DOES MANDATING SOCIAL INSURANCE AFFECT ENTREPRENEURIAL ACTIVITY?

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ABSTRACT

This paper estimates the effect of relaxing the social insurance mandate on entrepreneurial activity. We use a unique discontinuity in Finland that allows certain entrepreneurs not to pay social insurance contributions on their income. Using rich administrative data, we find that relaxing the social insurance mandate leads entrepreneurs to significantly reduce their contributions, which they channel instead into their firms. While young firms use this windfall to increase business activity, older ones use it to improve their net lending position by purchasing stocks. Our results imply that the social insurance mandate is binding and its efficiency cost is heterogeneous.

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1 Introduction

Dubbed "the engine of growth", entrepreneurship plays a central role in modern economies. In the US, for example, new businesses account for 20% of total gross job creation.[1] While entrepreneurs can be very successful and accumulate massive amounts of wealth, entrepreneurship remains one of the most economically risky lines of activity and can result in large wealth losses.[2] For this reason, mandating social insurance for this population can prove to be a first-order welfare improvement: without insurance, entrepreneurs face substantial old-age, disability and sickness risk. However, the marginal value of resources for entrepreneurs can be substantial, given how cash-constrained they often are. Therefore, mandating social insurance, while reducing risks, could significantly affect entrepreneurial activity.

In this paper, we offer novel causal evidence on the effects of relaxing the social insurance mandate on entrepreneurs and their business activity.[3] We exploit quasi-experimental variation in the amount of social insurance contributions and rich firm- and individual-level administrative data on the full population of Finnish entrepreneurs to address this question. While social insurance contribution rates are the same across all entrepreneurs in Finland, the base over which the rate applies is not. Once entrepreneurs own more than a certain share of their firm, 30% currently and 50% in earlier years, they have a lot more discretion over how much social insurance contributions to pay, irrespective of their compensation.[4] In contrast, below this ownership share threshold, entrepreneurs cannot choose their contribution rates, as their contributions are directly based on their earned income.

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[1]See, for example, Decker et al. [2014].

[2]This argument is articulated, for example, in Hall and Woodward [2010].

[3]Hereafter we use the term "entrepreneur" to refer to the owners of privately held corporations, which are the focus of this paper. We use this definition as the social insurance system only applies to entrepreneurs who actively work for their firm. Therefore, we believe that entrepreneur is a suitable term to describe the group of business owners that we are studying.

[4]In the US, owners of S corporations can reduce their social security contributions by reducing their compensation and opting for dividends instead.

We use a standard differences-in-differences strategy and exploit a reform in 2011 that changed the ownership share rule from 50% to 30% to assess how relaxing the social insurance mandate affects entrepreneurial activity. We compare firm owners with 30 to 50% pre-reform ownership shares (treatment) to firm owners with 51 to 70% pre-reform ownership shares (control). Importantly, our empirical analysis shows that entrepreneurs have not manipulated their ownership shares as a response to the reform, which would otherwise invalidate our research design.

Overall, we find that social insurance contributions are reduced by an average of 19% for the treatment group, which has more discretion over insurance contributions after the reform. This reduction represents a large cash windfall, equivalent to, on average, a 5 percentage-point reduction in corporate taxes. This variation is substantial, approximately five times larger than the average corporate tax rate changes used by Fuest et al. [2018] to estimate the incidence of corporate taxes, and three times larger than the variation used in Chetty et al. [2014] to estimate the crowd-out effect of subsidized pension plans. When we consider all firms together, we estimate that the effects of relaxing the social insurance mandate on business activity are limited, as we observe no significant responses in the main firm outcomes, such as turnover, investments or input costs.

However, this average analysis masks important heterogeneity by firm age. Following the entrepreneurship definition of Decker et al. [2014], who define entrepreneurs as firms that are younger than 5 years of age, we break down our sample of firms into young and older firms. As the social insurance mandate is relaxed, we observe a larger than average decrease in social insurance contributions by the owners of younger firms. The cash saved from the lower contributions is channeled into their firms, as we observe an increase in both employee compensations and other input costs, and an increase in turnover after the reform. We also observe that owners of older firms reduce their social insurance contributions, albeit by a significantly smaller amount, and channel the additional cash into their firms. However, instead of using this cash windfall to boost business activity, as young firms do, they use it to increase the net

lending position of the firm by increasing long-term investments in the form of stock holdings. As a consequence, the social insurance mandate has no effect on the business activity of older firms: we observe no changes in turnover or input use in response to the decrease in contributions for older firms. This differential response for the owners of young versus older firms suggests that entrepreneurs in younger firms are more liquidity-constrained and have access to better growth opportunities than more mature firms.

These findings imply that the efficiency cost of mandating social insurance for firm owners is very different for young versus older firms since the social insurance mandate affects them very differently. While virtually all countries in the OECD mandate that wage earners contribute to some form of old-age, disability and sickness insurance program, there is wide variation in the treatment of non-wage earners, including entrepreneurs. The OECD countries address the issue of insuring non-wage earners in three different ways: (1) 73% of countries do not differentiate between wage and non-wage earners, and mandate the participation of non-wage earners to the regular social insurance program. The remaining 27% either (2) mandate that non-wage earners participate in a special social insurance program specifically designed for them (15%) or (3) allow non-wage earners to opt into the regular social insurance program, with no specific mandate (12%).[5] This variation in the coverage of non-wage earners begs the question of which approach is better suited to insuring non-wage earners. While fully addressing the question of the optimal design of social insurance for entrepreneurs is beyond the scope of this paper, as it also requires estimating the benefit of social insurance, we make progress on this question by focusing on the efficiency cost of mandating social insurance on the business activity of entrepreneurs.

There is limited evidence of the effects of mandating social insurance on entrepreneurship, and we believe that this is the first paper to shed light on this question. However, our paper is also tangentially related to the following three literatures. The first literature estimates the crowd-out effect of subsidized

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[5]Source: Authors' calculations based on data from the International Social Security Association.

pension contributions on savings. Chetty et al. [2014] show, using a compelling quasi-experimental setting in Denmark, that pension contributions tend not to crowd out other savings for wage earners when individuals are defaulted into increasing their savings.[6] Our paper complements the analysis of Chetty et al. [2014] by focusing on a population of active savers, i.e. individuals who actively decide their level of contributions, and provides an answer to what outcomes are crowded out by subsidized pension savings for entrepreneurs.

Second, our paper is related to a literature that estimates the effect of regulation on entrepreneurial activity. This literature has mostly focused on the role of entry regulation on entrepreneurship. For example, Djankov et al. [2002] and Klapper et al. [2006] show that entry regulations are likely to reduce firm entry. More recently, Harju et al. [2019], Tazhitdinova [2016] and Aghion et al. [2017] estimate the effect of the hassle costs of complying with the tax code on entrepreneurs and incorporation. We focus on a different type of regulation – the social insurance mandate – and its effect on the intensive entrepreneurial margin.

