Dividend Taxes and the Allocation of Capital
American Economic Review, Online Appendix

Definition of variables

Variable	Definition
Productivity	Residual from the regression value-added on capital and labor (all in logs), estimated separately for each 2 digit industries
Total investment	Total Capital$_t$ -Total Capital$_{t-1}$
Tangible investment	Tangible Capital$_t$ -Tangible Capital$_{t-1}$
Total capital	Tangible capital + Intangible capital
Tangible capital	property, plants and equipment
Liquidity	cash + short-term investment
Net working capital	Current assets - current liabilities

Additional construction detail for some variables

All the code for the construction is available online and a detailed readme file explains how to get access to the data. The local labor market comes from the file Insee (2020) and is matched with firms using the city ("code commune") unique identifier. Subsidiaries are identified by using the dataset Lifi 2012–2017 (INSEE and DGFIP, 2013–2018) and "Enquete Lifi" 2008–2012 (INSEE, 2009–2013). The dataset allow to identify firms belonging to a business group to determine the ownership structure 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.

The data to produce the evolution of the number of new firms in Figure A.10 come from SIRENE 2007–2019 (INSEE, 2008–2020).

A Detailed differences across SAS and SARL

A.1 Firm differences

The differences and similarities between SAS and SARL can be summarized by the table below.

Table A.1: Main Legal Differences Between Treated and Control Firms

	SARL (Treated)	**SAS** (Control)
Owner-managers	**Majority-owner not employed**	**Employee**
Spouse status	Spouse collaborator	Employee
By-laws	Pre-defined	Completely flexible
Types of Shares	Ordinary	Different share classes possible
# of Shareholders	Limited to 100	No max
Bonds Issuance	Audit necessary + $\geq$ 3 year	No condition

As we explained in Section 1.2.2, the main difference regarding the owner-managers 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 owner-managers 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 are many 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 firms. This makes it particularly appealing for instance for entrepreneurs with potential shareholders / associates that they do not necessarily trust, or for unsophisticated entrepreneurs. SARL by-laws are almost "plug and play" and do not require a lawyer to design them.

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

- SAS also have 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.

- Finally, SAS firms face no restriction on the number of shareholders while SARL are capped at one hundred. In practise this constraint rarely binds as firms that need to have a large base of shareholders, for instance in prevision of an IPO, adopt the legal status "SA".

What these differences reflect is that how the reform affected the incentives to incorporate as a SAS or a SARL firm is complicated. Indeed, the optimal decision depends 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.

Why did entrepreneurs prefer the SARL status before the tax reform? There are multiple reasons for why the SARL status was preferred despite the lower flexibility regarding access to external financing.

First, the taxation of total compensation might be advantageous for SARL owner-managers when they paid themselves mostly in dividends. Second, the pension regime is different, with managers of SARL firms pay their payroll taxes to the "independent regime" and face lower social contributions (but also lower attached benefits), while managers of SAS firms pay their payroll taxes to the "general" regime. Third, the SARL status provides the possibility for the spouse of the owner-manager to work in the firm and be eligible for social benefits, without having to pay a wage.[44] Fourth, the lack of by-laws flexibility can be appealing for many entrepreneurs who do not have legal background and are worried they could be deceived by their other shareholders.[45]

44. The spouse only has to pay the social contribution that would be associated with wage the employer would have paid.

45. This is actually a point that is commonly raised in the different blogs or articles for aspiring entrepreneurs that explains the differences in legal status, with a majority of them advising for the SARL status in case the entrepreneur is not "legally sophisticated."

A.2 Managers compensation: SAS vs. SARL

To study the compensation of managers in SAS and SARL, we merge wage data from the DADs, which allows to identify employees whose social contributions are paid to the general regime, and data from the ACOSS file, to identify owner-managers of SARL who pay social contribution to the independent regime. We identify CEO of SAS firms as the highest employee paid if we cannot find one CEO from the occupation variable. We set the wage of SARL owner-managers to zero if we observe the firm pays dividends but does not report any wage in the ACOSS file.

Prior to the reform, the unconditional average wage for a SARL owner-manager is €27.000 when including owner-managers with no wage, and €47.000 if we restrict to managers who pay themselves a wage. The wage of the CEO of a SAS is €62.000. While purely based on the tax arbitrage between wage and dividend payroll tax rate, managing directors would have incentives to pay themselves mostly in dividends (implying no wage for owner-managers of SARL m and the minimum legal for SAS managers), this is not what we observe in the data. The reason is that there are other motives determining the mix wage-dividends than just the tax arbitrage. The two main ones are the following.

First, the payroll taxes paid 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 a social security contribution as "compulsory payments paid to general government that confer *entitlement* to receive a future social benefit. Setting part of their compensation in the form of a wage and paying a social security contribution will therefore allow the owner-manager and her family to access various social insurance benefits such as health care, child care benefits, rights to retirement. As the generosity of these social insurance benefits increase (although not one-for-one) with the amount of social contribution paid, owner-managers might have incentives to set the level of their wage above the minimum wage, to achieve the social security contribution that would provide them with the social security rights they desire and use dividends to pay themselves the rest of their compensations.[46]

Second, dividend payments are regulated along two dimensions: (i) dividends can never exceed the net income from previous accounting exercises, net of all past losses (if any) and amortization of various expenses, and (ii) dividends have to be

46. Most French websites for entrepreneurs discussing the arbitrage between having a compensation in wages or dividends advocate a mix for the entrepreneur's compensation for this specific reason.

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. The fact that firms are not allowed to distribute dividends if they make losses (unlike for wages) in particular, would make entrepreneurs facing "consumption commitments" such as a mortgage to repay to prefer to set for themselves a baseline level of wage to cover these commitments.[47].

In Table A.2, we provide a formal analysis of the difference in wages and dividends paid between SAS and SARL firms. We report the results of a regression estimated over the pre-reform period, showing the difference in average wage, dividend paid and ratio of dividends over wage between SAS and SARL firms. Because SAS and SARL firms might differ along their size or sectoral composition, we show the results with and without different fixed effects that controls for the heterogeneity across groups. It is important to note that dividends are the total dividends paid by firms and *not* the dividends paid directly to the managing-director. We find that on average, CEOs (owner-managers) of SARL firms are paid around 30% less than CEOs in SAS firms (columns 1–2). We also find that SARL firms pay more dividends, once we control for differences in industry, size and localization (column 4) .

Table A.2: SAS - SARL CEOs Pre-Reform

Dependent Variable	log(CEO Wage)		Dividend / Capital	
	(1)	(2)	(3)	(4)
SARL firm	-0.28***	-0.27***	-0.029***	-0.014***
	(0.0063)	(0.0066)	(0.0046)	(0.0026)
Fixed Effects				
Size× Year	—	✓	—	✓
Industry × Year	—	✓	—	✓
County × Year	—	✓	—	✓
Observations	584,559	584,559	593,939	593,939

This table shows the difference between SAS and SARL firms for the period 2008–2011. In columns 1–2, we use the inverse hyperbolic sine transformation of the log function (e.g., Burbidge, Magee, and Robb, 1988; MacKinnon and Lonnie, 1990), defined as: $log[X + (X^2 + 1)^{1/2}]$ for wages to handle cases where the CEO does not report any wage. Standard errors are clustered at the firm level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

47. For theoretical and empirical evidence that consumption commitments lead individuals to become risk-averse, see Chetty and Szeidl, 2007

B Discussion of the reform

B.1 Why did the reform only impact SARL firms?

There are two main reasons the reform only affected SARL firms:

Reform of independent workers' status. The first one is related to the status of the owner-manager and the social benefits 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 benefits regime. Independent workers contribute to the "*Régime Social des Indépendants*" (RSI), whereas employees contribute to the French standard regime ("*Régime Général de la Securité Sociale*"). Furthermore, in 2009 another category of independent French workers, the "*professions libérales*" (high skill self-employed) experienced the same change in taxation on their own dividends that affected SARL owner-managers in 2012.[48] One year after the 2012 reform, it was finally extended to another category of independent workers, the agricultural workers. The relationship between these three reforms is that they all concerned independent workers paying social contributions to the same RSI regime.

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 SARL firms. In turn SA and SAS firms are more likely to have a higher lobbying power. This appears clearly in 2015 when a parliamentary amendment to extend the tax reform to SA and SARL was rejected following intense lobbying by France's two main employers' organisations. In 2014, a French deputy proposed an amendment to the social security funding law to enlarge the reform to SA and SAS firms which was also ultimately rejected. The amendment specifically stipulates that its aim was to reduce fiscal optimization of SA and SAS owner-managers while ensuring equity between them and SARL owner-managers.[49]

From an article in the leading French newspaper *Le Monde*, we learn that its rejection was the result of an intense lobbying campaign by the two french employers' organizations.[50] The article reports that they lobbied Emmanuel Macron, then Secretary of Treasury (Minister of Economics and Finance), that finally man-

48. French "*professions libérales*" include lawyers, doctors, notaries, etc.

49. Amendment 876 to the 2015 *Loi de Finance pour le Financement de la Sécurité Sociale*

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

aged to convince President Francois Hollande to ask the parliament to withdraw the amendment. The underlying explanation is that SA and SAS firms are better represented among those two organizations than were SARL firms.

Subsequent reactions to the reform. The exclusion of SA and SAS firms from 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," lobbied against it but ultimately failed.[51] The election of Emmanuel Macron generated some hope that the reform would be abolished but it has remained in place.

Interaction with taxation around liquidation. The reform did not affect the taxation regarding liquidation and both SARL and SAS firms are exposed to the same taxation. 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.[52]

B.2 Details of the reform and kink

The new tax rate did not apply to 100% of the dividends paid, but actually only applied to for dividends accounting for more than 10% of the firm book value of share capital owned by the manager and her family. This created incentives for treated entrepreneurs to restrict their dividends at this threshold.

