Employment Protection and Firm-Provided Training in Dual Labour Markets

Massimiliano Bratti[a] Maurizio Conti[b] Giovanni Sulis[c]

[a]University of Milan and IZA
[b]University of Genova
[c]University of Cagliari, Crenos and IZA

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  - Previous work has analysed **the effects of EPL** on
    - jobs flows, labour and total factor productivity, physical and intangible capital investment, firms' propensity to grow, firms' entry and exit;
    - (un)employment levels, worker flows and turnover, wages.

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- A necessary condition for firms to sponsor (general) training is that these **rents are increasing in training**.
- However, these theoretical implications may be challenged (or even reversed) when labour markets are characterised by persistent **dualism** (different degree of protection for permanent and temporary contracts).

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- Going back to Cahuc et al, we know that **workers in temporary contracts enjoy less training**:
  - Arulampalam and Booth (1998) show that in the UK atypical contracts (including fixed term contracts) are associated with a -16/-19 pp decrease in training for men, and -11/-12 pp decrease for women;
  - Dolado et al (1999) show that in Spain the probability to receive free or subsidized on-the-job training in 1994 was 22 pp lower for workers in temp contracts;
  - Barbieri and Sestito (2008) estimate for Italy the training penalty to be in the range of 18/36 pp, in the years 1994-2003.

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- We exploit the effects of the **Fornero Reform** (FR) that in July 2012 substantially decreased EPL for permanent workers in firms above the threshold of 15 employees.
- We **identify** the impact of EPL on workers training by exploiting both the discontinuity at 15 employees and the change in EPL brought about by the FR, i.e. we use a **Difference-in-RDD** as in Grembi et al (2016). We need this estimation setting because of other important policies that change discontinuously at the 15 employees threshold.

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- We find evidence consistent with an **increase in firm-sponsored training following the reduction in EPL** brought about by the FR.
- We also suggest that this effect may be driven by positive (negative) effects of the reform on the **number of permanent employees** (**excessive worker turnover**).

Roadmap of the presentation

- Literature
- Institutional context
- Data
- Empirical strategy
- Main results
- Threats to Identification
- Robustness
- Mechanisms
- Concluding remarks

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- Evidence on the effect of EPL on training is **sparse and not conclusive**.
  - **Almeida and Ateiro (2011)** show that stricter enforcement of labour regulations is strongly associated with higher investments of firms in training, but that the effect is very small, in a cross-section of developing countries.
  - **Pierre and Scarpetta (2013)** use cross-country harmonised survey data on developing and emerging countries and find that higher EPL is associated with higher investment in training and more use of temporary contracts. They also find that EPL has larger effects on small firms and in sectors characterised by greater job reallocation.
  - **Picchio and Van Ours (2011)** use Dutch data for manufacturing firms and find that higher labour market flexibility (i.e. lower EPL) marginally reduces firms' investment in training; however, this effect is rather small.
  - **Messe and Rouland (2012)** exploit a reform of EPL in France using a diff-in-diff approach combined with propensity scores methods. They find that higher EPL (in the form of a tax on firings) had no effect on the training of eligible workers, while it had a positive effect on workers just below the eligibility threshold.

Literature II

- Bolli and Kemper (2015, 2017) use Eurostat data from the Continuing Vocational Training Survey (CVTS3) for Italy (and Finland) (2005-2006) and find, using RDD, a statistically significant **negative effect** of stricter EPL on the extensive margin of training (i.e. a dichotomous indicator for having provided training).

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- Similar results found by Centeno and Novo (2012) for Portugal: an increase in EPL for permanent workers reduced the proportion of fixed term contracts in the affected firms.

Institutional context

- Before the **Fornero Reform**, employees in firms with more than **15 employees** had the right, in the case of a **dismissal declared unfair** by a court of law, to ask for **reinstatement** (and receive all foregone wages plus health and social security contributions) or receive a monetary compensation.

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- The Fornero Reforms (passed in **July 2012**) **limited the possibility for workers** of firms with more than 15 employees to opt between reinstatement and a monetary compensation to a set of well-defined cases.
  - It **reduced the amount of the monetary compensation and eased the uncertainty** surrounding the duration and costs of litigation, which used to be non-negligible, especially in certain areas of the country (Gianfreda and Vallanti, 2017)

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- See Descriptive Table.

