Wage Incidence of Corporate Income Taxes: Market Equilibrium versus Rent Sharing

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Introduction

- **Policy**
  - Policy introduced in 2013 to curb unemployment and boost competitiveness
  - The **CETC** is a **corporate tax credit** whose amount is a proportion of the wages of workers paid **below 2.5 MW**
  - **Hybrid tool**: a tax credit aimed at reducing labor costs
  - **Sizable**: in 2016, nearly .85% of GDP

- **Objective of study**
  - Take advantage of the CETC to shed new light on **coporate tax incidence**
  - Disentangle **individual-level** and **firm-level** mechanisms
  - Focus on wage and employment outcomes

Introduction

- **Data 2009-2015**
  - Matched employer-employee data
  - Data on wages, hours worked, tax credit, firms characteristics

- **Methodology**
  - Treatment intensity is computed using **pre-existing wage structure**
  - Difference-in-difference and event-study approach
  - Leveraging the **discontinuity in eligibility** by comparing firms whose wage structure differs only around 2.5 MW

- **Findings**
  - Individual-level: no distortion in wage distribution at the eligibility cutoff, implies a discontinuity in the density of labor costs
  - Firm-level: **no employment effect** and **increase in wages** (mostly driven by white-collars) $\rightarrow$ Key role of firm-level mechanisms

Literature

- **Literature on incidence of corporate taxation**
  - ◇ Arulampalam et al. (2012), Suárez Serrato and Zidar (2016), Fuest et al. (2017), half of corporate tax seems to be born by workers through wages
  - ◇ All within-country evidence is based on local variation in local tax rates
  - → We use firm-level variation in treatment intensity, national policy

- **Literature on incidence of payroll taxes**
  - ◇ Textbook view: mostly born by workers (Gruber, 1997)
  - ◇ Recently challenged: Saez et al. (2012), Bozio et al. (2017), Saez et al. (2017)
  - → Firm-level mechanisms crucial to understand incidence

- **Literature on cuts in labor costs and employment**
  - ◇ In France, payroll taxes targeted at low wages boost employment (Crépon and Desplatz, 2001)
  - → Different results, possibly because indirect labor costs reduction

Data and estimation sample

- **Data sources**
  - **Data on the CETC, firm-level (2013-2015)**
    - → Amount and use of the CETC: tax deduction, cash flows (MVC, DGFiP)
  - **Balance sheet and income statement data, firm-level (2009-2015)**
    - → Data on turnover, employees, margins, etc. (FARE, INSEE)
  - **Jobs data, job level (2009-2015)**
    - → Wage, hours worked, SPC, type of contract, etc. (DADS, INSEE)

- **Estimation sample**
  - Keep only firms present in the 3 datasets and keep eligible
  - Drop outliers for eligible wagebill, wages, profits margins (P1 & P100)
  - Balanced panel of 328,674 firms (2009-2015)

  → Very **representative**: 86% of jobs, 90% of eligible wage bill

Measurement and empirical strategy

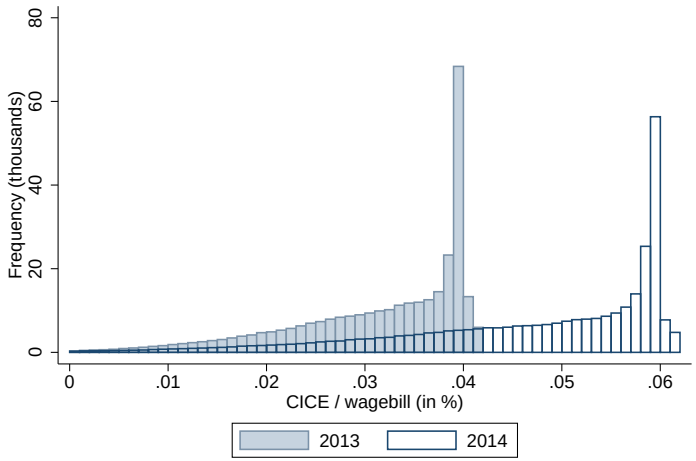
- **Main idea:** use variation in **treatment intensity** instead of treatment status as a vast majority of firms is eligible to the tax credit
- **Threat to identification**: treatment intensity is computed from the wage bill, whose dynamics can be influenced by the policy
- Use **pre-reform (2012) wage bill**

$$T_i = \frac{0.053 \cdot \sum_{j \in i} w_{j,2012} h_{j,2012} \cdot \mathbb{1}(w_{j,2012} < 2.5 \cdot MW_{2012})}{\sum_{j \in i} w_{j,2012} h_{j,2012}}$$