The new tax rate did not apply to 100% of the dividends paid, but actually only kicked in for dividends accounting for *more* than 10% of the firm nominal share capital owned by the manager and her family.[53] Below this threshold, the payroll tax rate remains at 15.5%. The rational for this kink was that the total compensation of an entrepreneur is a mix of compensation for the labor (and as such should be taxed like any wage) and compensation for the capital (and as such should be taxed like all other capital income). Therefore, the reform essentially introduced the notion that above a certain amount, dividends could not

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

52. This means in particular that following the change in the 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.

53. The inclusion of the shares owned by the family to determine whether the managing director owns a majority of the firm's shares prevents owner-managers from simply transferring the shares to their family members and as such escaping the reform.

be considered as compensating the capital invested by the entrepreneur (hence the ratio set relative to the value of equity owned by the entrepreneur) but instead, was necessarily the remuneration of labor.

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 the following payroll taxes:

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

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%×50,000 = €7,500 instead of €19,950.[54]

While this can create an incentive for owner-managers to increase the amount of nominal share 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 protection, they have an incentive to keep the value of the share capital to its minimum. We also directly test if treated firms increase their share capital after the reform and find no difference between treated and control firms. This can also be explained by the fact since we are looking at private firms, increasing the amount of share capital is difficult for these firms as there is no centralized market on which they can issue new equities.

It is important to note that share capital is *not* equivalent to total equity but only accounts for a subset of it. In particular, there is *no mechanical relation* between investment or retained earnings and share capital. Firms can increase their investment and accumulate more retained earnings without it having any effect on the amount of share capital in the firm.

In Figure A.1, we plot the distribution of dividends scaled by share capital for the sample of firms paying dividends. A large fraction of firms either pay no dividends, or pay dividends in proportion much higher than 100% of the firm share capital.[55] Therefore, to be able to visualize the bunching, we restrict the sample

54. 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.

55. While this number might seem high, it is important to stress that the accounting definition of "share capital" is *not* equivalent to the definition of equity in corporate finance. Share capital is only the book value of capital brought by the different shareholders to create the firm and

to firms paying at least some dividends but less than 100% of the firm's share capital. We reproduce the figure when we do not restrict the value of dividends paid in Appendix, Figure A.2.

The distribution of dividends is similar among treated and control firms and the ratio is evenly distributed across the different values until 2012. Starting in 2013, we observe a bunching right below the 10% threshold for the firms affected by the tax reform, while the distribution for firms not affected remains stable. Consistent with the idea that agents do not immediately understand the subtleties of the new tax regime, the fraction of treated entrepreneurs who bunch at the threshold increases slowly over time and peaks after four years.[56] While the bunching reaction might seem large, it is important to stress that the vast majority of firms paying dividends are paying much more than 10% of their share capital, and therefore are still exposed to the dividend tax increase.

In Figure A.2, we display the bunching analysis when we do not cut the distribution on the right at the 60% of share capital threshold, but instead winsorize the data at 2.5 times.

B.3 Intertemporal shifting

When studying whether firms could adjust their dividends, it is important to stress several elements that constrained this possibility:

- The election of Francois Hollande in May 2012 came largely as a surprise, and this specific reform was not part of his election platform. The law was introduced in November 2012, and affected dividends paid starting the 1^{st} of January 2013.

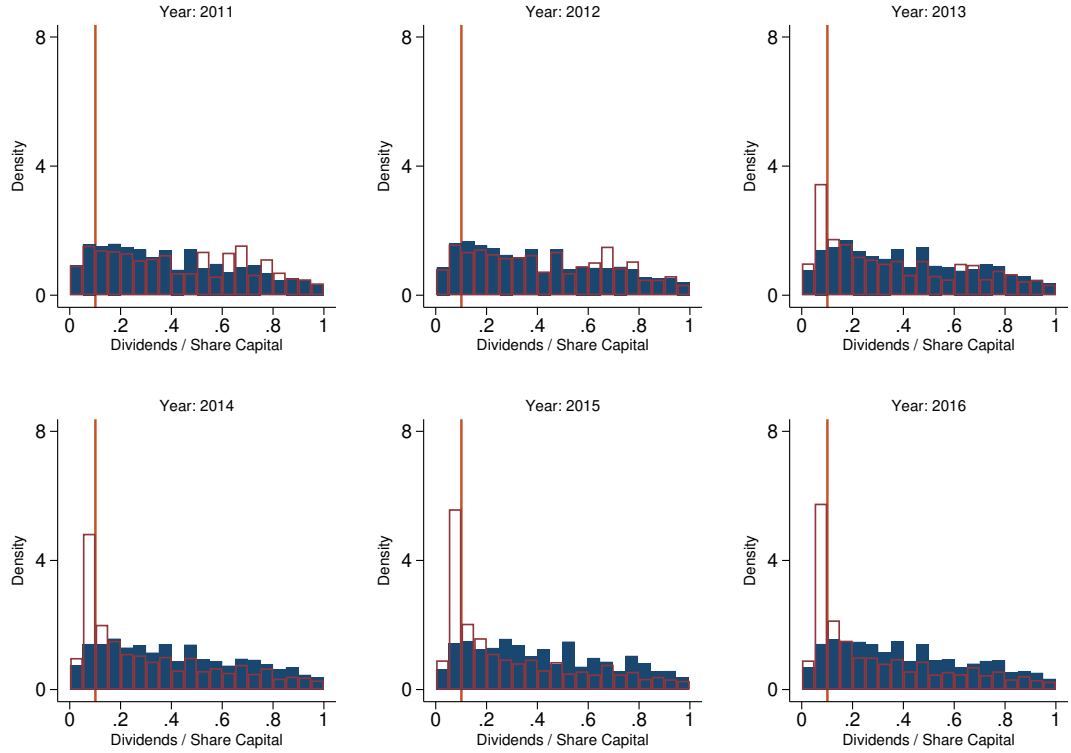
- Dividends are decided the day of the Shareholders General Meeting, who meet when the firm closes its annual account.

- When a firm pays an annual dividend, the fiscal administration prorates the tax over the previous twelve months of the firm fiscal date. This means for instance that firms closing their annual account in March 2013 only pay the new tax rate on one-fourth of the dividends paid, because only the dividends belonging to January-March are taxed at the new rate, while the rest of the dividends are assigned to the rate for months of April–December 2012.

determine their financial liability in case of a default of the firm. The more standard definition of equity in corporate finance is defined as: equity = share capital + reserves + retained earnings.

56. 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.

Figure A.1: Dividend Payment Around the 10% Threshold of Share Capital

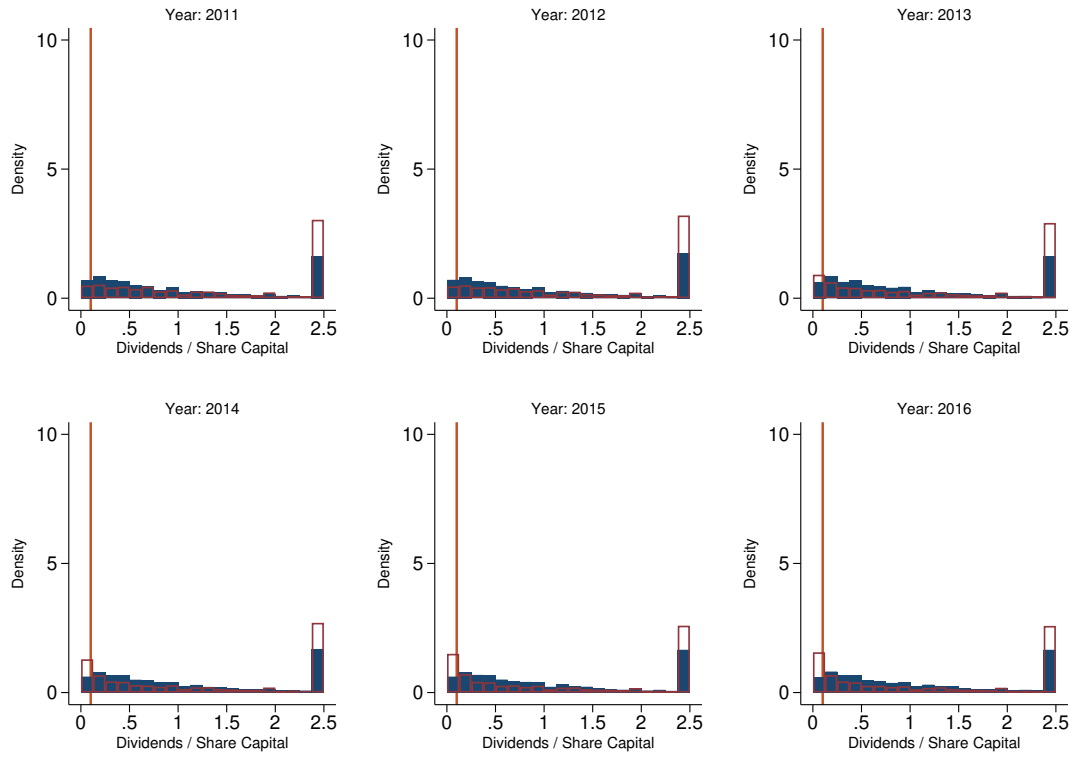


The figure plots the distribution of the ratio of dividends over share capital for the years 2011–2016 when we restrict the distribution to firms paying some dividends, but paying less than 100% of the firm's share capital. The x-axis is the ratio dividend/share capital (in percentage). The y-axis is the density of firms in a specific bin of dividend/share capital. "Treated" firms are firms affected by the 2013 tax reform on all dividends paid for a value above 10% of the firm's share capital (SARL) and "Control" firms are not affected (SAS). Control firms are in filled bars, treated firms are the empty bars.

