Higher Dividend Taxes, No Problem!

Evidence from Taxing Entrepreneurs in France [*]

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Abstract

This paper investigates how the large increase in dividend tax rate in France in 2013 affected firms' performance and corporate investment. Using administrative data covering the universe of firms for the period 2008–2016 and a quasi-experimental setting, we find that firms swiftly cut dividend payments. Firms use this tax-induced increase in liquidity to invest more, particularly so when facing high demand. For every additional euro of undistributed dividends, firms increase their investment by 0.2 euro, leading to higher sales growth. Heterogeneity analysis fails to find any group of firms having to cut their investment, thereby clearly rejecting models in which dividend tax reforms affect the cost of capital. Overall, our results suggest that entrepreneurs are credit constraints in equilibrium, despite paying dividends and do not hold enough liquidity to seize investment opportunities when they arise randomly in the economy.

Keywords: Financing Policy; Business Taxes; Capital and Ownership Structure
JEL Code: G11, G32, H25, O16

1   Introduction

Policy proposals to encourage firms to invest by limiting corporate payouts are regularly floated in the political debate. In 2019, U.S. Senators Schumer and Sanders argued that: *"when corporations direct resources [to payouts], they restrain their capacity to reinvest profits more meaningfully in the company in terms of R&D, equipment, higher wages."* Following a similar logic, in 2013, after its electoral victory, the French center-left party decided to raise the dividend tax rate for entrepreneurs explaining that: *"it is fair and legitimate to reward patient and productive investment (...). We want to incentivize investment rather than dividend payouts"*.[1] Supporters of limited taxes on dividends argue that lowering dividend tax rate will actually promote investment by reducing the firm's cost of capital. After the French reform, they argue that a tax increase would kill incentives to invest and result in growth slowdown. In contrast, when President Bush adopted the Jobs and Growth Tax Relief Reconciliation Act of 2003 that reduced the top federal tax rate on individual dividend income in the United States from 38.6% to 15%, he claimed that the tax cut would provide *"near-term support to investment"* and *"capital to build factories, to buy equipment, hire more people."* (cited in Yagan, 2015).

At the heart of this debate is the question of the impact of an increase in payout taxes. We provide a novel empirical answer to this question by exploiting the 2013 reform in France, that led to an almost threefold increase in the dividend tax rate, from 15.5% to 46%, one of the largest increases in developed countries. The French reform affected only firms with certain legal forms of incorporation, but that accounts for three-quarters of the population of firms, providing us with sizeable treated and control groups.[2]

We exploit rich, administrative panel data that covers the universe of French corporations from tax files to provide detailed balance sheet and income statement information over the period 2008–2016. Our identification relies on ex-ante differences in firm legal forms, which distinguishes between treated and control firms, but does not require that firms choose a legal form randomly, nor does it require common support in the *level* of covariates across different forms. To ensure our estimates are well-identified, we use two methods. First, we verify the "parallel trend" assumption for the key outcomes, such as dividends, cash or investment, in the years leading to the reform. Second, in our preferred

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[1]Francois Rebsamen, French senator and one of the most prominent figures of the "Parti Socialiste" (the left–wing party in power), 2012)

[2]We discuss in detail the theoretical literature below.

specification, we compare firms in the same industry, located in the same city and in the same quintile of pre-reform capital growth, so that we account for unobserved differences across firms due to these covariates.

Our first set of results show that the tax hike was a large and salient shock for the affected firms. we find that firms affected by the reform adjusted their behavior along three dimensions. First, firms existing pre-reform swiftly reduced their dividends in the year of the reform and have kept them constantly lower afterwards. This reduction in dividends happens both at the intensive and extensive margins and represents a total drop of 17% relative to the pre-reform sample mean, implying an elasticity of dividend to tax rate of between 0.5 and 0.6.[3] Second, the reform introduced a steep discontinuity in the tax-code, as the new tax rate of 46% only applies to dividends above an amount equal to 10% of the firm share capital.[4] Following the reform, a large and increasing bunching in dividend distributions appears at this threshold for affected firms. Third, while firms existing before the reform did not change their legal status, new entrepreneurs display important behavioral changes consistent with regulatory arbitrage and increasingly opt for the legal status not subject to the tax increase. These different reactions validate our design and confirm that entrepreneurs were highly aware of the reform and responded to it.

We next estimate the real effects of this tax increase on investment, employment and firm performance, the key outcomes proponents of an increase in dividend taxation hope to influence. We find that on average, the tax increase has a precisely estimated, positive, effect on investment and a precisely zero (small positive) effect on employment. Following the tax hike, affected entrepreneurs increase their investment by about 10%, implying an elasticity of investment with respect to the dividend tax rate of around 0.3. This increase is robust to alternative specifications, investment measures (total or tangible, gross or net of depreciation) and subsamples. This increase in investment translates into higher sales and value-added, without affecting firm productivity while reducing risk of exit. These results imply that *on average*, the dividend tax rate is not an important determinant of

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[3]Interestingly, this is almost the same elasticity estimated for the 2003 Bush tax cut estimated by Chetty and Saez (2005) and Yagan (2015).

[4]Note that the book value of the firm share capital is not the same as the broader concept of firm "equity," which also includes retained earnings and reserve. Share capital refers to the funds that a company raises in exchange for issuing an ownership interest in the company in the form of shares, which can take the form of either common stock or preferred stock. It is therefore harder to adjust.

the cost of capital.

The rest of paper is organized along three questions: (i) if the dividend tax rate does not affect the cost of capital of existing firms but simply the amount of their earnings retention, why do affected firms not channel *all* the tax-induced increase in liquidity retention to investment? (ii) does this average result mask important heterogeneity across firms, with equity-dependent firms becoming more financially constrained (iii) where do the additional undistributed dividends that are not reinvested go? And in particular do French entrepreneurs engage in more income shifting to extract money out of their firms?

While the tax hike led to a sizable increase in firm investment, we find that only part of the tax-induced undistributed dividends is use to invest more. We estimate that for every euro of dividend not distributed because of the tax hike, treated firms increase their investment by 0.2 euro.[5] We then explore two explanations for this incomplete pass-through: investment indivisibility and lack of investment opportunity.

First, while large relative to the pre-reform mean, the drop in dividends may be small in euro terms relative to the amount of money needed to invest, preventing treated entrepreneurs to pay the large sums of money required to make new investment if investment is indivisible and lumpy (e.g. Cooper and Haltiwanger, 2006). Using heterogeneity in the intensity of tax-induced drop in undistributed dividends, we rule out this explanation.

Second, increase in earnings retention should positively affect investment *only if* firms have new investment opportunities. By sorting firms based on post-reform growth in their relevant market, we indeed find that affected firms increase their investment far more when they face large investment opportunities, while by contrast, the dividend tax hike has no effect on firms facing sluggish perspectives.

Turning to possible heterogeneity across firms, we analyze the old view of dividend taxation, arguing that higher dividend tax rate increases the cost of capital (e.g. Poterba and Summers, 1983). Since old view firms are likely to be young and fast-growing and these two categories represent a small fraction of the total population of firms, the positive average effect of higher dividend taxation on investment can mask heightened financing constraints for the minority of equity-dependent firms. We compute multiple proxies for the degree of equity dependence, but fail to find any differential effect among the different groups. This suggests that even among those firms most likely to face an increase in their

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[5]While below one, this is still in the upper bound of what the literature on cash-flow shock to investment sensitivity has found, with an elasticity typically around 0.1.

cost of capital after the dividend tax hike, the reform has no negative impact on their investment. Moreover, we also explore differences across various standard proxies of credit-constraints and again do not find different results.

Having shown that affected firms reinvested roughly one-fifth of their unpaid dividends, we then examine how the remaining four-fiths are allocated. We leverage the detail balance sheet and income statement to formally test two margins of adjustment: more income shifting to extract money out the firm or an adjustment of the balance sheet.

Affected entrepreneurs own the majority of their firm, they have higher leeway to take money out of the firm and engage in "income shifting" (e.g. Gordon and Slemrod, 1998). We rule out an increase in tax avoidance behaviors by showing that following the reform, affected entrepreneurs are not more likely to transfer some of their personal consumption to their company, measured using intermediary good consumption or intermediary service consumption.

Next we consider balance sheet adjustment. Treated entrepreneurs increase their gross working capital to a factor almost equal to the remaining tax-induced undistributed dividends. The increase in gross working capital can then be essentially split across cash holding and customer credits. Higher credit extension to treated firms' customers could partially explain faster sale growth for affected firms. Current liabilities by contrast remain unchanged and in particular, affected firms do not use the higher retention to repay their suppliers faster.

Our paper is related to three prominent theoretical views on the effects of dividend taxation: the old view, the new view and the intertemporal arbitrage view. Our set of results clearly reject both the "old view" and "new view" of dividend taxation. The timing of dividend adjustments together with the positive increase in investment is inconsistent with the old view predictions. The new view is also clearly rejected as it predicts no change in investment and dividend payout policy. However, it is possible that firms engage in intertemporal tax arbitrage as in Korinek and Stiglitz (2009). We we do find that consistent with their model, treated firms invest relatively more when they have higher investment opportunities, particularly so when before the reform they distributed a lot of dividends.

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Related Literature. Our work relates to three strands of the literature. First, we contribute to the empirical literature on capital gain taxation. Despite a large theoretical literature on this topic, empirical analyses have been lagging behind, due to the challenge of finding plausible control groups, as most reforms of capital gain affect all firms in the economy. The most studied reform is the U.S. 2003 Dividend Tax Cut of the Bush Administration. It has been shown to have a positive effect on payout policy for listed firms on average (Chetty and Saez, 2005, Brown, Liang, and Weisbenner, 2007, Chetty and Saez, 2010, Blouin, Raedy, and Shackelford, 2011), to lead to lower debt financing (Lin and Flannery, 2013) and to raise stock prices (Auerbach and Hassett, 2007). The effect on firm investment is more nuanced. While Desai and Goolsbee (2004) and Yagan (2015) find no effect on physical investment of private firms, Ma (2018) finds a positive effect for innovation of listed firms with high managerial ownership. Using a calibrated model of firms with idiosyncratic productivity shocks, Gourio and Miao (2010) find that the tax cut increased aggregate investment and welfare, although the effect was mitigated by the increase in wages produced by firm investment and increased labor demand. In an international setting, dividend tax cut have been found to have weakly positive effect on investment (Becker, Jacob, and Jacob, 2013, Alstadsæter, Jacob, and Michaely, 2017, Moon, 2018) and a positive effect on payouts (Jacob and Michaely, 2017).

Second, we relate to the literature on capital gain taxation, in particular Sinn (1991) for the neoclassical model of dividend taxation, embedding the "old" and "new" view, Chetty and Saez (2010) for the agency view and Korinek and Stiglitz (2009) for the "intertemporal arbitrage" view. While we can confidently reject the neoclassical model, disentangling between the agency and intertemporal arbitrage views is more challenging. In particular, it stresses the importance of anticipations about the permanent vs temporary nature of policy reforms, something rarely observed by the econometrician (e.g. Chemla and Hennessy, 2017).

Finally, we relate more broadly to the literature studying the effect of corporate taxes on firm policies that has found substantial real effects. Several aspects have been studied: investment (Zwick and Mahon, 2017), financial policies (Heider and Ljungqvist, 2015, Ohrn, 2018), wages and profit (Suárez Serrato and Zidar, 2016, spatial misallocation (Fajgelbaum et al., 2019) as well as innovation (Moretti and Wilson, 2017, Hombert and Matray, 2018, Akcigit et al., 2018).

2 Institutional background and the 2013 reform

2.1 Background information

This section explains the differences in legal statuses that determines the split between control and treated firms after the reform.

Firm legal status. French corporations are mainly divided into three legal statuses: "*Société à Responsabilié Limitée*" (SARL), "*Société Anonyme Simplifiée*" (SAS) and "*Société Anonyme*" (SA).[6] In 2012, 77% of new firms were incorporated as SARL, 20% as SAS and 3% as SA.[7]

SARL and SAS are similar along the following dimensions: they have no minimum number of shareholders, face no restrictions on the amount of nominal equity they issue when created and guarantee limited liability for their partners up to the amount of the partner's contributions.

There are two main differences between SARL and SAS.[8] First, SAS offers more flexibility in the design of the company by-laws and easier access to external capital markets. Second, SAS managing directors are required by law to be employees of the firm, while SARL managing directors do not face this requirement. This has two implications: (i) SARL managing directors have a different social security scheme when they are compensated through wages.[9] (ii), SARL managing directors can be paid solely via capital income (dividends) without any labor income (wages), which will be of primary importance for the reform we consider.

Comparison with U.S. firms. All firms in our sample pay an entity-level tax and as such are similar to U.S. "C-corps". There is an equivalent of "S-corps" in France but, unlike in the U.S., this status is highly restrictive. Firms can only classify as pass-through entities during the first five years of a firm's existence, and they are required to have fewer than 50 employees and sales below 10 million. Therefore, unlike in the U.S.,

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[6]We omit discussion of two additional corporate forms: EURL and SASU. These corporate forms are simply a SARL or SAS with only one shareholder.

[7]The SA status is the mandatory status for listed firms and very rarely applies to private firms. To increase comparability between treated and control we remove these firms from the analysis even though including them leaves the results virtually unchanged.

[8]We detail the finer details in Appendix A.1

[9]We provide more detail in the Appendix. Broadly, the difference is that social security contributions are lower (around xx% vs xx%

pass–through entities are only found among the youngest and smallest firms and mostly limited to self–employed individuals. Such firms are excluded from our sample as they report only limited items in their balance sheet and because we focus on firms with at least two employees.

