A Depreciation Rules

The Finnish tax authorities' definition of capital is any fixed assets including all long-term tangibles used by firms in their production process to generate income that cannot easily be converted into cash, such as land, buildings, machinery, stocks, equipment, vehicles, leasehold improvements, and other such items. Firms can choose their depreciation rules: (1) linear depreciation with the same euro value per year, or (2) double declining balance depreciation with the same percentage per year. In Finland, buildings, other structures, machinery and equipment are all depreciated using the declining balance method. There are also different depreciation rules and percentages for different asset types. Depreciation is calculated separately for each building, with the maximum depreciation percentage varying from 4 percent to 20 percent, depending on the type of structure. For example, the annual depreciation rate for office buildings is 4 percent, 7 percent for factory buildings and 20 percent for immovable capital. The maximum rate of depreciation for machinery and equipment is 25 percent.

The life of assets can vary depending on the type of asset type that directly affects the amount of depreciation. Assets with a useful life of less than three years may be written off using the free depreciation method, i.e. up to 100 percent of the costs of the assets are deducted in a single tax year where the value of each item is less than EUR 850 and the total value of such assets is no more than EUR 2,500 per tax year. Patents and other intangible rights, such as goodwill, are amortized on a straight-line basis for 10 years, unless the taxpayer demonstrates that the asset has a shorter useful life.

B Bunching Methodology

We follow Chetty et al. [2011] and Kleven and Waseem [2013] to estimate the magnitude of bunching. First, we construct the counterfactual density by excluding the "distorted distribution" close to the observed distribution, and then fit a flexible polynomial function using the undistorted distribution.

We begin by constructing a bin sample. We divide the data into 100-euro bins and count the number of firms in each bin. Then we estimate a counterfactual density by running the following regression while excluding the region around the threshold $[D_L, D_H]$:

$$c_j = \sum_{i=0}^{p} \beta_i (D_j)^i + \sum_{i=D_L}^{D_H} \eta_i \cdot \mathbf{1}(D_j = i) + \varepsilon_j \tag{2}$$

where c_j is the count of firms in bin j, D_j denotes the depreciation in bin j and p is the order of the polynomial. Therefore, the estimated values for the counterfactual density are

$\hat{c}_j = \sum_{i=0}^{p} \beta_i (D_j)^i$. We can calculate the excess bunching by comparing the actual number of firms just below the threshold (within (D_L, D^*)) to the estimated counterfactual density within the same region:

$$\hat{b}(D^*) = \frac{\sum_{i=D_L}^{D^*}(c_j - \hat{c}_j)}{\sum_{i=D_L}^{D^*} \hat{c}_j / N_j}$$

where N_j represents the number of bins within $[D_L, D^*]$.

As is common in the bunching literature, we define the lower limit of the excluded region (D_L) simply based on visual observations, representing the point where bunching begins.

We follow the approach of Kleven and Waseem [2013] to define the upper limit and thus the marginal buncher firm D_H. This point is determined such that the estimated excess mass equals the estimated missing mass above the threshold D^*. In practice, we do this using an iterative process which starts with a small D_H and converges when the excess mass is equal to the missing mass, i.e. $\hat{b}_E(y^*) \approx \hat{b}_M(y^*)$.

Finally, we calculate standard errors by using a residual-based bootstrap procedure. We first generate a large number of depreciation distributions by randomly resampling the residuals from equation (2) with a replacement. Then, based on the resampled distributions, we estimate a large number of counterfactual densities. In the bootstrap procedure, we also take into account the iterative process to determine the marginal buncher. Based on these bootstrapped counterfactual densities, we evaluate variation in the estimates of interest. The standard errors for each estimate are defined as the standard deviation in the distribution of the estimate.

C Capital-Labor Elasticity of Substitution: Conceptual Framework

C.1 Micro Capital-Labor Elasticity of Substitution

Production Function. We assume that firms exhibit constant elasticity of substitution (CES) production functions as follows:

$$F(k, l) = (\alpha k^{\frac{\sigma-1}{\sigma}} + (1-\alpha) l^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}},$$

where k is capital, l is labor, and α and σ are parameters. σ is assumed to be strictly positive and has no upper bound. When $\sigma \to 0$, it can be shown that the production function is Leontief with the following form:

$$F(k,l) = \min(k,l).$$

Denote by $\epsilon_{k,l}$ the elasticity of substitution between capital and labor and by RTS the rate of technical substitution between capital and labor. It can be shown that the capital-labor substitution elasticity only depends on σ:

$$\epsilon_{k,l} = \frac{d(k/l)}{d(RTS)}\frac{RTS}{k/l} = \frac{d(k/l)}{d(-F_l/F_k)}\frac{-F_l/F_k}{k/l} = \sigma.$$

Next, since we are interested in how capital and labor respond to changes in payroll taxes, we derive the demands for labor and capital by minimizing the cost function subject to a production level constraint. We assume $\sigma > 0$ throughout and return to Leontief production functions below. Formally, we solve the following minimization problem for $\sigma > 0$, where w is wage and r is the cost of capital:

$$\min_{k,l} C(w,r) = wl + rk$$

subject to

$$F(k,l) = q_0$$

This yields the following condition:

$$k = \left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{\sigma} l$$

Using this relationship and the resource constraint $F(k,l) = q_0$, we get:

$$l = q_0\left(\alpha\left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{\sigma-1} + (1-\alpha)\right)^{\frac{\sigma}{1-\sigma}},$$

$$k = q_0\left((1-\alpha)\left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{1-\sigma} + \alpha\right)^{\frac{\sigma}{1-\sigma}}.$$

We take the derivative of these two equations with respect to w to get the elasticity of capital and labor with respect to wage:

$$\epsilon_{k,w} = \frac{\partial k}{\partial w}\frac{w}{k} = \frac{(1-\alpha)\sigma}{(1-\alpha) + \alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}},$$

$$\epsilon_{l,w} = \frac{\partial l}{\partial w}\frac{w}{l} = -\frac{\alpha\sigma}{\alpha + (1-\alpha)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma}}.$$

These two expressions imply that firms with CES production functions with $\sigma > 0$ will increase capital when wages decrease and decrease labor when wages increase. Empirically, firms with CES production functions would respond to labor cost changes by decreasing their number of employees and increasing their capital investment to replace workers.

Leontief Production Function. Leontief production functions are a special case of CES production functions: it can be shown that when $\sigma \to 0$, i.e. the capital-labor supply elasticity tends to zero, which means that capital cannot be substituted with labor and vice-versa, $F(k,l) = \min(\alpha k, \beta l)$. In this case, labor and capital are used in equal shares. For this reason, when the cost of labor increases, both the demand for labor and for capital decrease. This implies that when the capital-labor elasticity of substitution is zero, both $\epsilon_{k,w}$ and $\epsilon_{l,w}$ will be negative. Empirically, when labor costs increase, firms with Leontief production functions reduce both their number of employees and their investment in capital since both inputs are used in fixed proportions.

A Simple Empirical Test of Leontief versus CES Production Functions. The derivations above imply a simple test of whether $\epsilon_{k,l}$ is strictly positive or zero: estimating the response of capital flows, i.e. investments, to labor cost changes. If investments *increase* when labor costs increase, then $\epsilon_{k,l} > 0$. If instead, investments *decrease* when labor costs increase, then $\epsilon_{k,l} = 0$. In the rest of the paper, we setup our empirical framework to estimate how investments respond to changes in labor costs.

Alternative Test: Ratio of Capital to Labor A related test of Leontief vs CES production functions is to consider the response of the ratio of capital to labor to a change in the cost of labor. Below, we show that, except for a knife-edge case, Leontief production functions imply that $\frac{k}{l}$ should remain constant, while a CES production function predicts that $\frac{k}{l}$ will change when the cost of labor changes. To do so, we use the same notation and some derivations from above to derive the elasticity of $\frac{k}{l}$ with respect to w, which we denote by $\epsilon_{R,w} = \frac{\partial \frac{k}{l}}{\partial w}\frac{w}{\frac{k}{l}}$.