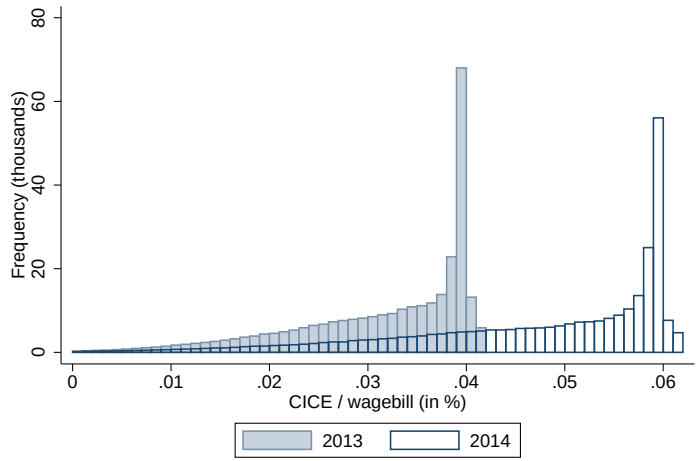
where h_{jt} and w_{jt} denote respectively hourly wage and hours worked for employee j in firm i at time t. 5.3% is the average rate over the period studied (2013-2015)

Measurement and empirical strategy

- **Distribution of actual treatment intensity, by firm size**



All



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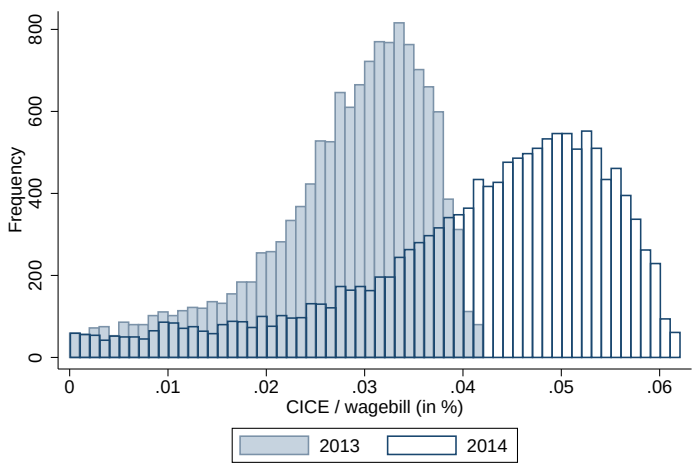

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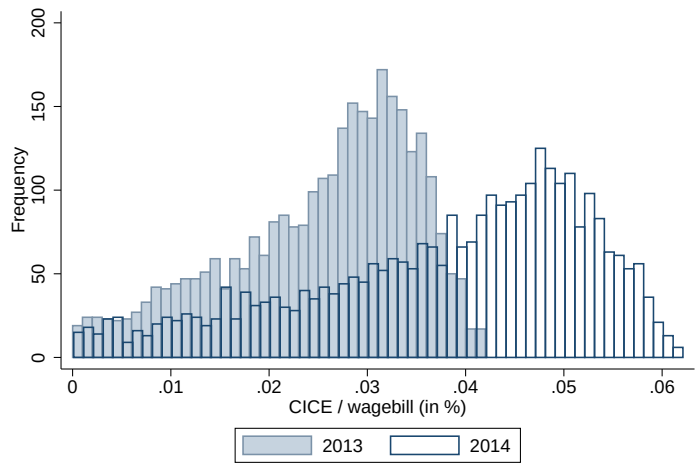
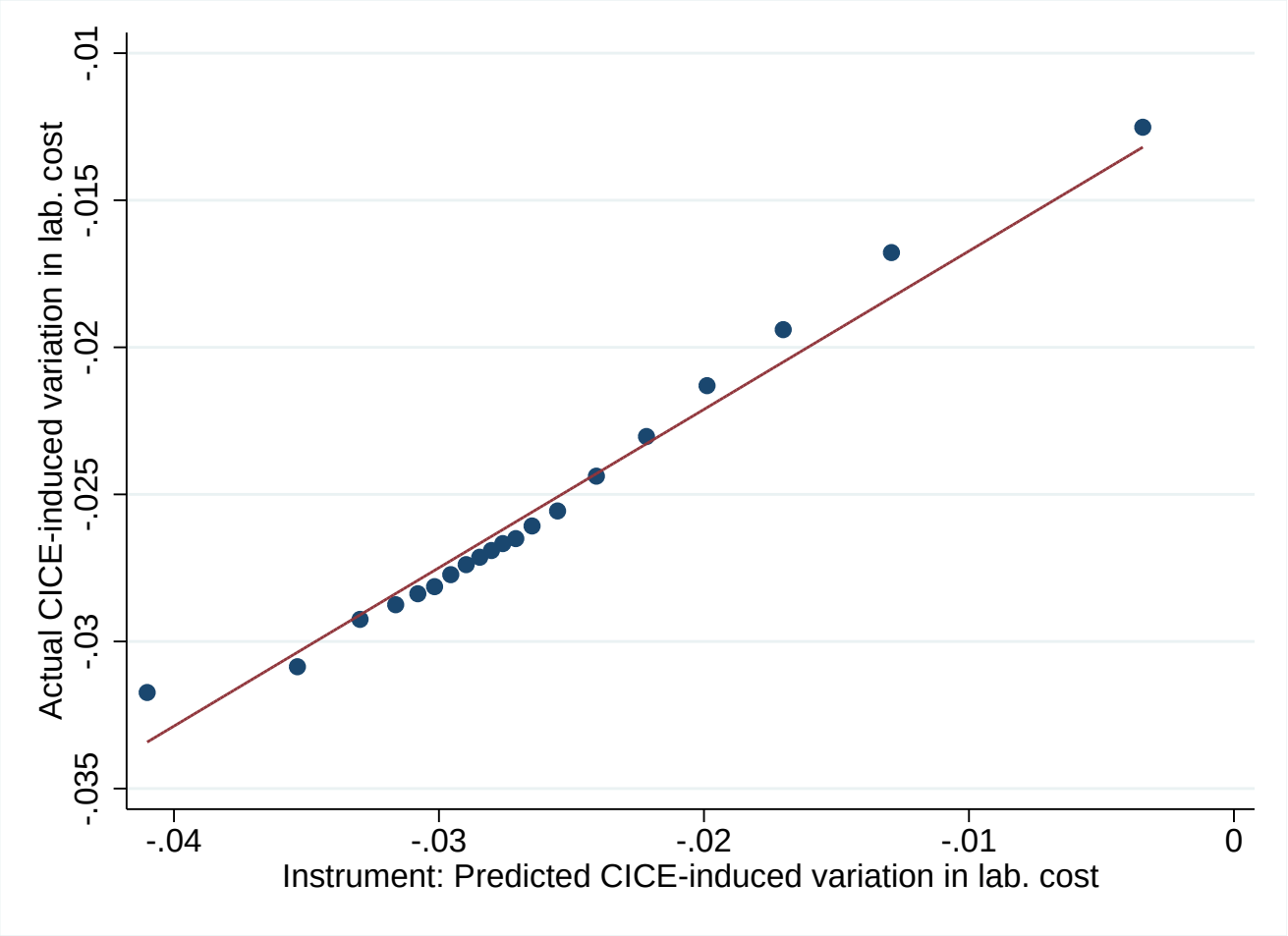