To ease exposition, in the rest of the text we refer to SARL as "treated firms" and to SAS as "control firms." The main take away is that control firms are very similar to treated firms, albeit bigger due to easier access to capital markets. Both pay corporate taxes and as such are equivalent to the U.S. C-corps legal status.

Taxation around liquidation. Shareholders can decide to liquidate their firms and share the remaining assets once all the obligations have been paid. Before any distribution, they have to pay a special tax (*"droit de partage"*) of 2.5% of the net value of assets. The distribution of the remaining money is then taxable at the appropriate dividend tax rate.[10]

2.2 Taxing dividends in France and the 2013 reform

In this subsection, we detail the French tax system (dividend and payroll taxation on labor and capital income) and explain why the dividend tax rate jumped from 15.5% to 46% for SARL (treated firms) in 2013.

French dividend taxation. After paying corporate taxes, firms are left with a net income that can be either held in cash and equivalents (short-term investment) or distributed to shareholders in the form of dividends. The allocation of the net income is decided on a yearly basis by the firm's assembly of shareholders during their Annual Ordinary General Meeting.

Dividend taxation in France consists of two components. The first component is a payroll tax with a rate around 15% that applies to the gross dividend amount decided during the General Meeting and withheld at source.[11] The second component is a standard progressive personal income tax, that applies to the "net" dividend after payroll

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[10]This means in particular that following the change in dividend tax rate for treated firms, the new tax rate will apply, implying that shareholders of treated firms cannot reduce their taxes by liquidating their firm.

[11]It may seem strange for dividends to be subject to a payroll tax. It should be noted however that the payroll tax paid by shareholders is of different nature than the payroll tax on wages, as it does not open rights to future benefits. In this sense, it is more a "pure" tax rather than a "contribution."

taxes. In 2012, the year before the reform, the payroll tax rate was 15.5% for all types of legal entities, treated and control.

Taxes on labor income have the same structure. The gross amount is subject to payroll taxes withheld at source and the net wage is then subject to a personal income tax. The noticeable difference between labor and capital income is that the payroll tax rate on labor income is much higher, around 46%. Since owner-managers of treated (SARL) firms do not have to be an employee of their own firm, this large distortion between labor and capital income taxation creates an incentive for owner-managers to receive their compensation in the form of dividends rather than wages.

Owner-managers may still prefer to receive wage compensation for two reasons. First, they may prefer to receive wage compensation because it allows their family to access social insurance benefits. Indeed, the payroll tax on dividends is a "pure tax" and does not grant any right to social benefits, while the payroll tax on wages is a social security contribution, which the OECD defines as "compulsory payments paid to general government that confer *entitlement* to receive a future social benefit."[12] Second, dividend payments are regulated along two dimensions: (i) dividends can never exceed the net income from previous accounting exercise, net of all past losses (if any) and amortization of various expenses, and (ii) dividends have to be split among shareholders in proportion to their equity holding, implying that large dividend payments to the owner-manager will trigger large dividend payments to the other shareholders.

Finally, regarding share buybacks, until 2015 they are typically taxed as dividends rather than capital gains (unless they can be explained by past losses that are forcing the firm to shrink), such that the dividend tax rate applies to the overall payout (share repurchases + dividends).

The reform. In 2012, Francois Hollande and the left party reduced the distortion between capital and labor income for entrepreneurs by abolishing the arbitrary distinction between dividends and wages for owner-managers of SARLs.[13] Following the reform, all dividends paid to SARL owner-managers were considered wages, and as such, became

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[12]For instance, most French websites for entrepreneurs discussing this arbitrage advocate a mix for the entrepreneur's compensation.

[13]*Loi de Finance pour le Financement de la Sécurité Sociale 2013.* The distinction was considered arbitrary since the entrepreneur can decide to have the compensation of her risk, capital invested and labor effort either labelled as "dividends" or "wages," given that she is the majority owner.

subject to the same 46% wage payroll tax rate. This change tripled the tax rate SARL owner-managers paid on dividends.

This new tax rate only applies to dividends accounting for more than 10% of the firm nominal share capital owned by the manager and her family.[14] Below this threshold, the payroll tax rate remains at 15.5%. To give a simplified example, consider an owner-manager of a treated firm with a share capital worth €100,000 who owns 100% of her company. In 2013, she receives a dividend of €50,000. She will have to pay payroll taxes:

$$15.5\% \times \underbrace{10,000}_{\text{10\% of €100,000 share capital}} + \underbrace{46\%}_{\text{post reform dividend tax rate}} \times 40,000 = 19,950$$

Her net dividend is then 50,000-19,950= €30,050, on which she has to pay a personal income tax. Before the reform, the payroll tax would have been: $15.5\% \times 50,000 = €7,500$ instead of €19,950.[15]

While this can create an incentive for owner-manager to increase the amount of nominal capital in the company, it is important to note that the value of share capital determines the shareholders' financial liability in case of a default of the firm. As such, if shareholders want to benefit from limited liability protections, they have an incentive to keep the value of the share capital to its minimum.

Control firms (SAS) were left out of the reform, mostly because their managing directors have to be employees and as such pay the standard payroll tax on their labor income. Their payroll tax on dividends remained at 15.5%, providing us with a natural control group that could have been subject to the reform, but never was.[16] Control firms (SAS) were left out of the reform, mostly because their managing directors have to be employees and as such pay the standard payroll tax on their labor income. Their payroll tax on dividends remained at 15.5%, providing us with a natural control group that could

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[14]The inclusion of the shares owned by the family to determine whether the CEO owns a majority of the firm's shares prevents owner-managers from simply transferring the shares to their partner and as such escaping the reform.

[15]Dividends paid to the other minority shareholders remains taxed at 15.5%. While creating a difference in the effective tax rate of dividends among shareholders, note that it is illegal to pay different amount of dividends to different shareholders. Therefore, it seems reasonable to assume that the tax rate of the majority shareholder is the most important in setting the level of dividend policies.

[16]While in theory managing directors of control firms could pay themselves mostly in dividends and with the lowest wage possible, in practise we observe in the data that wages are two and half time larger than dividends (assuming *all* dividends are paid to the managing director). Such higher wage relative to dividends could partially be explained by the fact that the minimum wage for skilled workers in France is regulated by the the collective agreement of their industry and go as far as €65,000 yearly.

have been subject to the reform, but never was.[17]

How the reform affected the choice of an entrepreneur to be incorporated as SAS (control) or SARL (treated) and the optimal mix between dividends and wages for her compensation is complicated. We provide some detailed case studies in the Appendix. The main point to stress is that the optimal decision depend on the specificities of the entrepreneur (family, numbers and age of kids, total compensation, etc.) and it is not obvious that "on average", one solution dominates.

The data suggests that to a first order there is: (i) no change in legal status for existing firms and (ii) no increase in wages relative to dividends.

Reactions to the reform. The decision to raise the payroll tax rate of dividends paid to the owner-manager of treated firms was part of a broader agenda to harmonize the taxation of capital and labor, pushed by the newly-elected President. Control firms managed to stay out of the reform, thanks to more effective lobbying coming from a better representation among employers' unions and the fact that their managers are legally obliged to be employees and not independent workers. We give a detailed discussion of the reform and the reasons why control firms were left out of it in Appendix A.

3 Data and empirical strategy

3.1 Firm data

Financial statements and firm legal statuses. We retrieve firm accounting information from tax files (FICUS for the period pre-2008 and FARE for 2008-onwards). The data contains income statements and balance sheets collected by the Treasury for the entire universe of French firms, for firms subject to the regular corporate tax regime (*Bénéfice Réel Normal*), the simplified corporate tax regime (*Régime Simplifié d'Imposition*) also called "non commercial" firms such as accounting firms or law firms (*Bénefice Non Commercial*). Firms with annual sales below €32,600 (€81,500 in retail and wholesale trade)

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can opt out and choose a special micro-business tax regime (*Micro-Entreprise*), in which case they do not appear in the tax files.

The data contains the legal form of the company, which allows us to identify the following legal statuses for commercial firms: SARL, SAS. We classify these firms into two groups: treated (SARL) and control (SAS).

Ownership structure. We identify firms belonging to a business group using a yearly survey of business groups by INSEE called "Enquête Liaisons Financieres (LIFI)." It covers all economic activities. Since 1998, the survey has been cross-checked with information from Bureau Van Dijk. LIFI provides information about both direct and indirect stakes and cross–ownerships, which makes it possible to reconstruct the group structure even in the presence of pyramids (Boutin et al., 2013, Hombert and Matray, 2019). We remove subsidiaries from our sample as they may exhibit significantly different behavior from stand alone firms, particularly regarding their payout policies.[18]

Firm creation and age. We use business creation files from the dataset "SIRENE," which contains the list of all business creation with the date of registration to construct firm age.

3.2 Empirical strategy

Analysis sample. We focus on firms present during the period 2008–2016 and impose that we observe them in 2012 (the year of the reform). Because we are interested in the real effects of the tax reform on investment, we exclude from the analysis financial firms (naf code 6000–6999) and utilities (naf code 3500–3999). We also drop observations reporting zero or negative assets, total sales, property, plant and equipment and wage-bill. All firms in our sample have at least one employee and are not operated by self-employed owners.

Unconditionally, control firms tend to be larger than treated firms, we increase the common support by removing all firms with assets below the fifth percentile and above the ninety fifth percentile of the SARL asset distribution in 2012. Finally, we only retain firms for which we observe at least four years in the data and with no gap in their filing

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[18]Including them does not change the results.

year.[19] This leaves us with a total of 26,843 distinct firms in the control group (205,027 observations) and 143,993 distinct firms in the treated group (1,196,868 observations).

Table 1 reports the descriptive statistics for our sample of treated and control firms before and after the reform. We scale most variables by total capital in 2011 defined as the sum of tangible and intangible capital. Before the reform, treated firms are slightly smaller and employ fewer workers than control firms, but are more profitable. Treated and control firms have similar investment rate, capital structures (cash-holding and leverage), pay dividends with similar probabilities (37% vs 40%) pay out similar proportions of their capital as dividends. (23% vs 25%).

Econometric specification. In order to test the effect of a change in dividend tax rate on firm outcomes, we estimate a series of differences-in-differences specifications of the form:

$$Y_{i,j,c,t} = \beta \, Treated_i \times \, Post_t + X_{i,t} + \theta_i + \, \delta_{j,t} + \, \gamma_{c,t} + \, \varepsilon_{i,j,c,t} \tag{1}$$

where $Y_{i,j,c,t}$ are various firm outcomes for firm i in industry j, located in area c at year t normalized in most cases by total capital in 2011 (to prevent changes in the denominator from driving our regression coefficients). θ_i are firm fixed effects and ensure that we remove time-invariant heterogeneity across firms. $\delta_{j,t}$ are industry×year fixed effects and control for time-*varying* unobserved heterogeneity across industries, such as differences in industry-level business cycles that may be correlated with the firm outcomes. In particular, the use of industry×year fixed effects forces the parameter of interest β to be identified solely by comparing firms within the *same* industry.[20] In robustness tests, we also include $\gamma_{c,t}$ that are commuting zone×year fixed effects to remove time-varying heterogeneity across local labor markets.[21] $X_{i,t}$ can be either a collection of time-varying firm-level controls, or ex-ante firm characteristics that we interact with year. Given that the reform may have a direct impact on the firm asset, using time-varying controls would bias the coefficient and in our preferred specification, we only use ex-ante characteristics.[22]

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[19]Results are virtually unchanged without these different restrictions.

[20]We use the 2 digit Naf rev2 code which includes 66 distinct industries.

[21]The definition of "commuting zone" is the French "Bassin d'Emploi" 1990 definition, which corresponds to local labor markets and partitions France into 357 geographic areas in France Metropolitan, plus two sub-regions for Corsica.

[22]This is commonly referred to as the problem of "bad controls" (cf Angrist and Pischke, 2008. This

In the most conservative specification we include industry×year, and commuting zone×year and as the main ex-ante firm characteristics the pre-reform capital growth quintile×year. Pre-reform capital growth is computed by taking the growth annualized growth rate of capital between the first appearance of the firm in the dataset since 2008 and 2012. The coefficient of interest β in this case is estimated by comparing firms operating in the same industry, located in the same city and having experienced the same size growth prior to the reform, and it measures the relative change in firm outcomes for firms facing a dividend tax rate increase relative to firms not facing this tax increase. Standard errors are clustered at the firm level to account for possible autocorrelation in the error term.

4 Effect on payout and regulatory arbitrage

4.1 Regulatory arbitrage

While the reform did not lead to important change in organizational form for existing firms, it did have a very large impact on the legal status chosen by new entrepreneurs. Figure 1 shows the evolution of the fraction of firms registered as treated (SARL) for new firms and firms existing before 2012. While the fraction of SARL stays essentially flat for firms existing before 2013, new entrepreneurs display important behavioral changes consistent with regulatory arbitrage. Over 80% of new firms were created as SARL prior to 2013, this number declines to 40% by 2018, with a sharp drop in 2014–2015. The important lack of behavioral response from existing entrepreneurs may be surprising, but is in line with results from Gordon and MacKie-Mason (1994), Mackie-Mason and Gordon (1997), Goolsbee (2004) or Giroud and Rauh (2018) that find for the U.S. that there is little shifting of organizational form between C and S-corps in responses to differential tax rates.