From above, it follows that:

$$\frac{k}{l} = \frac{q_0\left((1-\alpha)\left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{1-\sigma} + \alpha\right)^{\frac{\sigma}{1-\sigma}}}{q_0\left(\alpha\left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{\sigma-1} + (1-\alpha)\right)^{\frac{\sigma}{1-\sigma}}}$$

Which is the same as:

$$\frac{k}{l} = \left(\frac{(1-\alpha)\left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{1-\sigma} + \alpha}{\alpha\left(\frac{w}{r}\frac{\alpha}{1-\alpha}\right)^{\sigma-1} + (1-\alpha)} \right)^{\frac{\sigma}{1-\sigma}}$$

Let us take the derivative of this expression with respect to w:

$$\begin{aligned}\frac{\partial \frac{k}{l}}{\partial w} = & \frac{\frac{\sigma}{1-\sigma}\left(\frac{(1-\alpha)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma}+\alpha}{\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+1-\alpha}\right)^{\frac{2\sigma-1}{1-\sigma}}}{\left(\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+(1-\alpha)\right)^2} * \\ & ((1-\alpha)(1-\sigma)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{-\sigma}(\frac{1}{r}\frac{\alpha}{1-\alpha})(\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+(1-\alpha)) \\ & -(\alpha(\sigma-1)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-2}(\frac{\alpha}{r(1-\alpha)})((1-\alpha)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma}+\alpha)))\end{aligned}$$

In this expression, $\frac{\frac{\sigma}{1-\sigma}\left(\frac{(1-\alpha)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma}+\alpha}{\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+1-\alpha}\right)^{\frac{2\sigma-1}{1-\sigma}}}{\left(\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+(1-\alpha)\right)^2}$ is strictly positive for any values of σ, α, w or r. For this expression to be zero, i.e. for the ratio of capital to labor not to change when the wage changes, we need

$$\begin{aligned}0 = & ((1-\alpha)(1-\sigma)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{-\sigma}(\frac{1}{r}\frac{\alpha}{1-\alpha})(\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+(1-\alpha)) \\ & -(\alpha(\sigma-1)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-2}(\frac{\alpha}{r(1-\alpha)})((1-\alpha)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma}+\alpha)))\end{aligned}$$

This simplifies to:

$$(1-\alpha)(\alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{\sigma-1}+1-\alpha) = \alpha(\frac{w}{r}\frac{\alpha}{1-\alpha})^{2(\sigma-1)}((1-\alpha)(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma}+\alpha)$$

This further reduces to:

$$(\frac{w}{r}\frac{\alpha}{1-\alpha})^{1-\sigma} = \frac{\alpha}{1-\alpha}$$

And is the same as:

$$\frac{w}{r} = (\frac{\alpha}{1-\alpha})^{\frac{\sigma}{1-\sigma}}$$

This equality is satisfied only in knife-edge cases, implying that, in general, CES production functions will exhibit a change in the capital-to-labor ratio when wages change, except when the ratio of wage to the rental rate of capital happens to precisely equal $(\frac{\alpha}{1-\alpha})^{\frac{\sigma}{1-\sigma}}$.

If, instead, the production function is Leontief, i.e. $F(k,l) = \min(k,l)$, then capital and labor are always used in equal proportions, from which follows that the ratio of capital to labor will not change even when wages increase.

D Macro Elasticities

The capital-labor elasticity of substitution we have estimated is a micro elasticity and does not account for possible substitution across different firms and/or industries. However, we can use our micro elasticity to derive an estimate of the macro elasticity by relying on the framework of Oberfield and Raval [2014]. The authors show that the aggregate elasticity of substitution is a weighted average of the micro elasticity of substitution and the elasticity of demand.

Formally, given the following production function: $F(k,l) = (\alpha k^{\frac{\sigma-1}{\sigma}} + (1-\alpha)l^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}}$, we denote by $\alpha_i = \frac{rk_i}{rk_i+wl_i}$ and $\alpha = \frac{rk}{rk+wl}$ the capital share in the total costs of production for firm i and the aggregate capital share, respectively. Further, we define θ_i to be plant i's cost of labor and capital as a share of the aggregate costs of labor and capital. Oberfield and Raval [2014] show that the macro capital-labor elasticity of substitution σ^{agg} is a weighted average of the micro elasticity of substitution and the elasticity of demand ε:

$$\forall \sigma \geq 0,\ \sigma^{agg} = (1-\chi)\sigma + \chi\varepsilon \tag{3}$$

where $\chi = \sum_{i \in I} \frac{(\alpha_i-\alpha)^2}{\alpha(1-\alpha)}\theta_i$ represents the degree of heterogeneity in the relative use of labor and capital in a given market and I is the total number of firms. $(1-\chi)\sigma$ measures the substitution of labor with capital within a given plant as a response to changes in relative factor prices and $\chi\varepsilon$ measures the reallocation effect of labor and capital across firms when relative factor prices change: for example, when the cost of capital increases, firms that rely more heavily on labor gain a cost advantage that they can pass through to prices. The elasticity of demand ε determines the extent to which consumers respond to lower prices by shifting consumption to the labor-intensive commodity.

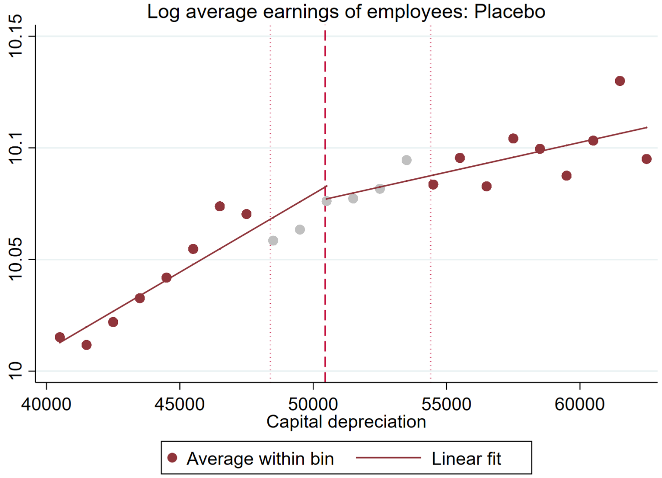
α_i, α and θ_i are directly observable in the corporate tax data, which report both labor and capital costs. To estimate ε, we use the average markup μ and assume that $\varepsilon = 1/\mu$. We follow Antras et al. [2017] and define markups as $\frac{sales-costs}{costs}$.

We estimate that $\chi = 0.13$ and $\varepsilon = 1.29$. These estimates imply a macro capital-labor elasticity of substitution $\sigma^{agg} = 0.17$.