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Identification strategy

- Given the sharp discontinuous change in the level of EPL at the 15-employee threshold, a way to estimate the effect of EPL on training is using a RDD such as:

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  - However, Grembi et al. (2016) demonstrate that, even in the presence of confounding policies, **if there is a change of the policy of interest (EPL in our case) over time**, its effect can be estimated using a diff-in-disc design.

Identification strategy 2

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  - A3. The effect of EPL at the threshold cannot depend on the confounding policies. With the three As, α_1 measures the causal effect of relaxing EPL in a neighborhood of the cut-off.

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  - We augment the equation (using periods before and after the FR) with interactions between the confounding policies and the *above*post* indicator (Assumption 3).

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- Equation (2) is estimated with OLS on the pooled cross section. In some specifications we also include firms fixed effects (restricting the sample to the panel component).
- NB. Our identification approach estimates the effect of the FR at the threshold in the presence of heterogeneous effects. We are not able to provide estimates of the effect that are mediated by changes in firm size. The panel FE estimate however go in that direction (they are similar to a DiD research design)

Baseline results: number of trained

Table: Baseline Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
post	1.084***	-2.416***	1.291***	-3.287***	1.084***	-2.611***	1.084***	-2.635***
	(0.137)	(0.611)	(0.303)	(1.107)	(0.137)	(0.642)	(0.137)	(0.690)
above	-0.407	-0.487	-0.501	-0.718	-0.848**	-0.857**	-1.966***	-1.925***
	(0.382)	(0.382)	(0.575)	(0.556)	(0.358)	(0.349)	(0.412)	(0.394)
post×above	1.722***	1.544***	1.946***	1.642***	2.049***	1.887***	3.075***	2.857***
	(0.422)	(0.402)	(0.594)	(0.535)	(0.383)	(0.368)	(0.532)	(0.495)
Bandwidth	(6-25)	(6-25)	(11-20)	(11-20)	(6-30)	(6-30)	(6-50)	(6-50)
Polynomial	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Pol. inter.	above	above	above	above	above	above	above	above
Sec.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes
Reg.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes
Observations	16,486	16,462	7,851	7,836	17,826	17,797	21,266	21,229
R-squared	0.110	0.154	0.058	0.119	0.132	0.171	0.235	0.265

- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold). Post means post 2010 (period affected by reform).
- Robust standard errors in parentheses.

Baseline results: number of trained, quadratic polynomial

Table: Baseline Results, Quadratic polynomial

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
post	1.083***	-2.419***	1.284***	-3.311***	1.083***	-2.598***	1.083***	-2.607***
	(0.136)	(0.610)	(0.302)	(1.106)	(0.136)	(0.640)	(0.136)	(0.693)
above	-0.196	-0.426	-0.680	-0.928	-0.0720	-0.250	-1.221**	-1.258**
	(0.628)	(0.619)	(1.079)	(1.032)	(0.494)	(0.487)	(0.604)	(0.554)
post×above	1.726***	1.547***	1.952***	1.649***	2.063***	1.900***	3.065***	2.848***
	(0.421)	(0.401)	(0.589)	(0.531)	(0.382)	(0.368)	(0.534)	(0.499)
Bandwidth	(6-25)	(6-25)	(11-20)	(11-20)	(6-30)	(6-30)	(6-50)	(6-50)
Polynomial	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic	Quadratic
Pol. inter.	above	above	above	above	above	above	above	above
Sec.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes
Reg.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes
Observations	16,486	16,462	7,851	7,836	17,826	17,797	21,266	21,229
R-squared	0.110	0.154	0.058	0.119	0.133	0.171	0.236	0.266

- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold). Post means post 2010 (period affected by reform).
- Robust standard errors in parentheses.