The lack of changes in organizational form for existing firms combined with the large reaction for new firms suggest important adjustment costs in France. The monetary cost, while non-trivial, does not appear prohibitive (in the order of €5.000 to €10.000, representing around 10% to 25% of the firm net income). In addition, the law prohibits a

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is why our preferred specification uses quintile of capital growth in the pre-period and age before the shock, both interacted with year.

legal status change if the change is "purely motivated by the motive to escape or reduce social security contributions" (article L243-7-2).[23]

4.2 Effect on payouts

Baseline effect on dividends. Figure 2 displays the yearly evolution of the raw data when we look at the probability of paying dividends (top figure) or when we scale total dividends by total capital (bottom figure). In both cases, a clear pattern emerges. Despite differences in *level*, it can be seen that the *evolution* of the two groups is largely parallel before the reform. Between 2008 and 2012, the evolution of paid dividends is similar between treated and control firms, validating the "parallel trends" assumption. After 2013, firms affected by the tax reform sharply reduce the probability of paying dividends (from 35% to 25%) and the amount of dividends paid as a percentage of their 2011 total capital (from 26% to 18%). While the effect is already clear in the aggregate data, we formally test the effect of the tax reform and evaluate its robustness in Table 2.

Table 2 Panel A reports the effect of the dividend tax reform on dividends when we only include firm and industry×year fixed effects. In all cases, we find a negative effect, highly statistically significant with p-values well below 0.001. In column 1, we find that treated firms reduce their dividends by €0.042 for every euro of capital, implying a 17% drop relative to the pre-reform mean.

This estimation mixes both the intensive margin (firms are paying less in dividends) and the extensive margin (firms stop paying dividends). We decompose the two effects in columns 2 and 3. In column 2, we use dividends in (log) euros, which is thus defined only when dividends are positive and can be directly interpreted as semi-elasticities. We find a drop of 13%. In column 3, we estimate a linear regression on the probability of paying any dividend and find a drop of 3.9 percentage points, representing a 13% decrease relative to the pre-treatment mean. The drop at the extensive margin does not imply that managers don't optimize. When we replace the dependent variable with a dummy equal to one if the total amount of dividends paid is above the 10% share capital threshold, we find in this case that the tax increase leads to a drop by 5.5 percentage point (column

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[23]It is in practice hard to assess to what extend this regulation is truly binding. Indeed, this regulation is almost never mentioned in professional medias as a barrier and it seems possible to always justify the change for a "economic motive" such as the plan to attract future investors, and not purely for a "fiscal motive."

5), a magnitude 40% larger.

Table 2 Panel B shows that the negative effect of dividend taxation is robust to an array of different fixed effects that removes pre–2013 time–varying unobserved heterogeneity. Column 1 shows the result with only firm and year fixed effects, column 2 adds (2–digit) industry×year fixed effects, column 3 adds commuting zone×year fixed effects, column 4 includes quintile of pre–treatment capital growth×year fixed effects and column 5 includes all three types of fixed effects (capital growth, local labor market and industry) jointly. In this final specification, the effect of the tax increase is estimated by comparing firms in the same industry, located in the same local labor market, that are in the same quintile of annualized capital growth over 2008–2012.

In column 5, we also add time–varying firm controls (profit margin, log of lagged sales and lagged sale growth, age and age-square). In all cases, the effect is highly significant and the magnitude is barely affected, ranging between -0.042 with firm and industry-by-year fixed effects (column 2) to -0.045 with all types of fixed effects (column 5), providing comfort that the tax increase is orthogonal to other variables that might explain dividend payment. In our preferred specification with the different set of fixed effects but without time–varying firm controls (column 5), the dividend tax increase leads to a decrease in dividend payment of -€0.045 for each euro of capital.

We also provide visual evidence of the decline by plotting the yearly coefficients of the regression with our preferred specification in Figure 3. The figure confirms what we showed in the aggregate. Prior to the reform, treated and controls behave similarly, confirming that the "parallel trend" assumption needed for differences-in-differences estimators is satisfied. Dividends then drop brutally the year after the reform and remain lower afterwards.

Kink optimization. Figure 4 provides visual evidence that the reform created strong incentives for treated firms to restrict their dividends at the 10% threshold of the firm share capital, consistent with the notion that entrepreneurs became progressively aware of the reform and optimized over time. The figure plots the distribution of dividends scaled by share capital for the sample of firms paying dividends. This distribution is similar among treated and control firms and the ratio is evenly distributed across the different values until 2012. After 2012, we observe a bunching right below the 10% threshold for

the firms affected by the tax reform, while the distribution of firms not affected remains stable. Consistent with the idea that agents do not immediately understand the subtleties of the new tax regime (e.g. Aghion et al., 2017), the fraction of affected entrepreneurs who bunch at the threshold increases slowly over time and peaks after three years.[24]

4.3 Elasticity Discussion

Estimation of the value of the post-reform tax rate. The elasticities of different outcome variables with respect to one-minus-the-tax-rate, we can apply the standard elasticity formula:

$$elasticity^{Y_i}_{\tau_{div}} = \Delta \ Y_i \Big/ \Big[(\tau^{new}_{div} - \tau^{old}_{div})/(1 - \tau^{old}_{div}) \Big]$$

While we know that the old tax rate τ^{old}_{div} equals 0.155 and we can estimate $\Delta \ Y_i$ from reduced form regressions, a challenge arises when defining the value of the new tax rate. Indeed, as discussed in Section 2.2, after the reform, dividends are treated as "wages", which changes the very nature of the payroll tax. Before the reform, the payroll tax was a "pure tax," but after the reform the payroll tax became a social security contribution.

This new link between taxes and social benefits introduces a gap between the nominal tax rate of 46% on the taxed income and the effective tax rate, that should be adjusted for the value of the benefits attached to the social security contribution (SCC). Intuitively, if the government increases the tax rate on entrepreneurs by one euro but return this euro back later as pensions for instance, the taxes have almost not increased. We detail the literature associated to how wage earners incorporate expected social benefits in their labor supply decision in Appendix A.3.

According to Bozio, Breda, and Grenet (2018), a large fraction of the SSC (if not the majority) is actually not a true "contribution," in the sense that the amount of benefit received does not equate one-for-one the amount of money paid.[25] Other contributions have a much stronger linkage with future benefits (e.g., main pension scheme , unemployment insurance, complementary pension schemes). Based on the work done by the Institut des Politiques Publiques (IPP), the value of retirement contribution for treated

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[24]Treated entrepreneurs may have an incentive to also increase the value of their firm share capital, but we find essentially no change in the data post reform.

[25]This is the case for instance for health care, child care benefits, etc.

entrepreneurs is around 20% of the taxed income.[26] This gives us a lower bound for the effective increase in the dividend tax rate. If entrepreneurs fully value the benefits associated with retirement contribution, their payroll tax rate following the 2013 reform would see an increase from 15.5% to 26% (=46% − 20%). If they fully discount the benefits, their effective tax rate should increase to 46%. If they value it retirement benefits at half their true value, as in Finkelstein, Hendren, and Luttmer (2019), their effective tax rate would increase to 36%. Therefore, even in the case of a perfect valuation of their future benefits, the new tax rate of treated firms reduces their total return to dividends (the net-of-tax dividends plus the benefits associated with the contribution) by 26%, a 10 percentage point increase relative to prior to the reform.

Elasticity of dividends. Note that while the complication associated with estimating the effective new tax rate can change the magnitude of the elasticity to some extent, it does not bias our reduced form estimates in any way, which is why we always report reduced form estimates.

If we assume that treated entrepreneurs do not value the benefits associated with their social security contribution (SCC), the effective new tax rate is 46%, implying an elasticity of dividend reaction to one-minus-the-tax-rate of 0.47,[27] which is strikingly the same elasticity estimated for the U.S. following the 2003 dividend tax-cut by Chetty and Saez (2005) and Yagan (2015). Treated entrepreneurs would not value the benefits promised by the government if, for instance, they think the government will default on the pension it promised in the future.

On the other hand, if we assume that entrepreneurs affected by the tax hike fully value the benefits associated to their SCC, the elasticity is 1.5. This implies that in economic terms that for every 1% increase in the dividend tax rate, entrepreneurs cut their dividends by 1.5%, which is a much higher magnitude than those estimated so far. Therefore, in the rest of the paper, we report elasticities assuming that the new effective tax rate is 46%, which may be a lower bound for the estimated elasticities.

The results in Table 10 and Figure 1 and 4 essentially confirms that the increase in dividend tax rate was both salient and sufficiently large to trigger changes in entrepreneurs'

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[26]We are deeply indebted to Antoine Bozio for his detail explanation of the arcania of the French contribution system and for producing all the statistics via the IPP.

[27]$(0.17)/(\tau_{div}^{new}\text{-}0.155/0.845) = 0.47$

behaviors to optimize over the new tax rate. While it is relatively well known that firms react strongly to dividend tax reform, to the point that it is not uncommon to observe dividend tax decreases which almost "pay for themselves" and dividend tax increases yielding virtually no additional revenue (e.g. Poterba, Hall, and Hubbard, 1987). However, so far it has remained unclear which of those responses in firm behavior corresponds to *real* economic responses and carry real implications for public finances and economic activity and which do not (e.g. Saez, Slemrod, and Giertz, 2012).

5 Real effects: investment and firm performance

There are two opposite channels through which the increase in dividend tax rate can affect investment and employment. First, as we found in Section 2, higher dividend taxes make dividend payment today less desirable and leave affected firms with higher earnings retention, which they can use to finance larger investment, or pay more their employees.[28]

Second, higher dividend taxes can increase the user cost of capital, which will negatively affect investment for firms that finance their marginal investment with new equity and use the return to investment to pay dividends (the "old view" of dividend taxation). This is particularly likely the case for young firms and cash-constrained firms with limited access to bank credit (e.g. Sinn, 1991).

5.1 Average effect on investment and employment

Total capital is defined as tangible and intangible capital. Tangible capital includes the book value of all property, plant and equipment at the end of tax year and intangible capital includes capitalized R&D spending, software, patent licences, goodwill, copyrights and franchises. Investment is defined as the change in the stock of capital (total or just tangible). For both variables, we compute the gross and net change, with net defined as book value minus depreciation and scale everything firm's total capital (tangible plus intangible) in 2011.

Figure 5 plots the yearly coefficient, and the 95% confidence intervals of the differences-in-differences estimation of the tax's impact on investment when we include the different

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[28]This is usually the argument made by politicians to justify why a tax rate increase can promote investment and the underlying justification of French politicians for the tax hike in 2013, as well as the argument behind the Sanders–Schumer proposal in 2019.

fixed effects. We scale the graph at 0.1 times the standard deviation of the dependent variable to ease economic interpretation. While point estimates are indistinguishable from zero before the reform, investment of treated firms start to increase relative to control firms two years after the tax hike, which could either be due to the fact that treated firms needed time to accumulate larger cash balance before investing or because they were initially anticipating a reversal of the policy that did not come.

Table 3 shows that our results are robust across different specifications and for the different measures of investment. Panel A shows the result when we use gross investment and Panel B the results for net investment. In all cases, we find a positive, precisely estimated effect of the dividend tax increase on investment. The dividend tax hike leads firms to increase their total investment by €0.0074 (column 2) to €0.0079 (column 1) for every euro of capital, which represents an increase around 10% relative to the pre–reform sample mean of €0.078 per euro of capital. We find a similar result for tangible investment, which increases at most by €0.0042 (column 2) for every euro of capital, a 7% increase relative to its pre–reform sample mean of €0.058 per euro of capital.

In Panel B, we report the estimate after accounting for book depreciation and again find similar, albeit bigger, point estimates across all different specifications, both for tangible and total investment.

Assuming a new dividend tax rate of 46% and focusing on total investment, the dividend tax increase had an effect of +€0.0079 per euro of capital, with a standard error of €0.0013, relative to the pre–reform mean of €0.078 and standard deviation of 0.31. These estimates imply an elasticity of total investment relative to one-minus-the-tax rate of 29%, with a 95% confidence interval of 20% to 38%.[29]

While we find economically meaningful effects on investment, we estimate a precise null (very slightly positive) effect on employment that we report in Appendix Table A1. We report the results when we look at employment in full-time equivalent terms, average wage and the labor share, defined as the sum of wages and salaries, payments for employee benefit programs (e.g. health insurance), and contributions to pension, divided by the firm value added. We take employment and average compensation in logs, so that the point estimate can be directly interpreted as a semi–elasticity. Regressions are estimated with our preferred baseline set of fixed effects: industry×year and pre–reform capital

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[29]The elasticity is estimated as follows: $(0.0079/0.078)/(0.3/0.845)$. The confidence interval is obtained by replacing 0.0079 by 0.0011 +/- 1.9 times the standard error of 0.0013.

growth quintile×year fixed effects. In odd columns, we also include commuting zone×year fixed effects given that heterogeneity across local labor markets are important to explain employment. We find that employment increases by 1.1% (column 1) to 1.2% (column 2) when we control for differences across local labor market. Average compensation did not change, while the labor share slightly increases relative to the pre-reform mean by 2.6%.

5.2 Discussion of the magnitude

In terms of economic magnitude, the elasticity of investment with respect to the change in taxes is meaningful. We estimate that a 1% change in the tax rate cause treated entrepreneurs to increase their investment by 0.3%. We also rule out a zero elasticity at the 95% confidence interval, as oppose to the confidently estimated null elasticity of investment obtained in Yagan (2015).

A usual way to interpret the economic magnitude of this tax-induced change in investment rate is to compare it with the drop in corporate earnings triggered by the tax hike. On average, firms reduced their payout by €0.045 euro, while increasing their investment by roughly €0.008, implying a pass-through of this "cash-flow shock" of around 0.2 (0.18 to be precise). This means that around four-fifths of the tax-induced undistributed earnings is not used to increase investment. We investigate in detail why "only" one-fifth is used to increase investment in Section 6.2 and we trace out the remaining four-fifths in Section 7.