This creates essentially two groups of firms. First, firms that close their annual account in December and can react to the announcement in November 2012 (but have a very short window for doing so), which will be able to pay the lower rate on all of their 2012 dividends. However, these firms will have to pay the new tax rate on *all* the dividends paid in 2013. Second, firms that close their annual account before the fiscal month of December (i.e., January–November). These firms could not adjust their dividend payments in 2012 since it was decided before the law is introduced. In 2013, they will only pay part of the new tax rate, and fully the new tax rate in 2014.

To test if we observe a differential reaction, we estimate our baseline regression but split firms between those that close their annual account before November, and those that close their annual account after. Figure A.3 reports the results. We find that indeed, while the group of firms that close their annual account before November paid more dividends in 2013 and only reached the lowest level of

Figure A.2: Dividend Payment Around the 10% Threshold of Share Capital



The figure plots the distribution of the ratio of dividends over share capital for the years 2011–2016 when we restrict the distribution to firms paying some dividends and winsorize the data at 2.5 times firm's share capital. The x-axis is the ratio dividend/share capital (in percentage). The y-axis is the fraction of firms in a specific bin of dividend/share capital. "Treated" firms are firms affected by the 2013 tax reform on all dividends paid for a value above 10% of the firm's share capital (SARL) and "Control" firms are not affected (SAS).

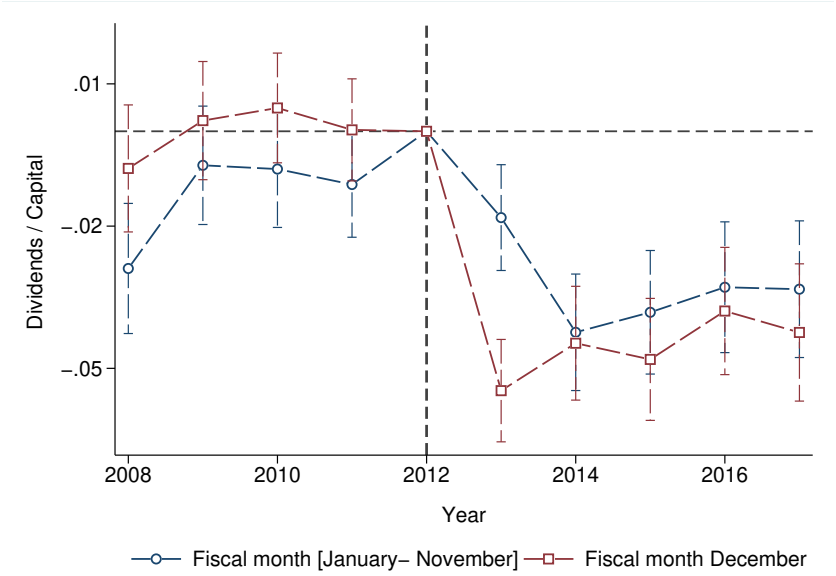
dividends payment in 2014, firms that have to pay the new tax rate on the total amount of dividends paid adjusted their dividends immediately in 2013.

B.4 Additional reforms around this period

Following the election of Francois Hollande, several reforms related to the taxation of individuals and firms were implemented. The three main reforms are:

- The cancellation of the flat tax on capital income. Following the reform, all types of capital income (dividends, bonds and capital gains) became taxed through the progressive income tax schedule only while before that, it was possible for individual to opt in for a flat-tax. This reform led to an increase in the marginal rate faced by the most affluent households and

Figure A.3: Effect of 2013 Tax Reform on Dividends Payment: Anticipation



This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The dependent variable is scaled by total capital in 2011. The blue round is the group of firms that close their annual account before November. The red square is the group of firms that close their annual account between November and December.

could potentially explain why aggregate dividends went down after 2013. From 2008 to 2012, taxpayers receiving dividends have the choice between progressive income tax and a flat-rate withholding tax called *Prélevement forfaitaire obligatoire* or PFL in France. The 2013 reform abolishes the PFL and reintroduces dividends into the progressive income tax schedule, leading to a potential increase in the level of taxation for some (well-off) taxpayers. In 2018, the introduction of the single flat-rate tax (PFU) optionally re-establishes a system of flat-rate taxation of capital income and in particular dividends.

- The government also implemented a tax credit aimed at boosting competitiveness and employment, named the CICE (standing for Competitiveness and Employment Tax Credit or *Crédit d'impôt pour la compétitivité et l'emploi* in French), which is explained in detailed in Malgouyres and Mayer (2018). This tax credit is set proportional to the share of the wage-bill paid to workers under a certain threshold (2.5 times the national minimum wage). Each firm receives a transfer of 4% (raised to 6% since 2014) of the total wagebill that is under the threshold.

- Finally, the 2013 Social Security reform also reduced owner-managers their professional expense deduction. Prior to 2013, they were able to deduct 10%

of professional expense from their taxable income, which got removed by the reform.

While concomitant to the reform analyzed in this paper, these two reforms are unlikely to be important source of biases for two reasons.

First, as they are not specific to a particular legal status and as such, both treated *and* control firms are affected in the same way. They do, however, strengthen the importance of having a tight control group and therefore justify the inclusion of multiple fixed effects in the baseline specification even more.

Second, we show in Table 5 that we find very similar results when, instead of exploiting the distinction between SARL and SAS, we exploit *within* legal status differences and compare high dividend payer SARL to low dividend payer SARL and include legal status×year fixed effects, to net out any additional differences existing between SARL and SAS.

C Discussion of tax incidence

How should wage earners incorporate expected social benefits into 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, Matsaganis, and Tsakloglou (2012) and Saez, Schoefer, and Seim (2019) which find, in Greece and Sweden, a full incidence on capital rather than labor.

Bozio, Breda, and Grenet (2018) uses 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 benefits 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 com-

plementary 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 guaranteed by the government is very limited. The best estimate we have comes from Finkelstein, Hendren, and Luttmer (2019) who, using the Oregon Medicaid Experiment, estimate the recipients value Medicaid benefits at around 50%. Since this estimation of the benefits valuation by recipients is made in a very specific context: Medicaid in the U.S. and might therefore not be representative for French entrepreneurs.

D External Validity

How much do our results apply to other contexts? Countries are different on multiple dimensions and applying results from one country to another is always a heroic exercise. Nonetheless, while the modal firm in this study might seem small relative to previous studies looking at (mostly listed) firms in the U.S., our final sample is representative of the French economy and the French economy is representative of most other developed countries.[57]

D.1 Share of French Economy

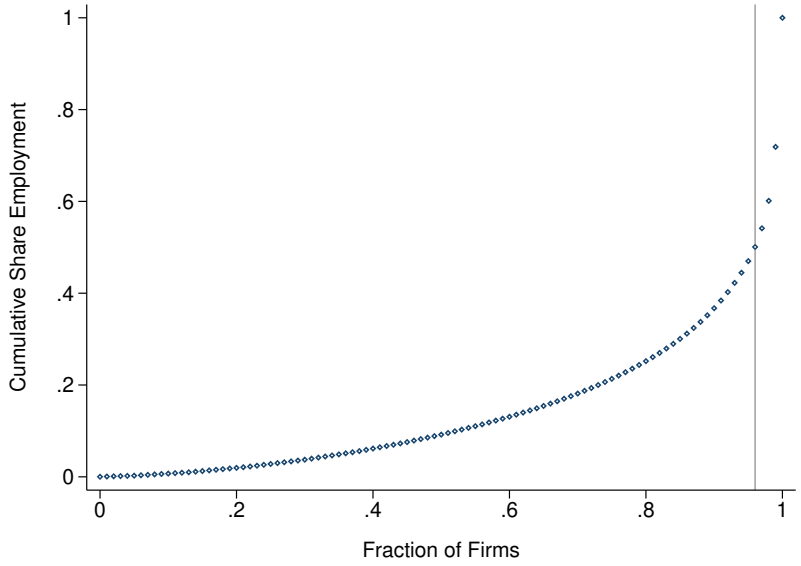
In Figure A.4, we plots the cumulative density function of firms by size. In Figure A.5, we plot the cumulative distribution of firm size (using employment) for treated and control firms separately. In Figure A.6, we plots the shares of employment, investment and value-added of by treated firms in the sample.

D.2 Comparison with Europe

We provide two set of analyses to support the idea that France is comparable to other OECD countries. First, using data from Eurostat, we show France has a similar distribution of small firms (fewer than 50 employees) and medium firms (between 50 and 250 employees) as other European countries (Figure A.7). We find the same similarity when looking at the sectoral composition (Figure A.8).

57. The U.S. is an exception in the OECD given the size of its economy relative to other countries. Using GDP in dollars, in 2019 the U.S. was 7 times larger than France and the U.K., 5 times larger than Germany, 10 times larger than Italy, and 16 times larger than Spain.

Figure A.4: Firm Size Distribution



This figure plots the cumulative distribution of firm size for all private firms in the French economy in 2011. The grey line indicates the 95^{th} percentile.