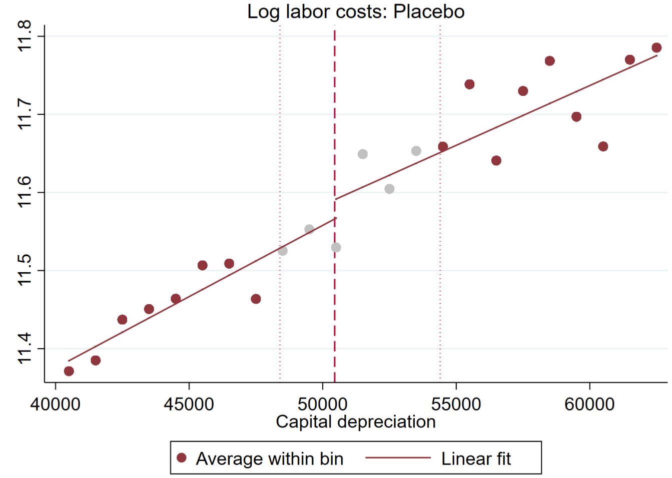
E Robustness Checks

Figure 11: Earnings and Labor Costs: Placebo years 2010–2015

(a) Earnings



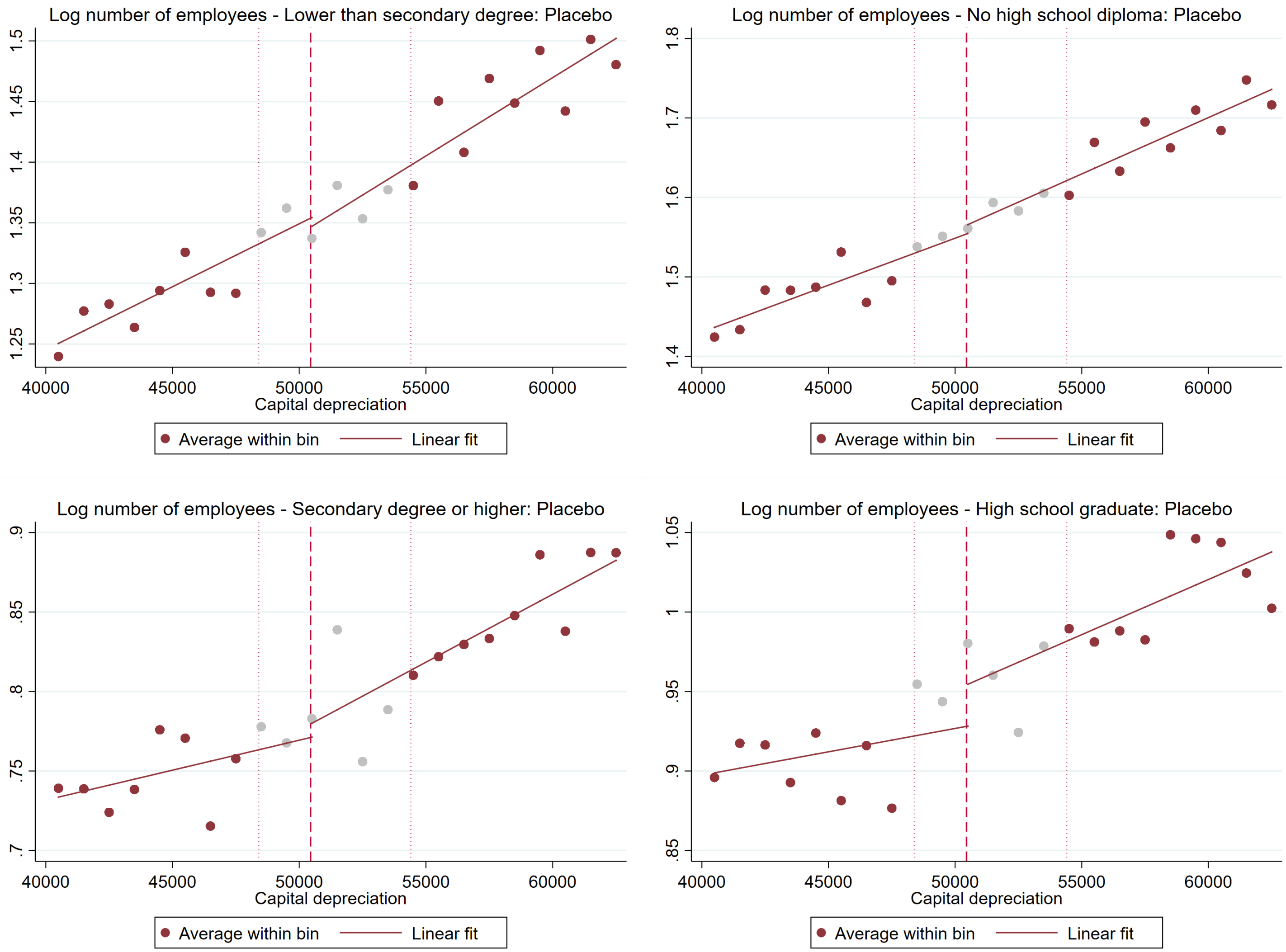
(b) Labor Costs



(c) Number of Employees

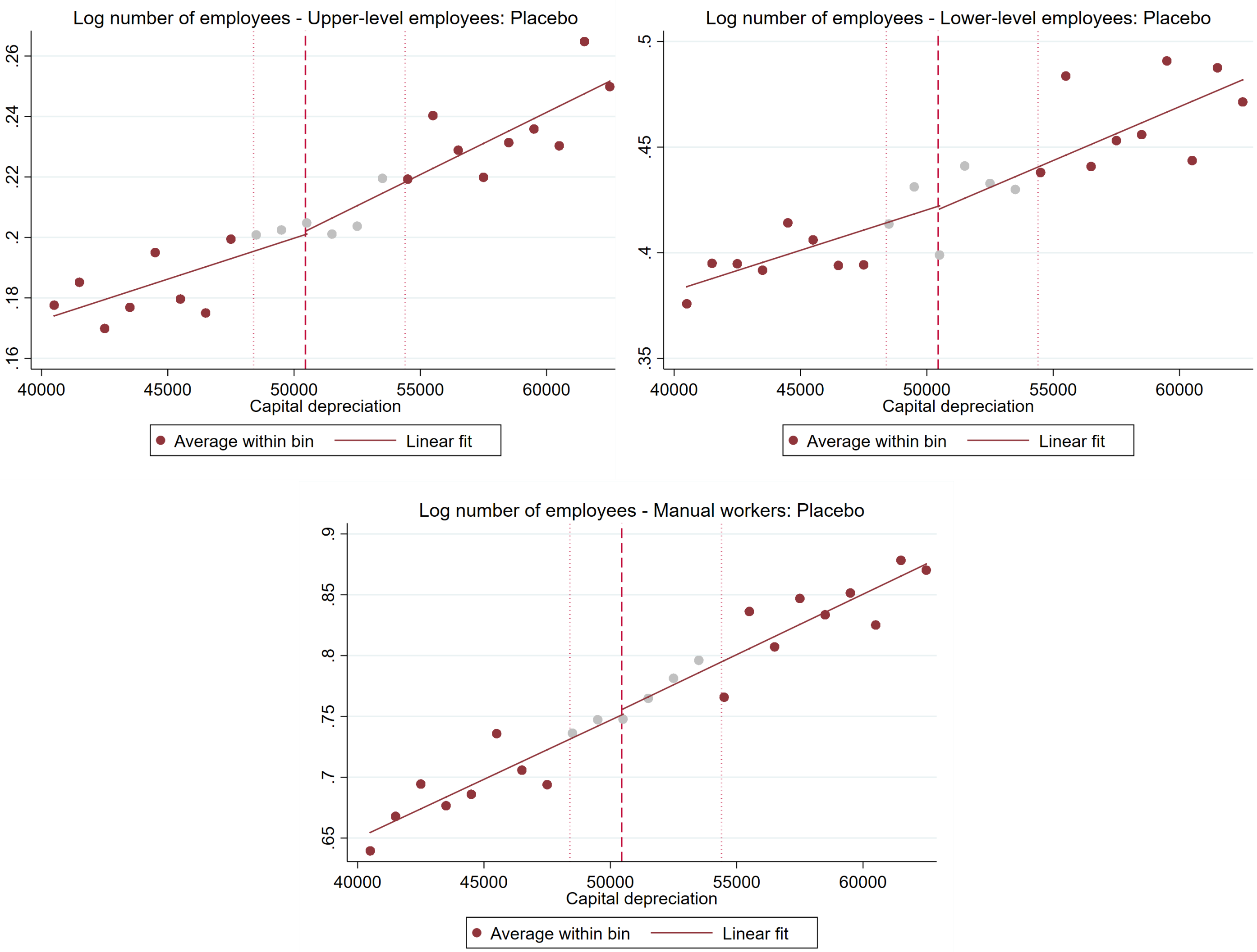
Notes: The figure shows the placebo effects at the threshold. The years included are 2010 to 2015. The first panel shows the response of earnings per employee (in logs) at the payroll tax discontinuity. The second panel shows the response labor costs of net of payroll taxes paid by firms to the payroll tax discontinuity.