Third, this paper is related to corporate finance and public finance literatures that estimate the effect of taxes on entrepreneurial activity. This is a central question as it matters for both tax policy and economic growth.[7] For example, Cullen and Gordon [2007] use time series variation in tax rates to estimate the effect of taxes on risk-taking by entrepreneurs, and Gentry and Hubbard [2000] use a discrete-choice model to estimate the effect of tax progressivity on entrepreneurial entry. The remaining research has mostly focused on cross-country comparisons of the level of taxes and entrepreneurial activity and found negative correlations between these two variables.[8]

This paper is organized as follows. Section 2 describes the institutions and the data we use. Section 3 presents our estimation strategy and the descriptive

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[6]See also Poterba et al. [1996], Engen et al. [1996], Benjamin [2003], Engelhardt and Kumar [2007] and Gelber [2011].

[7]See for example Schumpeter [2013] and Baumol et al. [2007] on the importance of entrepreneurship for growth.

[8]See for example Djankov et al. [2010] who find strong negative relationships between the level of corporate income taxes and entrepreneurship using data from 85 countries.

statistics. Section 4 presents the results, and Section 5 concludes.

2 Institutional Background and Data

2.1 The Finnish Social Insurance System

The Finnish social insurance system is funded by government-mandated contributions. The system includes pension contributions paid by both employees and employers, and health and unemployment insurance contributions paid by wage earners based on their earnings and predetermined contribution rates. In addition to earnings-related insurance benefits, there are regulated minimum guarantee pensions and sickness and unemployment allowances for those with no or very small earnings and short work histories. Overall, the mandatory insurance system covers the vast majority of pension, health and unemployment benefits in Finland, as there is only limited private provision of insurance.

2.2 Social Insurance Contributions of Entrepreneurs

Finland has a special social insurance scheme for entrepreneurs, called the Self-employed Persons' Pension Act, referred to as YEL.[9] The YEL insurance scheme applies to all self-employed individuals and excludes wage earners. In addition, to qualify for YEL, self-employed individuals must meet the following conditions: they have to be 18 to 67 years old, their firm must be at least four months old, and the income they derive from the firm has to be at least 7,557 euros per year (in 2016).[10]

The YEL insurance scheme also applies to all partners of partnership firms and to owners of privately held corporations who own, alone or together with family members, at least 50% of their firm. In addition, owners who hold a leading position in a privately held corporation (such as CEO or chairman

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[9]YEL stands for "Yrittäjän eläkelaki" in Finnish.

[10]The Self-employed Persons' Pension Act (HE 1272/2006) is available online here (in Finnish): https://www.finlex.fi/fi/laki/alkup/2006/20061272. More information in English can be found here: https://www.ilmarinen.fi/en/self-employed-person/self-employed-persons-pension-insurance/yel-contributions.

of the board) and own over 30% of the company's shares are considered to be YEL entrepreneurs. The above conditions are binding, and entrepreneurs cannot opt out of the YEL insurance scheme.

If the above conditions are not met, entrepreneurs are automatically subject to the TyEL insurance scheme, which is the same insurance program as for wage earners. Hereafter, we refer to all entrepreneurs to which YEL rules are applied as Y owners, and all other entrepreneurs who do not fulfill these requirements as T owners.

The main difference between Y and T owners is that T owners pay a set contribution rate on the income they earn from their firm, with no discretion over contribution levels, while Y owners can freely set the base over which the social insurance contribution rate applies as long as it falls between two bounds. In 2016, these bounds were 7,557 and 171,625 euros, respectively. Therefore, Y owners have significantly more discretion over their level of mandatory social insurance contributions. The contributions of T owners, on the other hand, are set automatically via a formula defined by a function of their earned income and the contribution rate.[11]

Future benefit entitlements are tied to contribution levels, and therefore, by reducing their contributions, Y owners are entitled to lower benefits. Note also that social insurance benefits are subsidized in Finland, implying that contributions are more than actuarially fair.[12] In addition, insurance contributions can be deducted from income taxes. Otherwise, the insurance status of an entrepreneur does not affect income taxation in any way, i.e. there is no difference in income taxation between Y and T owners.

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[11]Both the YEL and TyEL contribution rates, and the minimum and maximum YEL income levels vary slightly over time and are usually determined annually. The contribution rates also vary by age, and are higher for older individuals. In 2016, the TyEL rate is 25.2% for persons aged 53 or older, and the YEL contribution rate is 25.1% for persons aged 53 to 62. In addition, the contribution rates are lower for starting businesses of Y owners: 19.6% for persons aged 53 to 62, and 18.4% for others.

[12]In addition to pensions, the level of insurance contributions directly affects other social insurance benefits provided by the Social Insurance Institution of Finland in a similar way. These mainly include sickness and parental allowances, and unemployment benefits.

Ownership share threshold and the 2011 reform. In this paper, we focus on the owners of privately held corporations. The reason for this restriction is that these entrepreneurs faced an exogenous change in insurance contribution rules which we use in our empirical analysis. Before 2011, the owners of privately held corporations with an active role in their firm and owning over 50% of the company shares were treated as Y owners, i.e., they had more freedom to choose their level of insurance contributions. In 2011, this threshold was decreased to the current level of 30%. This meant that from 2011 onwards, owners with a 31-50% ownership share could now more freely determine their level of social insurance contributions. We use this variation, along with a difference-in-difference strategy discussed in Section 3 below, to uncover the effects of mandating social insurance on the economic activity of entrepreneurs.[13] Note that, in principle, T owners with ownership shares above 30% after the reform could opt out of switching to Y owners for 3 years. However, empirically, we observe that all of the switches from T to Y status occur at the time of the reform. Apart from this reform, there were no other notable changes to the social insurance program during the time period we analyze.

2.3 Data

We use two data sets: (1) data from the two largest Finnish pension companies managing the mandatory social insurance contributions of entrepreneurs, and (2) corporate tax and individual tax return data covering both firm and individual-level outcomes and characteristics. We use unique identifiers to link these data sets together. We describe the data in more detail below.

Insurance Contribution Data. Contribution levels for T owners can be calculated using our dataset, since they have no discretion over how much to contribute (the contribution level depends directly on their earned income and the contribution rate). Since contributions are not directly observable in

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[13]More information about the reform (HE 135/2010) can be found here (in Finnish): https://www.finlex.fi/fi/esitykset/he/2010/20100135.

tax data, and since Y owners have discretion over their level of contributions, the only available source of contribution data for these entrepreneurs is the pension companies that manage the public insurance system in Finland. We were able to access individual-level contribution data from the two largest Finnish pension companies, which cover 70% of all entrepreneurs. This data is available from 2006 to 2014.

Tax Return Data. We use tax return data covering the full population of individuals and firms, extracted from the Finnish Tax Administration database. The data include information on the financial statements and tax records of all Finnish businesses and their main owners. Since we only focus on Y and T owners of privately-held corporations, we exclude all other businesses from the sample. The data contain information on key measures of economic activity such as turnover, profits, intermediate inputs and employee costs. In addition, the data contain detailed balance sheet information, including, for example, various investment categories. In this paper, we mainly focus on the impact of social insurance contributions on these measures of firm-level economic activity. The owner-level data contain a substantial amount of income information, including, for example, wages and dividends received from different firms, taxable income and detailed information on capital income from different sources (for example, dividends from listed firms, investment fund shares and voluntary pension savings).