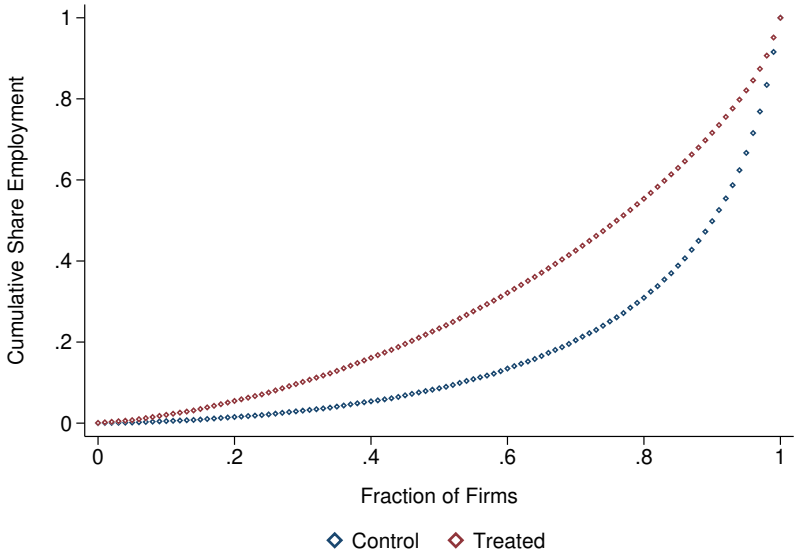
Eurostat, the European statistical office in charge of harmonizing data across European countries, produces many statistics to help us understand how France compares to the rest of Europe. We use data from structural business statistics (SBS), which gathers administrative data from members of the European Union and are used as a source of information to understand the detailed structure, economic activity and performance of businesses across the European Union (see **Eurostat˙ind** (**Eurostat˙ind**) and **Eurostat˙size** (**Eurostat˙size**)).

We start by plotting the distribution of firm size for each European economy, which can be split into three categories: small firms (fewer than 50 employees), medium firms (between 50 and 250 employees) and large firms (over 250 employees). Figure A.7 shows the distribution when we sort countries in ascending order of the share of small firms in the economy.

Two facts appear. First, the distribution of small and medium firms across countries is pretty similar, with small firms accounting for around 45% of the distribution in the EU. Second, France's fraction of small (40%) and medium (20%) firms is very representative, implying that conclusions draw on the French economy when looking at the population of small and medium size firms are likely to be valid for a large part of the European economy.

We can also examine the sectoral composition of France and the average of the European Union in Figure A.8 and find very similar distributions in economic

Figure A.5: Firm Size Distribution: Treated vs. Control



The figure plots the cumulative distribution of firm size between treated and control in 2009.

production.

D.3 Firm Size Distribution and Zipf's Law

Second, we show that the French economy, like other advanced economies, has a very similar firm size distribution as the U.S. economy that follows Zipf's law.[58] This empirical regularity implies that there is a mechanical link between the size of the country and the average firm size (e.g. Gabaix, 2016). Since the U.S. is an outlier in the overall size of the its economy, it is also actually an outlier in its average firm size. However, once "adjusted" for the size of the overall economy, the U.S. and French economies are very similar.

A well established empirical regularity in economics (and in other disciplines) is that the distribution of different variables follows a power law (see Gabaix (2016) for an overview). Power laws take the form $Y = aX^{\beta}$, where β is called the power law exponent. Such laws imply that if X is multiplied by a factor of 10, then Y is multiplied by a factor 10^{β}.

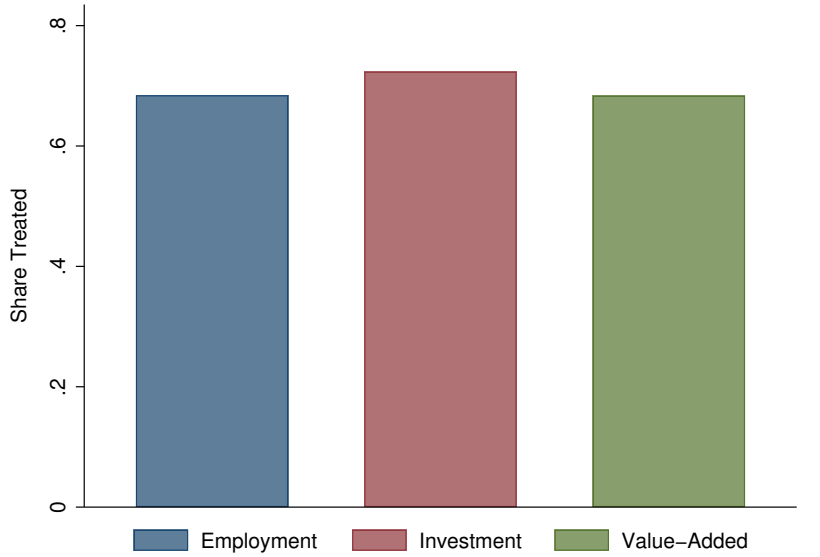
To estimate the value of β, we can simply estimate the following equation:

$$log(Rank) = \alpha + \beta \ log(Size)$$

where $Rank$ is the position of the firm in the distribution and $Size$ is the number

58. See Axtell (2001) for the U.S.; Fujiwara, Di Guilmi, Aoyama, Gallegati, and Souma (2004) for Europe; and Figure A.9 for a replication of the distribution in our sample.

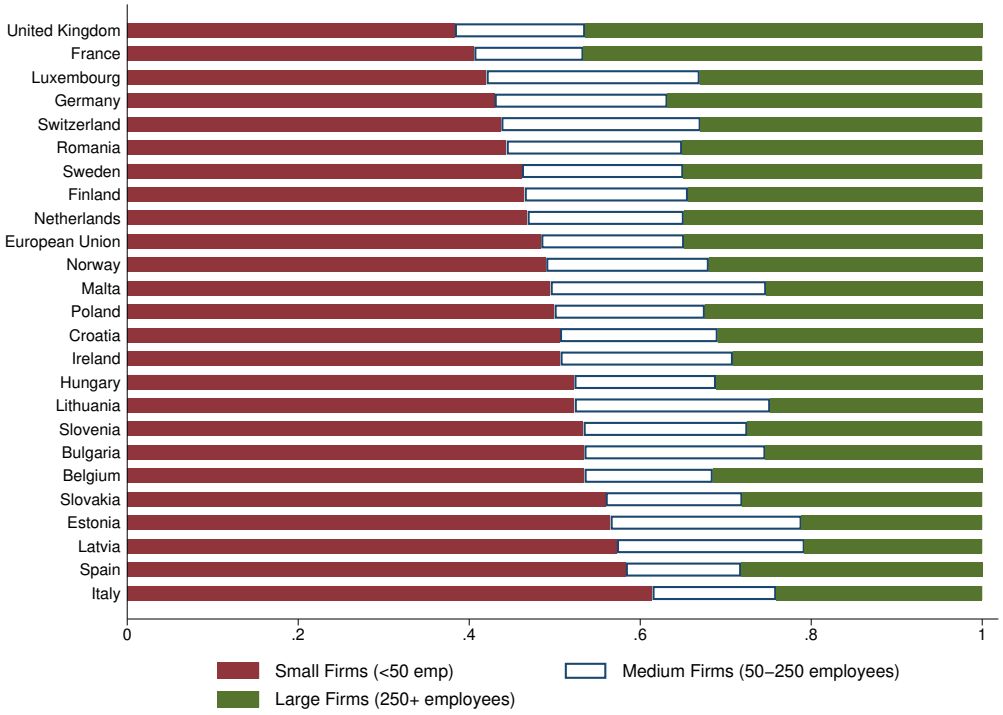
Figure A.6: Share Treated Firms



This figure plots plots the shares of employment, investment and value-added by treated firms in the sample.

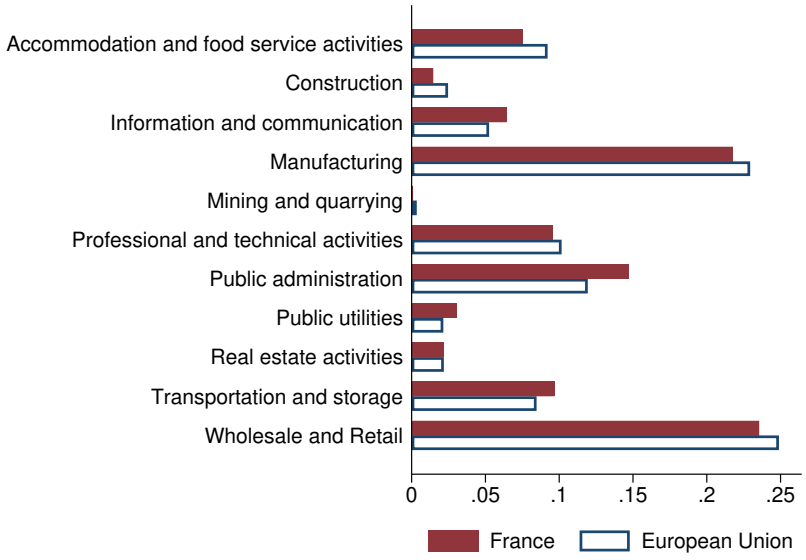
of employees. When the slope (or power law exponent) is equal to one, we say that the distribution follows a Zipf's law, based on a name of the Harvard linguist who first gathered evidence of the existence of such distribution. To estimate the relation for France, I follow Axtell (2001) who estimates it for the U.S. and put firms in "bins" according to their size as measured by their number of employees. I then regress the log rank on log size and obtain a β of -1.026 (s.e. = .107 and $R^2 = 0.92$), very close to the slope estimated by Axtell who finds β = -1.059.

