



# Occupational entry regulations (OER) and their effects on productivity in services

Measurement and firm-level evidence

By Christina von Rueden, **Giuseppe Nicoletti** and Indre Bambalaite

Bank of Italy, 8 November 2019

OP-ED  
**Eliminating the anti-competitive effects of occupational licensing**  
Ryan Nunn · Thursday, January 17, 2019



# Occupational Licensing Hurting West Virginia's Economy



4:44 / 18:08



How to rig an economy

Occupational licensing blunts competition and boosts inequality



ed a license to braid hair? | VISION TALKS

*Licence to kill competition*  
**America should get rid of oppressive job licensing**  
*Too many states have let rent-seekers run amok*



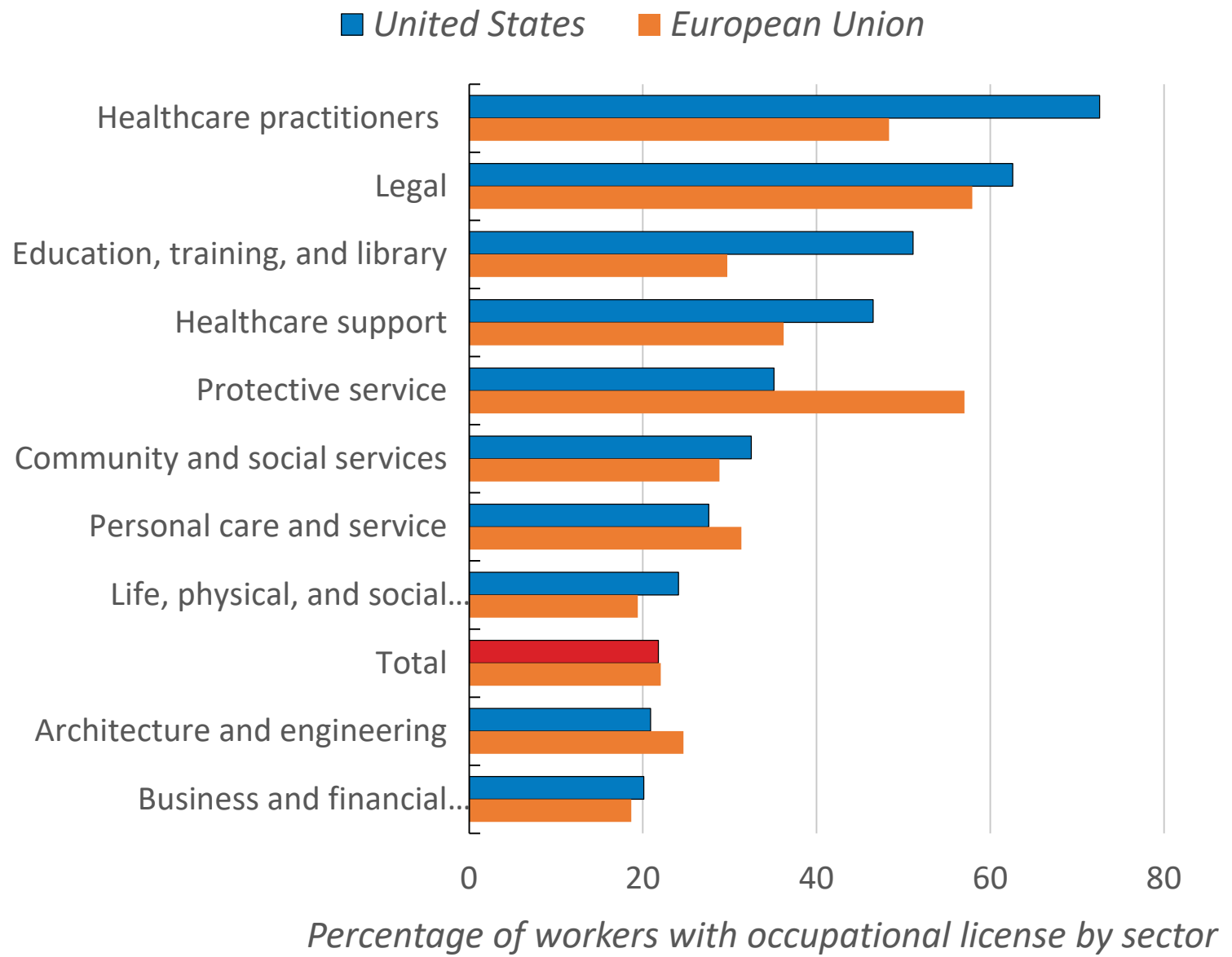
# Occupational licensing is replacing labor unions and exacerbating inequality