$\geqslant$ 250

Measurement and empirical strategy

- **Actual vs. computed CETC**



Note: The x-axis corresponds to 20 quantiles of the computed treatment intensity. The y-axis reports the average value of the actual treatment intensity in each quantile.

Measurement and empirical strategy

- **Reduced-form difference-in-difference**

$$\ln(Y_{it}) = \alpha_i + \alpha_{\textbf{cnst}} + \beta \cdot T_i \cdot \mathbf{1}(t \geq 2013) + X'_{it}\gamma + \varepsilon_{it}$$

- **Reduced-form event study**

$$\ln(Y_{it}) = \alpha_i + \alpha_{\textbf{cnst}} + \sum_{d=2009, d\neq 2012}^{2015} \beta_t \cdot T_i \cdot \mathbf{1}(d = t) + X'_{it}\gamma + \varepsilon_{it}$$

  - where Y_{it} stands for wages or employment of firm i at time t
  - where Z_i is the predicted treatment intensity of firm i
  - where X_{it} is a set of lagged controls (productivity, assets, % workers below 1.5 MW $\times$ year dummies)
  - α_i are firm fixed-effects
  - $\alpha_{\textbf{cnst}}$ are **cells** $\times$ industry $\times$ size $\times$ year fixed-effects

Measurement and empirical strategy

- **Main idea**: compare firms with similar wage distributions, except immediately around the cutoff

- **Cells**
  - Cummulative distribution of wage bill at 2.2 and 2.8 MW (0.05 wide brackets)
  - 21×21 cells with similar wage share under 2.2 and above 2.8 MW
  - Within cell variation in treatment stems from local differences in wage distribution between 2.2 and 2.8 MW

- **Implications**
  - Meant to ensure comparability of firms: the **common trend assumption needs only to hold within cell**
  - Use variation in treatment intensity only around the 2.5 MW cutoff: **meant to reduce possible influence of counfounding factors**

