

EMPLOYMENT EFFECTS OF RESTRICTING FIXED-TERM CONTRACTS: THEORY AND EVIDENCE

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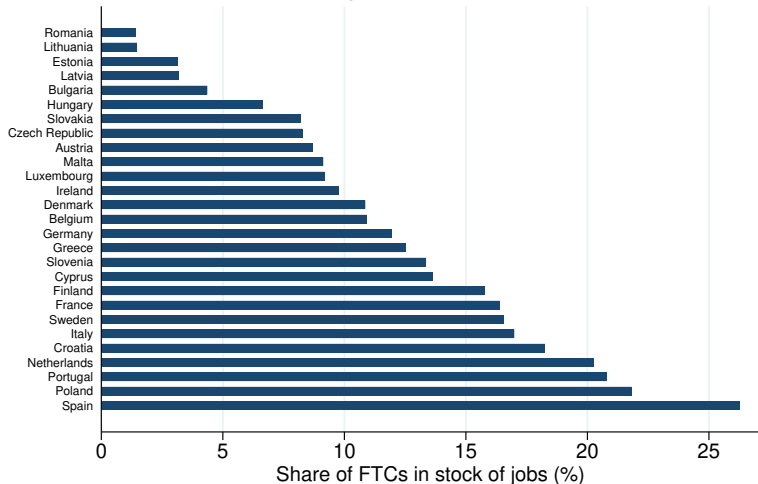
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MOTIVATION

- ▶ High unemployment and strong protection of permanent contracts led to reforms at the margin in many European countries since the 1980s
 - more flexible fixed-term contracts (FTC)
- ▶ But contributed to segmented / dual labor markets in many European countries
 - ▶ Raises questions about efficiency and equity
- ▶ Political debate : should we try to revert these reforms by restricting FTC or to extend them ?
 - ▶ Reforms in Italy and Germany in 2001 and France in 2015 to facilitate the use of FTC
 - ▶ Restrictions in Portugal in 2009 and in Spain in 2022

PORTUGAL : 3RD EU COUNTRY WITH HIGHEST SHARE OF FTC

FTC share per Member State, 2019



OECD data

What are the employment effects of restricting fixed-term contracts without changing employment protection of permanent contracts ?

The reform : implemented in Portugal in 2009 to restrict the use of FTC for large firms

Strategy :

- ▶ **Reduced form model** : direct and spillover effects using regression discontinuity design
- ▶ **Structural model** : directed search and matching model to quantify general equilibrium effects

▶ Related literature

CONTRIBUTIONS

1. **Policy** : restricting the use of fixed term contracts decreases employment
 - ▶ Firms do not substitute FTC with permanent jobs
 2. **Method** : a structural model can account for spillovers effects
 - ▶ Standard policy evaluations compare treated and controls
 - ▶ We show that small indirect effects on controls can translate into large aggregate affects
- ⇒ First paper studying general equilibrium effects due to employment protection legislation

ROADMAP

1. Institutional context
2. Empirical framework
3. Reduced-form results
4. Theoretical framework
5. Structural estimation and results
6. Conclusion

INSTITUTIONAL CONTEXT

- ▶ 22% of jobs are temporary
- ▶ Individual dismissals for permanent contracts are the most restrictive across OECD (OECD indicator)
- ▶ Restrictions for the use of fixed-term contracts :
 - ▶ to meet a temporary need of the firm
 - ▶ hiring of a long-term unemployed worker
 - ▶ **launching a new establishment**
- ▶ Maximum number of renewals is 3, maximum total duration 3 years

Introduction of a restriction on cases under which firms can use FTC :

