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Product market competition and gender discrimination

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Introduction

- ▶ Women earn lower wages than men in all countries.
- ▶ In the UK women earn 22% less than men, and are 12pp less likely to be in work. Similar in the US.
- ▶ In continental Europe smaller pay gap but higher employment gap.
- ▶ Large body of work documents the wage gap between men and women (Blau and Khan, 2016).
- ▶ The gender wage gap is very persistent.

Discrimination is costly

- ▶ Gender discrimination creates inefficiencies that contribute to significantly reduce output across countries (e.g., Cavalcanti and Tavares, 2016; Cuberes and Teignier, 2016; Hausmann et al., 2006).
- ▶ Finding appropriate policies to respond to gender discrimination is important.

What we do in this paper

- ▶ Study how increase in product market competition contributes to reduce gender discrimination.
- ▶ Investigate the dynamic implication from Becker (1957): changes in competition reduce employer discrimination.
- ▶ Exploit a comprehensive firm entry regulatory reform across industries in Portugal, the “On the Spot Firm” program, as a natural experiment (Fernandes et al. 2014, 2017).
- ▶ Use uniquely detailed **linked employer-employee data** for the universe of private sector firms and workers.

Competition and gender discrimination

- ▶ Becker's (1957) theory of employer discrimination; personal prejudice is the source of discrimination.
- ▶ Gender-biased employers have a preference for male workers even if their wages are higher than those of females with the same productivity.
- ▶ This gives rise to a gender wage gap and to segregation of workers across workplaces.
- ▶ Because discrimination is costly, an implication of Becker's (1957) model is that increased product market competition will reduce discrimination.

Our paper

- ▶ By using the [On the spot firm](#) reform as a natural experiment we are able to identify the causal link between competition and discrimination cleanly.
- ▶ We avoid the caveats associated with common measures of competition (HHI, CRs) used in previous studies.
- ▶ The use of LEED data allows controlling for biases arising from worker heterogeneity, non-random sorting.
- ▶ We are able also to estimate effects for workers with different skills and across the corporate hierarchy.

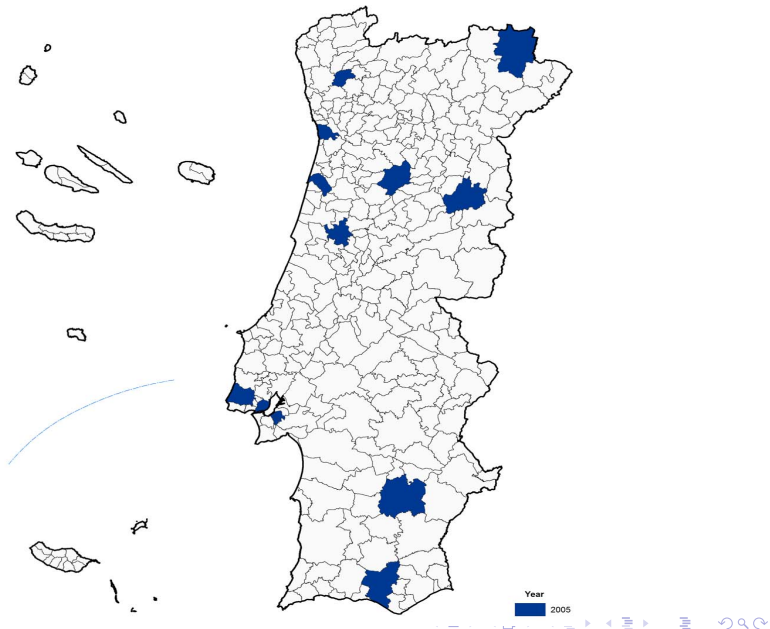
Background of the business entry reform

- ▶ Prior to 2005, to register a new firm the bureaucracy was extensive.
- ▶ An entrepreneur was required to:
 - ▶ Fulfil 11 procedures
 - ▶ Complete 20 forms
 - ▶ Visit separate offices of the Ministers of Justice, Finance, Economy, Labor to obtain the necessary documents and approvals
 - ▶ The process took 78 days
 - ▶ Costs equivalent to 13.4% GDP per capita (OECD)