Measurement and empirical strategy

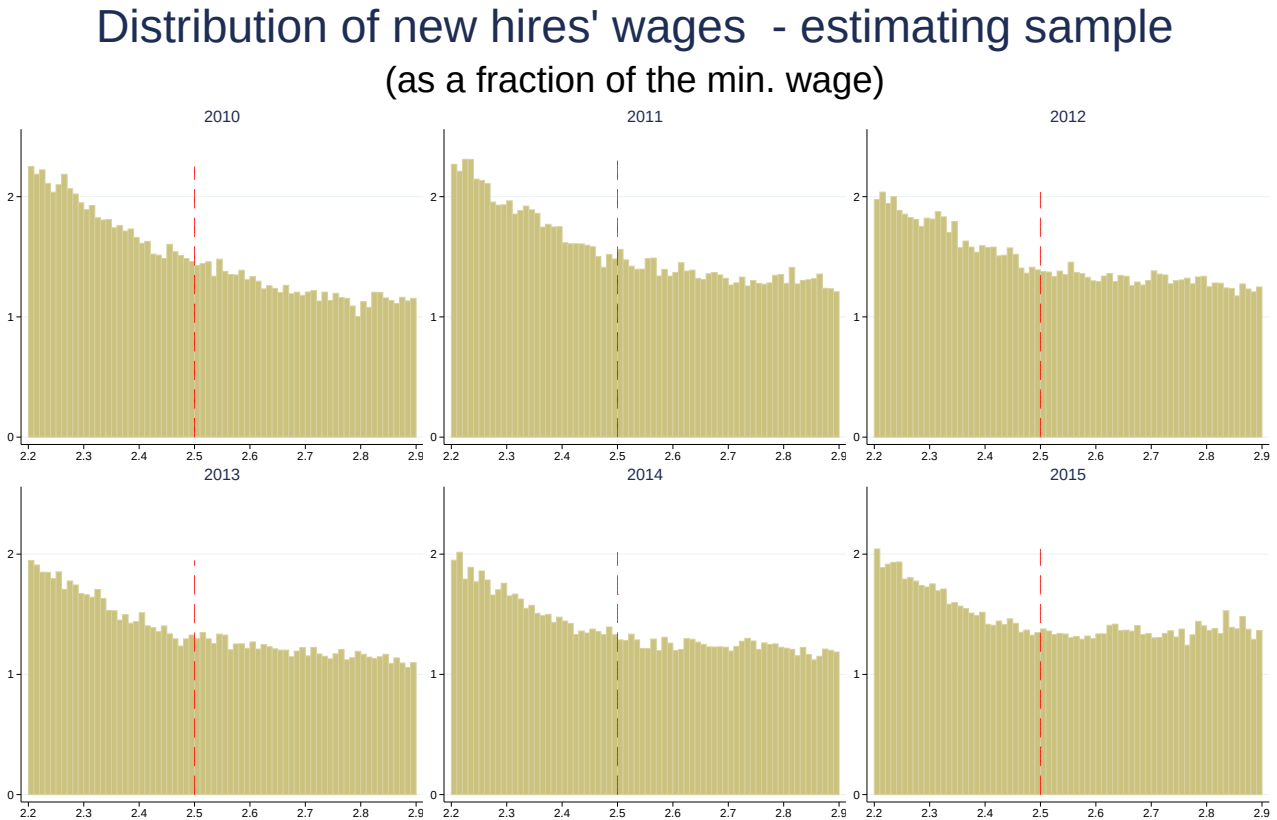
- If, within cell, variation in treatment is "as good as random", the **within-cell correlation with ex-ante characteristics** should be low.

Statistic	# firms	Uncondit.	Sector × size FEs	Sector × size × cells FEs
$\rho(Z_i, Assets_i)$	328,675	-0.162	-0.097	-0.004
$\rho(Z_i, (VA/L)_i)$	328,675	-0.343	-0.284	-0.007
$\rho(Z_i, ShMW_i)$	328,675	0.608	0.510	0.001

Cells are the interaction of 21 × 21 categories of the proportion of wage bill accruing to workers making less than 2.2 and less than 2.8 MW. We take the log of assets and the log of productivity.