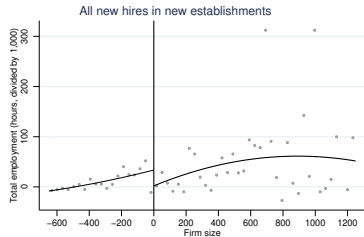
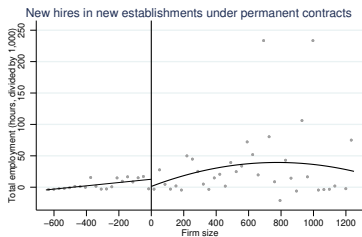
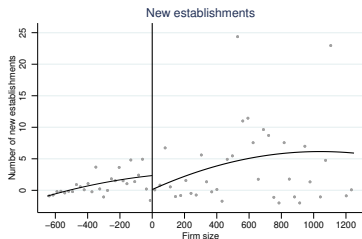
Launching a new establishment is no more a reason for hiring under FTC

- ▶ Only for firms having at least **750** employees (15% of employment)
- ▶ No change for firms below 750
- ▶ No other legal change at the same threshold
- ▶ Published and came into force in February 2009

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GRAPHICAL RDD



Quadros de Pessoal data. Data obtained controlling for industry effects. Firms size centered at 750 employees.

Regression discontinuity (sharp design) with Poisson model :

$$Y_j = \exp(\alpha_0 + \alpha_1 D_j + \lambda S(Z_j) + \delta_{i(j)} + \epsilon_j)$$

- ▶ Y_j : several measures of employment in firm j
- ▶ $D_j = 1$ if $Size_j(2008) \geq 750$, 0 otherwise
- ▶ $S(Z_j)$: polynomials of the firm size (Z_j)
- ▶ $\delta_{i(j)}$: industry fixed effects

Data : linked employer-employee (firms with 100-2000 workers in 2008)

▶ Dist.

▶ Descriptive stats

Impact on hires in new establishments :



- ▶ Hires under FTC decreased by 73%-85% [▶ Table](#)
- ▶ Negative effect on hires under OEC (not always significant) [▶ Table](#)
- ▶ Total hires decreased by 60%-70% [▶ Table](#)

Can be decomposed into :





- ▶ **Extensive margin** : establishment creation decreased by 45%-50%
[▶ Table](#)
- ▶ **Intensive margin** : decrease in hires in establishments that are created [▶ Table](#)

ROBUSTNESS

Additional outcomes :

- ▶ No increase in hires in establishments created before the reform 
- ▶ Large firms do not seem to create smaller firms to avoid regulation
 1. Would be costly : could not benefit from the brand, implementation costs
 2. No bunching after the reform
 3. No increase in gains in subsidiaries and associated firms 

Robustness :

- ▶ Additional controls for firms characteristics 
- ▶ Shorter range : 250-1250 
- ▶ Falsification test before the reform 
- ▶ Falsification test with other threshold 

Are there spillovers affecting firms not targeted by the reform ?

- ▶ RDD to compare firms that are more or less exposed to treated firms
- ▶ We consider all pairs of (i) firms with 1-99 workers and (ii) 100-2000 workers, based in same region and industry

$$Y_s = \exp(\alpha + \beta D_i + \lambda_1 S(Z_i) + \lambda_2 S(Z_s) + \epsilon_{is})$$

- ▶ Y_s : outcome of the small firm of the dyad
- ▶ $D_i = 1$ if the large firm of the dyad is larger than 750
- ▶ $S(Z_i)$ and $S(Z_s)$: polynomials of both firms' sizes

Results :

- ▶ Small firms increase hires when they share a market with treated firms [▶ Table](#)
⇒ Firms in the control group are indirectly affected by the reform

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Directed search and matching model with large establishments and endogenous job destruction :

- ▶ In every period, each establishment can create v job vacancies
 - ▶ Vacant jobs filled at rate $m(\theta)$, where θ is tightness
- ▶ Both temporary and permanent contracts :
 - ▶ Temporary contracts last one period (then destroyed or converted)
 - ▶ Permanent contracts can be destroyed at any date at red tape cost
- ▶ Perfect mobility and information of workers
 - ▶ Expected utility of an unemployed person : W_u

THEORETICAL FRAMEWORK

Establishments are heterogeneous in 3 dimensions :