Firm size and *observed* training provision before and after the Fornero reform

Note. The figure presents a scatter plot for the average number of employed workers by one employee-bins of firm size (computed using survey weights) before and after the Fornero reform as well as the fitted (solid) line of a regression of the

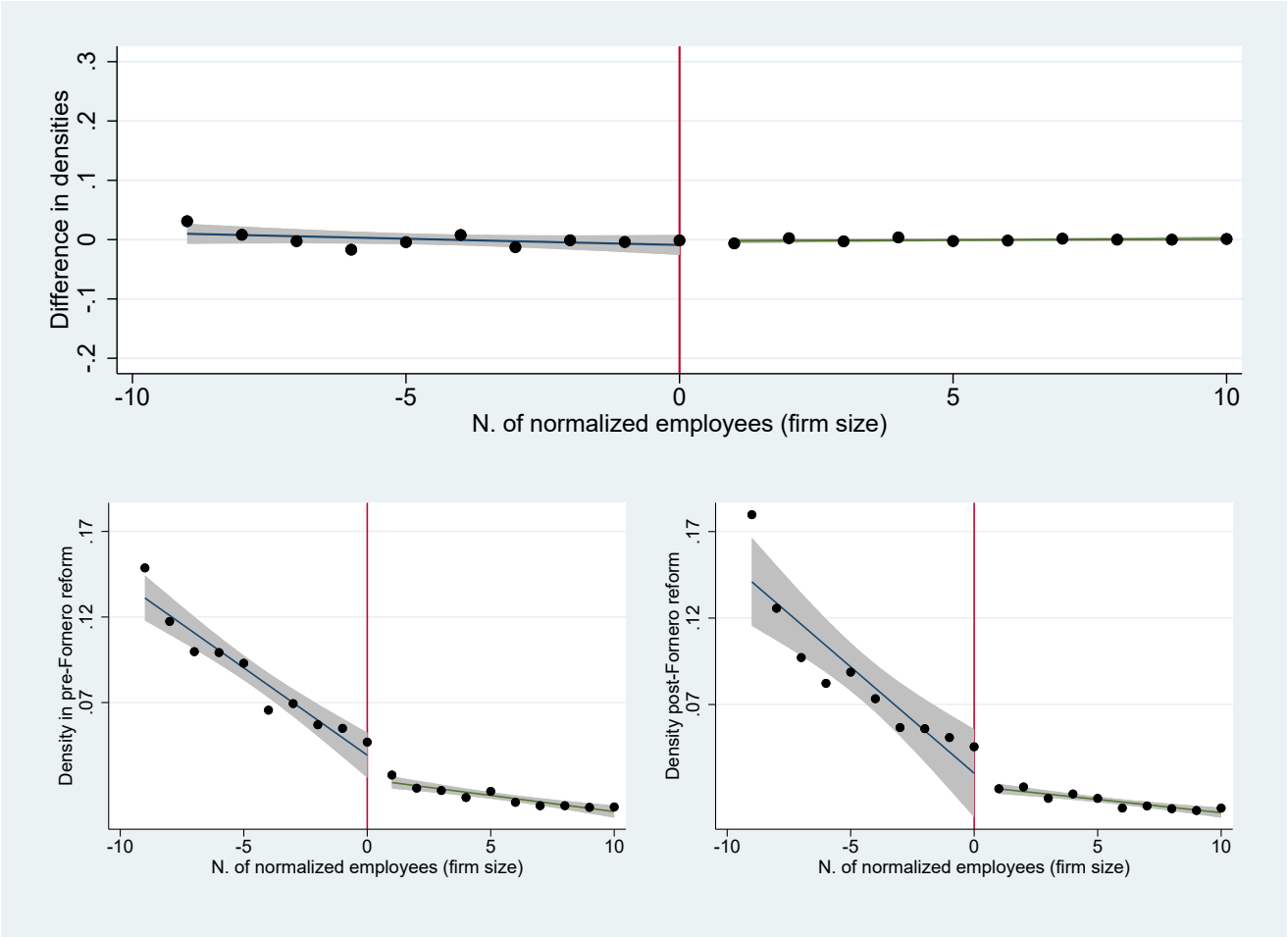
Absence of Manipulation

Table: Absence of Manipulation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Probability of growing				Probability of being above cut-off			
13 employees	-0.001	-0.015	-0.011	0.010	-0.248***	-0.158***	-0.167***	-0.142***
	(0.032)	(0.034)	(0.064)	(0.064)	(0.019)	(0.019)	(0.027)	(0.027)
14 employees	-0.091***	-0.105***	-0.089	-0.067	-0.266***	-0.175***	-0.220***	-0.193***
	(0.028)	(0.031)	(0.057)	(0.057)	(0.022)	(0.023)	(0.043)	(0.042)
15 employees	-0.042	-0.056	-0.065	-0.037	-0.172***	-0.085**	-0.146***	-0.112**
	(0.035)	(0.037)	(0.061)	(0.062)	(0.033)	(0.034)	(0.050)	(0.051)
13 employees × post	-0.024	-0.025	-0.064	-0.058	-0.015	-0.010	0.027	0.034
	(0.054)	(0.054)	(0.079)	(0.079)	(0.024)	(0.024)	(0.031)	(0.030)
14 employees × post	0.192	0.191	-0.014	-0.007	0.152	0.158	0.017	0.025
	(0.123)	(0.123)	(0.074)	(0.074)	(0.144)	(0.144)	(0.054)	(0.054)
15 employees × post	-0.027	-0.028	0.004	0.004	-0.042	-0.037	-0.095	-0.094
	(0.047)	(0.047)	(0.074)	(0.074)	(0.044)	(0.044)	(0.063)	(0.064)
Bandwidth	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)
Polynomial	Linear	Quadratic	Linear	Quadratic	Linear	Quadratic	Linear	Quadratic
Firm f.e.	No	No	Yes	Yes	No	No	Yes	Yes
Sample	cross-section	cross-section	panel	panel	cross-section	cross-section	panel	panel