3 Empirical approach

Estimation. In order to estimate the effect of mandating social insurance on entrepreneurs and their business activity, we use a difference-in-difference approach where we take advantage of the fact that the ownership share threshold changed due to the 2011 reform. Prior to 2011, entrepreneurs who owned less than 50% of their firm were considered T owners, and they had no direct control over their level of mandatory social insurance contributions. In contrast, entrepreneurs who owned more than 50% of their firm were considered

Y owners, and they had more freedom to decide their level of social insurance contributions. In 2011, the threshold changed from 50% to 30%, such that now only entrepreneurs with ownership shares below 30% were considered T owners. In other words, the social insurance mandate was significantly relaxed for entrepreneurs who owned 30% to 50% of their firms. We compare these entrepreneurs to those who owned 51% to 70% of their firm, thus being subject to the Y ownership status both before and after the 2011 reform.[14]

Formally, we estimate the following specification:

$$Y_{i,t} = \alpha_0 + \alpha_1 Treat_i + \alpha_2 Post_t + \alpha_3 (Treat_i * Post_t) + \alpha_4 X_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

where Y is the outcome variable of interest (in logs), i is a given entrepreneur, and t is time. $Treat$ is a dummy variable equal to 1 for the treated entrepreneurs, and equal to 0 for the control group. $Post$ refers to the period after the reform (from 2011 onward). X includes a set of owner- and firm-level control variables. The owner-level controls are age, age squared, gender and ownership share of the firm. The firm-level controls include the number of employees, municipality dummies for the location of a firm and one-digit industry dummies. λ_t are year fixed effects and ε represents the error term.[15]

Identification. The identifying assumption for the difference-in-difference design is *not* random assignment to the treatment and control groups, but that the treatment (31-50% ownership share) and control (51-70% ownership share) groups would have behaved similarly in the absence of the 2011 reform. This is commonly referred to as the parallel trends assumption. We test this assumption by comparing the evolution of our main outcome variables for the treatment and control groups prior to the reform. This assumption holds for all the main outcomes we consider, as shown below in Section 4. The fact that

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[14]The results are not sensitive to the choice of the 70% upper bound. In Appendix Table 3, we also use an alternative definition for the control group with ownership shares between 51% to 80% prior to the reform. The results are quantitatively and statistically very similar.

[15]We also run specification (1) not controlling for firm- and owner-level characteristics. Whether or not including controls does not have a significant effect on the estimates, see Appendix Table 4.

the outcome variables follow parallel trends prior to the reform and that the summary statistics are very similar for the treatment and control groups prior to 2011 (as shown in Table 1) validates our empirical approach and mitigates the potential concern that the two groups would not be comparable.

Furthermore, a potential threat to identification is that ownership shares can, in principle, respond to the 2011 reform. Entrepreneurs could manipulate their ownership shares in order to self select into the Y or T insurance status. However, we find no empirical evidence supporting this threat. Appendix Figure 4 shows the changes in ownership shares for owners with more than 50% ownership shares to less than 50% (first panel), less than 50% ownership shares to more than 50% (second panel) and less than 30% ownership shares to more than 30% (third panel) in 2006-2016. Overall, there are no significant changes across these thresholds over time nor around the 2011 reform. This alleviates the concern that owners might intentionally manipulate their ownership shares as a response to the 2011 reform.

Note that, in principle, we could also use a regression discontinuity design (RDD) instead of a difference-in-differences strategy. However, the following two reasons make such a design challenging: (1) RDD is very data intensive, and the number of entrepreneurs just around the ownership share threshold is not large enough to provide very accurate results, particularly when analyzing responses separately for young and old firms; (2) firms are unevenly distributed across the ownership share distribution, as there is a large number of entrepreneurs with certain ownership shares (e.g. 33% and 50% for firms with three or two owners), posing a challenge in defining the bandwidths in the RDD approach. Overall, as the treatment and control groups have parallel trends prior to the reform and have very similar pre-reform characteristics, we believe that the difference-in-differences design provides more robust and accurate results on the impact of the 2011 reform.

Descriptive Statistics. Table 1 shows the pre-reform descriptive statistics separately for the treatment and control groups for all firm owners, and separately for younger and older firms. Following the entrepreneurship definition

of Decker et al. [2014], who define entrepreneurs as firms that are younger than 5 years of age, we break down our sample of firms into young and older firms based on this five-year threshold.

Both owner and firm-level characteristics, including e.g. wages, dividends, firm-level turnover, assets and inputs are very similar across the control and treatment groups prior to the reform. The only variable that differs across the control and treatment groups is the level of mandatory pension contributions, which are significantly lower in the control group prior to 2011. This is consistent with the fact that, for the treated firms, these contributions were mandatory prior to the 2011 reform, while they were voluntary in the control group, providing prima facie evidence that the social insurance mandate has an effect on the level of insurance contributions, which we show causally below.

4   Results

Social Insurance Contributions.   Figure 1 plots the average annual change in public insurance contributions from 2006 to 2014 for all firms in the upper panel, and for younger firms in the bottom-left panel and older firms in the bottom-right panel. First, the pre-reform period clearly supports the parallel trends assumption, as insurance contributions in both the treatment and control groups evolve very similarly in all three panels prior to 2011. In contrast, at the time of the 2011 reform, there is a discontinuous decrease in the level of social insurance contributions in the treatment group. The trends are also parallel after 2011, suggesting that most of the response to the policy change occurs in the year of the reform. The corresponding regression estimates, using specification (1), are reported in column (1) of Table 2. We estimate that, on average, pension contributions are reduced by 18.9% after the reform (see the bottom panel of Table 2). The reduction in social insurance contributions is larger among younger firms, 23.3%, and smaller among older firms, 17.3%.

Overall, the reduction in social insurance contributions results in a large cash windfall to the entrepreneur, equivalent to a 5 percentage point cut in

their corporate tax rate.[16] This decrease in contributions is substantial, and is approximately five times larger than the average corporate tax rate changes used by Fuest et al. [2018] to estimate the incidence of corporate taxes, and three times larger than the variation used in Chetty et al. [2014] to estimate the crowd-out effect of subsidized pension plans. Given the magnitude of this windfall, one could expect it to affect firm-level outcomes.

Business Activity Outcomes. Figure 2 shows the effect of the 2011 reform on business activity for young firms that are equal to or younger than five years old. The figure shows a positive effect on firm turnover, and an increase in wage costs. However, we find no increase in investments and stock holdings for these young firms. The corresponding regression estimates are reported in the first panel of Table 2. These results are consistent with the graphical evidence: we estimate a 9.9% increase in turnover and a 6% increase in employee wage costs. Overall, these results imply that firms use the saved cash to pay for additional intermediate inputs and labor in order to increase turnover, and suggests that these firms might be facing liquidity constraints.

Figure 3 shows the effects of the reform on the business activity of firms that are older than five years old. Old firms respond to the reform very differently compared to young firms: turnover, wage costs and investments do not increase due to the reform, but firm-level stock holdings increase instead. This suggests that the owners of these firms accumulate firm-level stock holdings as a response to the decrease in social security contributions. Therefore, the money saved is used instead to increase the net lending position of the firm by buying more stocks. The second panel of Table 2 shows the regression estimates which confirm the graphical evidence discussed above: the only variable that responds to the reform is firm-level stock holdings, which increased by 14.2% as a response to the reform. This implies that the additional windfall is reinvested by the owners of mature firms, not to increase business activity, but instead to increase the net lending position of their firm.