The existing literature estimating the pass through of cash flow shocks to investment provides some context for our estimate. Previous estimates exploit different variations and estimate pass-through on a different sets of firms, but subject to these differences suggest that our estimate is large. Lamont (1997) finds that for every dollar in oil cash flow, non-oil investment rises 12 cents, Gan (2007) and Chaney, Sraer, and Thesmar (2012) find an increase in investment of $0.12 and $0.06 for every $1 increase in firm collateral value respectively,[30] and the literature overall finds an investment–cash flow coefficients of around $0.10. Therefore, despite an imperfect pass-trough, the elasticity of €0.20 appears in the upper tail of the cash-flow shock to investment sensitivity estimated by the literature. This suggests that some firms are potentially liquidity constraints de-

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[30]Gan (2007) and Chaney, Sraer, and Thesmar (2012) are more precisely shocks to debt capacity rather than pure cash-flow shocks. They still provide order of magnitude that can be useful to think about the size of the effect.

spite paying dividends before the reform and decide to use the tax-induced undistributed dividends to raise their investment after the reform. We explore this possibility in greater detail in section 6.

5.3   Effect on firm performance

We investigate how the increase in dividend taxes and investment affect firm performance in Table 4. Following the tax hike, sales (column 1) and value-added (column 2) of treated firms increase by 1.4% and 1.6% respectively. While the profitability (ROA) of these firms go down a little (column 3), the magnitudes is extremely low (-0.3% of the firm asset). In addition, the small drop in ROA could be completely mechanical rather than implying a slow down in economic performance. Indeed, because now the payroll tax on dividends are paid when social security contributions are paid (i.e. when the firm pays wages), this mechanically reduces firm profitability, equal to value added minus net wages and social security contributions. For this reason, looking at sales and value-added growth appear more informative.

   In column (4), we estimate firm productivity as the residual of the regression of value-added on capital and labor (all in logs) and find no effect of the reform, suggesting that the tax-induced higher investment allowed firms to expand their size, without reducing their efficiency. Finally in column (5) we look at the probability the firm disappears from the sample in year t+1 and find that if anything, the higher dividend tax rate reduced the probability of exit. While this last result might be surprising, we show in Section 7.2 that the remaining undistributed dividends not reinvested is essentially stored as cash, implying a drop in firm's risk.

6   Heterogeneity in investment response

In this section we explore differences in investment response along different dimensions. Indeed, the positive average effect we find may mask different, and possibly opposite, reactions: (i) if investment is not divisible enough, treated firms may not cut their dividends paid by enough to make additional investment ; (ii) firms may have more liquidity to invest but lack the investment opportunities to do so ; (iii) equity-dependent firms may face stricter constraints after the tax hike, but account for a fraction of the firm

population too small to show up in the average.

Exploring this heterogeneity provides us with novel estimates of the effect of the tax rate at the microlevel. Furthermore,it allow us to test the different theories of dividend taxation. We find evidence for the intertemporal arbitrage view arguing that larger liquidity retention triggered by the tax hike can lead to substantially larger investment, but *only* when firms have more investment opportunities. By contrast, we fail to find any evidence in favor of the old view of dividend taxation predicting a drop in investment for equity-dependent firms.

6.1 Available liquidity

Assuming that the old view of dividend taxation is rejected (in line with significant positive average effect on investment in Table 3) and that changes in the dividend tax rate do not affect the cost of capital, the imperfect pass-through of the tax-induced higher liquidity retention has two main explanations. First, capital expenditures may simply be not divisible enough for the tax-induced increase in liquidity to produce a strong effect, especially in light of evidence of substantial capital stock adjustment costs (Cooper and Haltiwanger (2006)).[31]

This hypothesis appears somewhat plausible for the average firm. Because dividend payment is very skewed in the data, it is possible to identify sub-groups of firms for which the tax-induced drop in distributed dividends is large in euro terms relative to the amount spent by these firms in investments. In Table 5, we compute the mean dividends over total capital for the period 2008–2012 for each firm and split the sample in five bins. The first bin (the largest one) is made of all the firms with zero average dividend over the pre-reform period. We then split the distribution with positive support into four bins of similar size and re-estimate equation 1 for dividends (first line), total investment (second line) and tangible investment (third line) for each bin separately.

The decomposition reveals that the tax–induced drop in dividend payments can be sizable at the top of the distribution of the pre-reform dividend payment (Panel A). In the fourth quintile (column 4), treated firms reduce their dividends by 7.6% of their capital, an amount almost equivalent to their pre-reform investment rate. In the fifth quintile

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[31]This is for instance the conclusion reached by Yagan (2015) to reconcile the large increase in dividend payment and the absence of investment response following the Bush 2003-dividend tax cut.

(column 5), treated firms reduced their dividends by 18% of their capital, an amount almost three time larger than their pre-reform investment rate, implying that these firms could triple their investment rate had they used these extra retention for investment.

Despite the large drop in paid dividends at the top of the distribution, these firms do not expand their investment more relative to firms for which the tax rate hike barely changed their payout policy. Comparing column 1 and column 5 for total investment (Panel B), we see that firms less affected in their dividend policy after the tax hike (column 1) increase their investment by 0.73% of capital, while firms that most decrease their dividend payments the most (column 5) increase their total investment by 0.85%. We find similar patterns for other types of investment (tangible, net). Given these magnitudes, we can confidently rule out an explanation based on euros undistributed being too small relative to the amount of investment.

6.2 Investment opportunities

The comparison in terms of investment between firms paying dividends before the reform and firms not paying dividends is complicated by the fact that firms paying dividends are potentially at a different moment of their life cycle and have fewer investment opportunities.[32] More broadly, the limited pass-through cash to investment in Section 5.1, could be explained by limited investment opportunities during the period post-reform. Indeed, this corresponds to a moment of slower macroeconomic activity in Europe triggered by the European Debt Crisis that started in 2010. If the tight definition of controls ensure that treated and control firms are similarly affected by these macro shocks, in an environment with no investment opportunities, the only effect possible on investment would come from offsetting depreciation, which by definition is limited in euro value.

To generate investment shock opportunities, we use a classic leave-one-out approach and compute the overall change in investment between the pre and post period reform at the industry and commuting zone level. We then rank firms along tercile of investment opportunities and reestimate equation 1 over each sub-sample. Table 6 reports the results and shows a very linear increase in the sensitivity of investment to the tax shock across the three bins. While a change in dividend tax rate has no effect for firms

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[32]Note that while this argument applies for large listed firms, it is much less obvious for our sample of firms, as dividends are essentially a way for the entrepreneur to pay herself to her wage and not the residual of cash-flows after the firm has exhausted all the NPV positive projects.

with the lowest investment opportunities (column 1), firms with the highest investment opportunities increase their investments three times more after the tax hike than firms in the second tercile of investment opportunities (column 3 relative to column 2). The limited pass-through of €0.2 between the tax-induced increase in liquidity and investment is caused by a limited amount of available investment opportunities. Firms with more investment opportunities are more likely to allocate extra liquidity from treatment to increase investment than firms with fewer investment opportunities.

We have established in Table 5 that firms paying more dividends pre-reform reduce their dividend payments by a larger amount after the tax hike, in particular for the firms in the last two quintiles of the pre-reform dividend distribution (columns 4 and 5 in Table 5). Since these firms have more additional liquidity they can use to invest, we create a dummy variable *High Dividends* that equals one if the firm is in the last two quintile of the pre-reform dividend distribution and zero if it is in the first two and intersact it with the variable *Treated×Post* in equation 1. We then run the following investment regression on each tercile of investment opportunity:

$$Y_{i,j,c,t} = \beta \ Treated_i \times Post \times High \ Dividends_i + X_{i,t}$$

$$+ \theta_i + \delta_{j,t} + \gamma_{c,t} + \ Treated_i \times \lambda_t + \varepsilon_{i,j,c,t}$$

Since we now also have within treated group variation (between ex-ante high and low dividend firms), we can also include a set of fixed effects for treatment×year to account for time-varying unobserved heterogeneity between treatment and control and ensure the parameter of interest β is estimated solely by comparing firms within the treated group. In this case, β gives use the marginal difference between treated firms with high amount of dividends pre-reform relative to treated firms with low amount of dividends pre-reform. There is no difference between these two groups in the first two terciles of investment opportunity (columns 4 and 5) in terms of investment. However, when we focus on the group facing the highest investment opportunities, we a highly significant and economically meaningful difference between the two groups of entrepreneurs exposed to the tax hike. Relative to firms that were paying limited dividends pre-reform, firms paying large dividends increase their investment by an extra 1.5% of their capital (column 6). These results are in line with the predictions in Korinek and Stiglitz (2009), where firms are at the equilibrium credit constraints despite paying dividends and cut then

while the tax rate is high. As a result, the liquidity available increase and can be used to invest when investment opportunities arise in the economy, which happens in a non-deterministic and unpredictable way.

6.3   Reallocation: looking for the old view

Recall that according to the old view of dividend taxation, a higher tax rate on dividends should increases the user cost of capital and investment for equity-dependent firms. Therefore, despite the positive average effect, the tax increase may have important consequences for the reallocation of resources across treated firms (e.g. Gourio and Miao, 2010, Alstadsæter, Jacob, and Michaely, 2017) and may have been binding only for a sub–group of firms. In particular, old view firms, which rely on the equity markets to finance their investment, may co-exist in the economy with firms for which the dividend taxation is not distortionary (growing and mature firms). Since the latter likely dominate the population of firms, the effect of dividend taxation can be positive for the average firm and yet strongly increase credit constraints for equity-dependent firms.

Equity dependence.   In the standard model of investment, higher dividend taxation would lower investment only if the marginal source of funding is equity. In order to identify such firms, we use three different proxies. First, we split firms along bins of age. Indeed, in firm life cycle models (Sinn, 1991), young firms start cash–constrained and finance investment via equity issuance, then become mature and generate enough cash–flows to finance their investment internally.

We therefore estimate equation 1 separately for each decile of age and report the point estimate and 95 percent confidence intervals for each coefficient regression in Figure 6. For each within–decile estimate, the reform has always a precise, positive, small effect and the figure displays no upward or downward trends in point estimates cross–decile.

Second, we compute the fraction of capital that has been financed by equity prior to the reform, by summing up all equity issuance (including the amount of equity at creation) and dividing it by the value of total capital (tangible and intangible) in 2012. This proxy reveals that a large fraction of firms relied substantially on equity to finance their previous investment, with the last tercile of the distribution having a ratio of equity issued over capital equal to 1.15, implying that for every euro of productive capital, the

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firm has issued €1.15. By contrast, the firms in the first tercile of the distribution have a ratio of equity over capital of 0.036, meaning that every euro of capital has been financed with only 2.3 cents of equity.

Columns 1 to 5 in Table 7 report the results when we estimate equation 1 for each bin separately. The effect of the tax increase on investment is positive and with somewhat similar point estimate.

The last proxy we use is the number of times a firm issued equity during the sample period. Because instances of equity issuance are rare, we split the sample in only two categories: firms that never issued equity (column 1) and firms that issued at least once (column 2). We also compute the number of equity issuance over a longer time period (2004–2016), which allows us to split the sample in three categories: no issue (column 3), one issue (column 4) and two or more than two issues (column 5). As with other proxies for equity-dependence, we do not find that any difference across groups, with point estimate of the effect of the reform that are virtually the same.

Of course, we would ideally like to estimate the probability that firms fund their future investment via equity, which we don't observe. If the new tax rate discourages firms from issuing new equity, in particular for old view firms, our estimate of equity issuance using past issues will underestimate the degree to which the tax change tightens the constraint for treated firms. While we still view this proxy as informative, we also adopt a different approach following Auerbach and Hassett (2003) by using the probability that a firm issues equity as a sorting variable. To do so, we create a dummy *New Equity Issuance* that equal one if we observe a positive change in equity between t and $t+1$ over the period 2000–2008. We then predict the probability of the firm issuing new equity by using a linear probability model, where we regress the variable *New Equity Issuance* on industry-by-year, commuting zone-by-year, age quartile dummies, profitability and lagged profitability, debt and lagged debt investment and lagged investment all scaled by asset and (log) assets.[33] We then split the sample in quintiles and again failed to find any drop in investment, even for the firms most likely to be more equity-dependent.

Taken together, these results strongly reject the "old view" theory of dividend taxation, that predicts that young, equity-dependent firms should reduce their investment following an increase in dividend tax rate. We find that if anything, such firms increase

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[33]The predicted value ranges from -2.5% to 11%, with a mean of 3.5% and a standard deviation of 2.6%.

their investment relative to less equity-dependent firms.

Liquidity constraints. We perform two analyses that estimate the degree to which liquidity constrained firms are more responsive to the reform. First, we estimate the effect separately for each decile of size, measured by firm assets the year before the reform.

Figure 7 displays the effects on total investment by firm size decile. Each regression is estimated using equation 1 and we report the point estimate and 95 percent confidence intervals for each coefficient regression. As for age, the reform has always a precise small effect with no upward or downward trend, at the exception of the first three decile which displays slightly higher positive reaction.

Second, to investigate in a systematic and compact way heterogeneity effect for other classic firm characteristics, we follow Yagan (2015) and estimate seven triple–difference regressions, one for each characteristic: firm revenue, age, revenue growth, return on asset, liquidity over asset (cash plus short–term investment), leverage over asset and trade credit over sales. Because in the end non of these splits are different, with point estimate virtually similar, we report the detail in Appendix A.4.