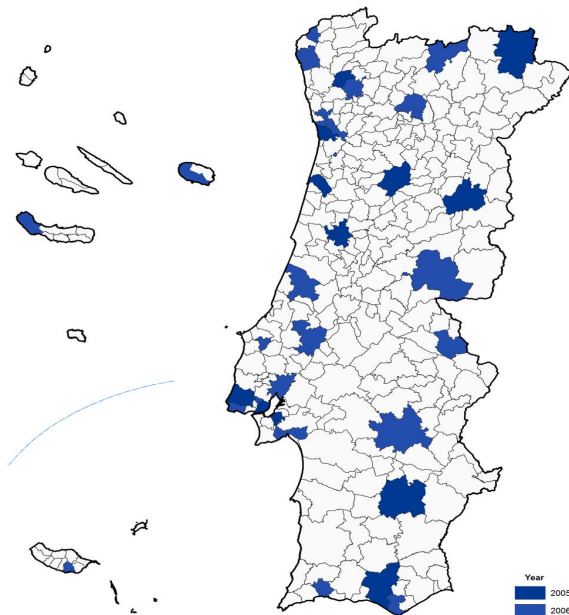
The 'On the Spot Firm' is a natural experiment

- ▶ Planning for business entry reform began when the new PM took office in March 2005.
- ▶ A taskforce was created (UCMA) to coordinate across ministries to reduce red tape, time and complexity to create a firm.
- ▶ In 4 months 'On the Spot Firm' was fully operational.
- ▶ The program introduced 'one-stop shops' to create a company at a single office desk, in less than an hour.
- ▶ Costs 3% GDP per capita (below the OECD average of 6.8%).

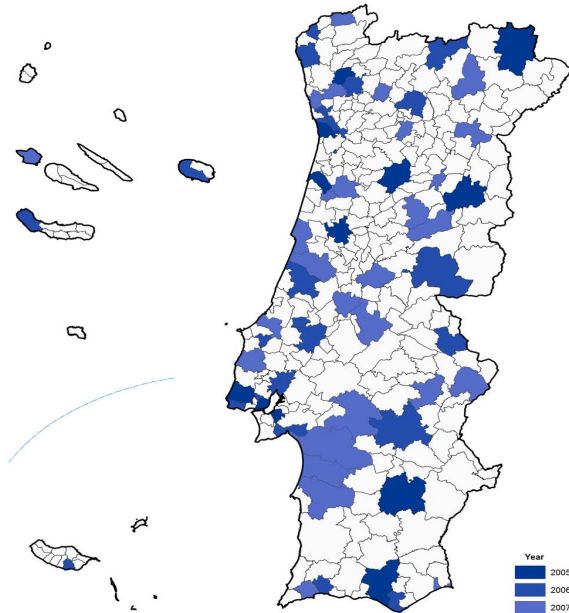
'On the Spot Firm' by year and municipality



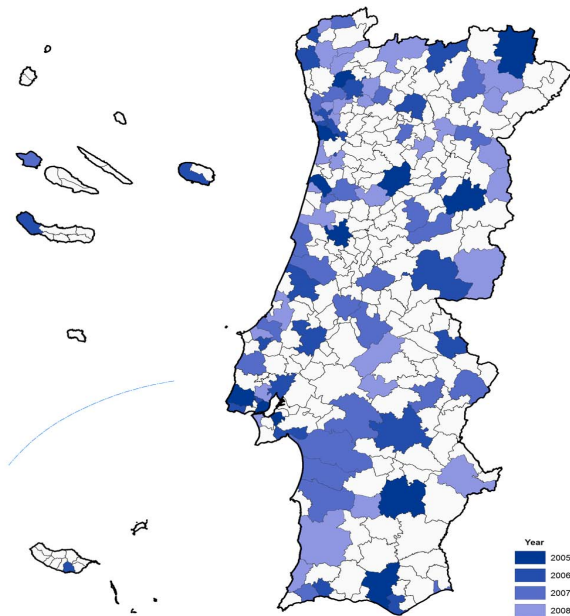
'On the Spot Firm' by year and municipality



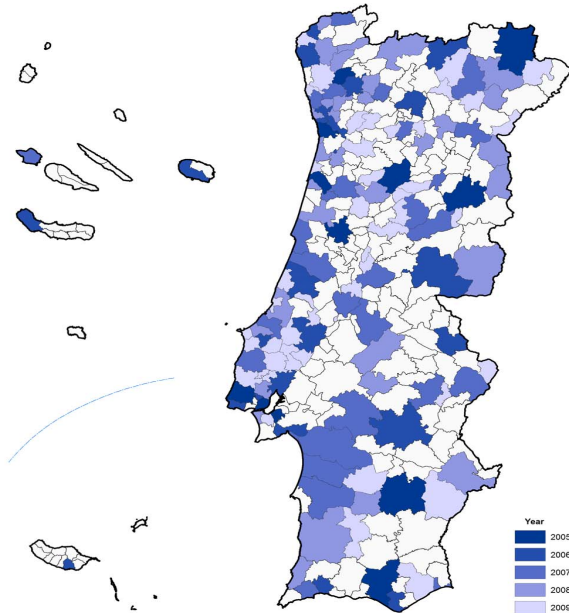
'On the Spot Firm' by year and municipality