- ▶ With respect to **productivity** : output per job is $\epsilon \times z$
 - ▶ z is establishment specific, constant over time
 - ▶ ϵ is job specific and is affected by shocks
- ▶ With respect to **age** : new or existing establishment
- ▶ With respect to the **size of the firms** they belong to
 - ▶ Productivity is drawn in a cdf specific to the firm size

Labor market regulation :

- ▶ When a job is created, it has to be permanent with probability π
- ▶ π takes two values : π_ℓ for the less stringent regulation, $\pi_h > \pi_\ell$ for the most stringent one

PARTIAL EQUILIBRIUM EFFECTS OF THE REFORM

A rise in the stringency of the regulation, π , at the establishment level :

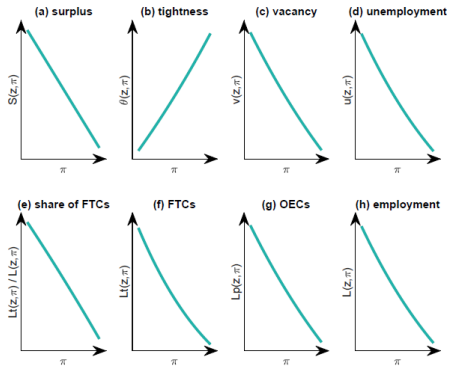
- ▶ Decreases the number of vacancies
- ▶ Increases the duration of vacancies

→ Decrease in job creation

- ▶ Lower share of FTC
- ▶ Higher share of permanent contracts

→ Decrease in destruction

⇒ Ambiguous impact of a restriction of FTC on employment



GENERAL EQUILIBRIUM EFFECTS OF THE REFORM

Reform : new regulation, $\tilde{\pi}_\ell$, for new establishments created by large firms

Direct effects of the reform :

- ▶ The number of establishments created by large firms decreases
- ▶ These establishments open fewer vacancies

Indirect general equilibrium effects :

- ▶ For unemployed workers, the probability to find a job decreases \Rightarrow decreases the value of unemployment, W_u
- ▶ The drop in W_u increases the surplus of jobs
 - ▶ \Rightarrow Small firms create more establishments & post more vacancies
 - ▶ \Rightarrow Feedback effect on large firms

\Rightarrow Aggregate impact is a combination of the direct effects on treated firms and indirect effects on all firms

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OVERVIEW OF THE EMPIRICAL STRATEGY

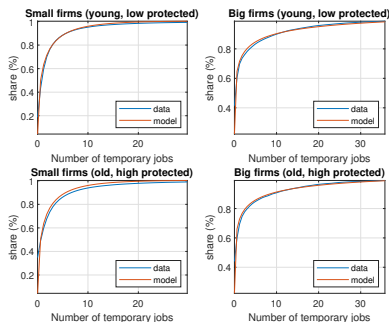
1. Assumptions about functional forms and distributions
2. Calibration of some of the parameters
3. Estimation of the remaining parameters **over the period before the reform**
4. Conditional on the estimated structural parameters, **identification of the policy shock using our reduced form estimate**
5. Implementation of the policy shock in the model
6. Computation of the effects (we are able to disentangle the direct effect of the treatment from spillovers)

► Steps 1 and 2

ESTIMATION STRATEGY

Estimation :

- ▶ Parameters of the model estimated before the reform
- ▶ Generalized Method of Moments
- ▶ Moments used :
 - ▶ Total number of jobs and total number of unemployed workers
 - ▶ Distributions of the number of FTCs
- ▶ **Estimated parameters**



SIMULATION OF THE REFORM

Policy parameter $\tilde{\pi}_\ell$ is calibrated to reproduce the RDD estimate for the impact on hires under FTC.

