 B.3).

SOURCE : Barèmes IPP.

B.1.3 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). 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).

B.2 The abolition of the flat-rate withholding tax (PFL)

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 scale¹².

- **Option 2 : the scale**

In the event of an option for the scale, dividends are taxed with other types of income (business income, replacement income, etc.) on a progressive basis. Progressivity means that the rate is *marginal* (the rate applied to an additional euro) is increased with the total household income. In the event of taxation on the scale, 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 LFP 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

¹²This includes dividends from exempt profits distributed by listed real estate investment companies (SIICs) and by investment companies with a preponderance of real estate with variable capital (SPPICAV) since 2011, taxable income from unlisted securities held in a PEA, distributed income taken into account in determining the taxable profit of an industrial, commercial, craft or agricultural company or a liberal profession and taxable distributed income following a correction by the tax authorities.

reductions for which that household is eligible, or the nature of the dividends it receives). The equations 5 and 6 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 places them in the last two brackets of the income tax scale in 2012 (see table A2). Moreover, not all of these taxpayers receive dividends.

$$T(D) = (\tau^{PFL} + \tau^{PS}) \times D \quad (5)$$

$$T(D) = \tau^{bareme} \times \max(0, (1 - \delta^p) - \gamma \times D - \delta^f) + \tau^{PS} \times D \quad (6)$$

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)

The 2013 Finance Act removes the PFL option for dividends paid on or after January 1, 2013. This applies 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

Table A2: Distribution of (fiscal) households in 2012 across brackets of the progressive income tax schedule

	Number of households de foyers	% 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.

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 %, but this is now non-taxable. Maintaining a withholding tax avoids a cash hole for public finances. Then, dividends are taxed as progressive income tax 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 libérateur* 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.

B.3 Reforming the dividend taxation of LLC managers from 2013

Until 2012, dividends are subject to income tax and social security contributions on financial income. The legislation distinguishes two types of financial income for the calculation of social security contributions: *income from assets* and *investment income*. The payment terms and the rate applied have differed between these two categories over time. Until 2007, dividends were considered as *wealth income*. Since 2008, they have been taxed in the category of investment 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.

B.4 The 2015 reform of the 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 *hybridog*. 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.

B.5 The creation of the single flat-rate tax (PFU) in 2018

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).

B.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.

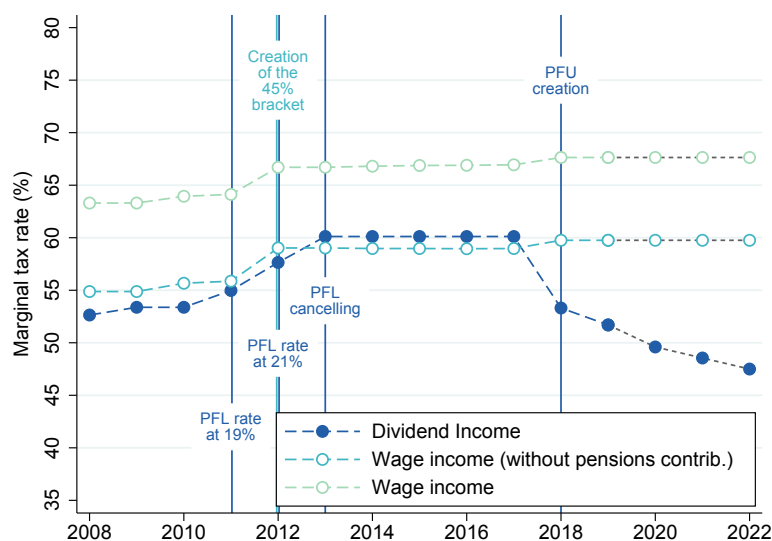
B.5.2 The possibilities of income shifting in 2018

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 A5 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 %

Figure A5: Changes in taxes on dividends and wage income (2008–2022)



NOTES: The marginal rates represented are marginal rates applied to super gross income (gross income plus employer contributions, if any). They correspond to the case of a single person without children, employee, manager, contributor to the general social security system, not benefiting from any credit or tax reduction, and having annual taxable income between four and eight times the social security ceiling. The marginal dividend rate includes corporate income tax, social security contributions and income tax (assuming that the individual opts for the flat-rate tax in the years when this option is possible, i.e. from 2008 to 2012 and from 2018 onwards). The marginal rate on wages includes social contributions, social contributions and income tax (the amount of income in this case being high, the 10 % deduction on wages is capped in his case and the individual is in the last bracket of the scale). The marginal rate on wages excluding pension contributions corresponds to the same marginal rate as that described above minus the amount of social contributions financing pensions. This rate is the same for an individual with incomes between 4 and 8 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.

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, 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.