'On the Spot Firm' by year and municipality



'On the Spot Firm' by year and municipality



The 'On the Spot Firm' natural experiment

- ▶ Over 60,000 firms were created using the OTSF (over 70% of all new firms in recent years).
- ▶ Companies saved 16 Million Euros (Standard Cost Model, European Commission).
- ▶ Rose from 113th in 2005 (out of 150 countries) to 26th in 2010 in the World Bank "Doing Business" ranking.

Data description

Main Data set: Matched employer-employee data 'Quadros de Pessoal', Ministry of Labor

- ▶ census of private sector firms in Portugal and all of their workers. Unusually rich and detailed worker-level and firm-level information.
- ▶ we use data for 2002-2009 and manufacturing and services firms.

Identification

- ▶ We exploit the roll-out of the **OTSF program** across municipalities over time to identify the effects of increased product market competition on the gender pay gap.
- ▶ Use variation in the timing of adoption across municipalities for identification.
- ▶ treatment group includes firms and workers in municipalities that adopted the reform.

Effect of the OTSF reform on firm entry

$$Y_{mst} = \beta Spot_{mt} + d(.) + \epsilon_{mst}$$

- ▶ Y_{mst} is the number of new entrant firms by municipality-industry-year (mst).
- ▶ $Spot_{mt}$ is the OTSF experiment indicator variable; equal to one in the year when the reform is adopted in municipality m and in all subsequent years, 0 otherwise.
- ▶ We control for industry (d_s), year (d_t) and municipality (d_m) fixed effects.

Effect of the OTSF reform on firm entry - results

Table 4: Effect of the "On the Spot Firm" program on firm entry

Panel A				
Dependent variable:	Firm entry			
	(1)	(2)	(3)	(4)
<i>OTSF</i>	0.621*** (0.140)	0.809*** (0.154)	0.474*** (0.133)	0.430*** (0.133)
Constant	1.871*** (0.053)	2.437*** (0.094)	1.558*** (0.108)	2.122*** (0.113)
Municipality FE	Yes	Yes	Yes	Yes
Industry FE		Yes		Yes
Year FE			Yes	Yes
R ²	0.125	0.342	0.126	0.343
No. Obs.	56,782	56,782	56,782	56,782
Panel B				
Dependent variable:	Firm entry			
	(1)	(2)	(3)	(4)
<i>OTSF</i>	0.113*** (0.016)	0.227*** (0.017)	0.075*** (0.019)	0.079*** (0.020)
Constant	0.699*** (0.006)	0.417*** (0.043)	0.590*** (0.017)	0.287*** (0.047)
Municipality FE	Yes	Yes	Yes	Yes
Industry FE		Yes		Yes
Year FE			Yes	Yes
R ²	0.061	0.289	0.061	0.291
No. Obs.	56,782	56,782	56,782	56,782

The OTSF and the gender pay gap

$$\ln w_{ijmkt} = \alpha + \beta_1(Fem_i \times S_{k,it} \times Spot_{mt}) + \beta_2(Fem_i \times S_{k,it}) + \beta_3(Fem_i \times Spot_{mt}) + \beta_4(S_{k,it} \times Spot_{mt}) + \beta_5 Spot_{mt} + \beta_6 S_{k,it} + \gamma X'_{it} + \lambda Z'_{jt} + d(.) + \epsilon_{ijmkt}$$

- ▶ $\ln w_{ijmkt}$ is the natural log of real hourly wage.
- ▶ $Spot_{mt}$ is the OTSF treatment variable.
- ▶ Fem_i is a female dummy.
- ▶ $S_{k,it}$ is the skill category (or occupation) of the worker.
- ▶ We control for worker or worker-firm match FEs, d_i or d_{ij} .
- ▶ X'_{it} = worker charact.; Z'_{jt} = firm charact.; d_s, d_t, d_m = FEs.