- ▶ Potential outcome : $y_i(T_i, I)$
- ▶ $T_i = 1$ if i is treated, 0 otherwise
- ▶ $I = 1$ if reform is implemented, 0 otherwise

We identify $\tilde{\pi}_\ell$ such that :

$$\hat{\alpha}_1 = \underbrace{\log \left(\frac{\sum_{i|A_i=1} y_i(1, 1)}{\sum_{i|A_i=1} y_i(0, 0)} \right)}_{\widehat{ATT}} - \underbrace{\log \left(\frac{\sum_{i|A_i=0} y_i(0, 1)}{\sum_{i|A_i=0} y_i(0, 0)} \right)}_{\widehat{Bias}}$$

- ▶ $\hat{\alpha}_1$: RDD estimated parameter for hires under FTC
- ▶ $A_i = 1$ if i is assigned to treatment (large firm), 0 otherwise

IMPACT ON EMPLOYMENT

	Total employment	Permanent	FTC
	General equilibrium		
<i>Establishment type</i>			
Small firm - New estab.	1.22	1.22	1.22
Small firm - Existing estab.	1.19	1.19	1.18
Large firm - New estab.	-50.06	-37.99	-76.52
Large firm - Existing estab.	-9.70	-10.51	1.50
All	-0.10	-0.08	-0.30
	Impact wrongly assuming SUTVA		
Small firm - New estab.	0	0	0
Small firm - Existing estab.	0	0	0
Large firm - New estab.	-50.67	-38.73	-76.80
Large firm - Existing estab.	-10.77	-11.57	0.31
All	-1.28	-1.26	-1.48
	Reduced form estimates for large firms		
$\hat{\alpha}_1$	-0.71	-0.49	-1.46
<i>Bias</i>	-0.01	-0.01	-0.01
	(% change)		

- ▶ Effects at the firm level are very small in the control group \Rightarrow the RDD bias is small
- ▶ Non-treated firms are a large employment share \Rightarrow spillovers are important at the aggregate level

POLICY EXPERIMENT : REFORM APPLYING TO ALL FIRMS

<i>Establishment type</i>	Total employment	Permanent	FTC
	Reform covers all firms		
Small firm - New estab.	-21.85	-15.41	-33.72
Small firm - Existing estab.	1.36	0.74	9.12
Large firm - New estab.	-46.44	-33.49	-74.81
Large firm - Existing estab.	-0.98	-1.90	11.67
All	-0.44	-0.30	-1.88
<i>Establishment type</i>	Reform covers large firms only		
Small firm - New estab.	1.22	1.22	1.22
Small firm - Existing estab.	1.19	1.19	1.18
Large firm - New estab.	-50.06	-37.98	-76.51
Large firm - Existing estab.	-9.70	-10.51	1.50
All	-0.09	-0.07	-0.30
	(% change)		

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CONCLUSION

In this paper :

- ▶ We quantify the causal effect of a restriction on the use of fixed-term contracts using a regression discontinuity design
- ▶ We measure the aggregate impact of the policy taking into account potential general equilibrium effects using a structural model

Our findings :

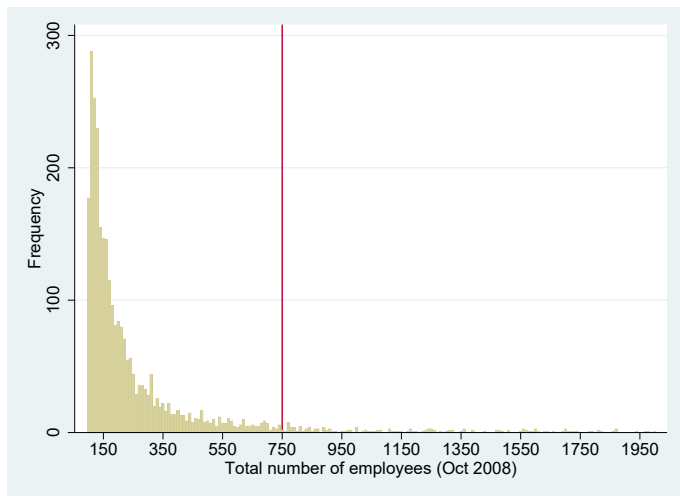
- ▶ Restricting the use of fixed term contracts decreases employment because of very limited substitutability between permanent and temporary jobs
- ▶ Neglecting spillovers could lead to a large bias at the macro level, even when average spillovers are small at the firm level