Figure 12: Employment Effects by Skill Level: Placebo years 2010–2015



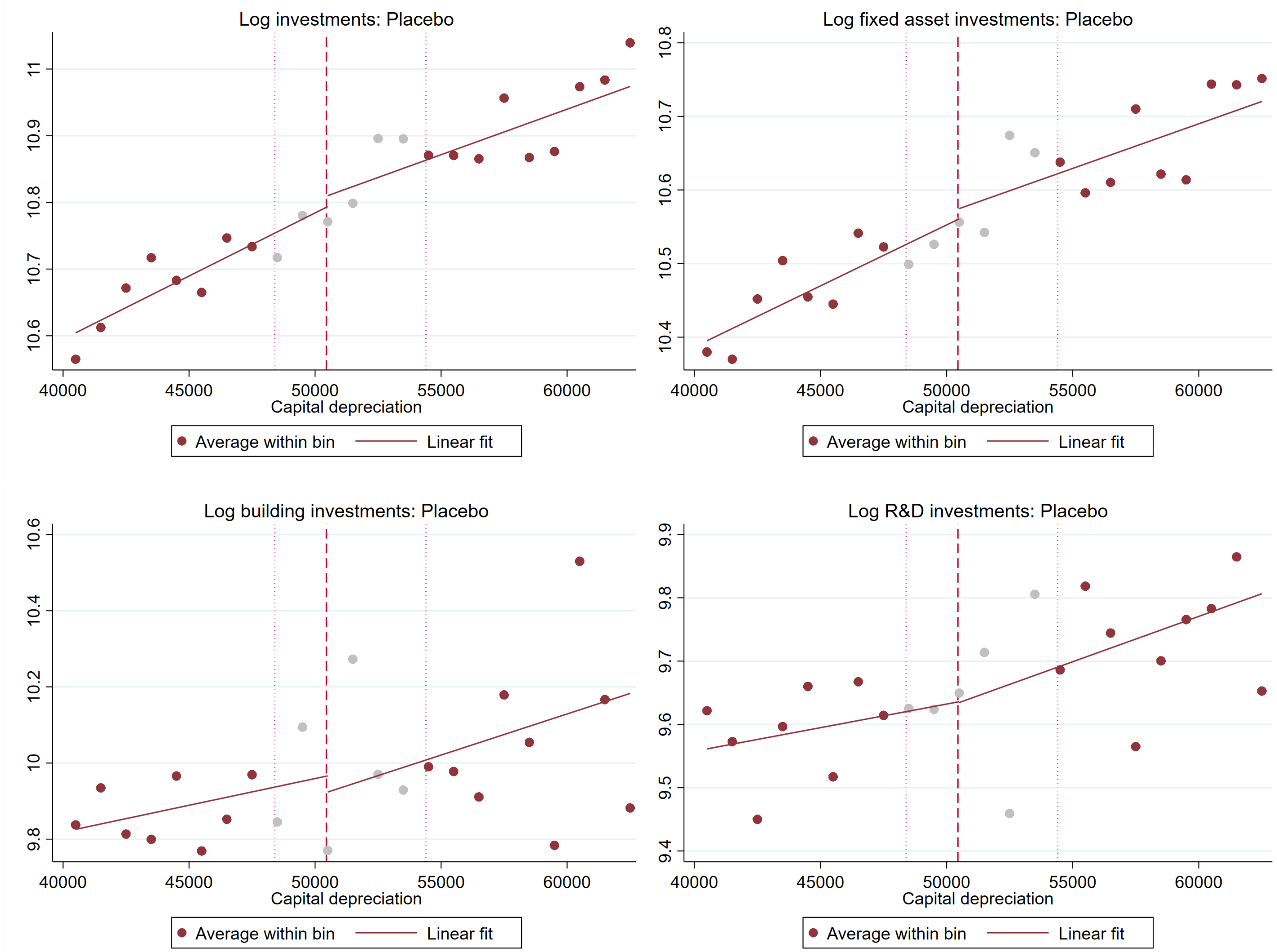
Notes: The figure shows the placebo effects at the threshold. The years included are 2010 to 2015. These figures plot the (log) number of employees with lower than secondary education (first panel), with no high school diploma (second panel), with higher than secondary education (third panel) and with a high school diploma in firms around the capital depreciation threshold.

Figure 13: Employment Effects by Job Task: Placebo years 2010–2015



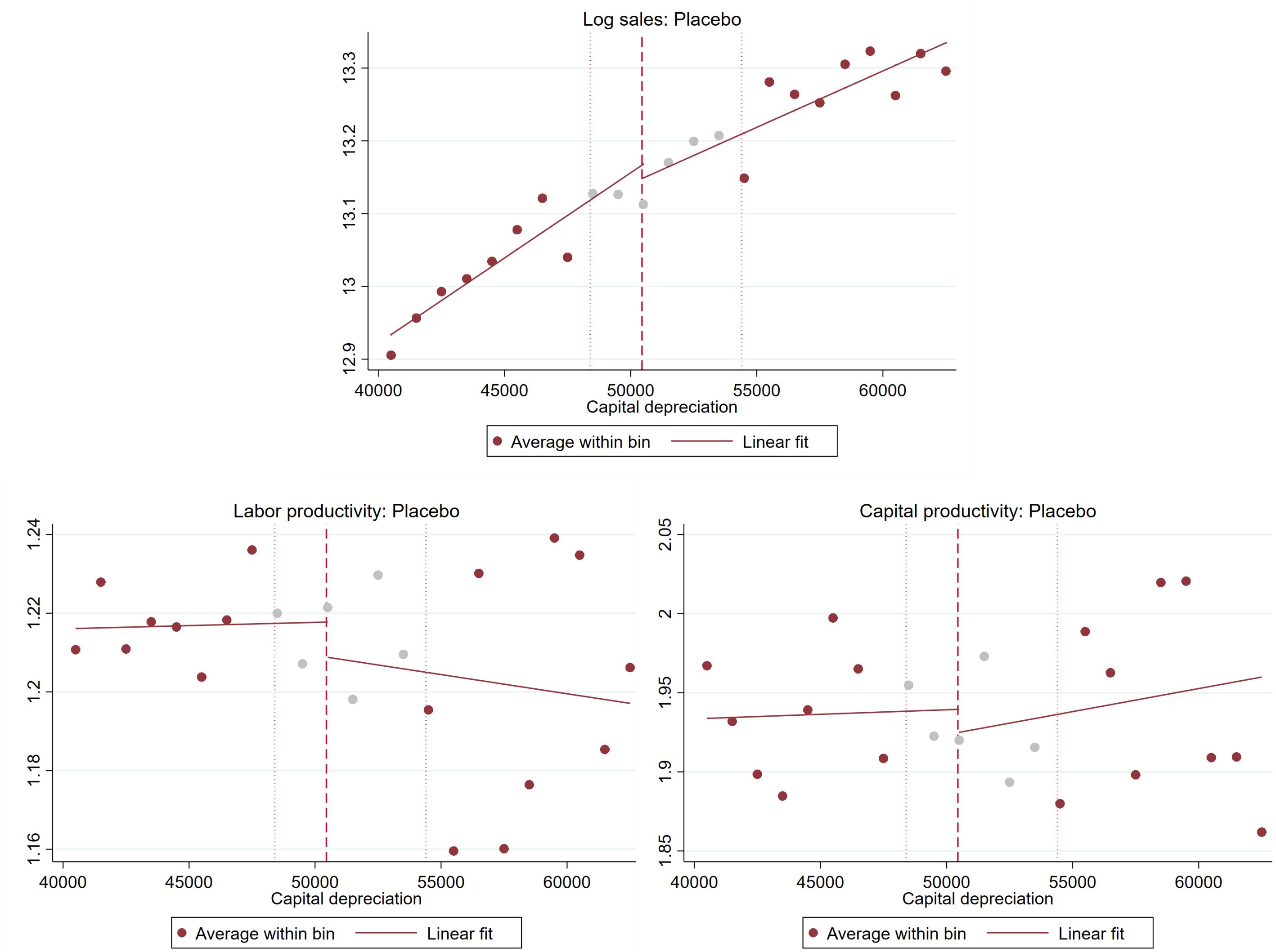
Notes: The figure shows the placebo effects at the threshold. The years included are 2010 to 2015. These figures plot the (log) number of employees by task measures.