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[16]The corporate tax rate is currently 20% in Finland, but the rate has been reduced several times in recent years, from 26% to 24.5% in 2012 and from 24.5% to 20% in 2014.

When pooling young and old firms together in the bottom panel of Table 2, we find no effects on business activity measures but do observe an increase in stock holdings.[17] These results reflect more those of older firms because they cover nearly three quarters of the overall sample. Consequently, the average responses mask important heterogeneity by firm age.

Overall, our findings imply that the social insurance mandate is binding for both young and mature firms. However, its efficiency cost varies by the age of the firm. While it crowds out business activity for young firms, it tends to depress stock holdings for more mature ones.

5   Conclusions

This paper estimates the effects of relaxing the social insurance mandate on entrepreneurs. Using quasi-experimental variation and a difference-in-differences design, we find that entrepreneurs substantially reduce their contributions to the social insurance program when these contributions are not mandatory, implying that the social insurance mandate is binding for entrepreneurs. The money saved is channeled into firms differently depending on the age of the firm. Younger firms tend to use the money to increase their business activity, while more mature firms use it to improve their net lending position by purchasing stocks. Overall, this implies that the social insurance mandate for entrepreneurs has heterogeneous efficiency costs.

Efficiency gains could be achieved by designing social insurance schemes that set lower social insurance contributions for younger firms. These schemes exist, for example, in France where new small firms are exempted from paying social insurance contributions for as long as 12 months after their creation. However, estimating the benefit of social insurance for entrepreneurs is an additional key factor needed in order to fully assess the optimality of such firm age-dependent social insurance schemes, which we leave for future research to investigate.

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[17]Appendix Figure 5 plots the main business activity outcomes using the pooled sample, including both young and old firms.

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References

Philippe Aghion, Ufuk Akcigit, Matthieu Lequien, and Stefanie Stantcheva. Tax Simplicity and Heterogeneous Learning. *NBER Working Paper*, 2017.

William J. Baumol, Robert E. Litan, and Carl J. Schramm. *Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity.* Yale University Press, 2007.

Daniel J Benjamin. Does 401(k) Eligibility Increase Saving? Evidence From Propensity Score Subclassification. *Journal of Public Economics*, 87(5-6): 1259–1290, 2003.

Raj Chetty, John N. Friedman, Søren Leth-Petersen, Torben Heien Nielsen, and Tore Olsen. Active vs. Passive Decisions and Crowd-Out in Retirement Savings Accounts: Evidence From Denmark. *The Quarterly Journal of Economics*, 129(3):1141–1219, 2014.

Julie Berry Cullen and Roger H. Gordon. Taxes and Entrepreneurial Risk-Taking: Theory and Evidence for the US. *Journal of Public Economics*, 91 (7):1479–1505, 2007.

Ryan Decker, John Haltiwanger, Ron Jarmin, and Javier Miranda. The Role of Entrepreneurship in US Job Creation and Economic Dynamism. *The Journal of Economic Perspectives*, 28(3):3–24, 2014.

Simeon Djankov, Rafael La Porta, Florencio Lopez-de Silanes, and Andrei Shleifer. The Regulation of Entry. *The Quarterly Journal of Economics*, 117(1):1–37, 2002.

Simeon Djankov, Tim Ganser, Caralee McLiesh, Rita Ramalho, and Andrei Shleifer. The Effect of Corporate Taxes on Investment and Entrepreneurship. *American Economic Journal: Macroeconomics*, 2(3):31–64, 2010.

Gary Engelhardt and Anil Kumar. Employer Matching and 401(k) Saving: Evidence From the Health and Retirement Study. *Journal of Public Economics*, 91(10):1920–1943, 2007.

Eric M Engen, William G Gale, and John Karl Scholz. The Illusory Effects of Saving Incentives on Saving. *Journal of Economic Perspectives*, 10(4): 113–138, 1996.

Clemens Fuest, Andreas Peichl, and Sebastian Siegloch. Do Higher Corporate Taxes Reduce Wages? Micro Evidence From Germany. *American Economic Review*, 108(2):393–418, 2018.

Alexander M Gelber. How do 40(k)s Affect Saving? Evidence From Changes in 401(k) Eligibility. *American Economic Journal: Economic Policy*, 3(4): 103–22, 2011.

William M. Gentry and R. Glenn Hubbard. Tax Policy and Entry Into Entrepreneurship. *American Economic Review*, 90(2):283–287, 2000.

Robert E. Hall and Susan E. Woodward. The Burden of the Non-diversifiable Risk of Entrepreneurship. *American Economic Review*, 100(3):1163–94, 2010.

Jarkko Harju, Tuomas Matikka, and Timo Rauhanen. Compliance Costs vs. Tax Incentives: How Do Small Firms Respond to Size-Based Regulations? *Journal of Public Economics*, 2019.

Leora Klapper, Luc Laeven, and Raghuram Rajan. Entry Regulation As a Barrier to Entrepreneurship. *Journal of Financial Economics*, 82(3):591–629, 2006.

James M Poterba, Steven F Venti, and David A Wise. How Retirement Saving Programs Increase Saving. *Journal of Economic Perspectives*, 10(4):91–112, 1996.

Joseph A. Schumpeter. *Capitalism, Socialism and Democracy*. Routledge, 2013.

Alisa Tazhitdinova. Income Shifting and the Cost of Incorporation. *Working Paper*, 2016.

Figure 1: Social Insurance Contributions Over Time: Treatment and Control Groups.