Individual-level results

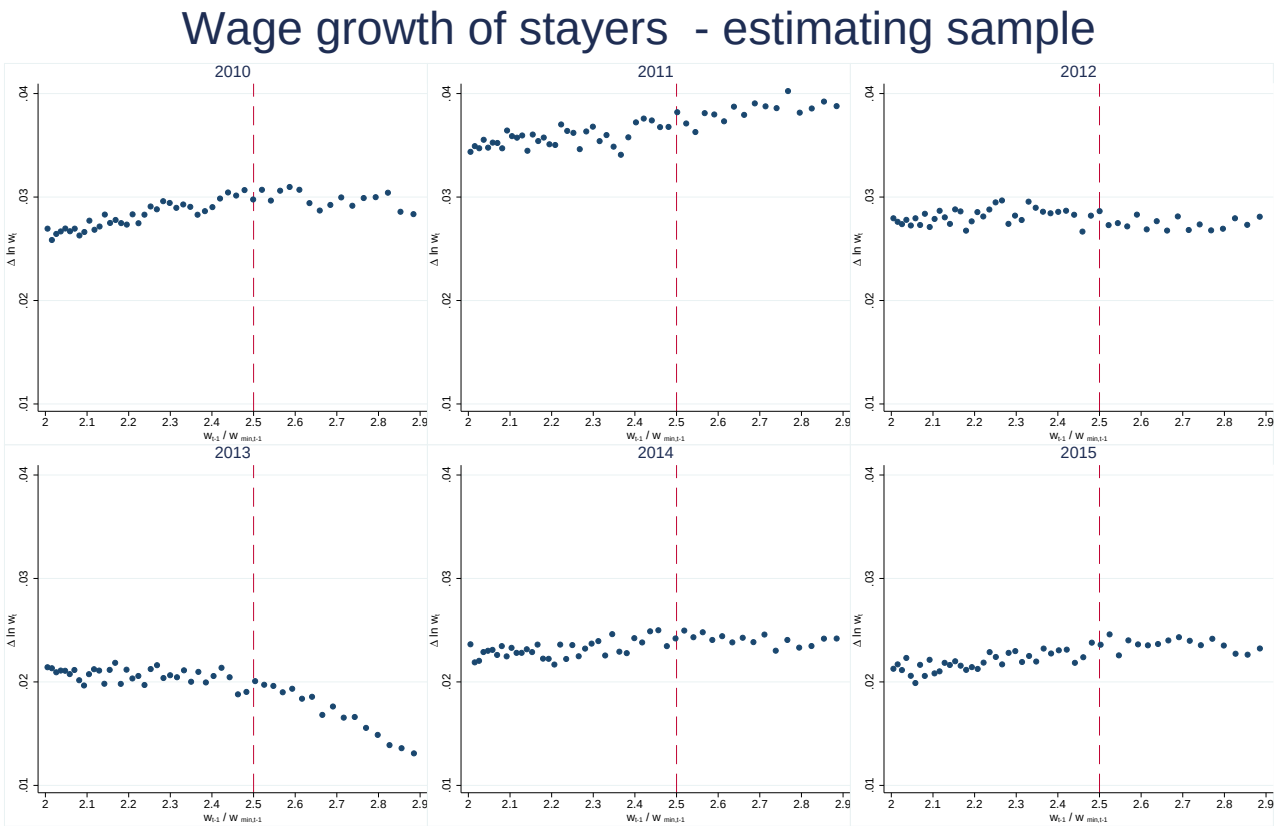
- **No discontinuity in the wage distribution of new hires at the cutoff**



Source: DADS. The y-axis refers to number of hires in thousands.
Hires are defined as jobs starting in Feb. or later at year t that did not exist in year t-1 taken up by workers not employed in the same firm at t-1. Firms with no employment at year t-1 are excluded.

Individual-level results

- **No discontinuity in the wage growth at the cutoff**



Source: DADS.
Stayers are defined as workers in permanent contract working full-time (32 hrs per week or more) who kept the same occupation within the same firm between t and t-1

→ Persistent discontinuity in labor costs at the cutoff.

Firm-level results

- **Effect on employment: Difference in difference, all employees**

Table: Impact on mean number of employees per firm

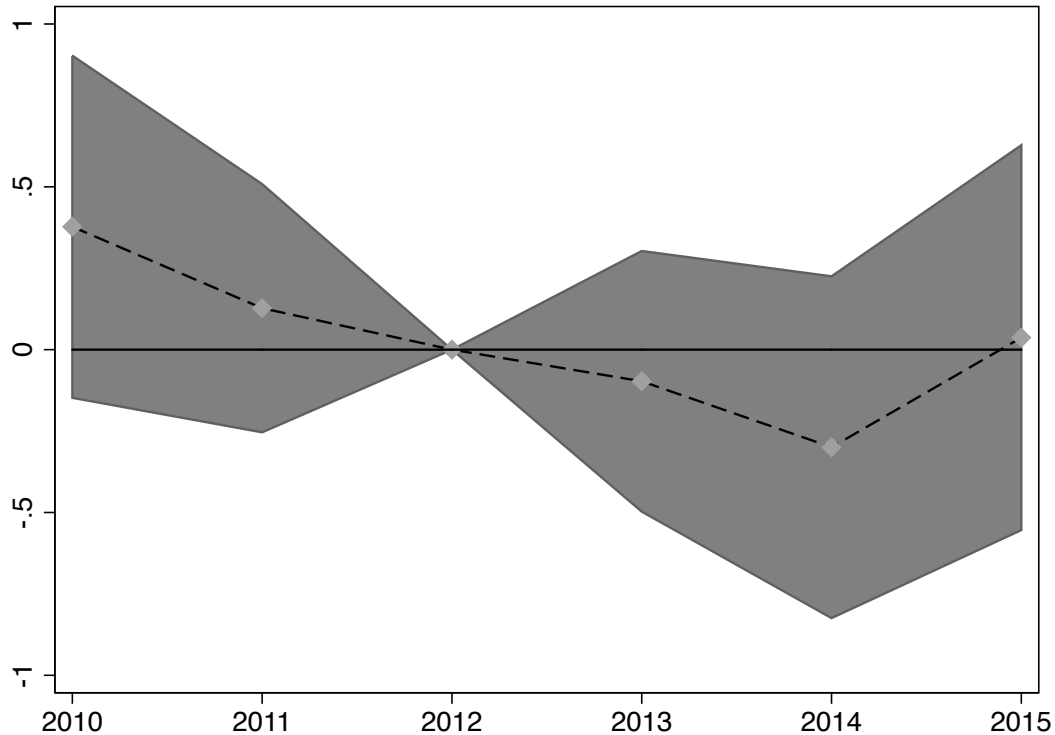
	(1) '09-'15	(2) '10-'15	(3) + Ctrls	(4) '09-'15	(5) '10-'15	(6) + Ctrls	(7) '09-'15	(8) '10-'15	(9) + Ctrls
Main specification									
$T_i \times \mathbb{1}\{t \geq 2013\}$	-0.199	-0.144	-0.149	-0.310	-0.278	-0.284	-0.179	-0.119	-0.0742
	(0.196)	(0.189)	(0.184)	(0.242)	(0.235)	(0.230)	(0.352)	(0.345)	(0.241)
Observations	931994	798852	779234	180894	155052	150277	48202	41316	39768
R^2	0.968	0.973	0.975	0.919	0.931	0.935	0.876	0.892	0.896
	'09-'12		+ Ctrls	'09-'12		+ Ctrls	'09-'12		+ Ctrls
Placebo reform									
$T_i \times \mathbb{1}\{t \geq 2012\}$	-0.238		-0.140	-0.185		-0.0396	-0.438		-0.0684
	(0.231)		(0.216)	(0.285)		(0.271)	(0.419)		(0.408)
Observations	542676		391465	108724		77590	29800		21031
R^2	0.979		0.987	0.942		0.961	0.906		0.934
Window defining cells	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)
% WB in window	0	0	0	.3	.3	.3	.5	.5	.5
Width Cells	.05	.05	.05	.05	.05	.05	.05	.05	.05
Lagged Controls			√			√			√