Figure 14: Effects on Investments: Placebo years 2010–2015



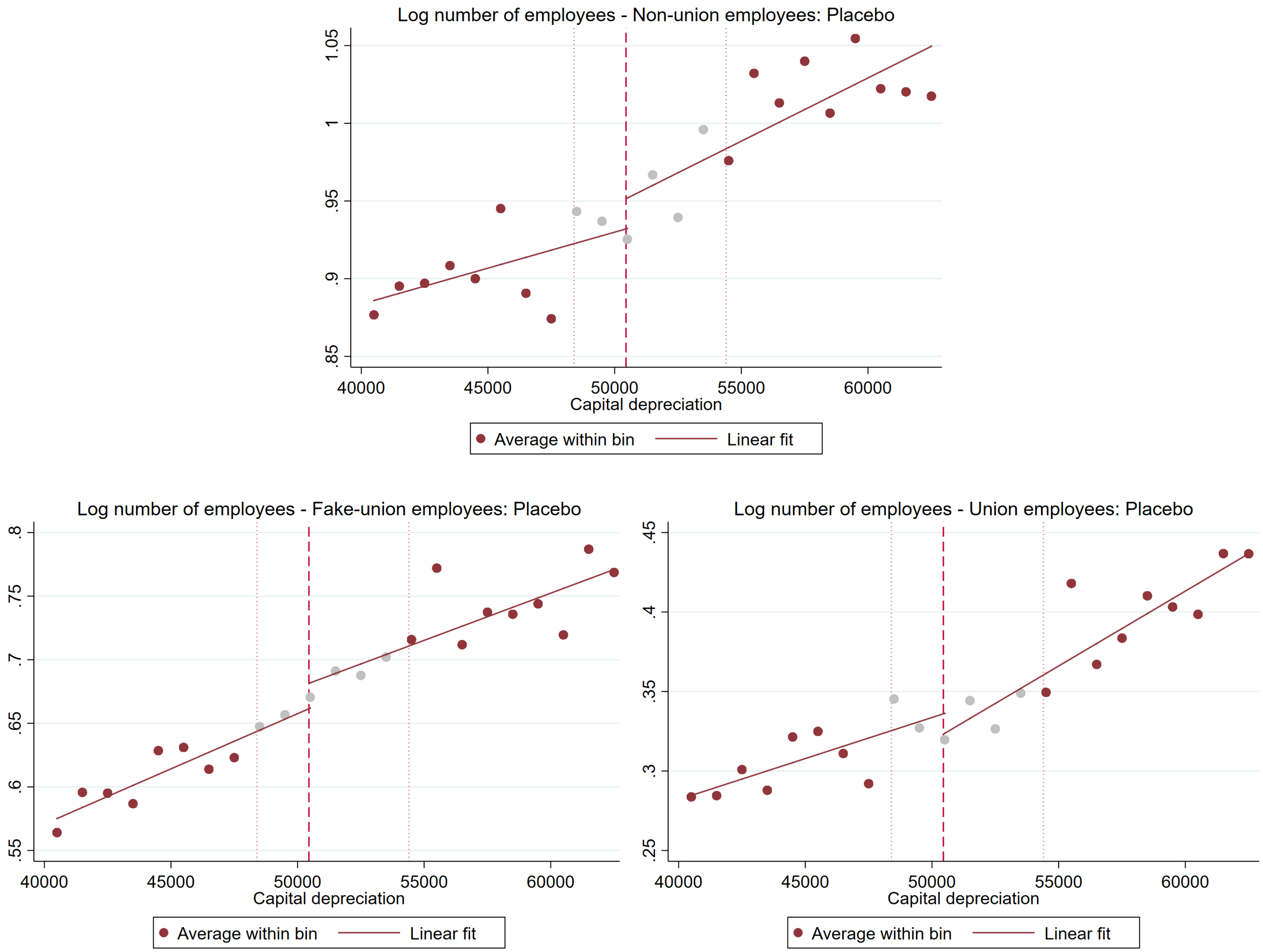
Notes: The figure shows the placebo effects at the threshold. The years included are 2010 to 2015. These figures plot the (log) total annual investments of firms (first panel), and total investments divided by fixed assets (second panel), buildings (third panel) and R&D (fourth panel) around the capital depreciation threshold.

Figure 15: Production and Productivity: Placebo years 2010–2015



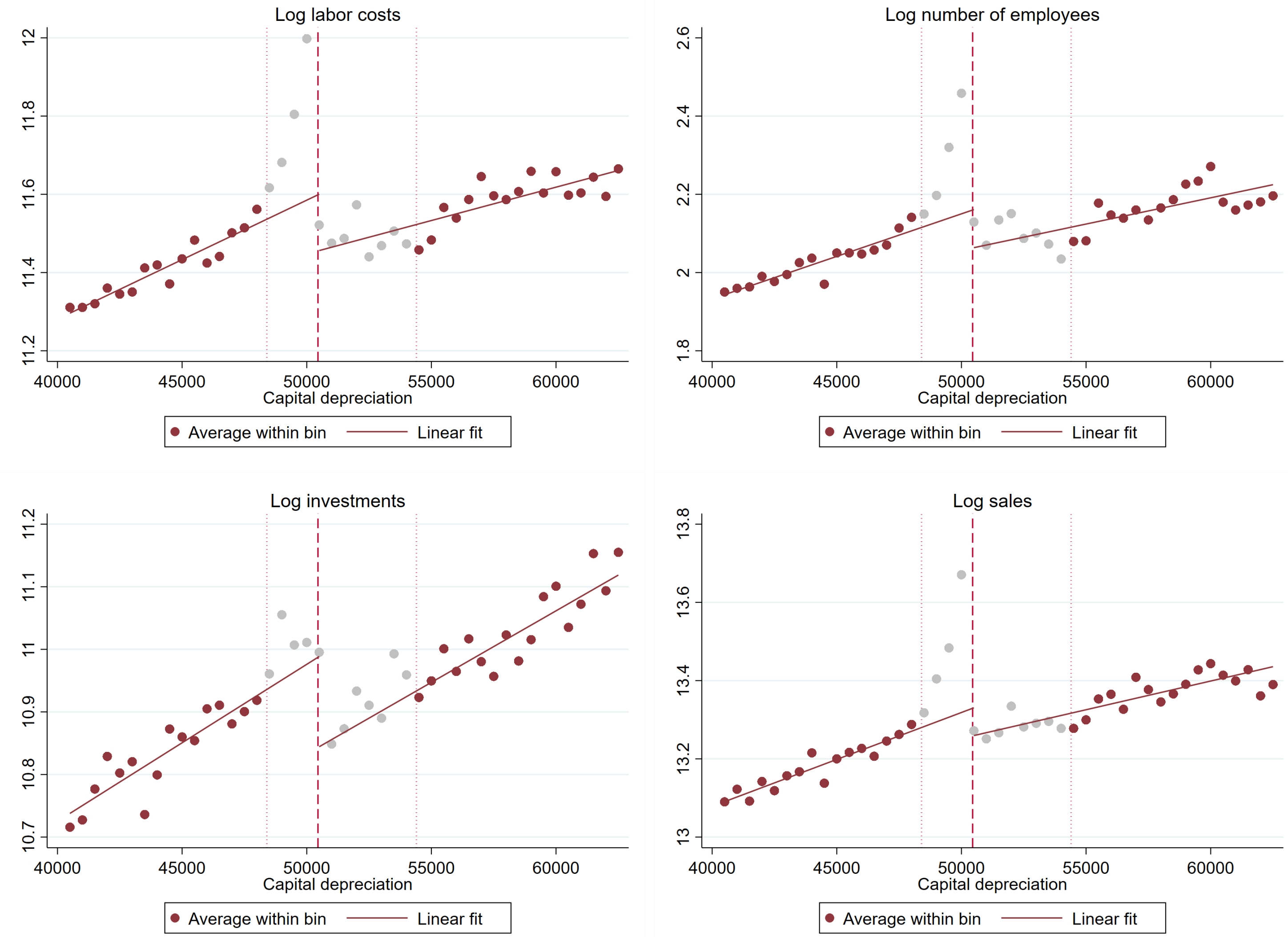
Notes: The figure shows the placebo effects at the threshold. The years included are 2010 to 2015. These figures plot the (log) sales (first panel), labor (lower-left panel) and capital productivity (lower-right panel) of firms around the capital depreciation threshold.