APPENDIX : RELATED LITERATURE

- ▶ **Employment protection effects** : Bertola et al. (1999), Blanchard & Landier (2002), Boeri & Garibaldi (2007), Boeri & Garibaldi (2019), Bratti et al. (2018), Cahuc & Postel-Vinay (2002), Cahuc et al. (2016), Daruich et al. (2020), Dräger & Marx (2017), Hijzen et al. (2017), Kahn (2010)
- ▶ **Firm size** :
 - ▶ Size distribution : Kaas & Kircher (2015), Lucas (1978)
 - ▶ Restrictions on size : Davis & Henrekson (1999), Garicano et al. (2016), Gourio & Roys (2014), Guner et al. (2006), Guner et al. (2008)
- ▶ **Measuring general equilibrium effects** : Albrecht et al. (2009), Blundell et al. (2004), Crépon et al. (2013), Ferracci et al. (2010), Gautier et al. (2017), Lalive et al. (2015), Lise et al. (2004)

APPENDIX

FIRM SIZE DISTRIBUTION IN 2008



▶ Back

APPENDIX

RDD RESULTS : NUMBER OF NEW ESTABLISHMENTS

Table 5: Effects on the number of new establishments per firm

	(1)	(2)	(3)
Large firm	-.695 (.395)*	-.654 (.312)**	-.589 (.313)*
Firm size (centered)	.002 (.0003)***	.002 (.0002)***	.003 (.0003)***
Firm size ²		-7.32 e-07 (2.64 e-07)***	
Firm size*Large firm			-.001 (.0005)***
Const.	1.779 (.246)***	2.052 (.244)***	2.084 (.258)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2,000 workers in October 2008. Poisson regression of the number of new establishments (created in 2009 and 2010) of each firm, as measured in October 2010. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : FTC HIRES

Table 2: Effects on fixed-term contracts in new establishments

	(1)	(2)	(3)
Large firm	-1.961 (.476)***	-1.461 (.337)***	-1.314 (.315)***
Firm size (centered)	.003 (.0003)***	.002 (.0003)***	.003 (.0003)***
Firm size ²		-1.12e-06 (3.34e-07)***	
Firm size*Large firm			-.002 (.0006)***
Const.	3.062 (.386)***	3.298 (.380)***	3.412 (.388)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in fixed-term contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. Tenure- and hours-weighted employment measure. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the ‘Quadros de Pessoal’ data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : OEC HIRES

Table 3: Effects on permanent contracts in new establishments

	(1)	(2)	(3)
Large firm	-.680 (.641)	-.863 (.444)*	-.713 (.427)*
Firm size (centered)	.002 (.0005)***	.003 (.0004)***	.004 (.0005)***
Firm size ²		-1.43e-06 (3.94e-07)***	
Firm size*Large firm			-.002 (.0007)***
Const.	2.008 (.354)***	2.646 (.344)***	2.735 (.362)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in permanent contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : ALL HIRES

Table 4: Effects on both fixed-term and permanent contracts in new establishments

	(1)	(2)	(3)
Large firm	-1.203 (.480)**	-1.065 (.331)***	-.931 (.316)***
Firm size (centered)	.002 (.0003)***	.003 (.0003)***	.004 (.0004)***
Firm size ²		-1.26e-06 (2.95e-07)***	
Firm size*Large firm			-.002 (.0005)***
Const.	3.296 (.339)***	3.735 (.330)***	3.838 (.340)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in both fixed-term and permanent contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : TOTAL HIRES IN NEW ESTABLISHMENTS

Table 4: Effects on both fixed-term and permanent contracts in new establishments

	(1)	(2)	(3)
Large firm	-1.203 (.480)**	-1.065 (.331)***	-.931 (.316)***
Firm size (centered)	.002 (.0003)***	.003 (.0003)***	.004 (.0004)***
Firm size ²		-1.26e-06 (2.95e-07)***	
Firm size*Large firm			-.002 (.0005)***
Const.	3.296 (.339)***	3.735 (.330)***	3.838 (.340)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in both fixed-term and permanent contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : TOTAL HIRES IN ESTABLISHMENTS EXISTING BEFORE