Change in public pension payments
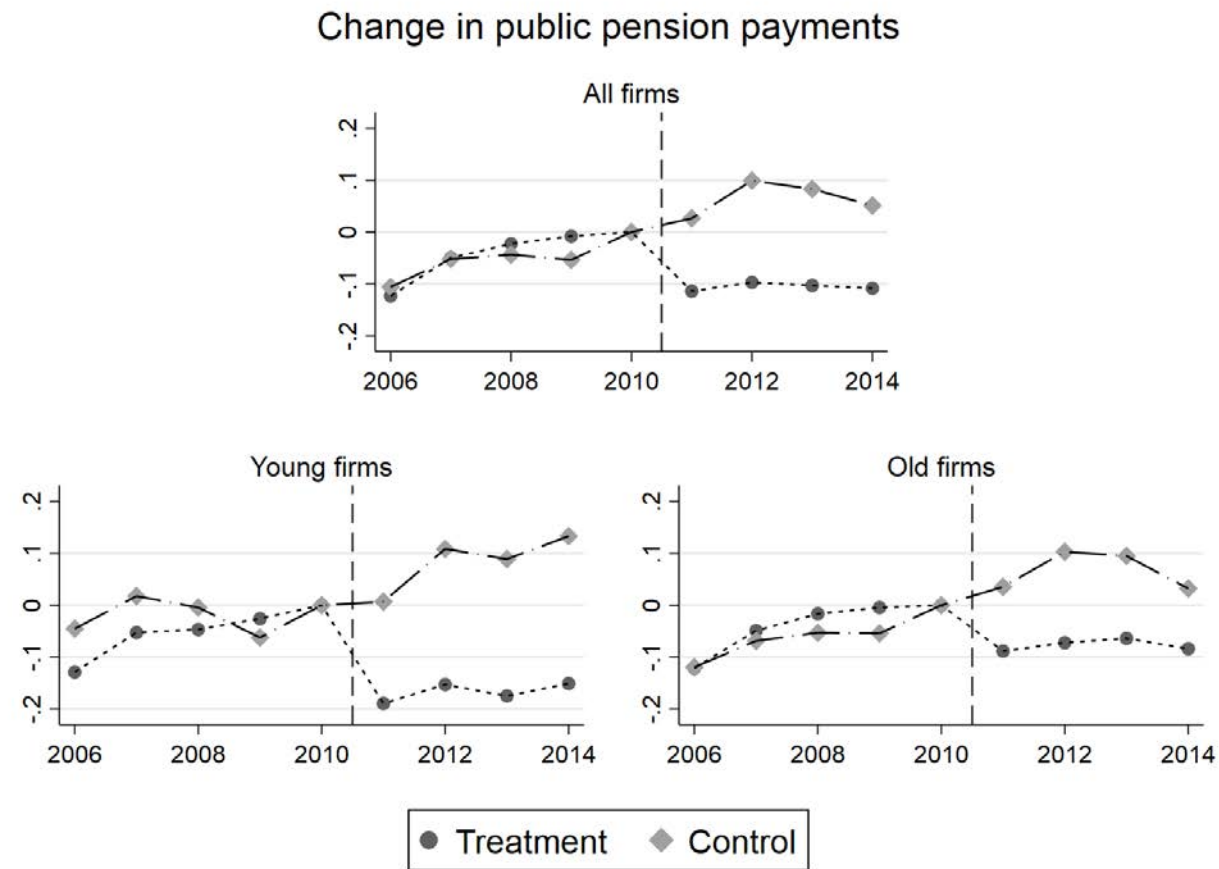
Note: Treatment: 31-50%, Control: 51-70%. Relative to year 2010.

Notes: This Figure plots public pension insurance contributions (in logs) over time for the treatment and control groups for all firms (top panel), young firms (second panel) and old firms (third panel). We define young firms as firms that are younger than 5 years of age, and old firms as firms that are older than 5 years of age.

Figure 2: Effect on Firm-Level Outcomes for Young Firms
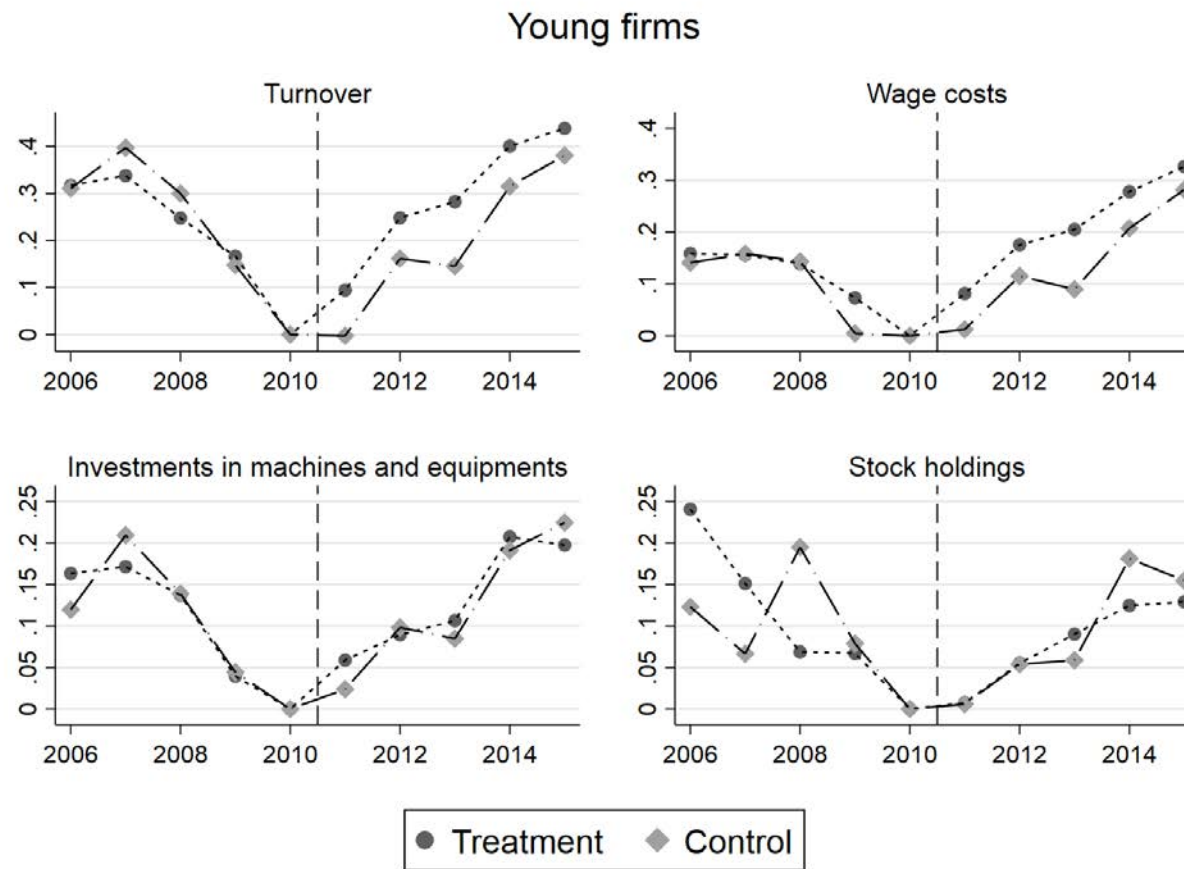
Young firms

Note: Treatment: 31-50%, Control: 51-70%. Relative to year 2010.

Notes: This Figure plots the response of firm-level outcomes to the 2011 reform for the treatment and control groups for young firms, which we define as firms that are younger than 5 years of age. Turnover, wage costs, investments in machines and equipment and stock holdings (in logs) are plotted in the first, second, third and fourth panels, respectively.