Observations	16,532	16,532	5,794	5,794	16,532	16,532	5,794	5,794
R-squared	0.010	0.011	0.658	0.659	0.601	0.629	0.881	0.883

Note. Columns (1)-(2) report the results of a specification similar to Schivardi and Turrini(2008), where the dependent variable is the probability that the size of the firm increased with respect to the previous period. The models include a polynomial in firm size and indicators for 13, 14 and 15 employees referring to years 2009 and 2014, and columns (3)-(4) report the results using the panel component of the data. In columns (5)-(8) the probability of being above the threshold is a dummy equal to one for firms above 15 employees in 2010 and 2015. The estimation sample only includes firms between 6 and 25 employees

Test of differences in densities before and after the Fornero reform



Note. The top part of the figure presents a plot of the difference in the pre- vs. post-Fornero reform densities of normalized employment size by one-employee bins along with a linear fit and the 95% confidence interval. The bottom part of the figure

Placebo: Constant effects of the confounding policies

Table: Constant effects of other policies

	(1)	(2)	(3)	(4)
post	-0.0747	-0.635	-0.0871	-0.663
	(0.104)	(0.748)	(0.110)	(0.771)
above	0.815*	0.834**	0.673	0.678
	(0.447)	(0.398)	(0.472)	(0.420)
post×above	-0.452	-0.505	-0.334	-0.392
	(0.460)	(0.377)	(0.485)	(0.394)
union			0.573	0.663*
			(0.432)	(0.372)
union×post			0.108	0.119
			(0.550)	(0.480)
Bandwidth	(6-25)	(6-25)	(6-25)	(6-25)
Polynomial	Linear	Linear	Linear	Linear
Pol. inter.	above	above	above	above
Sec.×year f.e.	No	Yes	No	Yes
Reg.×year f.e.	No	Yes	No	Yes
Observations	12,599	12,599	12,052	12,052
R-squared	0.065	0.118	0.067	0.119