Figure 16: Employment by Unionization Status: Placebo years 2010–2015



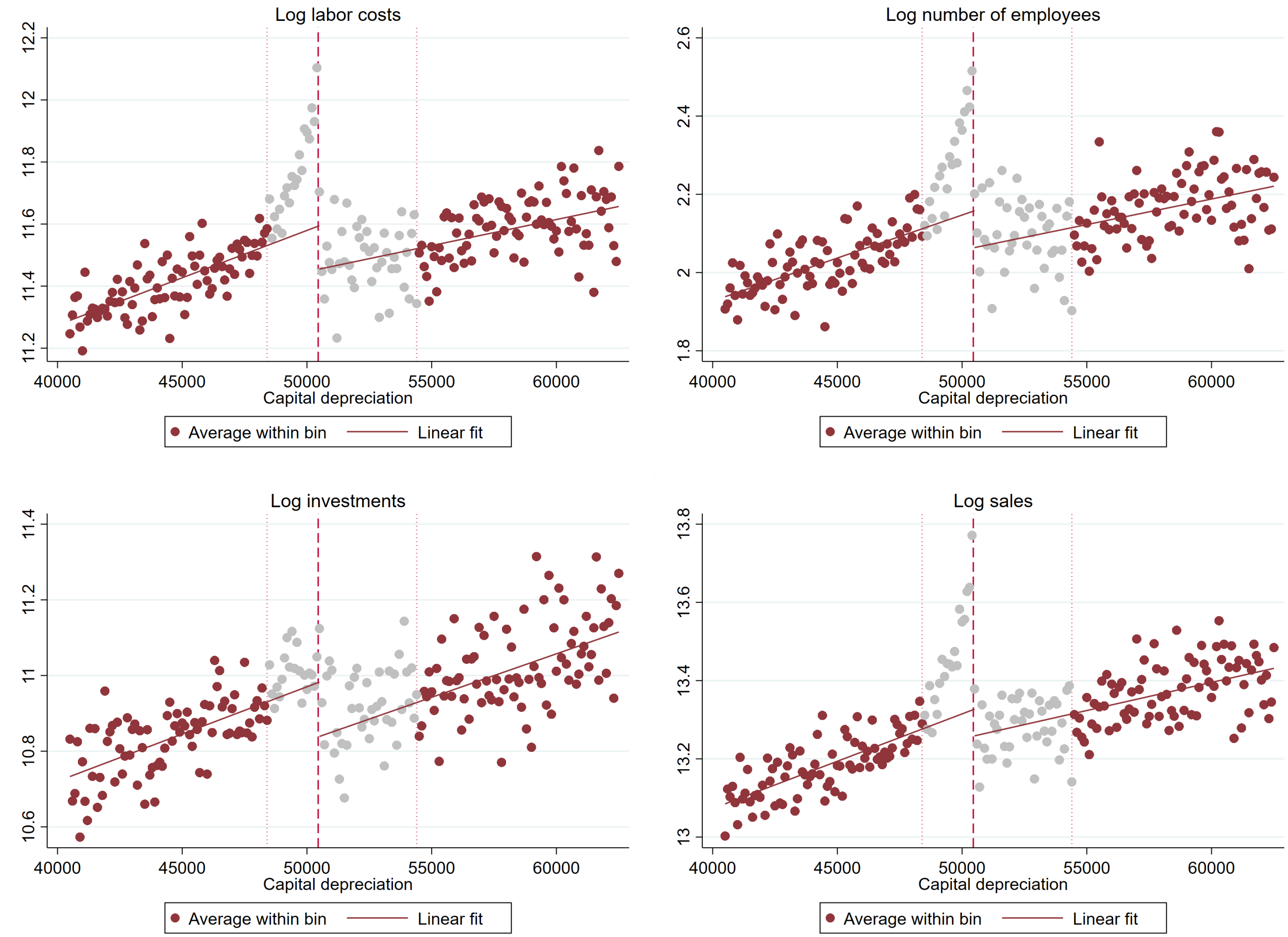
Notes: The figure shows the placebo effects at the threshold. The years included are 2010 to 2015. These figures plot the (log) number of non-union employees, employees paying unemployment insurance payments but not belonging to a union (fake union) and employees belonging to a labor union around the capital depreciation threshold.

Figure 17: Smaller Bin Width: 500 euros



Notes: These figures show the main firm-level outcomes with a smaller, 500-euro bin width at the payroll tax discontinuity from 1996 to 2009. In these Figures, we also plot the mean outcomes within the donut hole region.

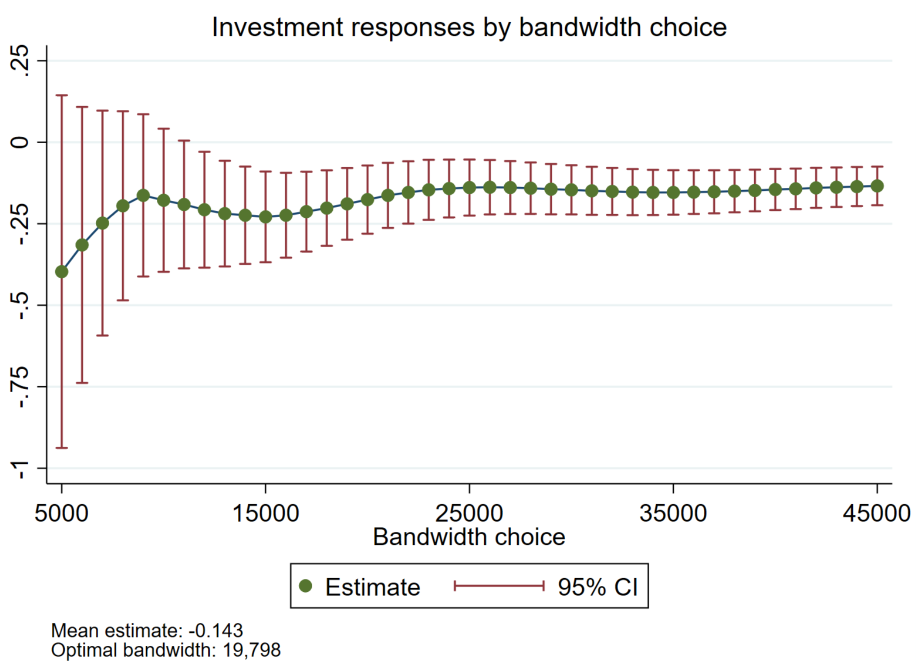
Figure 18: Smaller Bin Width: 100 euros



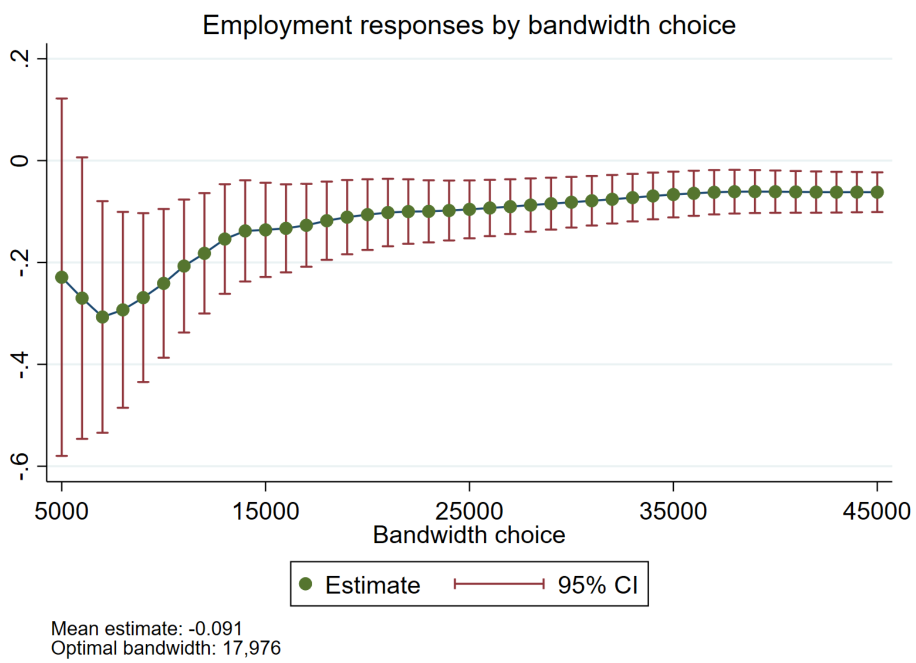
Notes: These figures show the main firm-level outcomes with a smaller, 100-euro bin width at the payroll tax discontinuity from 1996 to 2009. In these figures, we also plot the mean outcomes within the donut hole region.

Figure 19: Estimates by Different Bandwidth

(a) Investment Response by Bandwidth



(b) Employment Response by Bandwidth



Notes: These figures plot the estimated response of investment (panel a) and employment (panel b) by size of bandwidth.

Table 8: Estimates by Size of the Missing-Mass Region

	Size of the donut hole					
	500		1500		2500	
Outcome	Log investments	Log no. empl.	Log investments	Log no. empl.	Log investments	Log no. empl.
RD Estimate	-0.220***	-0.068*	-0.208***	-0.067	-0.229***	-0.133***
	(0.050)	(0.038)	(0.061)	(0.045)	(0.064)	(0.048)
Bandwidth	7,323	6,293	7,897	6,900	8,980	8,161
N above	12,358	11,035	11,392	10,159	11,240	10,304
N below	18,473	15,955	20,245	17,902	23,732	21,918

	Size of the donut hole			
	3500		4500	
Outcome	Log investments	Log no. empl.	Log investments	Log no. empl.
RD Estimate	-0.182***	-0.127***	-0.147***	-0.048**
	(0.049)	(0.035)	(0.035)	(0.019)
Bandwidth	16,125	13,621	28,162	40,161
N above	19,922	17,018	32,411	44,550
N below	50,715	42,056	104,006	108,741

Notes: This table reports the results of estimating equation (1) on employment and investment using different thresholds for the missing-mass region (donut hole to the right of the threshold). Table shows bias-corrected estimates with robust standard errors, the size of the optimal bandwidth (one common mean square error optimal bandwidth), the number of observations above (N above) and below (N below) the threshold within the bandwidth, respectively, following Calonico et al. [2014].