Figure A.7: Firm Size Distribution in Europe



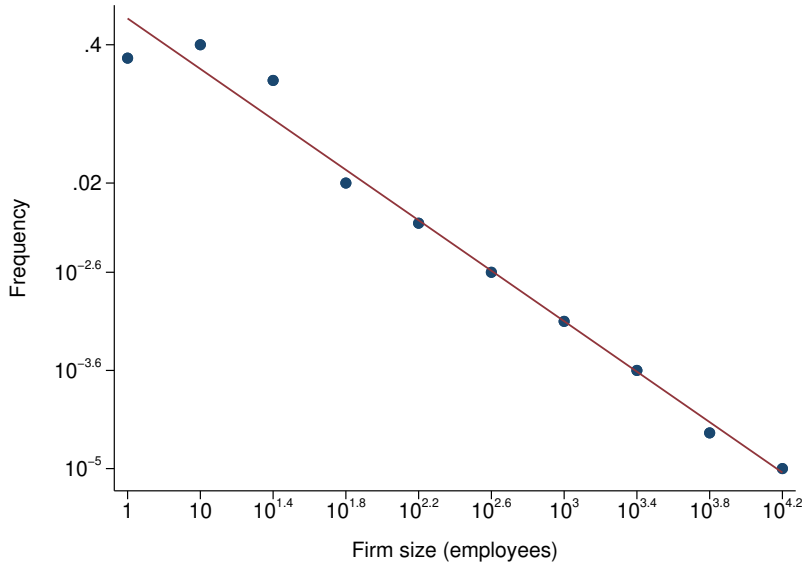
This figure plots the distribution of firm size across different European countries. Data comes from Eurostat.

Figure A.8: Sectoral Composition: France vs Europe



This figure plots the distribution of economic activities across sectors for France and the average of the E.U. Data comes from Eurostat.

Figure A.9: Firm Size Distribution: Zipf's Law for France



This figure plots the log frequency over log size of firms in France for 2009.

E Shareholder Data

SARL firms are affected by the reform if the manager owns, jointly with its family, at least 50% of the equity. We use the shareholder data in Amadeus to assess how often this is is the case.

We start with the shareholder data using the Amadeus CD of 2012 to ensure that we are not missing some firms.[59] The data are at the firm-individual level and reports the share of stocks that a given individual owns of the firm. Bureau (2020)

BvD compiles information about shareholder composition and managerial team from a variety of sources. Because the coverage is far from perfect (around 40% of firms) and the data accuracy about the exact shareholder composition is likely to be lower than for the administrative tax files, we view this information as mostly suggestive and do not use it in our analysis.

We start by summing all the stocks and dropping firms for which we cannot recover at least 90% of the total equity. This removes 25% of the firms in the Amadeus data, leaving us with roughly 30% of the firms in the French economy. We then need to construct the total holding at the family level, as the reform defines "majority owner" not at the shareholder level but at the family level. To do so, we exploit the fact that the data provides the name of the shareholder as well as her type (e.g. "individual" or "government owned"). We extract the last name of each individual for individual shareholders and sum the amount of equity at the family level.[60]

As an example, we can see in the data that the firm with the siren 016650343 has four shareholders: Hubert Chassy (holding 24% of the firm), Bernard Chassy (holding 20% of the firm), Michel Chassy (holding 16%) and Patrick Chassy (holding 40%). So while individually, none of them are the majority shareholder, the Chassy family together owns 100% of the firm.

This procedure allows us to identify firms with a majority shareholder (defined at the family level). Around 95% of firms in our sample have a majority owner. Note that this not necessarily imply that 95% of SARL are affected by the reform, as it could be the case (even though quite unlikely) that the family owners have appointed a *professional* manager who is outside the family. To test

59. One well-known problem with Amadeus data is that it suffers from serious survivorship bias as Bureau Van Dick (BvD) removes firms that have been inactive in the dataset after 10 years. Using the 2012 CD implies that inactive firms will be kept up to 2022 ensuring the analysis of firms around the reform does not suffer from the survivorship bias.

60. We consider shareholders are individuals if they belong to the following categories: "Employees/Managers/Directors", "One or more named individuals or families", "Self ownership."

if this is the case or not, we need to merge the shareholder data with another dataset which reports all the top management composition of the firm, including their title (which contains 4101 distinct categories) and their names. We harmonize the function and consider that someone is a manager if she belongs to one of the following categories: business manager, associate business manager director, president, associate business manager, co-business manager, business operate, partner, chairman of the board of directors, chairman of the executive board, chief executive officer, independent director, member of the board and president, director, associate business manager. For all firms we are able to identify at least one person who is potentially the true manager of the firm.

We then match on the name with the shareholder data to check if the name of the manager appears also among the name of shareholders (and therefore if the firm is run by an *owner*-manager). Because name matching is always tricky and subject to error, the procedure we use is the following. We start by cleaning obvious typos in first name as much as possible (e.g. "Ardien" or "Adrine" becomes "Adrien".) and then compare all firms in the shareholder data with all firms in the manager data and use string distance.

We then match these data with our sample coming from the tax-files. We manage to match slightly over 40% of observations. We report below some statistics for shareholders. The bottom line is that consistent with the statistics reported by the French statistical office, the over 95% of SARL firms is operated by an owner-manager, meaning that the approximation of using *all* SARL as the treated group is not an important source of noise.

Table A.3: Summary Statistics on Shareholders

	SARL			**SAS**		
	Mean	s.d.	p50	Mean	s.d.	p50
Nb of shareholders	4.54	3.10	4	4.52	2.9	4
Largest shareholder	0.71	0.26	70	0.69	0.25	69
HHI Share	0.67	0.29	0.58	0.65	0.22	0.60
Has a majority owner	0.96	0.20	1	0.92	0.22	1
Has an owner-manager	0.95	0.18	1	0.88	0.22	1

This table reports summary statistics for firms for which we can identify their shareholders. Data from Amadeus BvD. "Largest shareholder" is the fraction of shares own by the largest shareholder. "HHI share" is the HHI of shares across all the shareholders of the firm.

F Comparison with other studies

First, and most importantly, our reform is a rare case of tax increase. In the context of intertemporal tax arbitrage, the effect of the tax rate is potentially asymmetric. Indeed, in the case of a tax decrease, firms would want to increase their dividend payments while the tax rate is lower. The change in tax rate does not affect the structural profitability of projects, but firms would have to cut investment if they are resource constrained. However, if firms have enough cash, or have cheap access to external capital, they could maintain their investment rate and pay more dividends at the same time, consistent with results in Yagan (2015).[61] In the case of a tax increase however, the increase in free cash-flow coming from the unpaid dividends can be directly used to invest more when unexpected investment opportunities appear.

Second, most empirical studies have looked at listed firms, or firms that are unlikely to be financially constrained. Our sample of private, closely-held firms can pay dividends and have high marginal return to capital at the same time. In Appendix Table 7 , we show that our sample of private firms have on average a higher MRPK than French listed firms. Taking the results of Table **??** at face value that firms reinvest their extra unpaid dividends only if they have high return to capital, this would imply that we should find a smaller investment response if the reform were extended to listed firms.

Third, related to this difference in firm characteristics, the average entrepreneur in our sample is likely to be less sophisticated than the average CEO of a large, listed firm, implying that she might have a harder time anticipating future investment opportunities. In particular given that this period in Europe was characterized by sluggish growth caused by the European Sovereign debt crisis, entrepreneurs with expectations of low investment opportunities would have ended up not saving enough and paying themselves dividends instead. This explanation is consistent with our results in Table **??** that the increase in investment only happens for firms facing high investment opportunities post reform.

Fourth, the dividends paid to firms affected by our reform are with certainty used to pay the owner-manager of the firm. This means that the increase in the dividend tax rate is really an increase in the CEO compensation tax rate, who can counterbalance the higher tax rate by producing more. The effect on firm investment will therefore depend on whether the income or substitution effect

61. Note that the Bush-tax cut happened during a period where interest rates where historically low, which could explain why firms were able to not reduce their investment *and* increase their dividends at the same time.

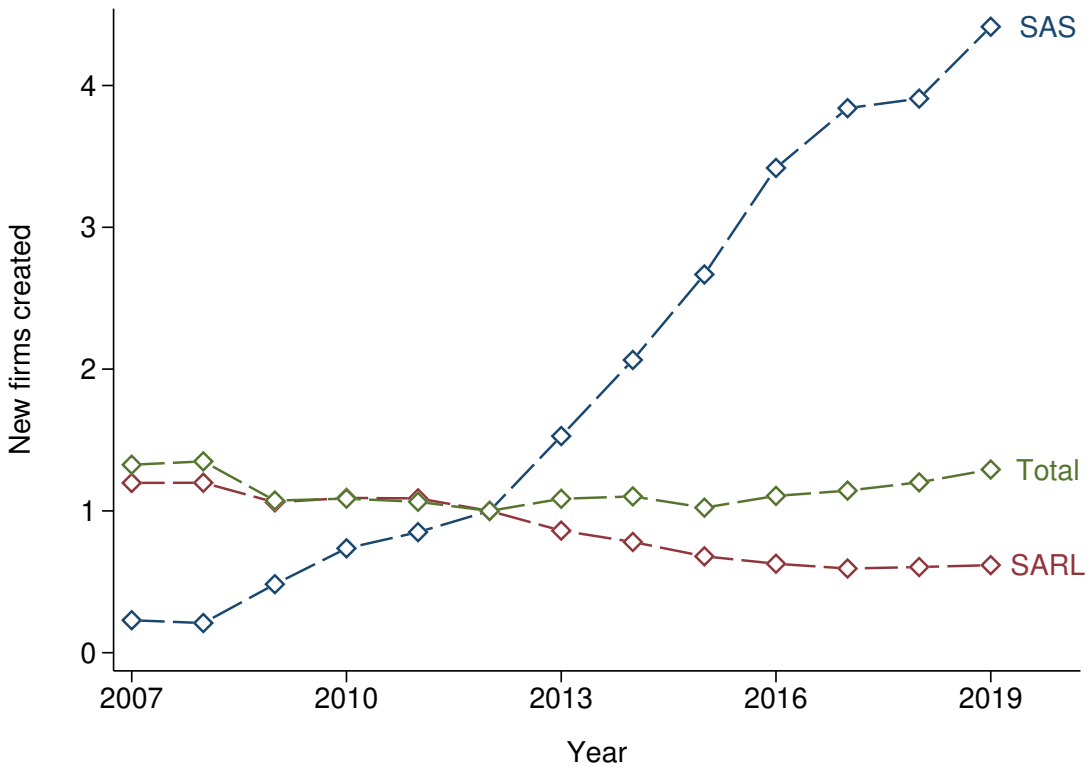
dominates. If owner-managers of SARL firms have a lot of committed consumption for instance, they might prefer to invest more to increase the firm future cash-flows to be able to meet their consumption, despite the increase in the tax rate. While it is usually assumed in the public finance literature that the substitution effect dominates, some recent papers have found evidence that in other contexts the income effect dominates.[62]

62. See for instance, Ring (2020) in Norway, Gelber, Isen, and Song (2016) in the US, Bosch and Klaauw (2012) in the Netherlands.