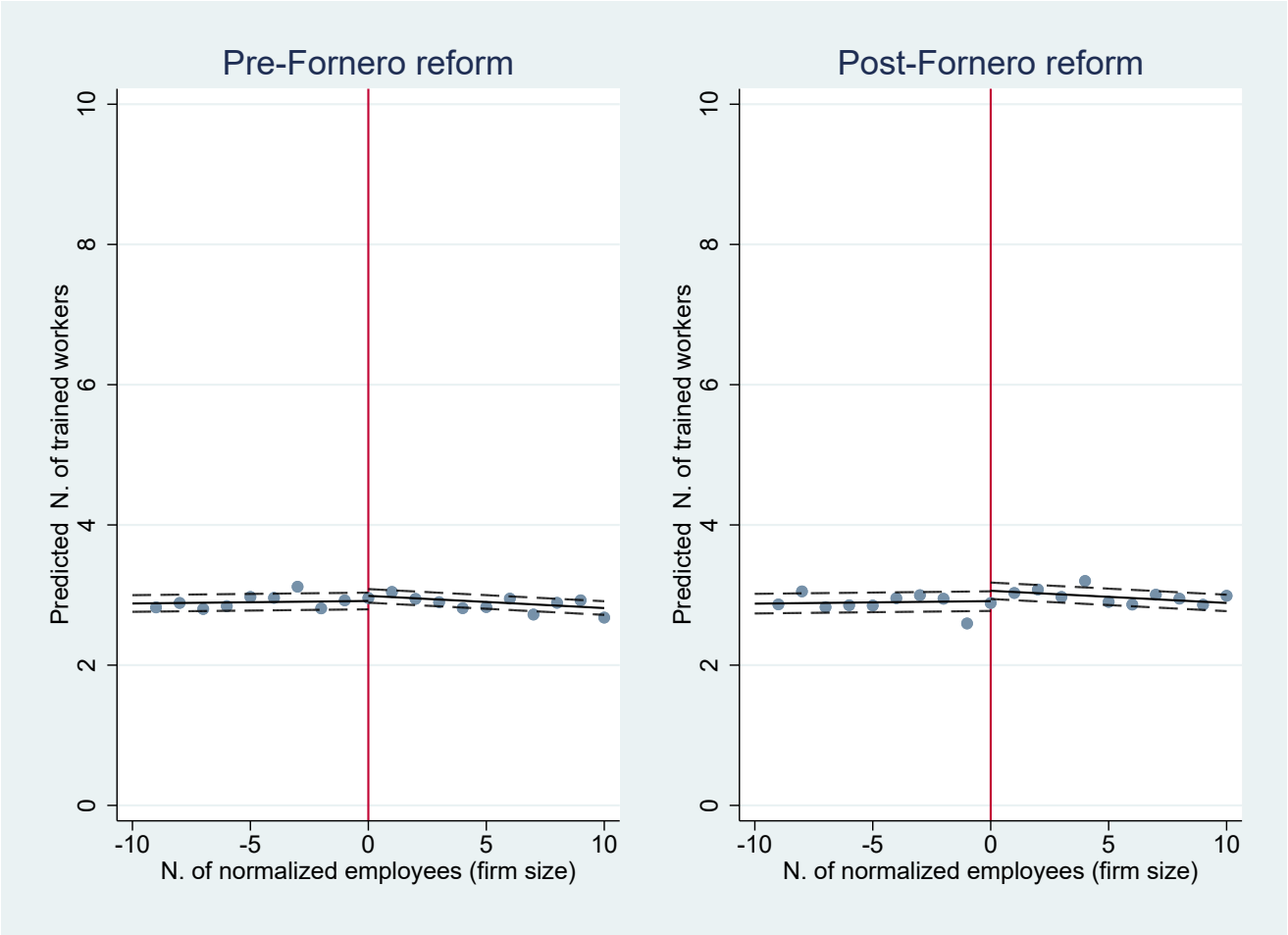
Note. The dependent variable is the number of trained workers. The analysis uses the 2005 and 2007 RIL waves, and the 2007 wave is defined as the placebo post period. Polynomials in employment have been interacted with the dummy above (15-employee threshold). Union is a dummy equal to 1 for firms with a works council and zero otherwise.