The OTSF and the gender pay gap - results

Table 6: Effect of the "On the Spot Firm" program on the gender pay gap, by skill levels

Dependent variable:	ln Compensation			
	(1)	(2)	(3)	(4)
Female	-0.134*** (0.003)	-0.102*** (0.004)		
<i>OTSF</i>			-0.005 (0.004)	-0.002 (0.004)
Med-skill× <i>OTSF</i>			0.003 (0.003)	-0.001 (0.004)
High-skill× <i>OTSF</i>			0.014*** (0.003)	0.013*** (0.003)
Mid-manag× <i>OTSF</i>			0.026*** (0.003)	0.022*** (0.004)
Top-manag× <i>OTSF</i>			0.039*** (0.005)	0.033*** (0.005)
Female× <i>OTSF</i>			-0.004 (0.004)	-0.007 (0.005)
Med-skill×Female× <i>OTSF</i>			0.010** (0.005)	0.011* (0.006)
High-skill×Female× <i>OTSF</i>			0.016*** (0.006)	0.017** (0.008)
Mid-manag×Female× <i>OTSF</i>			0.015** (0.006)	0.017** (0.007)
Top-manag×Female× <i>OTSF</i>			0.005 (0.005)	0.006 (0.006)
Med-skill	0.129*** (0.005)	0.152*** (0.007)	0.047*** (0.002)	0.024*** (0.002)
High-skill	0.364*** (0.009)	0.384*** (0.011)	0.078*** (0.003)	0.035*** (0.002)
Mid-manag	0.476*** (0.011)	0.493*** (0.009)	0.113*** (0.003)	0.061*** (0.003)
Top-manag	0.709*** (0.018)	0.757*** (0.017)	0.126*** (0.003)	0.063*** (0.003)
Med-skill×Female		-0.047*** (0.008)	-0.024*** (0.002)	-0.011*** (0.002)
High-skill×Female		-0.041*** (0.009)	-0.019*** (0.004)	-0.008** (0.004)
Mid-manag×Female		-0.033*** (0.010)	-0.004 (0.003)	0.003 (0.003)
Top-manag×Female		-0.125*** (0.013)	-0.013*** (0.004)	0.001 (0.004)
Municipality FE	Yes	Yes	Yes	
Industry FE	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes
Worker FE			Yes	
Match (worker-firm) FE				Yes
R ²	0.610	0.611	0.111	0.089
No. Obs.	11,884,645	11,884,645	11,884,645	11,884,645

The OTSF and the gender pay gap - results

Table 6: Effect of the "On the Spot Firm" program on the gender pay gap, by skill levels

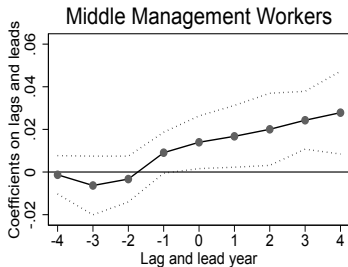
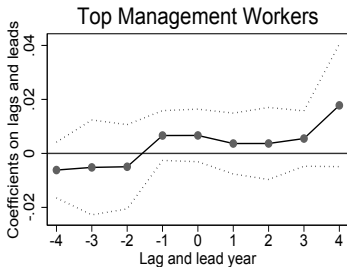
Dependent variable:	ln Compensation			
	(1)	(2)	(3)	(4)
Female	-0.134*** (0.003)	-0.102*** (0.004)		
<i>OTSF</i>			-0.005 (0.004)	-0.002 (0.004)
Med-skill× <i>OTSF</i>			0.003 (0.003)	-0.001 (0.004)
High-skill× <i>OTSF</i>			0.014*** (0.003)	0.013*** (0.003)
Mid-manag× <i>OTSF</i>			0.026*** (0.003)	0.022*** (0.004)
Top-manag× <i>OTSF</i>			0.039*** (0.005)	0.033*** (0.005)
Female× <i>OTSF</i>			-0.004 (0.004)	-0.007 (0.005)
Med-skill×Female× <i>OTSF</i>			0.010** (0.005)	0.011* (0.006)
High-skill×Female× <i>OTSF</i>			0.016*** (0.006)	0.017** (0.008)
Mid-manag×Female× <i>OTSF</i>			0.015** (0.006)	0.017** (0.007)
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Med-skill×Female		-0.047*** (0.008)	-0.024*** (0.002)	-0.011*** (0.002)
High-skill×Female		-0.041*** (0.009)	-0.019*** (0.004)	-0.008** (0.004)
Mid-manag×Female		-0.033*** (0.010)	-0.004 (0.003)	0.003 (0.003)
Top-manag×Female		-0.125*** (0.013)	-0.013*** (0.004)	0.001 (0.004)
Municipality FE	Yes	Yes	Yes	
Industry FE	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes
Worker FE			Yes	
Match (worker-firm) FE				Yes
R ²	0.610	0.611	0.111	0.089
No. Obs.	11,884,645	11,884,645	11,884,645	11,884,645