Appendix Tables and Figures

F.1 Evolution of the number of new firms by legal status

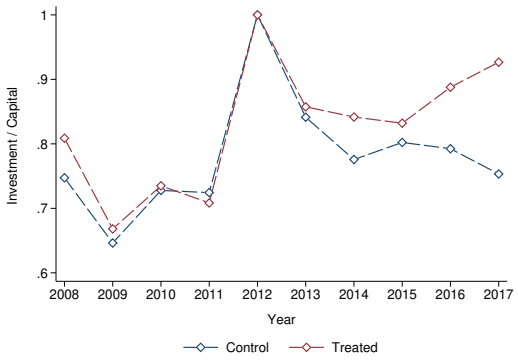
Figure A.10: Effect of 2013 Tax Reform on Firm Entry



This figure plots the evolution of the number of firms created, normalized in 2012 (the year prior to the reform).

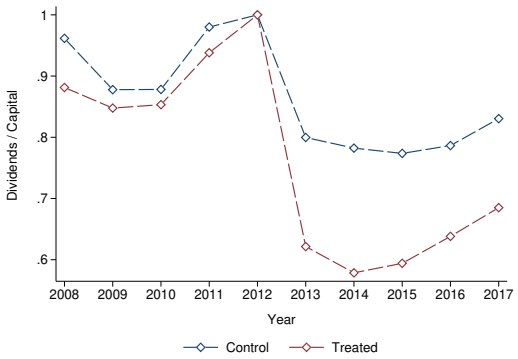
We show the evolution of the two principal outcomes in the paper for treated and control separately: total investment and dividends. To simplify the reading, we normalize to one the level for treated and control separately in 2012.

Figure A.11: Evolution of Investment: Treated vs. Control



The figure plots the evolution of investment scaled by capital for control and treated firms, normalized in 2012.

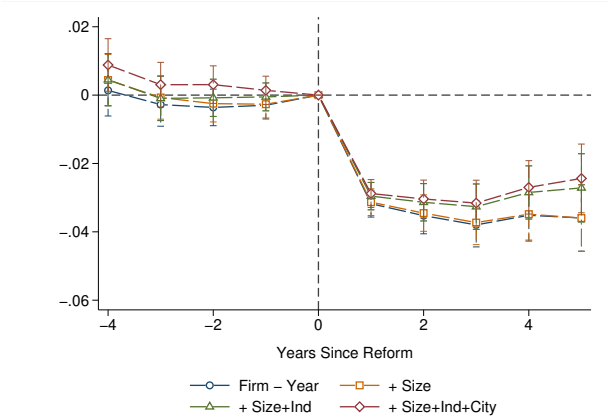
Figure A.12: Evolution of Dividends: Treated vs. Control



The figure plots the evolution of dividends scaled by capital for control and treated firms, normalized in 2012.

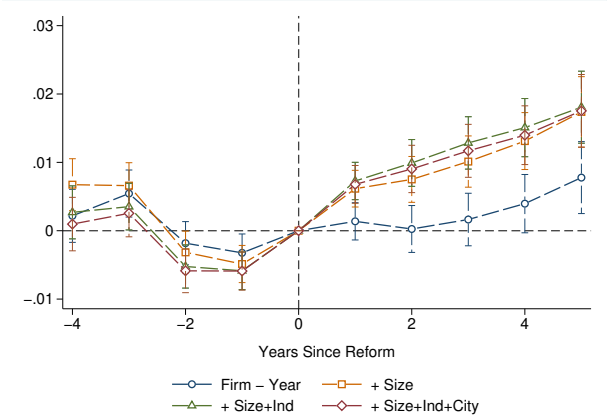
F.2 Event studies

Figure A.13: Yearly Response: Dividends



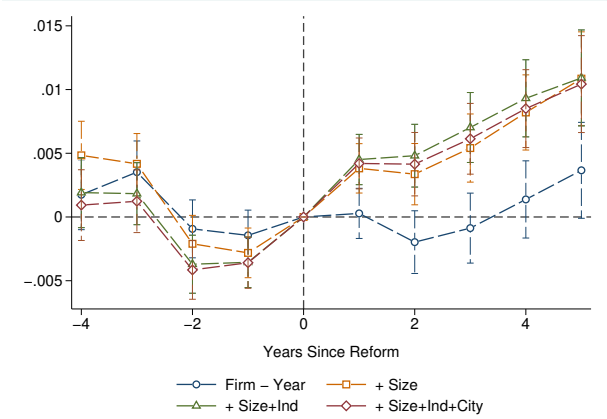
This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The dependent variable is scaled by total capital in 2011. The blue dot is the specification estimated only with firm and year fixed effects, the square orange is the specification estimated with firm and pre-reform size quartile-by-year fixed effects, the green triangle are the results estimated with firm, pre-reform size-by-year and industry-by-year and finally the red diamond are estimated with all fixed effects including city-by-year fixed effects.

Figure A.14: Yearly Response: Total investment



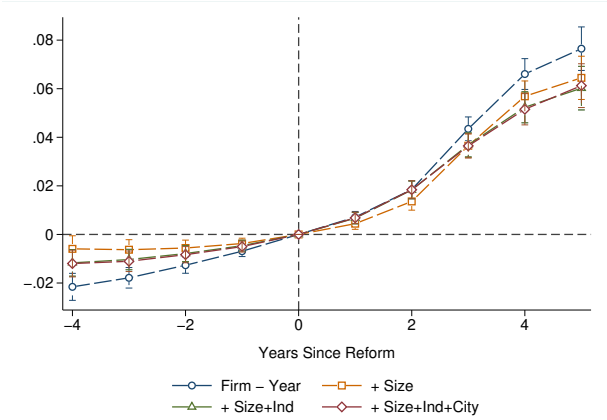
This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The dependent variable is scaled by total capital in 2011. The blue dot is the specification estimated only with firm and year fixed effects, the square orange is the specification estimated with firm and pre-reform size quartile-by-year fixed effects, the green triangle are the results estimated with firm, pre-reform size-by-year and industry-by-year and finally the red diamond are estimated with all fixed effects including city-by-year fixed effects.

Figure A.15: Yearly Response: Tangible investment



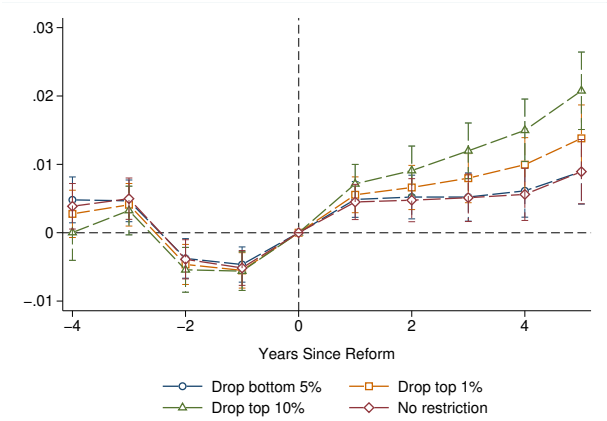
This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The dependent variable is scaled by total capital in 2011. The blue dot is the specification estimated only with firm and year fixed effects, the square orange is the specification estimated with firm and pre-reform size quartile-by-year fixed effects, the green triangle are the results estimated with firm, pre-reform size-by-year and industry-by-year and finally the red diamond are estimated with all fixed effects including city-by-year fixed effects.

Figure A.16: Yearly Response: Employment



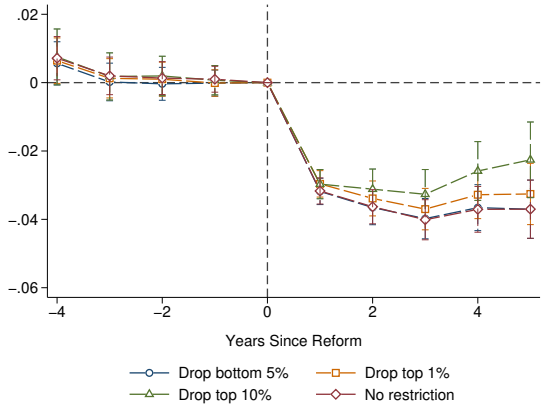
This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The dependent variable is log employment. The blue dot is the specification estimated only with firm and year fixed effects, the square orange is the specification estimated with firm and pre-reform size quartile-by-year fixed effects, the green triangle are the results estimated with firm, pre-reform size-by-year and industry-by-year and finally the red diamond are estimated with all fixed effects including city-by-year fixed effects.