Expectations of reversal. A final possibility for the lack of reaction is that French entrepreneurs exposed to the reform expected a swift policy reversal. Indeed, a dividend tax hike increases the cost of capital for new investment only insofar as those payouts will be taxed at the new high rate. If investment take several years to pay off, or if entrepreneurs are not cash-constrained on their personal finance and can wait for the reform to be undone, entrepreneurs expecting to face only a transitory tax hike should not reduce their investment, but simply store the payoffs inside their firm and wait.[34]

When introduced, the reform was marketed as "permanent" since it was implemented to correct a tax distortion.[35] However, it is true that the election of Francois Hollande to the French Presidency came as a surprise and many expected him not to be reelected after the first two-years of his mandate.[36]However, it is worth stressing that President

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[34]It is unfortunately impossible in France to link individual balance sheet with the firm balance sheet, but the possibility that these entrepreneurs might be financially unconstrained for several years seem unlikely given that this is their only income and in the vast majority of cases, the average compensation is in the order of one or two hundred of thousands of euros annually.

[35]Unlike the the initial setting of the 2003 Bush tax cut, the French experiment had no default expiration date. The U.S. tax cut was originally legislated to expire in 2009, then extended to 2013 and finally made permanent.

[36]French Presidency is a five-year mandate.

Emmanuel Macron who replaced Francois Hollande, despite being more pro-market and pro-business and having introduced a reform of other aspect of the taxation of dividends, decided to uphold the alignment of the tax rate between capital and labor income for managing owners of SARL.

7   Additional margins of adjustments

Since treated firms after the tax hike reduce their amount of dividends paid by around €0.045 per euro of capital but only reinvest around one fifth of this (+€0.0079), four-fifths remain "missing." In this section, we leverage the detailed additional data from the tax files to track where the additional undistributed money flows to. This exercise is an important complement to Yagan (2015), who, probably due to a lack of detailed company account data, does not provide an accounting decomposition that can investigate the sources of cash that companies have had to tap into in order to make those generous payouts.

We explore two main possibilities. First, affected entrepreneurs could engage in more aggressive income shifting and find creative ways to take money out from their firm (e.g. Gordon and Slemrod (1998). Second, affected entrepreneurs could adjust other elements of their balance sheet and in particular their current assets (customer credit and cash and short-term investment holding) and their current liabilities.

7.1   Tax Avoidance

Because the tax reform only affected entrepreneurs owning at least 50% of the capital of treated firms, newly taxed entrepreneurs have substantial control over the way firm spending is allocated and therefore have a larger ability to engage in income shifting between corporate and personal income (e.g. Gordon and Slemrod (1998), Piketty, Saez, and Stantcheva (2014)). In particular, owner-managers of closely-held firms can reduce their tax base by purchasing private consumption goods and services through their firm rather than first paying themselves a dividend and then buying the good or service.[37]

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[37]Classic examples of such behaviors include declaring the personal housing rent as a "work office" or personal dinners as "work dinner."

Regulation barriers. It is important to stress here that even though the majority owner has some leeway to engage in income shifting, this practise is extremely regulated. In particular, even if the CEO owns one hundred percent of the company, there is still a clear legal distinction between the company's best interest and the CEO's personal and private interests. In particular, by using the company as her personal bank account, the owner-manager is exposed to the risk of "misappropriation of corporate asset" (*abus de biens sociaux*), as she would no longer act in the "Company's best interests under all circumstances." Such behavior is liable to a term of imprisonment of five years in jail and a fine of €375,000. Should the company be on the verge of bankruptcy, the CEO also becomes personally liable for the losses of the company and no longer benefits from the protection of limited liability (article L.241-3 4).

This regulation also applies to the case where the entrepreneur would try to use her firm asset as collateral to secure a *personal* loan, implying that it is not possible for treated entrepreneurs to extract money out of their firm using this behavior, as no bank in France would accept taking the legal risk.[38]

Evidence from cash-flow statements. While constrained by law, entrepreneurs may still engage in some income shifting, which can be detected from the cash-flow statement of the firm. The French tax-files unfortunately do not report detailed itemized spending, but they do provide the amount spent for "raw materials," "intermediary consumption of goods" and "intermediary consumption of services" (which includes e.g. office rent, cars renting, external consultants, etc.). The data also provides firm valued added, defined as total revenues minus all the costs related to production. We express each variable as a percentage of the business revenue since the income-shifting hypothesis would predict an "abnormal" increase in intermediary consumption relative to what the business used to need to produce one euro of revenue. This increase in intermediary consumption should lead to a decrease in the fraction of euros of revenues transformed in euros of value-added.

For each variable, we estimate equation (1) and report the results in Table 9. Whether it is intermediate goods (column 1), intermediate services (column 2), raw materials (column 3) or value-added over revenues, we do not find any meaningful change. Most coefficients are not only statistically insignificant, and their magnitudes are essentially

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[38]Note that the reverse is not true and it is possible for managing directors can engage their personal liability to secure a loan for their society.

zero, with changes around 0.2%–0.4% of revenues. If anything, the share of intermediate goods in the firm revenue decreases by 0.4% in relative terms (column 1). Therefore, the hypothesis of "income shifting," according to which treated owner-managers decide to relabel some expenses and increase the firm's "discretonary expenses" for their personal benefit is not verified. The results, if anything, even suggest opposite effects to this hypothesis. Notice that the absence of results does not imply that French entrepreneurs are particularly virtuous. It simply means that following the tax hike, they do not engage in *more* income shifting. Given that what entrepreneurs can do is regulated, it is well possible that even before the reform they optimized as much as possible and have simply no more leeway when the tax increased.

7.2   Balance sheet adjustment

Owner-managers of treated firms are reinvesting only a fraction of their undistributed dividends and don't seem to shift part of their consumption to take money out from their firm without paying taxes. Therefore, the remainder of the undistributed dividends should accumulate in the firm balance sheet as gross working capital, either in the form of liquidity (defined as cash and short–term investment) or in the form of credit to their customers.[39] They could also use this extra cash to repay their suppliers faster, reducing their net working capital (gross working capital minus short-term liabilities).

To trace out the change in net working capital, we estimate a series of models similar to equation (1), where the dependent variables are different items of the firm balance sheet scaled by 2011 assets. We also decompose the *Post* dummy into four dummies for the years 2013, 2014, 2015 and 2016 to see how the effect evolves over time.

Table 10 reports the results. Column 1 simply reproduces the effect of the reform on dividends. Every year from 2013 onwards, firms exposed to the tax increase reduce their dividends payment by around 0.5% of their 2011–capital. If all these undistributed dividends were used to expand the firm's working capital or to reduce its short-term liabilities, net working capital should increase by $4{\times}0.5 = 2$, which is what we observe in column 2 in 2016 and suggests that a large fraction of the unpaid dividends is kept in the balance sheet. This expansion in net working capital is driven for the largest part

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[39]To be precise, owner–managers could also decide to produce more and store the extra products as inventories, but this account for a small fraction of a firm working capital.

by the hoarding of liquidity (column 3). Over time, treated firms continuously increase their liquidity to the point that by 2016, it reaches 1.2% of their capital.

In order to see if firms actively change the management of their customers and suppliers' credit, in columns 5 and 6 we scale supplier debt and customer debt by the firm's lagged sales. We find that while treated firms do not repay their suppliers faster, they do increase the volume of credit they provide to their customers for each euro of sale realized. By 2016, the increase in customer debt propensity corresponds to a 10% increase relative the pre–reform mean. The conjunction of higher investments and more extended credit for customers could explain why sales of treated firms grow more after the tax increase.

8 Discussion with theory

The prominent theories on the effects of dividend taxation on investment predict different effects based on two parameters: the marginal source of investment finance and the magnitude of liquidity-constraints[40] (e.g. Sinn, 1991); and firms' ability to carry resources over time by holding cash rather than investing it, creating a possible "intertemporal tax arbitrage" (Korinek and Stiglitz, 2009).[41]

Our set of results clearly reject both the "old view" and "new view" of dividend taxation. In the "old view", tax changes do not affect dividend payments directly, but instead affects equity issuance and investment, which eventually affects dividends when the additional investment pays off. The timing of dividend adjustments together with the positive increase in investment is inconsistent with these predictions. The new view is also clearly rejected as it predicts no change in investment and dividend payout policy.

We are therefore mostly left with the possibility that firms engage in intertemporal tax arbitrage as in Korinek and Stiglitz (2009). In their model, if managers view the tax increase as only temporary, they have an incentive to reduce dividends, build up liquidity

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[40]The difference between cash-rich and cash-poor firms maps the distinction between the "old view" and "new view" of dividend taxation. In the "old view" investment will decrease because it is financed with new equity issuance and higher taxes raises the cost of equity (e.g. Harberger, 1962, Feldstein, 1970, Poterba and Summers, 1983). By contrast, in the "new view" higher taxes reduces the marginal return on investment but also reduces the ex–post marginal incentive to distribute payouts by a similar amount, leaving investment and payout unchanged (e.g. King, 1977, Auerbach, 1979, Bradford, 1981.

[41]There is a fourth theory: the "agency view" (Chetty and Saez, 2010) highlighting the importance of agency cost of holding cash in determining the link between dividend taxation and investment, but it is unlikely to apply in our setting. By design, treated firms are always firms run by a managing director who is also the majority shareholder and therefore face very limited agency costs. As such, the agency view of dividend taxation would provide little guidance to explain our results.

buffer and wait for the tax reversal to payout shareholders. Because in equilibrium investment opportunities arise randomly and future dividend payments are discounted at a higher rate than the market rate, these tax-induced higher liquidity reserve also reduce firms liquidity constraints. As such, when investment opportunities arise in the economy, then can then use these liquidity reserves to seize them and invest more.[42] We do find that consistent with their model, treated firms invest relatively more when they have higher investment opportunities, particularly so when before the reform they distributed a lot of dividends.

What our results show is that many entrepreneurs do not leave enough liquidity in their firm balance sheet to overcome financial frictions when investment opportunities arise. The classic explanation in corporate finance for why it would happen is the "free cash flow" hypothesis developed by Jensen. But this seems unlikely to be an important determinants in our setting as the CEO of the firm is also the majority owner and therefore, should not face important agency problems. Three hypotheses remain: (i) entrepreneurs may make systematic errors when anticipating future investment opportunities and in this case could underestimate their future needs for liquidity. (ii) entrepreneurs may display "hyperbolic discount factor" (Laibson, 1997) implying they will overvalue consumption today (paying dividends) over investments for the future. In this case, a higher dividend tax rate will be a solution to restore the proper arbitrage between consumption and savings. (iii) Even if the classic agency problems should not arise in our context, a more subtle one may exist, based on intra-household bargaining. If for instance the capital is owned by the family but only one member works in the firm, this potentially reintroduce a form a separation between ownership and and management and the family members not working at the firm but owning it my prefer not to leave too much cash in it.

Disentangling these different hypotheses would require additional data that unfortunately are often not available. We leave these questions open for future research.

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[42]Cash holdings within firms can be discounted at a higher rate than cash holdings outside for multiple reasons: agency concerns (e.g. the "Jensen free cash-flow problem"), managerial myopia, imperfections in risk markets, which may result in households being even more credit rationed than firm, or simply the accumulated retained earnings tax, which punishes firms for holdings excessive cash balances.

9 Conclusion

The capital share of income for individuals at the top of the income distribution has increased continuously over time (Eisfeldt, Falato, and Xiaolan, 2019). At the same time, it is becoming harder to clearly distinguished between labor income and capital income, in particular for business owners (e.g. Smith et al., 2019).

The effects of the distortions introduced by a tax wedges between capital and labor income is therefore more pressing than ever. France decided to align taxation on one form of capital income (dividends) in 2013. We show that, far from producing the economic armageddon that opponents to the reform predicted, this tax hike led to higher investments and higher sales growth.

Our finding have multiple implications about how a tax reform affects economic decisions of entrepreneurs. First, we find in a differences-in-differences setting that affected firms swiftly cut dividends, with an implied elasticity of around -0.5. Tax-induced higher liquidity retention lead firms to increase their investment, with a positive elasticity around $+0.30$, particularly when firms have higher investment opportunities and boosted firms' sale growth. The rest is accumulated as cash and used to extend credit to customers, boosting firms sales and value-added. Treated entrepreneurs do not appear to engage in income shifting to evade tax increase.

These results suggests that anticipations of policy reversal play an important role in the way agents react to economic reforms. This is in contrast to the common theoretical assumption that taxes are perceived as permanent

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Figure 1: . Effect of Tax Reform on Organisational Form
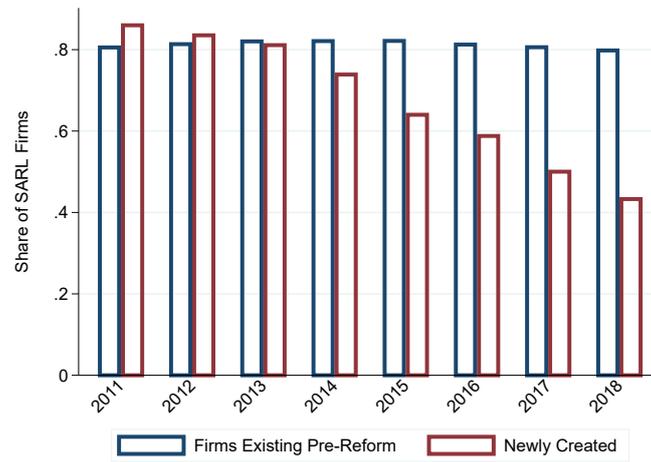
Legal forms of organization over time. This figure plots the percentage of companies whose legal form of organization is SARL for firms existing prior to the reform or younger than two year ("newly created").