Table 9: Estimates by Size of the Excess-Mass Region

	Size of the excess-mass region							
	3500		3000		2500		2000	
Outcome	Log investments	Log no. empl.	Log investments	Log no. empl.	Log investments	Log no. empl.	Log investments	Log no. empl.
RD Estimate	-0.178***	-0.065*	-0.143***	-0.062*	-0.120**	-0.068**	-0.113**	-0.079***
	(0.060)	(0.033)	(0.054)	(0.032)	(0.049)	(0.030)	(0.045)	(0.031)
Bandwidth	15,592	18,041	17,238	18,090	18,646	18,869	19,997	17,604
N above	18,610	22,835	20,911	22,891	22,837	23,937	24,514	22,215
N below	41,112	54,674	49,862	56,386	58,236	62,024	66,825	56,880

	Size of the excess-mass region					
	1500		1000		500	
Outcome	Log investments	Log no. empl.	Log investments	Log no. empl.	Log investments	Log no. empl.
RD Estimate	-0.116***	-0.082***	-0.143***	-0.091***	-0.148***	-0.127***
	(0.043)	(0.029)	(0.044)	(0.029)	(0.0413)	(0.032)
Bandwidth	20,700	18,094	19,798	17,976	20684	15,882
N above	25,404	22,897	24,254	22,757	25382	19,731
N below	72,144	60,848	68,659	61,859	75400	53,735

Notes: This table reports the results of estimating equation (1) on employment and investment using different thresholds for the excess-mass region (donut-hole to the left of the threshold). The table shows bias-corrected estimates with robust standard errors, the size of the optimal bandwidth (one common mean square error optimal bandwidth), the number of observations above (N above) and below (N below) the threshold within the bandwidth, respectively, following Calonico et al. [2014].

Table 10: Estimates by Different Polynomials of Different Degrees

	Polynomial fit			
	2nd degree		3rd degree	
Outcome	Log investments	Log no. empl.	Log investments	Log no. empl.
RD Estimate	-0.159***	-0.109***	-0.267**	-0.195***
	(0.054)	(0.039)	(0.127)	(0.070)
Bandwidth	36,829	34,030	44,397	44,431
N above	41,702	40,543	47,688	49,228
N below	102,494	107,148	102,494	107,148

Notes: This Table reports the results of estimating equation (1) on employment and investment using different polynomial fits. Table shows bias-corrected estimates with robust standard errors, the size of optimal bandwidth (one common mean square error optimal bandwidth), the number of observations above (N above) and below (N below) the threshold within bandwidth, respectively, following Calonico et al. [2014].

F Additional Tables

Table 11: Social insurance percentages by firm categories, different insurance types and years

	Health and pension				Unemployment					
	Firm categories*			Accident	Firm categories**		Group life	Employers	Total	Total
Year	I	II	III	insurance***	I	II	insurance***	pension***	lowest	highest
1996	4.000	5.600	6.500	1.2	1.00	4.00	0.100	16.80	23.100	28.600
1997	4.000	5.600	6.500	1.4	1.00	4.00	0.090	16.70	23.190	28.690
1998	4.000	5.600	6.500	1.4	0.90	3.90	0.080	16.80	23.180	28.680
1999	4.000	5.600	6.500	1.3	0.90	3.85	0.080	16.80	23.080	28.530
2000	4.000	5.600	6.500	1.2	0.90	3.45	0.090	16.80	22.990	28.040
7/2000	3.600	5.600	6.500	1.2	0.90	3.45	0.090	16.80	22.590	28.040
2001	3.600	5.600	6.500	1.2	0.80	3.10	0.095	16.60	22.295	27.495
2002	3.600	5.600	6.500	1.1	0.70	2.70	0.095	16.70	22.185	27.085
3/2002	2.950	5.150	6.050	1.1	0.70	2.70	0.095	16.70	21.535	26.635
2003	2.964	5.164	6.064	1.1	0.60	2.45	0.081	16.80	21.545	26.495
2004	2.964	5.164	6.064	1.1	0.60	2.50	0.080	16.80	21.544	26.544
2005	2.966	5.166	6.066	1.2	0.70	2.80	0.080	16.80	21.746	26.946
2006	2.958	5.158	6.058	1.1	0.75	2.95	0.080	16.70	21.588	26.888
2007	2.951	5.151	6.051	1.1	0.75	2.95	0.080	16.64	21.521	26.821
2008	2.771	4.971	5.871	1.0	0.70	2.90	0.080	16.80	21.351	26.651
2009	2.801	5.001	5.901	1.0	0.65	2.70	0.070	16.80	21.321	26.471
4/2009	2.000	4.201	5.101	1.0	0.65	2.70	0.070	16.80	20.520	25.601
2010	2.220	2.220	2.220	0.8	0.75	2.95	0.070	16.90	20.74	22.94
2011	2.210	2.210	2.210	1.0	0.80	3.20	0.070	17.10	21.18	23.58
2012	2.210	2.210	2.210	1.0	0.80	3.20	0.070	17.35	21.43	23.83
2013	2.040	2.040	2.040	0.9	0.80	3.15	0.070	17.35	21.16	23.51
2014	2.140	2.140	2.140	0.9	0.75	2.95	0.070	17.75	21.61	23.81
2015	2.080	2.080	2.080	0.9	0.80	3.15	0.070	18.00	21.85	24.89
2016	2.120	2.120	2.120	0.8	1.0	3.90	0.070	18.00	21.99	24.89
2017	1.080	1.080	1.080	0.8	0.8	3.30	0.070	17.95	20.70	23.20

* Refers to firm categories by wage sums and capital depreciation.
** Category I is for wages below certain wage sums threshold, e.g. 2,059,500 euros in year 2017, and Category II is for wages above the threshold. The threshold varies slightly over years.
*** Represents the average values of these insurances.

Table 12: Definitions of the variables used in the analysis

Variables	Definitions
Payroll tax rate	Firm-level payroll tax rate for health and pension contributions.
Capital depreciation in taxation	Firm-level annual capital depreciations used in taxation in euros.
Capital depreciation in accounting	Firm-level annual capital depreciations in accounting in euros.
Earnings	Employee-level total annual earnings of employees.
Labor costs	Annual total wages and other wage-related compensations paid by the firm to employees excluding all social insurance contributions and taxes in euros.
Number of employees	The sum of the number of employees who worked in the firm during the tax year.
Secondary degree	Employee-level education measure for individuals who have bachelor or masters degree or higher.
High school graduate	Employee-level education measure for individuals who have graduated from high school.
Upper-level employees	Employee-level task measure for individuals whose position is senior official or upper management, senior officials and employees in research and planning, senior officials and employees in education and training or other senior officials and employees.
Lower-level employees	Employee-level task measure for individuals whose position is supervisor, clerical and sales workers or independent work.
Manual workers	Employee-level task measure for individuals whose position is clerical and sales worker, worker in agriculture, forestry and commercial fishing, manufacturing worker, other production worker or distribution and service worker.
Investments	Annual euro value of gross investments in fixed capital, buildings and research and development.
Fixed asset investments	Annual euro value of gross investments in machines and equipment.
Building investments	Annual euro value of gross investments in buildings.
R&D investments	Annual euro value of gross investments in research and development.
Sales	Gross annual sales of the firm from its primary operating activity minus any discounts given, valued-added taxes, and other taxes based on sales volumes.
Intermediate inputs	Annual euro value of the costs used as intermediate inputs in production.
Labor productivity	Annual euro value of sales minus intermediate inputs divided by labor costs.
Capital productivity	Annual euro value of sales minus intermediate inputs divided by annual investments.
Union employees	Employee-level dummy for individuals with above median tax deductible labor union membership fee.
Fake union employees	Employee-level dummy for individuals with below median tax deductible labor union membership fee.
Not union employees	Employee-level dummy for individuals with no tax deductible labor union membership fee.