Figure A.17: Yearly Response: Total Investment, Different Samples



This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The blue dot is the sample when we drop the bottom 5% of the asset distribution, the square orange is when we drop the top 1% of the asset distribution, the green triangle is when we drop the top 10% of the distribution, and finally the red diamond is when we do no restrict the sample at all.

Figure A.18: Yearly Response: Dividends, Different Samples



This figure plots the yearly coefficient and their 95% confidence intervals of the event study difference-in-differences estimator in equation (1) of the 2013 dividend tax increase. The blue dot is the sample when we drop the bottom 5% of the asset distribution, the square orange is when we drop the top 1% of the asset distribution, the green triangle is when we drop the top 10% of the distribution, and finally the red diamond is when we do no restrict the sample at all.

F.3 Summary Statistic: Dividends Paying vs. Not

Table A.4: Summary Statistics: Dividends Paying Firms

	Pre-Reform 2009–2012					
	Treated			**Control**		
	Mean	s.d.	p50	Mean	s.d.	p50
Dividend / Capital	0.33	0.59	0.11	0.35	0.62	0.11
Dividend / Net income	0.51	0.39	0.43	0.56	0.41	0.50
Other Firm Characteristics						
Asset	761,156	552,436	595,054	1,344,030	708,997	1,250,161
Tangible Capital	212,491	246,976	128,835	383,761	367,966	265,602
Employee compensations	253,536	214,066	198,007	389,422	312,703	308,840
Employment	8.42	9.19	6.10	13.7	13.8	10.2
Net Income / Capital	0.097	0.46	0.026	0.11	0.74	0.021
Liquidity / Capital	0.20	0.41	0.067	0.21	0.44	0.067
Debt / Capital	0.15	1.16	0.041	0.10	0.83	0.027
Total investment / Capital	0.081	0.13	0.058	0.055	0.13	0.036
Tangible investment / Capital	0.064	0.094	0.052	0.041	0.085	0.033
Net Current Asset / Capital	0.20	0.48	0.068	0.23	0.51	0.083
Supplier Credit / Capital	0.13	0.30	0.044	0.15	0.33	0.049
Supplier Credit / Capital	0.22	0.49	0.069	0.25	0.52	0.076

This table reports summary statistics for the universe of firms pre-reform. Capital is defined as tangible capital (property, plant and equipment) plus intangible capital (R&D, software, etc.). Employment is number of full-time equivalent

Table A.5: Summary Statistics: Firms Paying No Dividends

	Pre-Reform 2009–2012					
	Treated			**Control**		
	Mean	s.d.	p50	Mean	s.d.	p50
Dividend / Capital	0	0	0	0	0	0
Dividend / Net income	0	0	0	0	0	0
Other Firm Characteristics						
Asset	669,495	546,136	487,516	1,255,817	740,374	1,113,655
Tangible Capital	201,833	256,968	114,069	392,816	413,805	250,873
Employee compensations	211,982	212,815	156,330	381,087	368,379	279,332
Employment	7.85	11.1	5.50	13.8	15.5	9.75
Net Income / Capital	0.029	0.30	0.0054	0.025	0.43	0.0028
Liquidity / Capital	0.12	0.34	0.026	0.14	0.36	0.027
Debt / Capital	0.23	1.24	0.056	0.22	1.21	0.044
Total investment / Capital	0.067	0.16	0.038	0.064	0.21	0.026
Tangible investment / Capital	0.049	0.11	0.034	0.031	0.10	0.021
Net Current Asset / Capital	0.15	0.48	0.036	0.19	0.53	0.052
Supplier Credit / Capital	0.17	0.37	0.053	0.19	0.41	0.060
Supplier Credit / Capital	0.23	0.54	0.054	0.28	0.62	0.061

This table reports summary statistics for the universe of firms pre-reform. Capital is defined as tangible capital (property, plant and equipment) plus intangible capital (R&D, software, etc.). Employment is number of full-time equivalent

F.4 Non-linearity

To test for the existence of lumpy investment, we run a test inspired by Cooper and Haltiwanger (2006) and report the results in Table A.6. For different thresholds of investment, we create a dummy equal to one if the firm investment experiences a "jump" above this threshold (columns 1, 4, 7 and 10) to test the extensive margin, and then estimate separately the intensive margin when we observe a jump (columns 2, 5, 8, 11) and when we do not (columns 3, 6, 9, 12). We choose investment thresholds at 6% as this is the mean in our sample, 9% which roughly corresponds to the 75^{th} percentile, 12% (twice the mean) and 15% (75^{th} percentile conditioning on investment being positive).

We find evidence of investment lumpiness, particularly once we look at investment jump above 12% (columns 7–12). The probability to observe a jump increases by 4.9% (column 7) for investment above 12%, and increases by 6.5% for investment greater than 15%. By contrast, there is essentially no significant effect on the intensive margin, suggesting that a large part of our results on investment are consistent with investment being lumpy. Of course, we want to be careful here, as using lower threshold of investment to define jumps show that both the extensive and the intensive margin play a role (e.g., column 3 and 4).

Table A.6: Test of Lumpy-Investment

Investment jump threshold	6%			9%			12%			15%		
Dependent variable	Jump> 0	Investment		Jump> 0	Investment		Jump> 0	Investment		Jump> 0	Investment	
Conditioning on jump		Yes	No		Yes	No		Yes	No		Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treated×Post	0.023***	0.015***	0.00050	0.028***	0.016***	0.00052	0.036***	0.014***	0.00037	0.062***	0.0052	0.00047
	(0.0052)	(0.0033)	(0.00063)	(0.0061)	(0.0042)	(0.00060)	(0.0070)	(0.0051)	(0.00058)	(0.0094)	(0.0077)	(0.00057)
Fixed Effects												
Firm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	1,406,087	446,376	959,711	1,406,087	355,031	1,051,056	1,406,087	291,141	1,114,946	1,406,087	188,267	1,217,820

This table shows the effect of the 2013 dividend tax increase on investment. In columns 1, 4, 7 and 10, the dependent variable is a dummy that equal one if the investment is above a certain threshold (6%, 9%, 12% and 15% in columns 1, 4, 7 and 10 respectively). The other columns test the intensive margin of investment when we observe a jump or not. The dependent variable it total investment scaled by capital. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

F.5 Other robustness

Table A.7: Robustness

	Investment	Dividends	Sample
Treated×Post	.0052***	-.037***	No restriction
	(.0011)	(.0021)	
Treated×Post	.0054***	-.036***	Drop bottom 5%
	(.0022)	(.0022)	
Treated×Post	.0078***	-.033***	Drop top 1%
	(.0022)	(.0022)	
Treated×Post	.011***	-.030***	Drop top 10%
	(.0013)	(.0025)	

This table shows the effect of the 2013 dividend tax increase for different sample selections. All specifications are estimated as equation 1 with size bin, county and industry by year fixed effects. Restrictions are based on the asset distribution in 2012 and include both listed and private firms. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.8: Average Results: Firms Not Exiting

Dependent Variable	Dividends	Total Investment	Tangible Investment	Sales	Productivity
	(1)	(2)	(3)	(4)	(5)
Treated×Post	-0.033***	0.012***	0.0083***	0.023***	0.0070***
	(0.0027)	(0.0014)	(0.00095)	(0.0018)	(0.0017)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	1,077,838	1,075,331	1,075,364	1,079,625	1,079,437

This table shows the effect of the 2013 dividend tax increase when we restrict to firms not exiting. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.9: Cross-Sectional Results: Firms Not Exiting

Dependent Variable	Total Investment					
	Investment Opportunity Bin			MRPK Bin		
	1^{st}	2^{nd}	3^{rd}	1^{st}	2^{nd}	3^{rd}
	(1)	(2)	(3)	(4)	(5)	(6)
Treated×Post	0.0092***	0.014***	0.018***	0.0056***	0.012***	0.015***
	(0.0022)	(0.0023)	(0.0028)	(0.0019)	(0.0019)	(0.0030)
Fixed Effects						
Firm	✓	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓	✓
Observations	331,581	331,638	331,619	358,854	357,922	356,922

This table shows the effect of the 2013 dividend tax increase when we restrict to firms not exiting. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.10: Sensitivity of Dividends Response

Dependent Variable	Dividends					
Cross-section	Investment Opportunity			Pre-Reform MRPK		
Bin	1^{st}	2^{nd}	3^{rd}	1^{st}	2^{nd}	3^{rd}
	(1)	(2)	(3)	(4)	(5)	(6)
Treated×Post	-0.021***	-0.026***	-0.049***	-0.011***	-0.016***	-0.061***
	(0.0029)	(0.0035)	(0.0055)	(0.0021)	(0.0030)	(0.0062)
Fixed Effects						
Firm	✓	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓	✓
Observations	468,882	469,043	469,024	470,352	469,481	468,485

This table shows the effect of the 2013 dividend tax increase on dividend policies when firms are sorted by their investment opportunities (columns 1–3) and pre-reform marginal return to investment. We compute investment opportunity by using a leave-one out mean at the industry-county level of investment over the post period and sort firms into terciles, 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. We compute marginal return to capital as revenue over capital. We then sort firms into terciles within each industry Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.11: Cross-Sectional Results: Agency Conflicts

Dependent Variable	Dividends		Total Investment		log(employment)	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated ×Post × High Dividends Pre-Reform	-0.031***	-0.031***	0.097***	0.099***	0.028***	0.030***
	(.0024)	(.0024)	(.0013)	(.0014)	(.0018)	(.0017)
Treated ×Post × Non family shareholders		0.0032		-0.0011		0.0012
		(.0046)		(.0015)		(.0018)
Fixed Effects						
Firm	✓	✓	✓	✓	✓	✓
Size× Year	✓	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓	✓
Treated × Year	—	✓	—	✓	—	✓
Observations	564,226	564,226	564,226	564,226	564,226	564,226