Figure 2: . Effect of Tax Reform on Dividend Payment
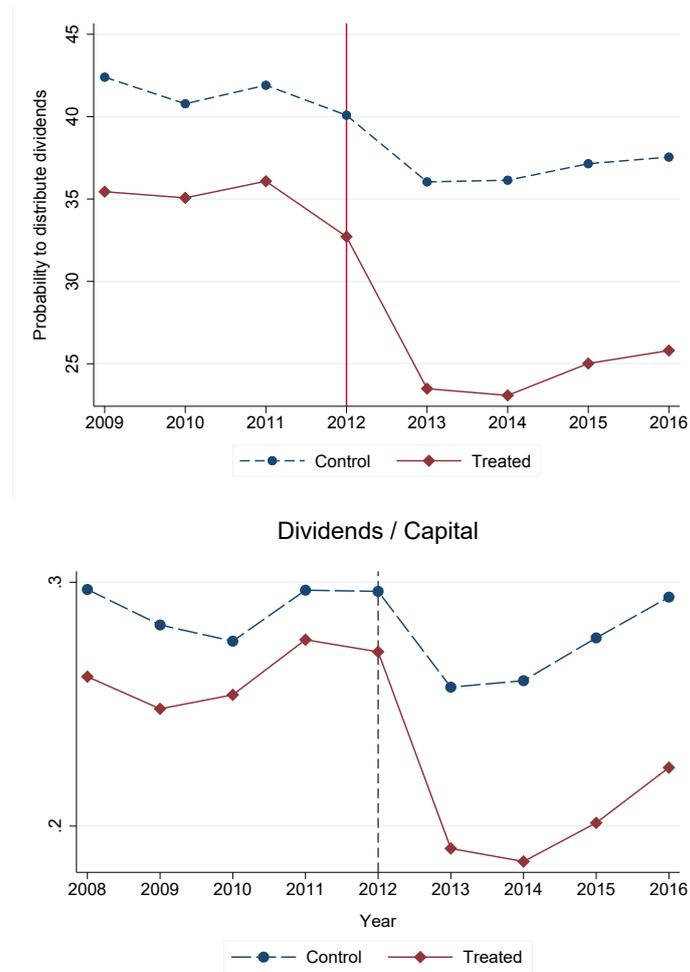
The figure shows the evolution of the probability for a firm to pay dividend (in percentage) and the bottom figure shows the evolution of the ratio dividend over total capital in 2011. "Treated" firms are firms affected by the 2013 tax reform on dividend payment (SARL) and "Control" firms are firms not affected (SAS)

Figure 3: . Effect of Tax Reform on Dividend Payment
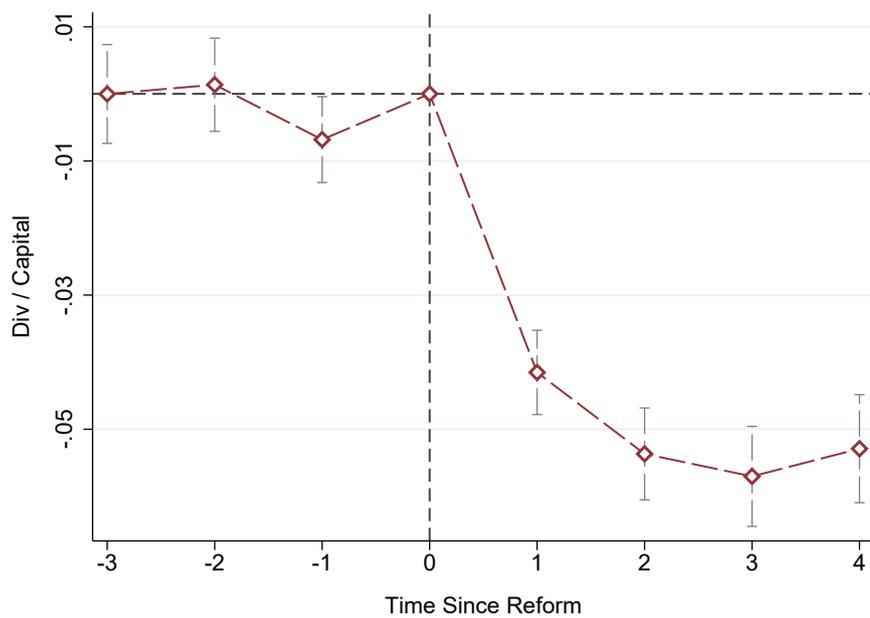
This figures plot the yearly coefficient and its 95 % confidence interval of the difference-in-difference estimator in equation (1) of the 2013 dividend tax increase, when the dependent variable is dividends over asset in 2011. The specification include industry–by–year, pre-reform asset growth quintile–by–year fixed effects.

Figure 4: . Dividend Payment Around the 10% Threshold of Share Capital
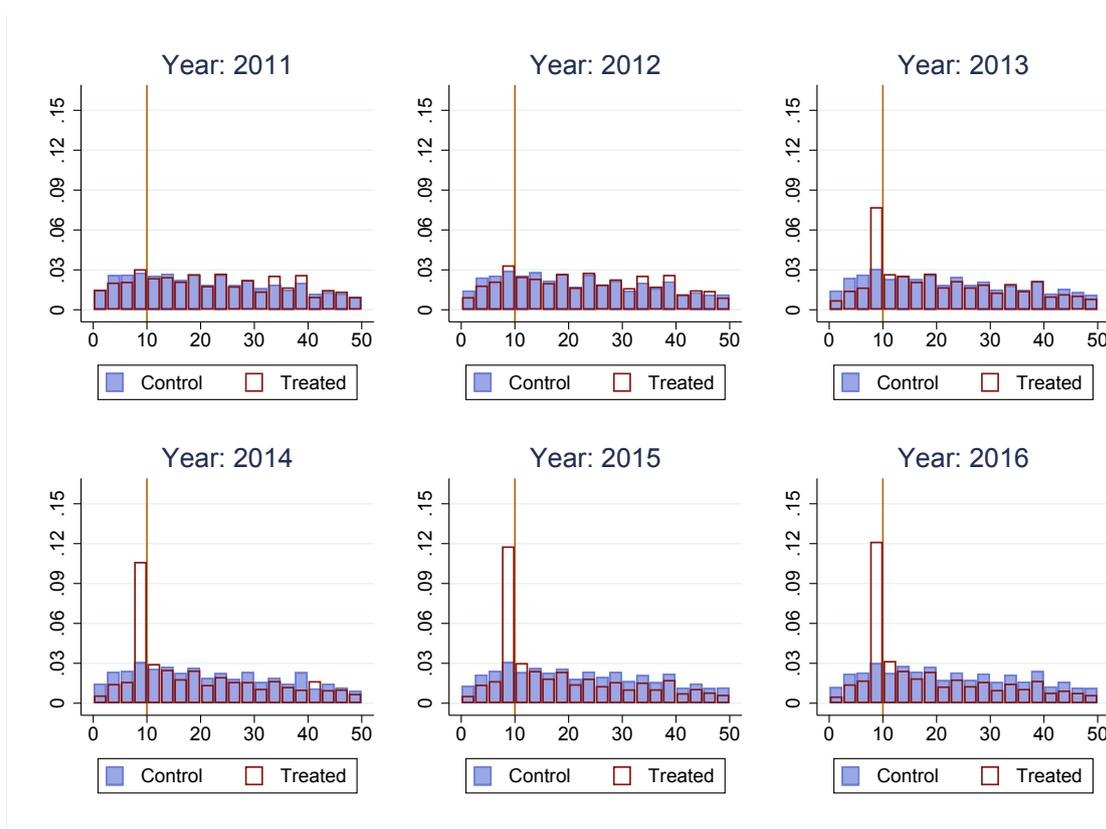
The figure plots the distribution of the ratio of dividends over equity for the years 2011–2016 for firms paying dividends. The x–axis is the ratio dividends dividend/share capital (in percentage). The y–axis is the fraction of firms in a specific bin of dividend/equity. "Treated" firms are firms affected by the 2013 tax reform on all dividend paid for a value above 10% of the firm's share capital (SARL) and "Control" firms are firms not affected (SAS)

Figure 5: Effect of Tax Reform on Investment

This figures plot the yearly coefficient and its 95 % confidence interval of the difference-in-difference estimator in equation (1) of the 2013 dividend tax increase, when the dependent variable is total investment scaled by the firm total capital in 2011. The height of the Y-axis is fixed at 0.1 s.d. of the pre-reform sample mean of the dependent variable to ease the economic interpretation.

Figure 6: Total Investment: Heterogeneity by Age
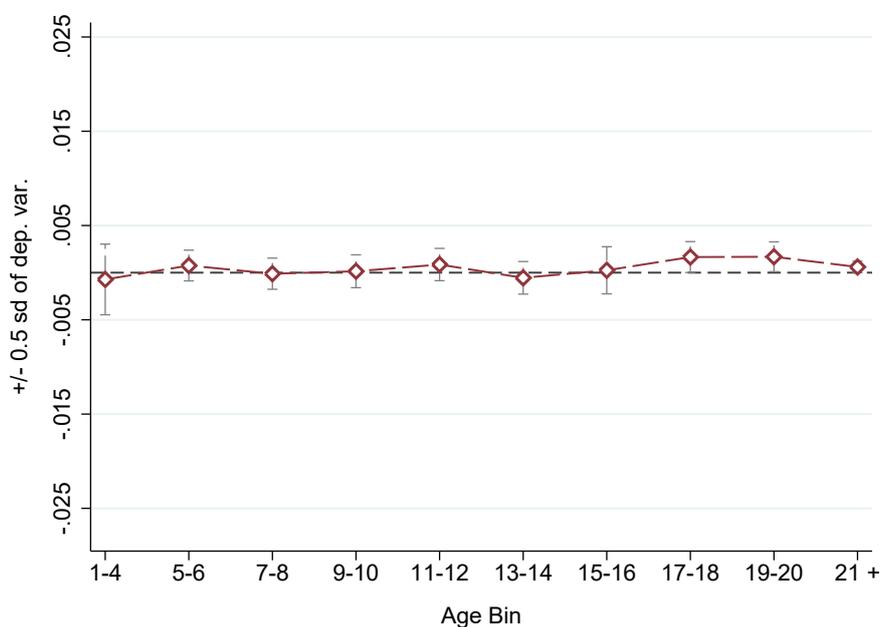
This figures plot the post coefficients and its 95 % confidence interval of the difference-in-difference estimator in equation (1) when the dependent variable is total gross investment scaled by total capital in 2011. Each coefficients is estimated for a given bin of firms sorted by decile of 2012 assets' value. The height of the Y-axis is fixed at 0.5 s.d. of the pre–reform sample mean of the dependent variable to ease the economic interpretation.

Figure 7: Total Investment: Heterogeneity by Size
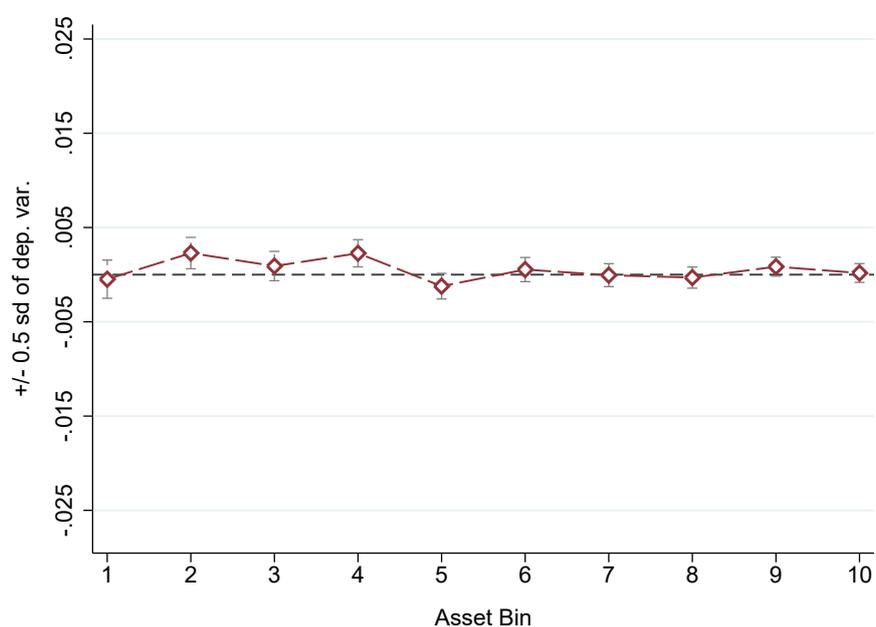
This figures plot the post coefficients and its 95 % confidence interval of the difference-in-difference estimator in equation (1) when the dependent variable is total gross investment scaled by total capital in 2011. Each coefficients is estimated for a given bin of firms sorted by decile of 2012 assets' value. The height of the Y-axis is fixed at 0.5 s.d. of the pre–reform sample mean of the dependent variable to ease the economic interpretation.