Figure 3: Effect on Firm-Level Outcomes for Old Firms
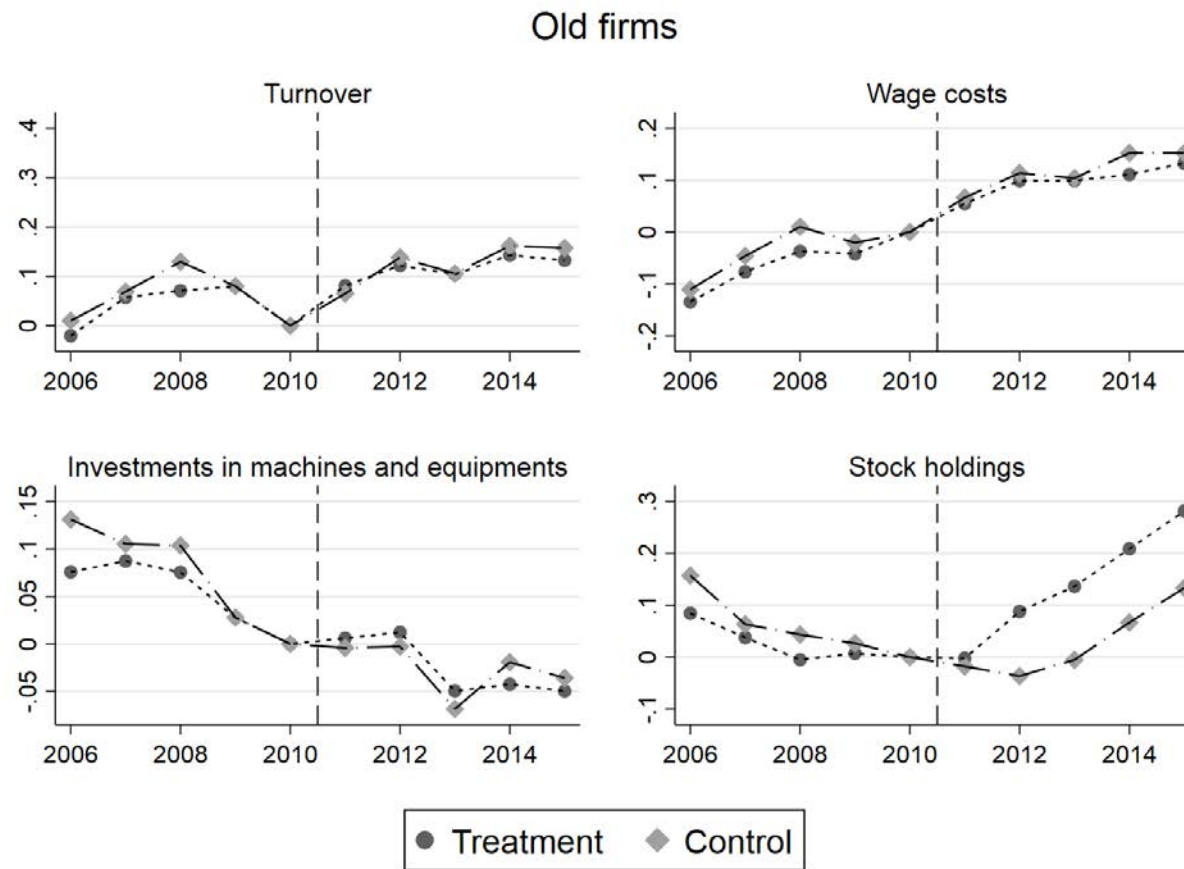
Notes: This Figure plots the response of firm-level outcomes to the 2011 reform for the treatment and control groups for old firms, which we define as firms that are older than 5 years of age. Turnover, wage costs, investments in machines and equipment and stock holdings (in logs) are plotted in the first, second, third and fourth panels, respectively.

Table 1: Descriptive statistics: 2006-2010 by treatment status and age of the firm

		Owner-level variables						Firm-level variables				
		Pension cont.	Total income	Wages	Dividends	% of males	Age	Turnover	Assets	Liabilities	Equity	No. of empl.
All				Treatment						Treatment		
	Mean	7,623	56,628	35,809	20,822	.776	49.1	1,150,961	768,378	296,176	497,149	10.4
	Median	6,588	42,885	31,306	6,458	1	49	306,153	163,376	43,900	109,486	4
	N	51,284	57,282	57,278	57,282	57,282	57,282	57,282	57,282	57,282	57,282	56,943
				Control						Control		
	Mean	5,710	55,973	31,406	24,570	.822	51.7	1,186,131	770,361	307,310	495,249	9.8
	Median	4,508	40,000	26,682	7,644	1	53	288,438	159,788	42,126	110,114	4
	N	24,489	32,219	32,217	32,219	32,219	32,219	32,219	32,219	32,219	32,219	32,083
Young				Treatment						Treatment		
	Mean	7,584	49,808	35,058	14,750	.769	48.147	952,128	556,534	266,250	330,925	10.570
	Median	6,487	37,102	30,240	3,042	1	48	206,782	82,564	27,152	50,515	3
	N	11,176	12,358	12,358	12,358	12,358	12,358	12,358	12,358	12,358	12,358	12,212
				Control						Control		
	Mean	5,664	49,870	31,332	18,641	.813	50.713	930,864	554,082	263,008	328,470	9.809
	Median	4,422	34,347	26,351	3,600	1	51	210,753	83,209	29,591	51,004	3
	N	4,943	6,358	6,357	6,358	6,358	6,358	6,358	6,358	6,358	6,358	6,301
Old				Treatment						Treatment		
	Mean	7,859	58,504	36,015	22,492	.778	49.389	1,205,658	826,653	304,408	542,875	10.337
	Median	6,755	44,500	31,500	7,800	1	50	332,339	192,101	48,382	131,872	4
	N	40,108	44,924	44,920	44,924	44,924	44,924	44,924	44,924	44,924	44,924	44,731
				Control						Control		
	Mean	6,177	57,474	31,448	26,027	.825	51.960	1,248,889	823,534	318,202	536,253	9.802
	Median	4,965	41,433	26,775	8,918	1	53	306,729	182,848	45,114	128,529	4
	N	19,546	25,861	25,860	25,861	25,861	25,861	25,861	25,861	25,861	25,861	25,782

Notes: This Table shows descriptive statistics for the control and treatment groups. The samples include firms belonging to the treatment or control group for the time period 2006-2010. We define young firms as firms that are younger than 5 years of age, otherwise they are defined as old. The treatment group is defined as firms with ownership shares of 31 to 50% prior to 2011 and the control group as firms with ownership shares of 51 to 70% prior to 2011. Monetary variables are presented in current euros.