Table 8: Fixed-term and permanent contracts in existing establishments before the reform

	(1)	(2)	(3)
Large firm	-.432 (.266)	-.571 (.165)***	-.428 (.153)***
Firm size (centered)	.002 (.0002)***	.002 (.0002)***	.003 (.0002)***
Firm size ²		-1.46e-06 (1.47e-07)***	
Firm size*Large firm			-.003 (.0003)***
Const.	4.379 (.174)***	4.999 (.164)***	5.134 (.172)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in both fixed-term and permanent contracts in all existing establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : FTC HIRES IN ESTABLISHMENTS EXISTING BEFORE

Table 7: Effects on fixed-term contracts in establishments that already existed before the reform

	(1)	(2)	(3)
Large firm	-.604 (.331)*	-.533 (.190)***	-.387 (.184)**
Firm size (centered)	.002 (.0002)***	.002 (.0002)***	.003 (.0002)***
Firm size ²		-1.69e-06 (1.96e-07)***	
Firm size*Large firm			-.003 (.0003)***
Const.	3.864 (.225)***	4.457 (.198)***	4.603 (.201)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2005. Poisson regression of new hires in fixed-term contracts in all existing establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : GAINS AND LOSSES FROM SUBSIDIARIES AND ASSOCIATED FIRMS

Table A.5: Robustness: Potential effects in terms of subsidiaries (as opposed to establishments), 2/2

	(1)	(2)	(3)
<i>Extensive margin 1 (net profits)</i>			
Large firm	-.035 (.048)	-.021 (.052)	-.020 (.051)
Firm size (centered)	.0001 (.00004)***	.00009 (.00005)**	.0001 (.0002)
Firm size ²		-5.33e-08 (5.11e-08)	2.64e-09 (2.09e-07)
Firm size*Large firm			-.0001 (.0004)
Const.	.106 (.022)***	.114 (.022)***	.123 (.043)***
Obs.	2666	2666	2666
R ²	.013	.014	.014
<i>Extensive margin 2 (gross operating surplus)</i>			
Large firm	.007 (.033)	.016 (.036)	.015 (.037)
Firm size (centered)	.00003 (.00002)	.00002 (.00003)	-.00002 (.00009)
Firm size ²		-3.29e-08 (2.94e-08)	-7.45e-08 (9.77e-08)
Firm size*Large firm			.00008 (.0002)
Const.	.040 (.014)***	.045 (.014)***	.038 (.021)*
Obs.	2666	2666	2666
R ²	.006	.007	.007

APPENDIX

RDD ROBUSTNESS : ADDITIONAL CONTROLS

Table A.9: Robustness: Effects on both fixed-term and permanent contracts in new establishments (additional controls)

	(1)	(2)	(3)
Large firm	-1.180 (.438)***	-1.021 (.332)***	-1.084 (.372)***
Firm size (centered)	.002 (.0003)***	.003 (.0003)***	.002 (.001)**
Firm size ²		-1.08e-06 (2.97e-07)***	-1.56e-06 (1.36e-06)
Firm size*Large firm			.0009 (.002)
Const.	2.938 (.369)***	3.308 (.367)***	3.253 (.410)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in both fixed-term and permanent contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects, capital equity, foreign ownership share, domestic private ownership share, sales, number of establishments, firm age, and three regional dummy variables (Lisbon, Porto and Braga). Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD ROBUSTNESS : SHORTER RANGE

Table A.11: Robustness: Effects on both fixed-term and permanent contracts in new establishments, shorter firm size range

	(1)	(2)	(3)
Large firm	-1.152 (.453)**	-1.051 (.483)**	-.994 (.765)
Firm size (centered)	.003 (.0006)***	.002 (.0008)***	.003 (.0007)***
Firm size ²		-6.33e-07 (1.41e-06)	
Firm size*Large firm			-.0004 (.002)
Const.	2.767 (.514)***	2.772 (.515)***	2.790 (.523)***
Obs.	758	758	758