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Sources: DADS, FARE, MVC 2009-2015.

→ No significant effect on employment.
→ Placebo coefficients are close to zero and not significant.

Firm-level results

- **Effect on employment: Event study, all employees**



- Dependent variable: the average number of workers by firm
- 21 $\times$ 21 cells
- At least 30% of the wage bill is between 2.2 and 2.8 MW
- With controls

Results

- **Effect on employment: Difference in difference, by occupation**

Table: Impact on mean number of employees per firm

	(1) '09-'15	(2) '10-'15	(3) + Ctrls	(4) '09-'15	(5) '10-'15	(6) + Ctrls	(7) '09-'15	(8) '10-'15	(9) + Ctrls
Blue collar									
$T_i \times \mathbb{1}\{t \geq 2013\}$	-0.361	-0.277	-0.251	-0.341	-0.226	-0.225	-0.425	-0.216	-0.190
	(0.229)	(0.224)	(0.220)	(0.283)	(0.277)	(0.275)	(0.410)	(0.406)	(0.403)
Observations	895921	767886	749917	162735	129342	125315	40397	34576	33372
R^2	0.957	0.963	0.964	0.875	0.891	0.894	0.823	0.841	0.847
White collar									
$T_i \times \mathbb{1}\{t \geq 2013\}$	0.214	0.246	0. 212	0. 275	0.267	0.199	0.339	0.191	0.128
	(0.247)	(0.240)	(0.239)	(0.291)	(0.284)	(0.284)	(0.397)	(0.392)	(0.395)
Observations	789163	675765	658234	140730	120239	116251	35245	30080	25874
R^2	0.941	0.948	0.951	0.925	0.934	0.936	0.893	0.906	0.907
Window defining cells	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)
% WB in window	0	0	0	.3	.3	.3	.5	.5	.5
Width Cells	.05	.05	.05	.05	.05	.05	.05	.05	.05
Lagged Controls			√			√			√

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Sources: DADS, FARE, MVC 2009-2015.

→ No employment effect on blue collars or white collars.

Results

- **Effect on wages: Difference in difference, all employees**

Table: Impact on mean hourly wages

	(1) '09-'15	(2) '10-'15	(3) + Ctrls	(4) '09-'15	(5) '10-'15	(6) + Ctrls	(7) '09-'15	(8) '10-'15	(9) + Ctrls
Main specification									
$T_i \times \mathbb{1}\{t \geq 2013\}$	0.385***	0.378***	0.355***	0.484***	0.452***	0.430***	0.567***	0.551***	0.546***
	(0.0701)	(0.0673)	(0.0632)	(0.0881)	(0.0846)	(0.0794)	(0.120)	(0.125)	(0.117)
Observations	917349	786818	767825	177545	152266	147638	47258	40523	39042
R^2	0.915	0.925	0.930	0.826	0.842	0.852	0.723	0.742	0.761
	'09-'12		+ Ctrls	'09-'12		+ Ctrls	'09-'12		+ Ctrls
Placebo reform									
$T_i \times \mathbb{1}\{t \geq 2012\}$	0.0643		0.0555	0.00344		0.0104	0.0552		0.0600
	(0.0878)		(0.0850)	(0.109)		(0.106)	(0.153)		(0.151)
Observations	534732		386278	106946		76430	29253		20668
R^2	0.937		0.953	0.859		0.889	0.769		0.812
Window defining cells	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)
% WB in window	0	0	0	.3	.3	.3	.5	.5	.5
Width Cells	.05	.05	.05	.05	.05	.05	.05	.05	.05
Lagged Controls			√			√			√