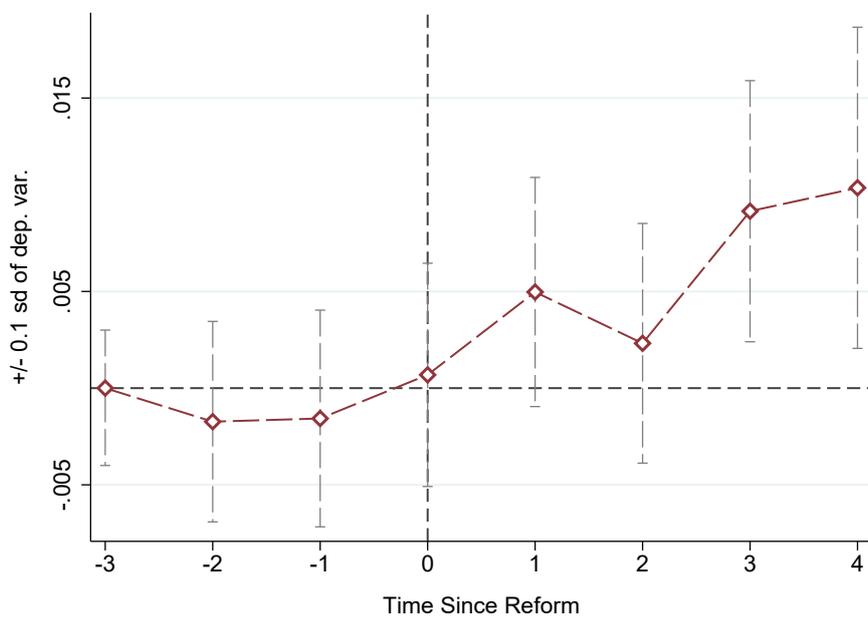Figure 8: Tracing Out Unpaid Dividends: Cross–Section
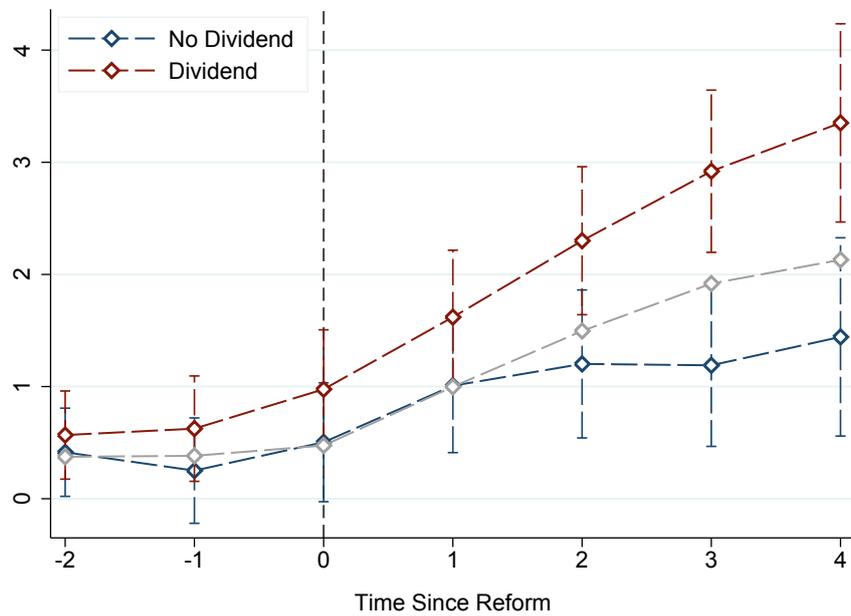
This figures plot the yearly coefficient and its 95 % confidence interval of the difference-in-difference estimator in equation (1) of the 2013 dividend tax increase, when the dependent variable is Net current assets scaled by asset in 2011 multiplied by 100 to express it as a percentage. The red line is estimated on the sample of firms having always paid dividends in the 2009-2012 period. The blue line is estimated on the sample of firms that have never paid dividends in the 2009-2012 period. The grey line is estimated on the whole sample as in Figure ??.

Table 1: Summary Statistics

	Panel A: Pre-Reform 2009–2012					
	Treated			**Control**		
	Mean	s.d.	p50	Mean	s.d.	p50
Dividend Variables						
Dividends (in K€)	19	53	0	40	110	0
Dividend / Capital	.23	.74	0	.25	.8	0
Dividend ≥ 0	.37	.48	0	.4	.49	0
Dividend / Total Capital	.23	.74	0	.25	.8	0
Other Firm Characteristics						
Asset (in K€)	871	716	641	1,592	944	1413
PPE (in K€)	206	267	115	395	420	248
Equity (in K€)	45	92	15	140	341	70
Employment	7.9	9.8	6	13	16	10
Net Income / Total Capital	.52	1.9	.14	.48	2	.11
Liquidity / Total Capital	1.9	5.2	.45	2.2	5.7	.47
Debt / Total Capital	1.5	4.5	.41	1.3	4.3	.28
Total Investment / Total Capital	.078	.31	.021	.072	.32	.018
Tangible Investment /Total Capital	.058	.21	.019	.042	.19	.015
Observations	675,760			119,404		

This table reports summary statistics. Total capital is defined as tangible capital (property, plant and equipment) plus intangible capital. All denominators are the value of total capital in 2011.

Table 2: Effect of Tax Reform on Dividend Payment

Panel A: multiple dividend adjustment margins

Dependent Variable	Div / Capital	Log(Div)	Div≥0	Div ≥ 10% [Div/Equity]
	[1]	[2]	[3]	[4]
Treated×Post	-.042***	-0.13***	-0.039***	-0.055***
	(0.0025)	(0.0063)	(.0017)	(.0017)
Obs.	1,397,067	1,397,067	425,705	1,397,067
Firm	✓	✓	✓	✓
Ind× Year	✓	✓	✓	✓
Mean LHS	0.25	0.3	0.33	0.37

Panel B: saturating the regression in fixed effects

Dependent Variable	Div / Capital					
	[1]	[2]	[3]	[4]	[5]	[6]
Treated×Post	-.042***	-.041***	-.042***	-.044***	-.045***	-.043***
	(0.0024)	(0.0025)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
Obs.	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067
Firm	✓	✓	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓	✓	✓
Commuting Zone×Year	—	—	✓	—	✓	✓
Capital Growth Quintile×Year	—	—	—	✓	✓	✓
Controls Set 1	—	—	—	—	—	✓

This table shows the effect of the 2013 dividend tax increase on dividend payment. In Panel A, we decompose the effect for various measures of dividends. In column 1, the denominator "*capital*" is total capital fixed in 2011. In Panel B the dependent variable is dividend scaled by total capital in 2011. In Column 4, "Commuting Zone" corresponds to local labor markets defined by the statistical office ("Bassin d'Emploi"). In column 5, Capital growth is firm annualized capital growth in the pre-reform period. In column 6, controls include the second lags of sales, change of sales and profit margin as well as quartile of age interacted with year fixed effects. In column 7, controls include assets and net income lags. All variables are scaled by total capital in 2011. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3: Effect on Investment

Dependent Variable	Total Investment		Tangible Investment	
	[1]	[2]	[3]	[4]
Panel A: Gross Investment				
Treated×Post	0.0079***	0.0074***	0.0042***	0.0038***
	(0.0013)	(0.0013)	(0.00089)	(0.00089)
Panel B: Net Investment				
Treated×Post	0.0075***	0.0075***	0.0039***	0.0036***
	(0.0013)	(0.0013)	(0.00097)	(0.00098)
Firm	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓
Commuting Zone × Year	—	✓	—	✓
Obs.	1,397,067	1,397,067	1,397,067	1,397,067

This table shows the effect of the 2013 dividend tax increase on investment. Total investment includes tangible (machine, property, plant and equipment) and intangible (software, patents, licences) investment. Net investment is total investment minus depreciation. Capital growth quintile is computed using the annualized capital growth pre-reform. Pre-reform sample for the dependent variables are 0.078 (total gross investment), 0.058 (tangible gross investment), -0.039 (total net investment) and -0.058 (tangible net investment). All variables are scaled by total capital in 2011. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Effect on Firm Performance

Dependent Variable	Log(Sales)	Log(VA)	ROA	Productivity	Prob(exit)
	[1]	[2]	[3]	[4]	[5]
Treated×Post	0.014***	0.016***	-0.003***	.0015	-.0075***
	(0.0016)	(0.002)	(0.00044)	(0.0017)	(0.00072)
Firm	✓	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓	✓
Obs.	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067
Mean LHS			0.085		0.0051

This table shows the effect of the 2013 dividend tax increase on firm performance. In column 4, *Productivity* is defined as the residual of the regression log(valued added) over capital and labor (in logs). In column (5) *Exit* is a dummy equal to one if the firm exited the sample in year t+1. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Heterogeneity: Amount of Earnings Not Distributed

Pre–2013 Bin [Dividend/Asset]	1	2	3	4	5
Pre–2013 Total Inv / Capital	0.069	0.091	0.088	0.086	0.079
	[1]	[2]	[3]	[4]	[5]
Panel A: Dividends					
Treated×Post	-0.0099***	-0.028***	-0.054***	-0.076***	-0.18***
	(0.002)	(0.0045)	(0.0066)	(0.0073)	(0.013)
Panel B: Total Investment					
Treated×Post	0.0073***	0.0056*	0.0091***	0.012***	0.0085**
	(0.002)	(0.0034)	(0.0034)	(0.0034)	(0.0039)
Panel C: Tangible Investment					
Treated×Post	0.0024**	0.0037*	0.0071***	0.0068***	0.0065***
	(0.0013)	(0.0023)	(0.0024)	(0.0024)	(0.0027)
Firm	✓	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓	✓
Obs.	672,071	173,678	173,291	172,035	169,215

This table shows the effect of the 2013 dividend tax increase when firms are sorted by their amount of dividends paid scaled by firm total capital over the period 2008–2012. The first bin is made of all firms not paying any dividend. We then compute quartile over the positive distribution. The first line indicates the average of dividends paid over asset within each bin. The second line reports the average investment rate in the bin. We estimate equation 1 for each group separately and for three dependent variables: Dividends / Total Capital$_{2011}$ (panel A), Total Investment / Total Capital$_{2011}$ (panel B) and Tangible Investment/ Total Capital$_{2011}$ (panel C). Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Sensitivity by Investment Opportunities

Dependent Variable	Total Investment					
Investment Opportunity Bin	1	2	3	1	2	3
	[1]	[2]	[3]	[4]	[5]	[6]
Treated×Post	0.0025	0.0055***	0.014***			
	(0.0022)	(0.0021)	(0.0024)			
Treated×Post ×High Dividends				-0.0024	-0.00074	0.015***
				(0.0051)	(0.0052)	(0.0057)
Firm	✓	✓	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓	✓	✓
Treated×Year	—	—	—	✓	✓	✓
Obs.	435,861	442,281	441,611	318,326	332,211	330,231

This table shows the effect of the 2013 dividend tax increase when firms are sorted by their investment opportunity. We compute investment opportunity by using a leave-one out mean at the industry-commuting zone level of investment over the post period and sort firms into tercile, such that the first tercile is made of firms with the lowest investment opportunities and the last tercile is made of firms with the highest investment opportunities. In columns 4 to 6, *High Dividends* is a dummy equal to one if the firm belong to the last two quintile of the dividends over capital distribution during the pre-period, as in Table 5 and to zero if it belongs to the first two quintile. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7: Equity Dependence–Fraction of Capital Financed Through Equity

Equity Issued / Capital$_{2012}$	.023	.065	.14	.31	1.5
	[1]	[2]	[3]	[4]	[5]
	Total Investment				
Treated×Post	0.0089***	0.013***	0.017***	0.014***	0.011***
	(0.0024)	(0.0024)	(0.0027)	(0.0024)	(0.0021)
	Tangible Investment				
Treated×Post	0.0046***	0.0068***	0.008***	0.007***	0.0072***
	(0.0017)	(0.0017)	(0.0018)	(0.0017)	(0.0017)
Firm	✓	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓	✓
Obs.	269,387	269,785	266,841	263,924	251,587

This table shows the effect of the 2013 dividend tax increase when firms are sorted by the fraction of capital in 2012 financed by equity since the firm entered in the dataset starting in 1994. The first line indicates the average of equity issued / capital within each bin. We estimate equation 1 for each group separately for total investment and tangible investment both scaled by total capital in 2011. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Equity Dependence–Number of Equity Issuance

# equity issued	2009–2016		2003–2016		
	0	1	0	1	2
	[1]	[2]	[3]	[4]	[5]
Total Investment					
Treated×Post	0.0086***	0.0066***	0.0089***	0.0058***	0.0074**
	(0.0019)	(0.0018)	(0.0021)	(0.0019)	(0.0037)
Tangible Investment					
Treated×Post	0.0051***	0.0027**	0.0055***	0.0025**	0.004*
	(0.0013)	(0.0012)	(0.0015)	(0.0013)	(0.0023)
Firm	✓	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓	✓
Obs.	636,691	723,426	542,667	633,748	183,684

This table shows the effect of the 2013 dividend tax increase when firms are sorted by the number of instances of equity issued over the period 2009–2016 (columns 1–2) or the period 2003–2016 (columns 3–5). In columns 1 and 2, we split the sample between firms that never issued equity (column 1) or issued once or more than once (column 2). In columns 3–5, we split into no issue (column 3), one issue (column 4) or two or more issue (column 5). We estimate equation 1 for each group separately for total investment and tangible investment both scaled by total capital in 2011. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Tunneling

Dependent variable / Sales	Intermediate Goods	Intermediate Services	Raw Material	Value Added
	[1]	[2]	[3]	[4]
Treated×Post	-0.00081***	-.00019	.00035	-0.000027
	(0.00035)	(.00037)	(.00027)	(0.00039)
Mean Sample	0.21	0.12	0.04	0.41
Firm	✓	✓	✓	✓
Ind×Year	✓	✓	✓	✓
Capital Growth Quintile×Year	✓	✓	✓	✓
Obs.	1,397,067	1,397,067	1,397,067	1,397,067

This table shows the effect of the 2013 dividend tax increase on different intermediate consumption of the firm. Intermediate services include rents, consulting, vehicle renting etc. Each variable is scaled by contemporaneous sales. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10: Balance Sheet Adjustments

Dependent variable	Dividends / Asset	Net Working Capital/ Asset	Liquidity/ Asset	Supplier Debt/ Asset	Customer Debt/ Asset	Supplier Debt/ Sales	Customer Debt/ Sales
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Treated×(Year=2013)	-.043***	0.041***	.015*	.0017**	.037***	0.0005	.0014**
	(0.0041)	(0.0041)	(0.0083)	(0.0006)	(0.0084)	(0.0005)	(.00066)
Treated×(Year=2014)	-.051***	0.067***	.03**	.0023***	0.049***	-0.000083	0.0014**
	(0.0044)	(0.0130)	(0.0098)	(0.0007)	(0.0095)	(0.0006)	(0.00076)
Treated×(Year=2015)	-0.053***	0.1***	0.051**	0.0028***	0.059**	-0.00032	0.0017**
	(0.0048)	(0.0310)	(0.0250)	(0.0008)	(0.0270)	(0.0007)	(.00087)
Treated×(Year=2016)	-0.047***	0.19***	0.12***	0.0043***	0.1***	-0.00075	0.0025**
	(0.0051)	(0.0420)	(0.0280)	(0.0009)	(0.0300)	(0.0008)	(0.00092)
Firm	✓	✓	✓	✓	✓	✓	✓
Industry×Year	✓	✓	✓	✓	✓	✓	✓
Asset Growth Quintile×Year	✓	✓	✓	✓	✓	✓	✓
Obs.	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067

This table shows the effect of the 2013 dividend tax increase on the firm balance sheet. Asset growth is the annualized growth of firm asset between 2008 and 2012. Net working capital is defined as gross working capital (liquidity plus account receivables plus inventory) minus short-term liability. Liquidity is the sum of cash and cash-equivalents (marketable securities, commercial paper, Treasury bills). In columns 1 to 5, each variable is scaled by asset in 2011. In columns 6 and 7 the denominator is contemporaneous sales. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

A.1   Detailed differences across SAS and SARL

Differences for the firm.   The differences and similitude between SAS and SARL can be summarized by the table below.