The OTSF and the gender pay gap - results

Table 6: Effect of the "On the Spot Firm" program on the gender pay gap, by skill levels

Dependent variable:	ln Compensation			
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<i>OTSF</i>			-0.005 (0.004)	-0.002 (0.004)
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Female× <i>OTSF</i>			-0.004 (0.004)	-0.007 (0.005)
Med-skill×Female× <i>OTSF</i>			0.010** (0.005)	0.011* (0.006)
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Mid-manag×Female× <i>OTSF</i>			0.015** (0.006)	0.017** (0.007)
Top-manag×Female× <i>OTSF</i>			0.005 (0.005)	0.006 (0.006)
Med-skill×Female		-0.047*** (0.008)	-0.024*** (0.002)	-0.011*** (0.002)
High-skill×Female		-0.041*** (0.009)	-0.019*** (0.004)	-0.008** (0.004)
Mid-manag×Female		-0.033*** (0.010)	-0.004 (0.003)	0.003 (0.003)
Top-manag×Female		-0.125*** (0.013)	-0.013*** (0.004)	0.001 (0.004)
Municipality FE	Yes	Yes	Yes	
Industry FE	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes
Worker FE			Yes	
Match (worker-firm) FE				Yes
R ²	0.610	0.611	0.111	0.089
No. Obs.	11,884,645	11,884,645	11,884,645	11,884,645

Event study - results



Effect of the OTSF on the female share

- ▶ Increased competition following the reform should increase female employment share.
- ▶ Discriminatory employers could prefer to keep women in lower positions than implied by their skills.
- ▶ We test whether the proportion of female employment increased following the OTSF, in each skill category.

Effect of the OTSF on the female share - results

Table 9: Effect of the "On the Spot Firm" program on female employment shares

Dependent variable:	female employment share						
	All (1)	Non-managerial (8)	Top-manag (2)	Mid-manag (3)	High-skill (4)	Med-skill (5)	Low-skill (6)
$OTSF_{t-1}$	0.056*** (0.010)	0.047*** (0.010)	0.134*** (0.016)	0.121*** (0.011)	0.138*** (0.018)	0.036*** (0.011)	0.001 (0.009)
Constant	-2.630*** (0.004)	-2.660*** (0.004)	-3.805*** (0.013)	-4.325*** (0.009)	-3.116*** (0.013)	-3.311*** (0.005)	-2.782*** (0.004)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.001	0.001	0.002	0.002	0.002	0.001	0.001
No. Obs.	1,270,791	1,244,837	185,919	264,716	201,831	924,406	760,691

Firm growth, female share and the OTSF

- ▶ Competition should also increase employment by non-discriminatory employers, approximated by a high female fraction.
- ▶ We investigate how firm growth and the female share are related following the OTSF.
- ▶ We regress firm employment growth on an interaction between the OTSF variable and female share.

Firm growth, female share and the OTSF - results

Table 10: Effect of the "On the Spot Firm" program and female share on firm growth

Dependent variable:	employment growth	
	(1)	(2)
$Femshare_{t-1} \times OTSF_{t-1}$	0.004** (0.002)	0.014*** (0.003)
$OTSF_{t-1}$	0.003 (0.002)	-0.005** (0.002)
$Femshare_{t-1}$	-0.010*** (0.001)	-0.011** (0.004)
Constant	-0.011*** (0.002)	0.001 (0.003)
Municipality FE	Yes	
Industry FE	Yes	
Year FE	Yes	Yes
Firm FE		Yes
R ²	0.006	0.010
No. Obs.	1,138,333	1,138,333

Conclusions

- ▶ We present novel empirical evidence for the prediction that competition reduces discrimination.
- ▶ Use a comprehensive business entry reform that increased competition across industries.
- ▶ Increased competition following the reform reduces the gender pay gap for workers in mid-managerial or high- to med-skilled positions.
- ▶ Effects increase over time with increase in business registration.
- ▶ The share of female employees increased within firms in affected municipalities.
- ▶ Non-discriminatory employers grow faster following the reform.