Independence of the EPL effects from the confounding policies

Table: Constant effects of other policies

	(1)	(2)	(3)	(4)	(5)	(6)
post	1.072***	-2.390***	1.138***	-2.551***	1.124***	-2.531***
	(0.140)	(0.612)	(0.171)	(0.640)	(0.173)	(0.641)
above	-0.319	-0.388	-0.460	-0.583	-0.363	-0.472
	(0.396)	(0.385)	(0.423)	(0.425)	(0.433)	(0.425)
post×above	1.549***	1.354***	1.441***	1.303***	1.281**	1.129**
	(0.486)	(0.456)	(0.474)	(0.457)	(0.511)	(0.487)
union	1.061	0.935			1.095	0.966
	(1.042)	(0.980)			(1.039)	(0.979)
union×post	-0.717	-0.616			-0.645	-0.443
	(1.091)	(1.043)			(1.115)	(1.074)
union×above	-1.190	-1.122			-1.192	-1.186
	(1.208)	(1.183)			(1.216)	(1.200)
union×post×above	1.453	1.453			1.358	1.358
	(1.388)	(1.362)			(1.425)	(1.413)
CIG			-0.040	-0.049	-0.054	-0.058
			(0.181)	(0.203)	(0.179)	(0.202)
CIG×post			-0.234	-0.686*	-0.251	-0.711*
			(0.369)	(0.415)	(0.363)	(0.407)
CIG×post			-0.097	0.113	-0.132	0.117
			(0.582)	(0.576)	(0.608)	(0.614)
CIG×post×above			0.708	0.715	0.696	0.656
			(0.922)	(0.912)	(0.936)	(0.931)
Bandwidth	(6,25)	(6,25)	(6,25)	(6,25)	(6,25)	(6,25)

Firm size and *predicted* training provision before and after the Fornero reform



Note. The figure presents a scatter plot for the average number of employed workers by one employee-bins of firm size (computed using survey weights) before and after the Fornero reform based on the predicted values of a regression of observed

Robustness I

Table: Robustness: Different Interaction, Heaping, Donuts, Placebo

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Heaping		Donut		Fake 10		Fake 20		Interaction post	
post	1.004***	-2.646***	1.055***	-1.843***	0.983***	-2.657***	1.302***	-2.316***	1.503***	-1.886***
	(0.139)	(0.653)	(0.133)	(0.544)	(0.134)	(0.623)	(0.135)	(0.611)	(0.390)	(0.682)
above	0.0336	-0.101	-0.240	-0.134	-0.702	-0.714*	-0.867	-0.692	-0.356	-0.430
	(0.421)	(0.411)	(0.529)	(0.514)	(0.493)	(0.395)	(1.722)	(1.698)	(0.478)	(0.491)
post×above	1.384***	1.262***	1.566***	1.351***	0.810***	0.815***	0.668	0.490	1.631**	1.437*
	(0.474)	(0.450)	(0.469)	(0.446)	(0.280)	(0.248)	(0.629)	(0.611)	(0.801)	(0.764)
Bandwidth	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)
Polynomial	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Pol. inter.	above	above	above	above	above	above	above	above	all	all
Sec.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Reg.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	13,113	13,095	13,761	13,746	16,486	16,462	16,486	16,462	16,486	16,462
R-squared	0.109	0.151	0.116	0.159	0.108	0.153	0.106	0.151	0.111	0.155

- We exclude firms at the 5th and 95th percentile of the distribution of growth of employment (below and above 50%).
- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold) and the dummy *post* (period affected by reform).
- Robust standard errors in parentheses.

Robustness II

Table: Robustness: Panel Firm Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Baseline panel		Heaping		Donut		Interaction post		Non-switchers	
post	1.360***	2.386*	1.217***	2.130	1.231***	2.060	2.250***	3.029**	1.376***	1.428
	(0.125)	(1.245)	(0.135)	(1.396)	(0.126)	(1.386)	(0.363)	(1.261)	(0.126)	(1.052)
above	-0.465	-0.443	-1.301*	-1.131	-1.359	-1.134	-0.916	-0.997		
	(0.692)	(0.688)	(0.774)	(0.757)	(1.177)	(1.174)	(0.827)	(0.823)		
post×above	1.027**	0.838*	1.424**	1.222**	1.163*	0.993	1.858*	1.869*	1.036*	0.832
	(0.500)	(0.495)	(0.587)	(0.579)	(0.615)	(0.610)	(1.002)	(0.988)	(0.556)	(0.550)
Bandwidth	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)
Polynomial	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear
Pol. inter.	above	above	above	above	above	above	all	all	above	above
Sec.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Reg.×year f.e.	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Firm f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,754	5,732	3,778	3,766	4,232	4,220	5,754	5,732	4,994	4,976
R-squared	0.754	0.760	0.767	0.774	0.760	0.766	0.756	0.762	0.752	0.759

- We exclude firms at the 5th and 95th percentile of the distribution of growth of employment (below and above 50%).
- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold) and the dummy *post* (period affected by reform).
- Clustered Robust standard errors in parentheses.