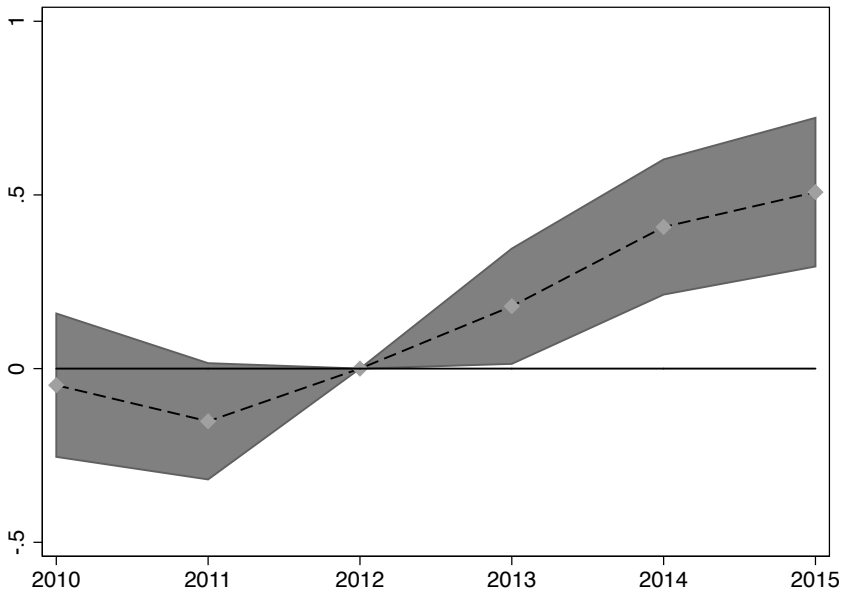
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Sources: DADS, FARE, MVC 2009-2015.

→ Significant, robust positive effect of labor cost reduction on wages.
→ Roughly, 1 euro of labor cost reduction increases wages by 50 cents.

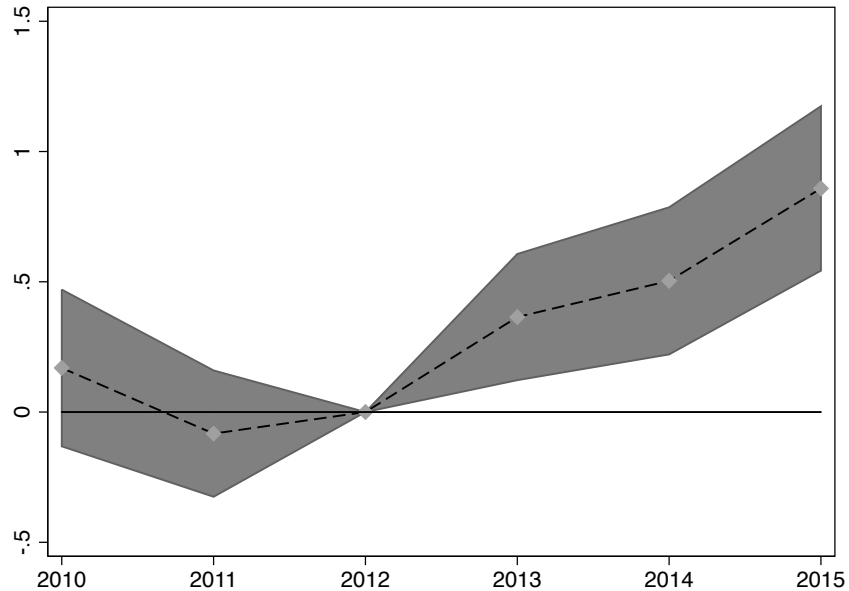
Results

- **Effect on wages: Event study, all employees**

30% of WB between 2.2 and 2.8 MW



50% of WB between 2.2 and 2.8 MW



- Dependent variable: mean hourly wage of employees working full-time with a permanent contract, by firm
- 21×21 cells
- At least 30% (left) 50% (right) of the wage bill is between 2.2 and 2.8 MW
- With controls