Table 2: Differences-in-differences results

Young firms	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.047	0.008	0.081**	0.039	0.028	0.066
	(0.034)	(0.038)	(0.033)	(0.040)	(0.056)	(0.051)
Treatment	0.222***	-0.277***	-0.161***	-0.230***	-0.047	-0.291***
	(0.023)	(0.028)	(0.024)	(0.030)	(0.039)	(0.037)
DD estimate	-0.233***	0.099***	0.059**	0.023	-0.016	0.127***
	(0.027)	(0.030)	(0.026)	(0.032)	(0.045)	(0.041)
Constant	4.583***	10.74***	10.52***	9.253***	-0.190	10.84***
	(0.179)	(0.434)	(0.264)	(0.353)	(0.190)	(0.285)
N	30,667	46,408	46,408	46,408	46,408	46,408
R2	0.173	0.865	0.939	0.872	0.030	0.845
Old firms						
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.248***	0.203***	0.315***	-0.083***	-0.008	0.154***
	(0.031)	(0.021)	(0.018)	(0.024)	(0.042)	(0.029)
Treatment	0.158***	-0.184***	-0.112***	-0.224***	-0.092***	-0.184***
	(0.012)	(0.014)	(0.012)	(0.016)	(0.027)	(0.020)
DD estimate	-0.173***	-0.010	-0.018	0.017	0.142***	-0.023
	(0.015)	(0.016)	(0.014)	(0.019)	(0.031)	(0.022)
Constant	3.517***	11.51***	10.31***	10.47***	0.938***	11.80***
	(0.113)	(0.133)	(0.114)	(0.133)	(0.200)	(0.136)
N	94,853	140,727	140,727	140,727	140,727	140,727
R2	0.197	0.863	0.934	0.812	0.020	0.848
All firms						
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.282***	0.143***	0.245***	-0.063***	-0.085**	0.050**
	(0.016)	(0.018)	(0.015)	(0.020)	(0.034)	(0.025)
Treatment	0.171***	-0.208***	-0.124***	-0.226***	-0.085***	-0.210***
	(0.011)	(0.013)	(0.011)	(0.014)	(0.022)	(0.017)
DD estimate	-0.189***	0.012	-0.001	0.017	0.096***	0.007
	(0.013)	(0.014)	(0.012)	(0.016)	(0.026)	(0.019)
Constant	3.546***	11.19***	10.19***	10.22***	0.583***	11.41***
	(0.100)	(0.123)	(0.102)	(0.120)	(0.172)	(0.120)
N	125,520	187,135	187,135	187,135	187,135	187,135
R2	0.182	0.861	0.935	0.829	0.018	0.845

Notes:: This table shows the results of estimating equation (1). The time period in these specifications is 2006-2015, except in Column (1) where we have data only until 2014. Heteroskedasticity-consistent standard errors in parentheses. Young firms are defined as firms younger than 5 years of age, and old firms older than 5 years of age. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

A   APPENDIX: FOR ONLINE PUBLICATION

Figure 4: Changes in Ownership Shares over Time
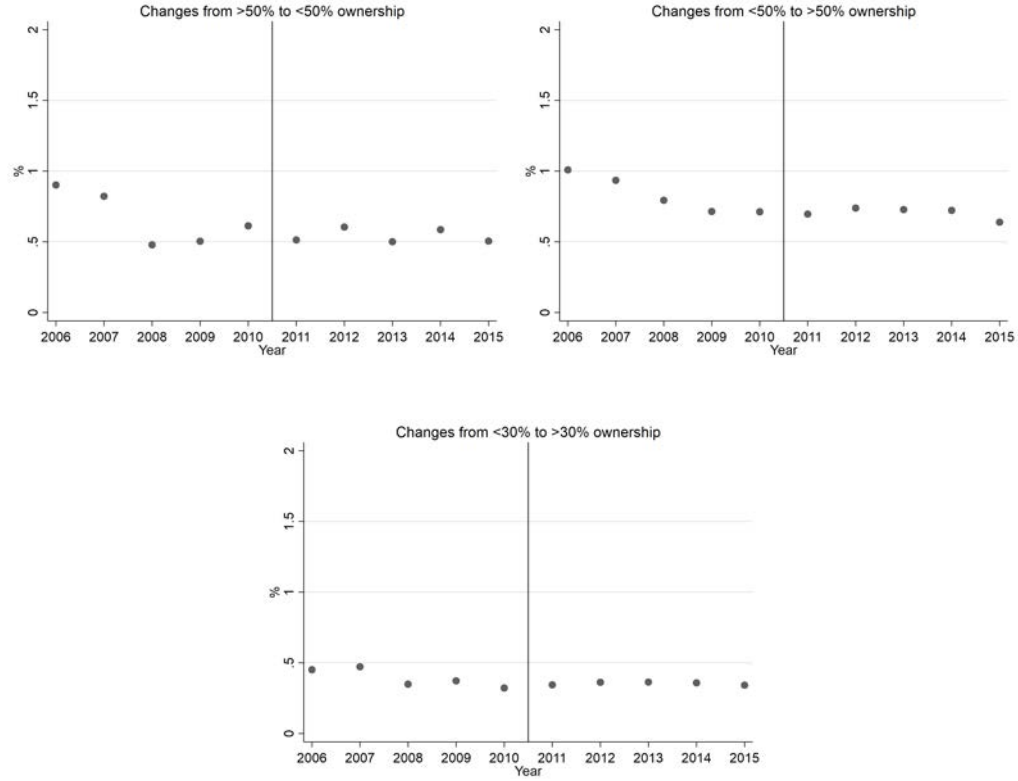
Notes: This Figure plots changes in ownership shares over time in 2006-2016. The first panel shows the changes in ownership shares for owners with more than 50% ownership shares to less than 50%. The second panel shows the changes in ownership shares for owners with less than 50% ownership shares to more than 50%. The third panel shows the changes in ownership shares for owners with less than 30% ownership shares to more than 30%. Overall, there are no significant changes across these thresholds over time or around the 2011 reform.

Figure 5: Effect on Firm-Level Outcomes for All Firms
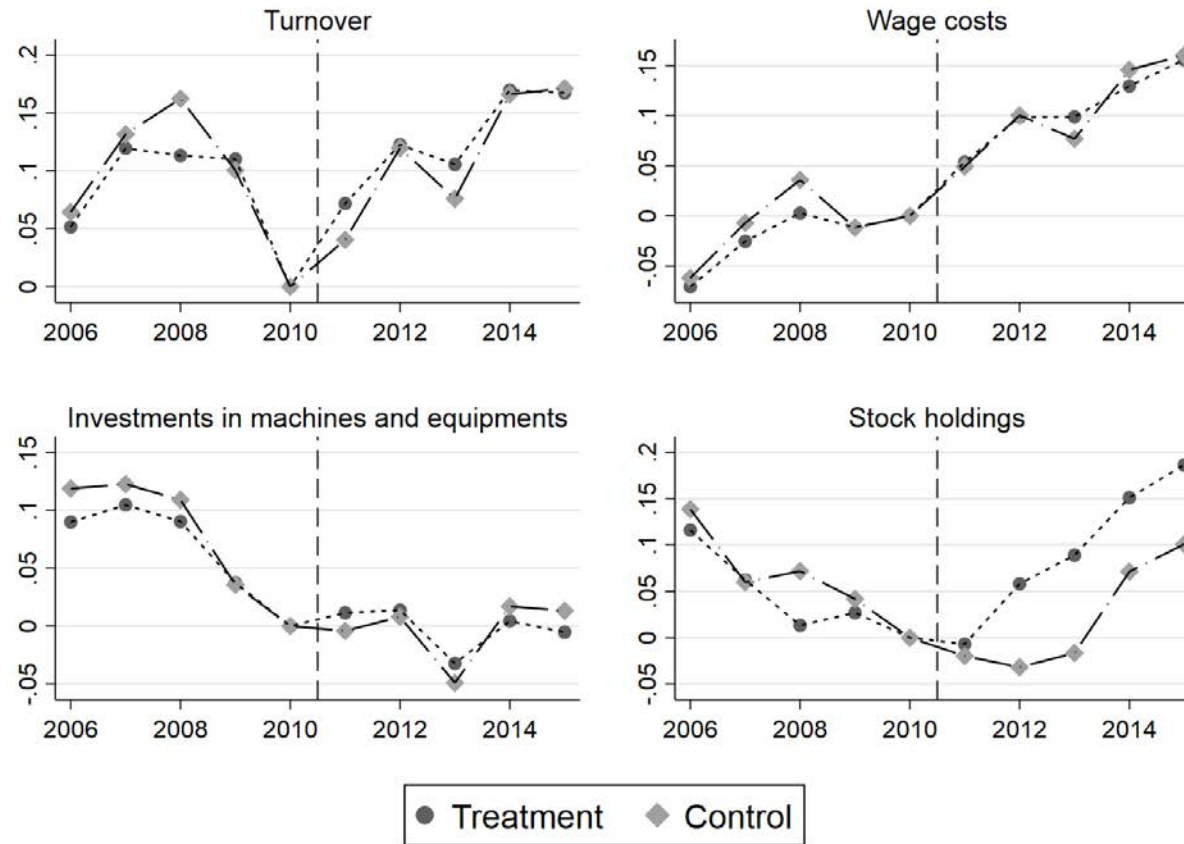
Note: Treatment: 31-50%, Control: 51-70%. Relative to year 2010.