This table shows the effect of the 2013 dividend tax increase on dividends, investment and log(employment). The sample is restricted to firms that are matched with the shareholder data from Amadeus BvD. Odd columns (1, 3, 5) report the average results . In even columns (2, 4, 6), we sort firms based on the ratio dividend over CEO wage. The dummy *Non Family Shareholders* takes the value one if we identify at least one shareholder that is not of the family of owning the majority of the firm equity. All the fixed effects are interacted with the new variable. Standard errors are clustered at the firm level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.12: MRPK: Comparison Listed and Private Firms

Dependent variable	MRPK (continuous)				MRPK>Industry Median				MRPK∈Industry Tercile = 3			
Industry level					2-digit	3-digit	4-diit	5-digit	2-digit	3-digit	4-diit	5-digit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Listed	-2.62***	-2.84***	-3.01***	-3.04***	-0.044*	-0.065***	-0.075***	-0.076***	-0.064**	-0.096***	-0.11***	-0.11***
	(0.42)	(0.29)	(0.27)	(0.27)	(0.024)	(0.013)	(0.011)	(0.0099)	(0.030)	(0.016)	(0.014)	(0.013)
Fixed Effects												
Industry (2-digit)	✓	—	—	—	✓	—	—	—	✓	—	—	—
Industry (3-digit)	—	✓	—	—	—	✓	—	—	—	✓	—	—
Industry (4-digit)	—	—	✓	—	—	—	✓	—	—	—	✓	—
Industry (5-digit)	—	—	—	✓	—	—	—	✓	—	—	—	✓
Observations	1,199,512	1,199,512	1,199,512	1,199,512	1,199,512	1,199,512	1,199,512	1,199,512	799,677	799,678	799,677	799,973

This table shows the difference in MRPK measured as value-added over capital for the pre-reform period (up to 2013). *Listed* is a dummy equal to one if the firm is listed or if it is a subsidiary of a listed firm. In columns 5–8, the dependent variable is a dummy equal to one if the firm MRPK is above the industry median. In columns 9–12, the dependent variable is a dummy equal to one if the firm MRPK is in the last tercile of industry distribution. The second tercile is omitted so that the comparison is between the first and last tercile. We vary the industry level to compute the distribution and indicate the level used in the line "Industry level". Standard errors are clustered at the industry level. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

G Cross section of equity-dependence

In addition to the usual challenge of finding empirical proxies for the dependence on equity funding, our setting presents another reason for why we might not find an effect on equity dependent firms. As explained in Section 1.2.2, the increase in dividend taxes only reduce the after-tax returns on equity for the owner-managers and working members of her family. This implies that in theory, external capital providers could invest in the firm without facing a reduction in their after-tax returns on equity. We think however that this problem is limited for two reasons. First, the tax increase applies to entrepreneurs holding more than 50% of the firm equity. Since it is not possible by law to discriminate dividend payments among shareholders, any increase in dividends would have to be paid in majority to the owner-manager, on which she will have to pay the extra tax. Since she can set the dividend policy by herself (as she is the majority owner), it seems reasonable to assume that her tax-rate is the tax-rate faced by the firm in general. Second, for most of these firms, the main capital provider is the entrepreneur herself, sometimes helped by her family who will have to pay the new tax rate as well if they work for the firm. So it is plausible the reform affected the cost of equity both indirectly and directly.[63]

With these limitations in mind, we create five different proxies to identify firms more likely to be equity-dependent. In the interest of space, we report the empirical results in Appendix G.

First, we split firms along bins of age. In firm life cycle models (Sinn, 1991), young firms start life cash-constrained and finance investment via equity issuance before becoming mature and generating enough cash-flows to finance their investment internally. We estimate equation 1 separately for each quintile of age and report the point estimate for each bin in Table A.13. For each quintile, the reform always has a precise, positive effect. Second, we do a similar exercise with size and again find very similar point estimates.

Our third proxy is the probability that a firm issues equity, following Auerbach and Hassett (2003). We create a dummy *New Equity Issuance* that equals one if we observe a positive change in equity between t and $t+1$ over the pre-reform period. We then predict the probability of the firm issuing new equity by estimating a linear probability model, where we regress the variable *New Equity Issuance* on a set of firm controls. We then split the sample into quintiles and again estimate

63. The notion the tax increase would discourage entrepreneurs to invest more in their firms was also the main argument of the opponents against the reform in France.

equation 1 on these subsamples and failed to find any drop in investment, even for the firms most likely to be more equity-dependent (Table A.14).

Fourth, 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. A large fraction of firms relied substantially on equity to finance their previous investment, with the last quintile of the distribution having a ratio of equity issued over capital equal to 1.15, implying that for every euro of productive capital, the firm issued €1.15 equity. Table A.15 shows that across these different bins, the effect of the tax increase on investment is always positive and statistically significant.

Fifth, we look at the number of times a firm issues equity during the sample period (Table A.16). We split the sample into firms that never issue equity and firms with one or more issues. We also compute the number of equity issuances over a longer time period (2004–2017). As with other proxies of equity-dependence, we find that a higher dividend tax rate always increases investment for the various subsamples.

Truly measuring equity-dependent firms is impossible for any empiricist and we have to rely on imperfect proxies. Yet taken together, these results are inconsistent with the "old view" theory of dividend taxation that predicts that young, equity-dependent firms should reduce their investment following an increase in the dividend tax rate.[64]

64. There is one final group of equity-dependent firms that might have been negatively affected by the reform: new firms discouraged from being created after the reform. We do not explore this "extensive margin" in this paper because it would require a completely different estimation strategy, and we leave this question for future research. Two reasons suggest that the reform did not affect entry significantly. First, new firms could always incorporate under the SAS legal status, which they increasingly do so after 2013 (Figure 2). Second, when plotting the evolution of the total number of new firms created, we find no obvious drop after 2013, which is explained by the fact that the number of new firms created as SAS increased much faster than the decline in new firms created as SARL (Figure A.10).

Table A.13: Cross Sectional Results: Age and Size

Dependent variable	Investment				
Bin	1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
	(1)	(2)	(3)	(4)	(5)
	Cross Section: Size				
Treated×Post	0.0052	0.012***	0.0085***	0.015***	0.011***
	(0.0035)	(0.0031)	(0.0028)	(0.0026)	(0.0023)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Size × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	282,352	282,074	281,654	280,777	279,230
	Cross Section: Age				
Treated×Post	0.0069*	0.012***	0.0071***	0.0071***	0.0051***
	(0.0040)	(0.0036)	(0.0028)	(0.0022)	(0.0016)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Size × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	313,090	252,162	282,929	280,748	277,158

This table shows the effect of the 2013 dividend tax increase when firms are sorted by size pre-reform (first row) or by age (second row). We estimate equation 1 for each group separately. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.14: Equity Dependence: Probability of Issuing Equity

Bin probability equity issuance	1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
	(1)	(2)	(3)	(4)	(5)
			Total Investment		
Treated×Post	0.015***	0.0053**	0.00027	0.000040	0.0054**
	(0.0032)	(0.0028)	(0.0025)	(0.0024)	(0.0026)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Size × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	279,833	281,578	281,712	281,400	277,835
			Tangible Investment		
Treated×Post	0.0095***	0.0041**	0.00082	-0.00015	0.0021
	(0.0023)	(0.0020)	(0.0018)	(0.0017)	(0.0017)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Size × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	279,847	281,582	281,717	281,409	277,869

This table shows the effect of the 2013 dividend tax increase when firms are sorted by their probability to issue equity. This probability is estimated by regressing a dummy *New Equity Issuance* that equals one if we observe a positive change in equity between t and $t+1$ over the pre-reform period onto profitability and lagged profitability, leverage and lagged leverage, investment and lagged investment, size log asset), industry, age bin, local labor market fixed effects. Standard errors are clustered at the firm level. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.15: Equity Dependence-Fraction of Capital Financed Through Equity

Bin of Equity Issued / Capital_{2012}	1^{st}	2^{nd}	3^{rd}	4^{th}	5^{th}
Value within bin	.023	.065	.14	.31	1.5
	(1)	(2)	(3)	(4)	(5)
			Total Investment		
Treated×Post	0.0017	0.0097***	0.0048**	0.011***	0.022***
	(0.0024)	(0.0021)	(0.0024)	(0.0026)	(0.0033)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	292,302	295,481	269,315	272,419	276,570
			Tangible Investment		
Treated×Post	0.0012	0.0060***	0.0028	0.0087***	0.010***
	(0.0017)	(0.0016)	(0.0018)	(0.0019)	(0.0021)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	292,308	295,494	269,318	272,430	276,605

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 A.16: Equity Dependence: Number of Equity Issuances

	2009–2016		2003–2016		
# equity issuances	0	1	0	1	2
	(1)	(2)	(3)	(4)	(5)
			Total Investment		
Treated×Post	0.0067***	0.012***	0.0062***	0.0079***	0.023***
	(0.0017)	(0.0016)	(0.0020)	(0.0017)	(0.0029)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	572,526	833,629	487,815	632,111	286,229
			Tangible Investment		
Treated×Post	0.0038***	0.0073***	0.0042***	0.0046***	0.013***
	(0.0013)	(0.0011)	(0.0014)	(0.0012)	(0.0019)
Fixed Effects					
Firm	✓	✓	✓	✓	✓
Size growth× Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
County × Year	✓	✓	✓	✓	✓
Observations	572,526	833,629	487,815	632,111	286,229

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 issues (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.

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