Table 13: Descriptive statistics: Firm-level sample vs. all Finnish firms in 2002

Sample							
VARIABLE Statistics	Depreciations in taxation	Depreciations in accounting	Capital Stock	Investments	Investments Fixed assets	Investments Buildings	Investments R&D
Mean	49627.8	41413.3	262603.9	90755.2	66497.8	17836.2	6421.2
Median	46634.5	44876.1	176874.5	57025.7	43283.8	0	0
Se. mean	135.4	560.5	8136.1	3364.3	1673.2	2895.1	600.5
	Sales	Intermediate costs	Labor costs	Number of employees	Profits	Value added	Labor Productivity
Mean	1132873	657483	205057.1	12.4	52490.7	475440	1.330
Median	561326.5	150501	156830.3	9	30872.7	379644.9	1.138
Se. mean	38766.3	36010.5	3118.6	.235	4301.0	7738.6	.017
N=2,972							

All Finnish firms							
VARIABLE Statistics	Depreciations in taxation	Depreciations in accounting	Capital Stock	Investments	Investments Fixed assets	Investments Buildings	Investments R&D
Mean	31249.6	27384.5	228694.9	58058.6	31461.2	18564.5	8032.8
Median	436.7	0	0	0	0	0	0
Se. mean	891.1	1008.3	13265.1	6080.1	1471.5	5624.6	951.2
	Sales	Intermediate costs	Labor costs	Number of employees	Profits	Value Added	Labor Productivity
Mean	606997.3	306996.0	102499.5	10.1	42562.6	300001.4	.968
Median	66537.0	3355.4	3124.8	1	3105.9	47954.8	.650
Se. mean	9730.6	6330.7	1841.2	.360	5009.9	5000.5	.003
N=148,211							

Notes: The upper panel of this table reports the descriptives statistics for the data used in the graphical analysis in the paper. The sample is restricted to firms with capital depreciations between 40,500–64,500 euros, and excluding the donut hole region. The lower panel of the table shows the same descriptive statistics for all Finnish firms with sales between 10,000–100,000,000 euros. The descriptive statistics are presented only for year 2002, the mid-year of our treatment period 1996–2009.

Table 17: Earnings Responses by Earnings Decile

Outcomes: Mean employee-level log earnings					
Decile	Smallest decile	2nd	3rd	4th	5th
RD Estimate	-0.128**	-0.021	-0.001	-0.007**	0.001
	(0.064)	(0.032)	(0.005)	(0.004)	(0.003)
Bandwidth	30,000	30,000	30,000	30,000	30,000
N above	1,818	2,715	3,422	3,971	4,139
N below	5,750	6,949	7,391	7,624	7,831
Decile	6th	7th	8th	9th	Largest decile
RD Estimate	-0.002	0.002	-0.007*	0.002	0.018
	(0.003)	(0.003)	(0.004)	(0.010)	(0.023)
Bandwidth	30,000	30,000	30,000	30,000	30,000
N above	4,327	4,093	4,180	3,463	3,276
N below	7,413	6,925	6,818	5,363	5,253

Notes: This table reports the results of estimating equation (1) on mean employee-level log earnings by deciles of earnings. We use a fixed 30,000 euro bandwidth in these specifications to have comparable estimates across earnings deciles due to the relatively small number of observations in each category.

Table 14: Descriptive statistics: Industry and organizational form distribution

	Below the threshold			Above the threshold		
Industry classification	Frequency	Share	Cumulative	Frequency	Share	Cumulative
Farming & Mining	2,389	8.93	8.93	1,920	9.91	9.91
Manufacturing	4,462	16.68	25.61	3,454	17.83	27.75
Construction & Transportation	14,356	53.66	79.27	9,915	51.19	78.94
Services	3,402	12.72	91.99	2,427	12.53	91.47
Finance & Real estate	1,883	7.04	99.02	1,472	7.60	99.07
Other & Missing	261	0.98	100.00	181	0.93	100.00
Organizational form	Frequency	Share	Cumulative	Frequency	Share	Cumulative
Sole proprietors	2,933	10.96	10.96	1,682	8.68	8.68
Corporations	19,185	71.68	82.64	14,613	75.43	84.11
Partnerships	4,647	17.36	100.00	3,079	15.89	100.00

Notes: This table reports the number of firms, the share of firms and the cumulative proportion of firms by industry codes and organizational form for the data used in the graphical analysis in the paper. The sample is restricted only to firms with capital depreciations between 40,500–64,500 euros, and excluding the donut hole region.

Table 15: Descriptive statistics: County distribution

	Below the threshold			Above the threshold		
Location	Frequency	Share	Cumulative	Frequency	Share	Cumulative
Uusimaa	8,259	28.4	28.4	8,484	29.34	29.34
Varsinais-Suomi	2,598	8.93	37.33	2,562	8.86	38.2
Satakunta	1,332	4.58	41.91	1,274	4.41	42.61
Kanta-Häme	853	2.93	44.84	846	2.93	45.54
Pirkanmaa	2,429	8.35	53.19	2,349	8.12	53.66
Päijät-Häme	1,057	3.63	56.82	987	3.41	57.07
Kymenlaakso	874	3.01	59.83	910	3.15	60.22
Etelä¬-Karjala	679	2.33	62.16	719	2.49	62.71
Etelä-Savo	941	3.24	65.4	924	3.19	65.9
Pohjois-Savo	1,231	4.23	69.63	1,231	4.26	70.16
Pohjois-Karjala	826	2.84	72.47	858	2.97	73.13
Keski-Suomi	1,320	4.54	77.01	1,233	4.26	77.39
Etelä-Pohjanmaa	1,455	5	82.01	1,265	4.37	81.76
Pohjanmaa	1,200	4.13	86.14	1,077	3.72	85.48
Keski-Pohjanmaa	527	1.81	87.95	509	1.76	87.24
Pohjois-Pohjanmaa	1,856	6.38	94.33	1,881	6.5	93.74
Kainuu	407	1.4	95.73	449	1.55	95.29
Lappi	1,063	3.66	99.39	1,119	3.87	99.16
Ahvenanmaa	175	0.6	100	244	0.84	100
Total	29,082	100		28,921	100	

Table 16: Descriptive statistics: firm age

	Below the threshold			Above the threshold		
Firm characteristics	Mean	Se mean	N	Mean	Se mean	N
Firm age in years	37.46	0.072	29,360	37.51	0.072	29,230

Table 18: Earnings Responses by Employee Types

Outcomes: Mean employee-level log earnings				
Unionization	All	Non-union	Fake union	Union
RD Estimate	-0.008	-0.025*	0.003	-0.001
	(0.014)	(0.015)	(0.014)	(0.013)
Bandwidth	30,000	30,000	30,000	30,000
N above	35,404	28,045	30,526	32,442
N below	67,317	50,133	54,015	58,536
Education	No High School	High School	No College	College degree
RD Estimate	-0.013	0.009	-0.011	-0.002
	(0.013)	(0.016)	(0.013)	(0.014)
Bandwidth	30,000	30,000	30,000	30,000
N above	34,592	24,220	32,168	34,363
N below	65,129	42,185	58,154	64,090
Tasks	Upper level	Lower level	Manual	
RD Estimate	0.027	0.003	-0.016	
	(0.017)	(0.015)	(0.013)	
Bandwidth	30,000	30,000	30,000	
N above	22,006	25,323	29,541	
N below	35,987	44,171	52,013	
Gender	Men	Women		
RD Estimate	-0.049	0.005		
	(0.043)	(0.023)		
Bandwidth	30,000	30,000		
N above	4,985	11,914		
N below	9,708	21,564		

Notes: This table reports the results of estimating equation (1) on mean employee-level log earnings for all workers ("All"), non-unionized workers ("Non-union"), fake union workers ("Fake union"), unionized workers ("Union"), workers with no high school diploma ("No high school"), workers with no college degree ("No College"), workers with a college degree ("College Degree"), upper-level workers ("Upper Level"), lower-level workers ("Lower Level"), manual workers ("Manual"), male workers ("Men") and female workers ("Women"). We use a fixed 30,000 euro bandwidth in these specifications to have comparable estimates across employee types due to the relatively small number of observations in some of the categories.