Notes: This Figure plots the response of firm-level outcomes to the 2011 reform for the treatment and control groups for all firms. Turnover, wage costs, investments in machines and equipment and stock holdings (in logs) are plotted in the first, second, third and fourth panels, respectively.

Table 3: Differences-in-differences results: Alternative control group with owners with 51–80% ownership share

Young firms	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.363***	-0.116***	0.017	0.020	0.019	0.029
	(0.043)	(0.036)	(0.031)	(0.038)	(0.052)	(0.048)
Treatment	0.232***	-0.240***	-0.131***	-0.217***	-0.028	-0.247***
	(0.022)	(0.027)	(0.023)	(0.028)	(0.038)	(0.035)
DD estimate	-0.237***	0.078***	0.040*	0.014	-0.042	0.094**
	(0.025)	(0.028)	(0.024)	(0.029)	(0.042)	(0.038)
Constant	4.431***	10.46***	10.29***	9.167***	-0.584***	10.49***
	(0.173)	(0.428)	(0.259)	(0.346)	(0.180)	(0.278)
N	33,360	50,899	50,899	50,899	50,899	50,899
R2	0.174	0.862	0.938	0.871	0.035	0.844
Old firms						
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.255***	0.135***	0.252***	-0.075***	0.080**	0.116***
	(0.017)	(0.019)	(0.016)	(0.022)	(0.038)	(0.026)
Treatment	0.169***	-0.162***	-0.092***	-0.195***	-0.087***	-0.158***
	(0.012)	(0.014)	(0.012)	(0.015)	(0.025)	(0.019)
DD estimate	-0.170***	0.001	-0.010	0.016	0.107***	-0.024
	(0.014)	(0.015)	(0.012)	(0.017)	(0.029)	(0.020)
Constant	3.418***	11.41***	10.27***	10.31***	0.804***	11.72***
	(0.110)	(0.127)	(0.108)	(0.126)	(0.208)	(0.129)
N	105,277	158,034	158,034	158,034	158,034	158,034
R2	0.196	0.860	0.933	0.811	0.022	0.846
All firms						
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.217***	0.092***	0.200***	-0.065***	0.002	0.038*
	(0.015)	(0.016)	(0.014)	(0.019)	(0.031)	(0.022)
Treatment	0.181***	-0.181***	-0.100***	-0.202***	-0.073***	-0.176***
	(0.010)	(0.012)	(0.010)	(0.013)	(0.021)	(0.016)
DD estimate	-0.188***	0.013	-0.002	0.014	0.059**	-0.007
	(0.012)	(0.013)	(0.011)	(0.015)	(0.024)	(0.018)
Constant	3.508***	11.04***	10.10***	10.06***	0.433**	11.24***
	(0.097)	(0.118)	(0.097)	(0.114)	(0.182)	(0.114)
N	138,637	208,933	208,933	208,933	208,933	208,933
R2	0.182	0.859	0.934	0.828	0.020	0.844

Notes:: This table shows the results of estimating equation (1). The time period in these specifications is 2006-2015, except in Column (1) where we have data only until 2014. Heteroskedasticity-consistent standard errors in parentheses. Young firms are defined as firms younger than 5 years of age, and old firms older than 5 years of age. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4: Differences-in-differences results: No controls

Young firms	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.047	0.172***	0.031	-0.002	0.049	0.058
	(0.037)	(0.044)	(0.037)	(0.045)	(0.056)	(0.056)
Treatment	0.324***	-0.022	0.067***	-0.057**	-0.025	-0.011
	(0.021)	(0.028)	(0.023)	(0.028)	(0.034)	(0.035)
DD estimate	-0.202***	0.111***	0.059**	0.007	-0.024	0.117***
	(0.029)	(0.034)	(0.028)	(0.035)	(0.044)	(0.044)
Constant	8.350***	12.15***	11.12***	9.544***	0.418***	10.92***
	(0.027)	(0.026)	(0.022)	(0.029)	(0.036)	(0.036)
N	31,067	47,063	47,063	47,063	47,063	47,063
R2	0.011	0.834	0.926	0.848	0.001	0.817
Old firms						
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	-0.206***	0.154***	0.253***	-0.144***	-0.046	0.119***
	(0.035)	(0.024)	(0.020)	(0.027)	(0.042)	(0.032)
Treatment	0.292***	0.070***	0.113***	-0.025*	-0.077***	0.102***
	(0.011)	(0.013)	(0.011)	(0.014)	(0.022)	(0.018)
DD estimate	-0.151***	0.008	0.001	0.022	0.144***	-0.009
	(0.017)	(0.019)	(0.015)	(0.021)	(0.031)	(0.025)
Constant	8.403***	12.64***	11.29***	9.921***	0.877***	11.41***
	(0.013)	(0.017)	(0.015)	(0.018)	(0.029)	(0.023)
N	95,384	141,686	141,686	141,686	141,686	141,686
R2	0.012	0.823	0.917	0.768	0.001	0.807
All firms						
VARIABLES	Pension contrib.	Turnover	Wage costs	Machines	Stock holdings	Variable costs
Post-2010	0.105***	0.029	0.149***	-0.112***	0.001	-0.029
	(0.017)	(0.020)	(0.017)	(0.023)	(0.034)	(0.027)
Treatment	0.298***	0.045***	0.101***	-0.036***	-0.072***	0.073***
	(0.010)	(0.012)	(0.010)	(0.013)	(0.019)	(0.016)
DD estimate	-0.164***	0.024	0.009	0.015	0.094***	0.007
	(0.014)	(0.016)	(0.013)	(0.018)	(0.026)	(0.022)
Constant	8.394***	12.67***	11.33***	9.874***	0.754***	11.43***
	(0.012)	(0.015)	(0.013)	(0.016)	(0.024)	(0.020)
N	126,451	188,749	188,749	188,749	188,749	188,749
R2	0.010	0.824	0.919	0.793	0.000	0.809

Notes:: This table shows the results of estimating equation (1). The time period in these specifications is 2006-2015, except in Column (1) where we have data only until 2014. Heteroskedasticity-consistent standard errors in parentheses. Young firms are defined as firms younger than 5 years of age, and old firms older than 5 years of age. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.