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 250 and 1,250 workers in October 2008. Poisson regression of new hires in both fixed-term and permanent contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD ROBUSTNESS : FALSIFICATION TEST (BEFORE THE REFORM)

Table A.15: Robustness: Falsification test, fixed-term and permanent contracts, 2007 instead of 2010

	(1)	(2)	(3)
Large firm	.214 (.506)	-.256 (.287)	-.058 (.278)
Firm size (centered)	.001 (.0003)***	.002 (.0003)***	.004 (.0003)***
Firm size ²		-2.31e-06 (2.63e-07)***	
Firm size*Large firm			-.004 (.0004)***
Const.	3.451 (.403)***	4.450 (.357)***	4.605 (.369)***
Obs.	2876	2876	2876

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2005. Poisson regression of new hires in both fixed-term and permanent contracts in all new establishments of each firm in October 2007. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2005) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 750 or more workers in 2005. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD ROBUSTNESS : FALSIFICATION TEST (500 THRESHOLD)

Table A.17: Robustness: Falsification test, fixed-term and permanent contracts, 500-worker threshold

	(1)	(2)	(3)
Large firm (500)	.863 (.290)***	.252 (.355)	.210 (.255)
Firm size (centered)	.0009 (.0003)***	.002 (.0005)***	.004 (.0005)***
Firm size ²		-1.05e-06 (3.71e-07)***	
Firm size*Large firm			-.003 (.0006)***
Const.	2.183 (.305)***	2.643 (.339)***	2.967 (.322)***
Obs.	2875	2875	2875

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all firms in Portugal employing between 100 and 2000 workers in October 2008. Poisson regression of new hires in both fixed-term and permanent contracts in all new establishments of each firm in October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the firm in 2008) is centered at 500, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for firms employing 500 or more workers in 2008. Control variables are 10 industry fixed effects. Standard errors clustered at the firm size level. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

RDD RESULTS : SPILLOVERS

Table 9: Spillover effects on the number of new fixed-term and permanent contracts in small firms

	(1)	(2)	(3)
Large firm	.070 (.034)**	.080 (.033)**	.049 (.284)
Firm size	-1.00e-05 (.00003)	-.00002 (.00003)	.00002 (.00003)
Firm size ²		-8.77e-08 (2.92e-08)***	
Firm size*Large firm			-.0001 (.00006)*
Firm (1-99) size	.040 (.0001)***	.098 (.0004)***	.040 (.0001)***
Firm (1-99) size ²		-.0007 (5.31e-06)***	
Firm (1-99) size*Large firm			-.00005 (.0004)
Const.	7.107 (.016)***	6.673 (.016)***	7.124 (.019)***
Obs.	2972680	2972680	2972680

Notes: The columns present different specifications of a (sharp) regression discontinuity model. The sample used is composed of all dyads of firms in Portugal employing between 100 and 2000 workers in October 2008 and firms employing between 1 and 100 workers that operate in the same one-digit industry and region ('concelho'). Poisson regression of new hires in both fixed-term and permanent contracts in each 1-99 firm by October 2010. Employment is weighted by the months with the firm and the hours worked of each new hire. The running variable (total number of workers of the 100-2000 firm in 2008) is centered at 750, when it takes value zero. The key regressor (Large firm) is a dummy variable taking value one for 100-2000 firms employing 750 or more workers in 2008. Standard errors clustered at the 100-2000 firm identifier. Own calculations based on the 'Quadros de Pessoal' data set. Significance levels: * 0.10, ** 0.05, *** 0.01.