Results

- **Effect on wages: Difference in difference, by occupation**

Table: Impact on mean hourly wages

	(1) '09-'15	(2) '10-'15	(3) + Ctrls	(4) '09-'15	(5) '10-'15	(6) + Ctrls	(7) '09-'15	(8) '10-'15	(9) + Ctrls
Blue collar									
$T_i \times \mathbb{1}\{t \geq 2013\}$	-0.0703	-0.0973	-0.111	-0.0572	-0.0795	-0.106	-0.190	-0.195	-0.230
	(0.0769)	(0.0748)	(0.0726)	(0.0103)	(0.100)	(0.0974)	(0.168)	(0.164)	(0.160)
Observations	828112	710481	694601	136218	116724	113438	31721	27113	26180
R^2	0.863	0.876	0.881	0.843	0.857	0.862	0.840	0.855	0.860
White collar									
$T_i \times \mathbb{1}\{t \geq 2013\}$	0. 306***	0.400***	0.394***	0.389***	0.437***	0.419***	0.518***	0.562***	0.569***
	(0.101)	(0.0965)	(0.0952)	(0.121)	(0.115)	(0.113)	(0.167)	(0.159)	(0.156)
Observations	728737	624188	608541	128383	109768	106156	32169	27497	26420
R^2	0.841	0.856	0.860	0.795	0.813	0.820	0.724	0.746	0.757
Window defining cells	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)	(2.2 ,2.8)
% WB in window	0	0	0	.3	.3	.3	.5	.5	.5
Width Cells	.05	.05	.05	.05	.05	.05	.05	.05	.05
Lagged Controls			√			√			√

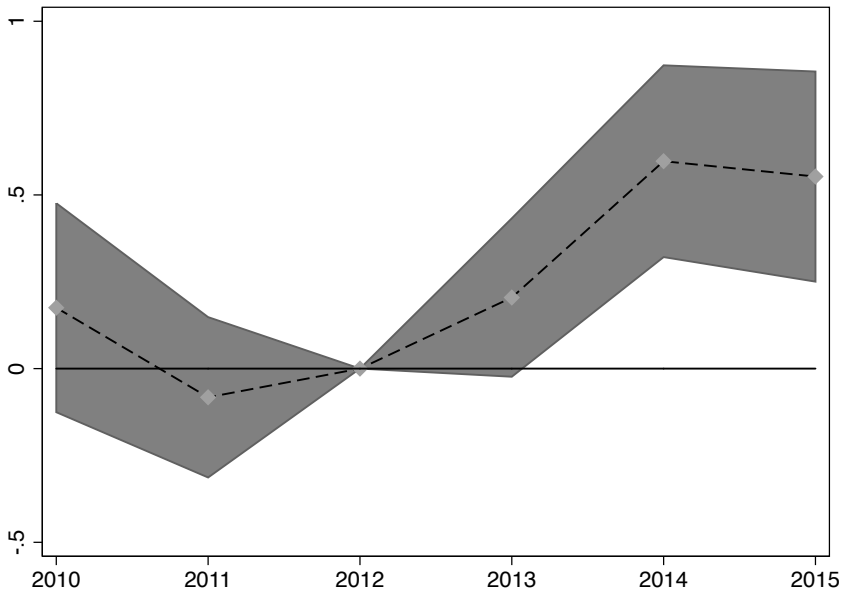
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Sources: DADS, FARE, MVC 2009-2015.

→ Positive effect on wages mostly driven by white collars

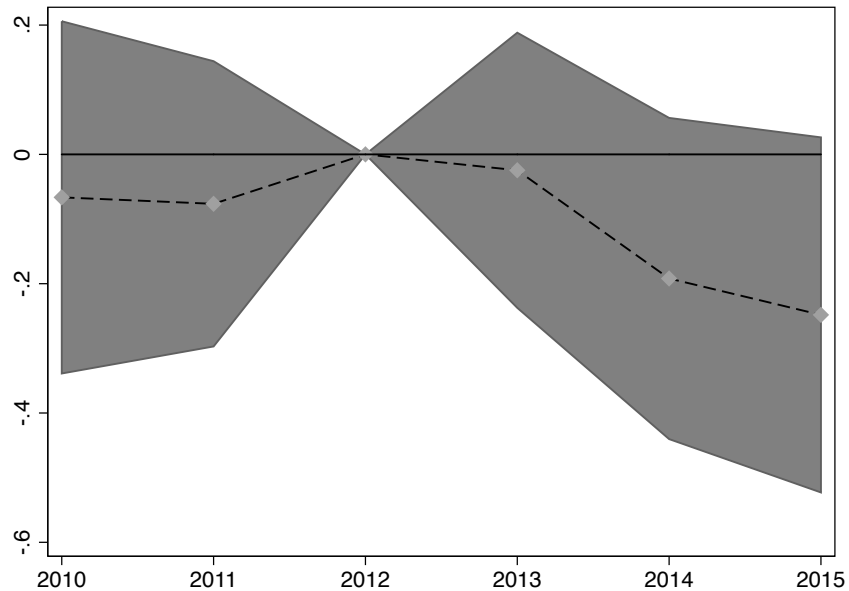
Results

- **Effect on wages: Event study, by occupation**

White collars



Blue collars



- Dependent variable: mean hourly wage of employees working full-time with a long-term contract, by firm
- 21×21 cells
- At least 30% of the wage bill is between 2.2 and 2.8 MW
- With controls

Conclusion

- **No distortion in the distribution of wages**
- Firms **don't use the tax credit to boost employment**
- More treated firms **increase wages** more
  - ◇ No increase in wages of most targeted employees (blue-collars)
  - ◇ Wage increase is **driven by white-collars**
- **Rent-sharing**: corporate tax credit cash windfall split at the firm-level