	SARL (Treated)	**SAS** (Control)
CEO	**Majority–Owner Not Employed**	**Employee**
Spouse status	Spouse collaborator	Employee
By-laws	Pre-defined	Completely flexible
Nb of Shareholders	Limited to 100	No max
Types of Shares	Ordinary	Different share classes possible
Bonds Issuance	Audit necessary + ≥ 3 year	No condition

As we explained in Section 2.2, the main difference regarding the CEO is that SAS managing directors are required by law to be employees of the firm, while SARL managing directors do not face this requirement. The status of the spouse also differs. While the spouse of a SARL CEO can benefit from the status of "spouse collaborator", which makes him/her eligible for social security benefits without having to be an employee (i.e. no need for a wage or a work contract), this is not the case for the spouse of a SAS managing director.

Because there is a lot of family firms in France, in particular among SMEs, this notion of "spouse collaborator" makes the SARL legal status attractive.

Regarding the design of the by-laws and access to outside finance, the differences are the following:

- By-laws are "pre-defined" for SARL. This makes it particularly appealing for instance for entrepreneurs with potential shareholders / associate they don't necessarily trust or for unsophisticated entrepreneurs. SARL by-laws are almost "plug and play" and do not require to use a lawyer to design them.

- As a consequence, while sARL are constrained to only issuing ordinary shares, SAS can issue all type of share classes (e.g. preferred, ordinary)

- SAS have also an easier access to the bond market. They can issue warrants and convertible bonds, which SARL cannot and face no restrictions on bond issuance, while SARL must have existed for at least 3 years and have an auditor to issue bonds. The higher flexibility of the SAS

- Finally, SAS face no restriction about the number of shareholders while SARL are capped at one hundred

A.2   Discussion of the reform

A.2.1   Why did the reform only impacted SARL firms?

The 2013 reform only impacted SARL owner-managers. However the arbitrage opportunity also existed for SAS and SAS owner-managers. There are two main reasons that explain that the reform only affected SARLs:

Reform of independent workers' status.   The first one is related to the status of the owner-manager and the social regime to which she contributes. As explained previously, SARL owner-managers are legally treated as independent workers, whereas SAS and SA managers are employees. As a consequence, they do not share the same social regime. Independent workers contribute to the "RSI"[43], whereas employees contribute to the french standard regime[44]. Furthermore, in 2009 another category of independent french workers, the "liberal professions"[45] was imposed the same change in taxation on their own dividends than the 2012 reform for SARL owner-managers. One year after the 2012 reform, it was finally extended to another category of independent workers: the agricultural workers. The relationship between those three reforms is that they both concerned independent workers paying social contributions to the same RSI regime. Hence the 2012 reform impacting SARL owner-managers was part of a global reform of the RSI regime and not the one of the *"Regime Generale de la Securite Sociale"*.

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[43] *Regime Social des Independants*

[44] *"Regime General de la Securite Sociale"*

[45] French "Liberal professions" include notably lawyers, doctors, notary.

Lobbying power. The second explanation lies in the bargaining power of SARL owner-managers versus SA and SAS ones. As described in the paper, SA and SAS firms are, on average, bigger than $SARLs$. In turn SA and SAS are more likely to have a higher lobbying power. This is further discussed below as in 2015, a parliamentary amendment to extend the tax reform to SA and SARL was rejected following intense lobbying by french two main employers' organisations.

A.2.2 Subsequent Reactions to the reform

A strong opposition. The exclusion of SA and SAS of the scope of the reform, as well as the sharp increase in taxation, created a strong opposition to it. An opposition group of SARL owner-managers, calling themselves "The sheeps" [46] lobbyied hard against it but ultimately failed, after having gained the support of the french Senate. However, the opposition remained strong afterwards. Parliamentary amendments to cancel the reform were proposed in the 2015, 2016 and 2018 *Loi de Finance pour le Financement de la Sécurité Sociale* [47]. To this date, they never have been accepted.

Attempt to extend it to SAS and SA. Even more interestingly, in 2014, a french deputy proposed an amendment to the social security funding law to enlarge the reform to SA and SAS which was ultimately rejected. The amendment[48] specifically stipulates that its aim is to reduce fiscal optimization of SA and SAS owner-managers while ensuring equity between them and SARL owner-managers.

Thanks to an article in the french leading newspaper [49], we know that its rejection was the output of an intense lobbying campaign of the two french employers' organizations. The article reports that they lobby to Mister Macron, then at the head of the Economy Ministry, that finally managed to convince the French President, Francois Hollande, to ask the parliament to withdraw the amendment. The underlying explanation is that SA and SAS are better represented among those two organizations that were SARL.

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[46]https://www.lemonde.fr/economie/article/2012/10/18/apres-les-pigeons-les-chefs-d-entreprises-moutons-du-rs_1776814_3234.html

[47]In 2015, 2016 and 2018 the amendment was proposed by Senator Cadic.

[48]Amendment 876 to the 2015 *Loi de Finance pour le Financement de la Sécurité Sociale*

[49]https://www.lemonde.fr/politique/article/2014/10/30/comment-le-gouvernement-a-cede-au-patronat-sur-la-taxation-des-dividendes_4515630_823448.html

A.2.3 Discussion

The 2013 reform was a major change for SARL dividends taxation aimed at limiting tax arbitrage opportunity between wages and dividends. For this group of firms, dividends taxes were subject to new social contributions, leading to a threefold increase in dividends taxes.

Meanwhile, SA and SAS firms, the two other main groups of french firms, were not concerned by the reform even though their owner-managers benefit from the same arbitrage opportunity. Despite proposals to subject them to a similar scheme, it appears that they manage to resist it through better lobbying networks.

SA and SAS companies having been left out of the reform they provide us with a natural control group, that could have been subject to the reform but never was, to analyze the effect of a dividend tax increase. The high level of opposition, still active today, that the reform triggered shows that this tax reform had a high political salience

A.3 Discussion Tax Incidence

How wage earners should incorporate expected social benefits in the their labor supply decision? Early empirical studies have found that social security contributions (SSC) are fully shifted to employees (e.g. Gruber (1997)), implying in our setting a full valuation of the benefit. This idea has recently been challenged by Saez, Slemrod, and Giertz (2012) and Saez, Schoefer, and Seim (2019) who find in Greece and Sweden a full incidence on capital rather than labor.

Bozio, Breda, and Grenet (2018) use French data and social security contribution reforms to show that the incidence of a SSC marginal rate change depends on the degree of tax-benefit linkage. In many countries such as France, a large fraction of the SSC (if not the majority) is actually not a true "contribution," in the sense that the amount of benefit received does not equate one-for-one the amount of money paid. This is the case for instance for health care, child care benefits, etc. Other contributions have imperfect relationships with future benefits (e.g., main pension scheme, unemployment insurance), while some specific SSCs have very strong linkage (e.g., complementary pension schemes). For contributions with little tax–benefit linkage, Bozio, Breda, and Grenet (2018) estimate a precise zero incidence on labor, while they found a precise full incidence when the

linkage is strong.

Value of benefits in the French system. The retirement contribution for treated entrepreneurs is around 20% (17.7% for the main contribution, with complementary pension schemes that can go up to 7%). While 7% is the maximum complementary possible, only a minority reach this maximum, hence the average being around 20%.

Subjective valuation of social benefits. The literature on the extent to which individuals value the benefits guarantee by the government is very limited. The best estimate we have come from Finkelstein, Hendren, and Luttmer (2019) who, using the Oregon Medicaid Experiment estimate the recipients value of Medicaid benefits at around 50%. Of course, because this estimation of the benefits valuation by recipients is made in a very specific context: Medicaid in the U.S. and therefore might not be representative for French entrepreneurs.

A.4 Estimation of triple difference: liquidity constraints

For each characteristic, we use the distribution in 2011 and split the sample into quintile, drop the firms in the middle quintile and restrict to firms below the twentieth and above the eightieth percentile of the distribution.[50] We then define a dummy variable equal to one if the firm is in the top quintile and estimate regressions of the form:

$$Y_{i,j,f,t} = \beta\, Treated_i \times\ Post_t \times High_i^k + Treated_i \times\ Post_t$$
$$+\, \theta_i +\ \delta_{j,t} \times High_i^k +\ \gamma_{f,t} + \varepsilon_{i,j,f,t}$$

Where $High_i^k$ is a dummy equal to one if firm i is in the top quintile of the distribution for the characteristic k. Because we fix the characteristic in 2011, the equation does not include the interaction $Treated_i \times High_i^k$ as it is colinear with firm fixed effects. Similarly, we do not include $Post_t \times High_i^k$ as we include in the regression the full set of fixed effects $High_i^k$–by–industry–by–year. The coefficient of interest β gives the marginal

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[50]We find similar results if we use tercile instead of quintile

effect for firms in the highest quintile relative to the lowest quintile. The advantage of this procedure is that it allows to estimate heterogeneity effects in a non–parametric way.

Table A2 report the results for dividends (column 1), total investment (column 2), tangible investment (column 3) and total employment (column 4). Each line reports the point estimate of the triple–difference from a separate regression in which we use the firm–characteristic k. Except for dividends, we do not find any differential effects across the different characteristics.

Appendix Tables

Table A1: Effect on Wages and Employment

Dependent Variable	Employment		Mean Wage		Wages / Value Added	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated×Post	0.011***	0.012***	0.0018	0.0014	0.0043***	0.0048***
	(0.0015)	(0.0015)	(0.0011)	(0L0012)	(0.0012)	(0.0012)
Fixed Effects Set	✓	✓	✓	✓	✓	✓
Ind×Yea	✓	✓	✓	✓	✓	✓
Asset Growth Quintile × Year	✓	✓	✓	✓	✓	✓
Commuting Zone×Year	—	✓	—	✓	—	✓
Obs.	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067	1,397,067

This table shows the effect of the 2013 dividend tax increase on employment. Employment is the total full-time equivalent. Mean wage is total compensation divided by number of employees. Both variables are in log. Asset growth is the annualized growth of firm asset between 2008 and 2012. ***, **, * and $\sim$ indicate statistical significance at the 0.1%, 1%, 5%, and 10% levels, respectively.

Table A2: Heterogeneity: Credit-Constraints Proxies

	Div/Asset	Total Inv/Asset	Tangible Inv / Asset	log(Emp)
	(1)	(2)	(3)	(4)
Treated×Post				
× Lagged Sale	.002***	0.00045	0.00027	.021***
	(.00052)	(.00069)	(.00058)	(.0035)
× Lagged Sales Growth	-.0044***	0.00019	0.00051	-.0036
	(.00054)	(.00074)	(.00063)	(.0039)
× Age	.0029***	0.00074	0.00054	-.0082*
	(.00049)	(.00065)	(.00054)	(.0042)
× Cash	-.0077***	0.00066	0.00095*	.0016
	(.00053)	(.00061)	(.00052)	(.0038)
× Debt	.0033***	-.00038	0.00025	.0025
	(.00048)	(.00065)	(.00054)	(.0039)
× ROA	-.011***	0.00056	0.00046	-.0004
	(.00065)	(.00068)	(.00057)	(.004)
× Dividend	-.017***	0.0009	.001*	.011**
	(.0011)	(.00069)	(.0006)	(.0043)
Fixed Effects Set	✓	✓	✓	✓
Obs.	558,826	558,826	558,826	558,826

This table shows the effect of the 2013 dividend tax increase for different proxies of credit constraints for separate regression and reports the coefficient on the triple interaction of a treated dummies interacted with the year being 2013 or later, and an indicator for the firm being in the top quintile rather middle three quintiles are omitted) of the traits specified in the row heading. We estimate equation 1 and interact all the different fixed effects with the firm characteristic dummy.The set of fixed effects is: firm, industry×year, pre-reform asset growth quintile×year and pre-reform capital growth quintile×year. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.