Robustness III: Measurement error

Table: Robustness: Measurement error

	(1)	(2)	(3)	(4)	(5)	(6)
	Drop 16		Drop 16 and 17		Drop 16, 17 and 18	
post	1.084***	-0.964*	1.084***	-1.039*	1.084***	-0.912
	(0.137)	(0.555)	(0.137)	(0.561)	(0.137)	(0.562)
above	-0.357	-0.344	-0.499	-0.485	-0.699	-0.706
	(0.502)	(0.486)	(0.686)	(0.650)	(1.119)	(1.042)
post×above	1.538***	1.407***	1.717***	1.584***	1.593***	1.454**
	(0.470)	(0.447)	(0.531)	(0.503)	(0.603)	(0.569)
Bandwidth	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)	(6-25)
Polynomial	Linear	Linear	Linear	Linear	Linear	Linear
Pol. inter.	above	above	above	above	above	above
Sec.×year f.e.	No	Yes	No	Yes	No	Yes
Reg.×year f.e.	No	Yes	No	Yes	No	Yes
Observations	15,894	15,875	15,348	15,329	14,840	14,823
R-squared	0.108	0.145	0.107	0.145	0.105	0.143

- We exclude firms at the 5th and 95th percentile of the distribution of growth of employment (below and above 50%).
- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold) and the dummy *post* (period affected by reform).
- Robust standard errors in parentheses.

Mechanisms 1

Table: Excess worker turnover Permanent workers

	Dependent variable			
	(1)	(2)	(3)	(4)
	excess worker turnover		number of permanent workers	
post	0.391***	0.486***	-3.013***	-3.557***
	(0.092)	(0.092)	(0.629)	(0.725)
above	0.098***	0.025	-0.656**	-0.484
	(0.032)	(0.051)	(0.265)	(0.433)
post×above	-0.104**	-0.135*	0.504	1.735**
	(0.049)	(0.075)	(0.612)	(0.738)
Bandwidth	(6-25)	(6-25)	(6-25)	(6-25)
Polynomial	Linear	Quadratic	Linear	Quadratic
Pol. inter.	all	all	all	all
Sec.×year f.e.	Yes	Yes	Yes	Yes
Reg.×year f.e.	Yes	Yes	Yes	Yes
Observations	10,724	10,724	16,508	16,508
R-squared	0.197	0.205	0.737	0.738

- We exclude firms at the 5th and 95th percentile of the distribution of growth of employment (below and above 50%).
- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold) and the dummy *post* (period affected by reform) as well as their interactions.

Mechanisms 2

Table: DID effect on Temp Perm employees

	Dependent variable	
	(1) temporary workers	(2) permanent workers
post	-0.265***	-0.189***
	(0.045)	(0.073)
above	-	-
post×above	-0.136	0.444*
	(0.208)	(0.267)
Bandwidth	(6-25)	(6-25)
Sec.×year f.e.	No	No
Reg.×year f.e.	No	No
Firm f.e.	Yes	Yes
Observations	5,030	5,030
R-squared	0.762	0.910

- We exclude firms at the 5th and 95th percentile of the distribution of growth of employment (below and above 50%).
- Polynomials in employment have been **interacted** with the dummy *above* (15-employee threshold) and the dummy *post* (period affected by reform).
- Robust standard errors in parentheses.

Summary of results

- We find evidence that, following the FR, the **number of trained workers increased** in the case of firms just above the threshold, with an order of magnitude of 1.5 additional workers at the threshold, depending on the specification.

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Summary of results

- We find evidence that, following the FR, the **number of trained workers increased** in the case of firms just above the threshold, with an order of magnitude of 1.5 additional workers at the threshold, depending on the specification.
- This result is robust to a series of sensitivity checks, such as measurement errors in the forcing variable, inclusion of firm fixed effects, bandwidth, polynomial order, among the others.
- In terms of the mechanism, we find an reduction in excess worker turnover and an increase of 1.7 permanent workers at the threshold, which suggest that a temp-perm substitution might have been at work. A diff-in-diff estimate on non-switchers confirms an increase above the threshold in the number of permanent employees in a DiD identification framework.