APPENDIX

ASSUMPTIONS FOR THE STRUCTURAL ESTIMATION

- ▶ Functional forms :
 - ▶ Matching function : $m(\theta) = m_0\theta^{-\eta}$
 - ▶ Vacancy cost function : $C(v) = c_i v^\alpha$, $i = b, s$
- ▶ Distributions :
 - ▶ ϵ , the job-specific productivity, is drawn in a uniform distribution
 - ▶ z , the establishment specific productivity, is drawn in a generalized extreme value distribution
- ▶ Calibration of some parameters :
 - ▶ Discount factor, elasticity of the matching function, conversion rate of young establishments into old, destruction rate of establishments
- ▶ 18 remaining parameters to be estimated

Table 10: Parameters values of the search and matching model

<i>1. Baseline parameters</i>			
Description	Symbol	Value	Sources
Annual discount factor	β	0.9524	Standard
Elasticity of the matching function	η	0.5	(Petrongolo & Pissarides 2001)
Productivity shock arrival rate	λ	1	Normalization
Establishments' aging rate	ρ	0.5	Portuguese labor code
Establishments' attrition rate	μ	0.17	'Quadros de Pessoal'
<i>2. Calibrated parameters</i>			
			Targets
Flow utility of unemployment	b	-54.2632	Average # of unemployed workers
Scale parameter of the matching function	m_0	0.4657	Average # of employed workers
<i>3. Estimated parameters</i>			
			Standard errors (S.E)
<i>Common Parameters (small and large firms)</i>			
Value of unemployment	W_u	430.2893	(7.9161e - 05)
Firing costs	F	16.1107	(0.0008)
Upper and lower bounds of the idiosyncratic productivity	ε	1.0310	(0.0352)
Elasticity of the vacancy cost function	α	1.3921	(0.0121)
<i>Specific parameters for establishments created by small firms</i>			
Scale parameter of the vacancy cost function	c_a	2.8081	(0.0004)
Share of permanent jobs created in young establishments	π_{ad}	0.1226	(0.0068)
Share of permanent jobs created in old establishments	π_{oh}	0.2080	(0.0787)
G.E.V distribution location parameter	γ_{e1}	-0.2760	(0.0327)
G.E.V distribution scale parameter	γ_{e2}	20.4001	(0.0008)
G.E.V distribution shape parameter	γ_{e3}	31.0728	(0.0004)
<i>Specific parameters for establishments created by large firms</i>			
Scale parameter of the vacancy cost function	c_b	0.3786	(0.0030)
Share of permanent jobs created in young establishments	π_{bd}	0.2914	(0.0430)
Share of permanent jobs created in old establishments	π_{bh}	0.3304	(0.0572)
G.E.V distribution location parameter	γ_{b1}	-0.3032	(0.0285)
G.E.V distribution scale parameter	γ_{b2}	14.1732	(0.0018)
G.E.V distribution shape parameter	γ_{b3}	13.2708	(0.0044)

DECREASE IN WELFARE AND ESTABLISHMENT CREATION

► Establishment creation :

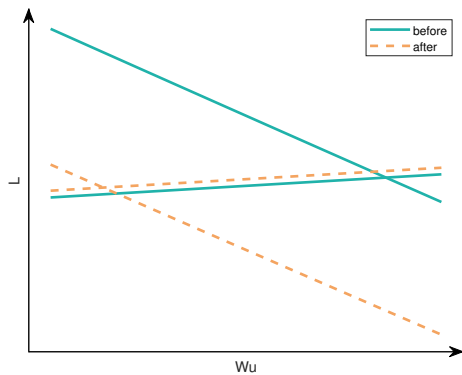
<i>Establishment type</i>	Partial eq. after reform	General eq. after reform
Small firm-Young	0	0.09
Small firm-Old	0	0.09
Large firm-Young	-10.27	-9.97
Large firm-Old	-10.28	-9.97

► Welfare :

<i>Establishment type</i>	W_p	W_t	W_u
Small firm-Young	-1.14	-0.60	
Small firm-Old	-0.44	-0.60	
Large firm-Young	13.27	-0.73	
Large firm-Old	0.18	-0.65	
Total	-0.07	-0.80	-0.73

APPENDIX

STRUCTURAL ESTIMATION : EMPLOYMENT EFFECTS



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