By Evan Soltas | Evan.Soltas@voxmedia.com | Apr 18, 2014, 11:00am EDT





The share of workers holding an occupational license is high



Source: Calculations produced by Maria Koumenta (Queen Mary University of London) based on EU Survey of Regulated Occupations and US Bureau of Labour Statistics Current Population Survey.

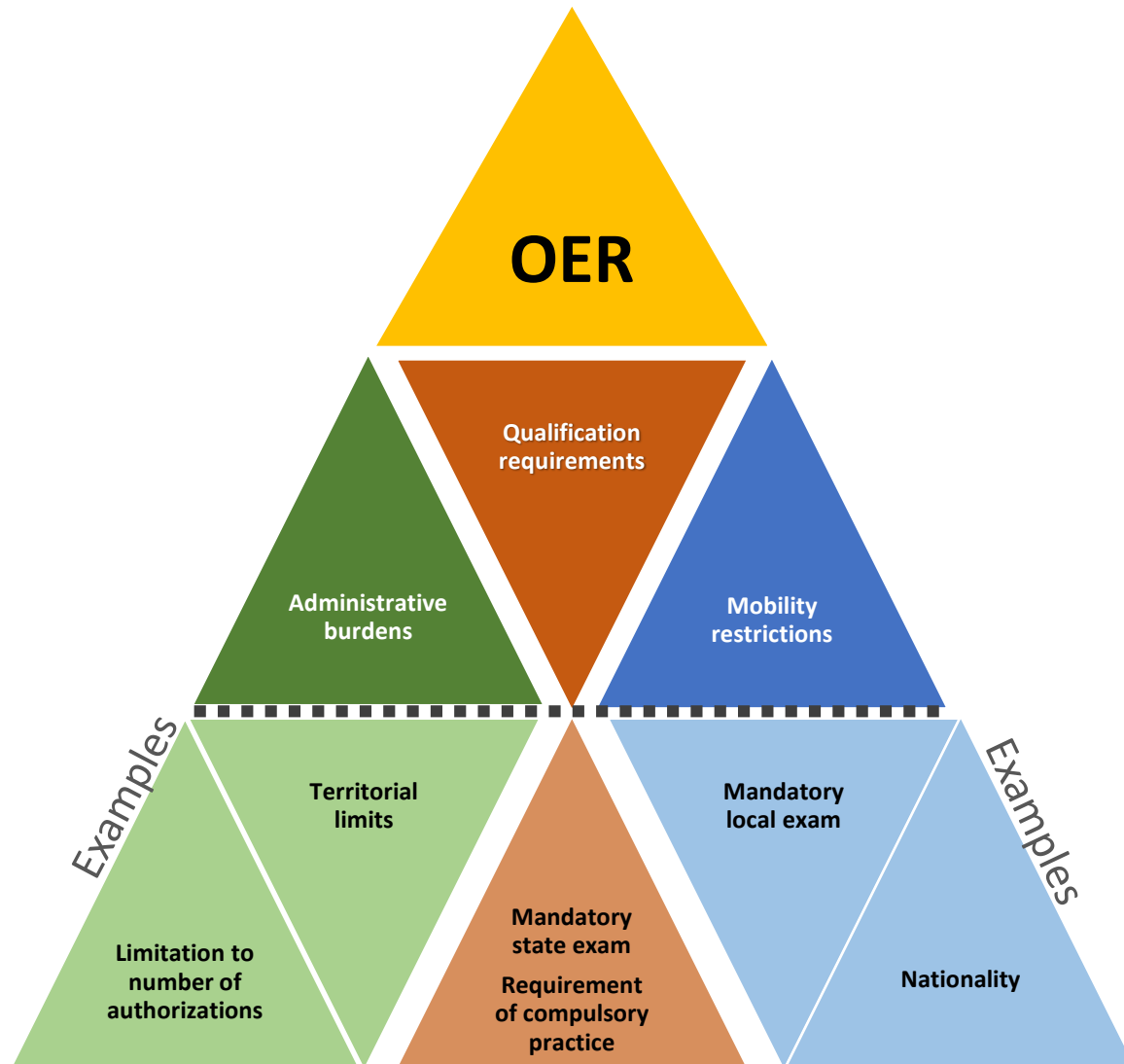


# Part 1:

A new cross-country measure of  
Occupational Entry Regulations (OER)

# Structure and construction of the OER Indicator

Step 1: Collecting and summing individual information



Step 2: Discounting the overall value

100% License

- Protected title
- Reserved activities

70% Only the supervisor needs the license

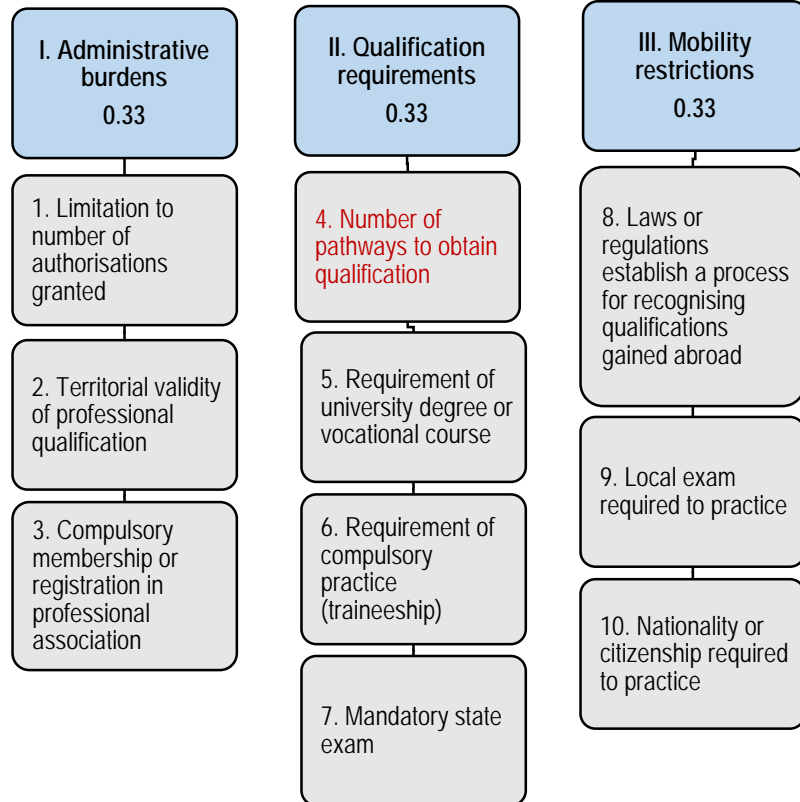
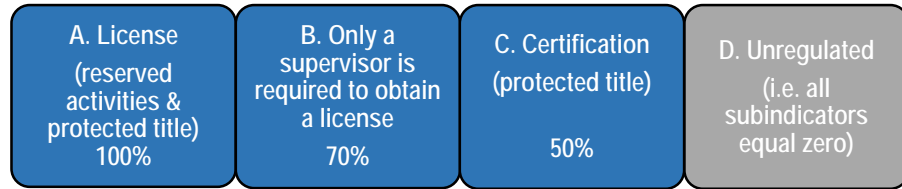
- Reserved activities
- Protected title

50% Certification

- Protected title

0% Unregulated

Composite OER indicator



### Question example:

How many pathways are there to obtain qualifications to legally practice the profession?

Answers:

One pathway;

Two pathways;

Three or more pathways.

Definition: A pathway is a process by which a person can obtain the qualifications to legally practice the profession (e.g. one pathway may require an undergraduate degree plus 1 year of compulsory practice, while another could require a short vocational course and a much longer period of compulsory practice).

# First cross-country indicator of OER for personal and professional services

— Included in empirical analysis

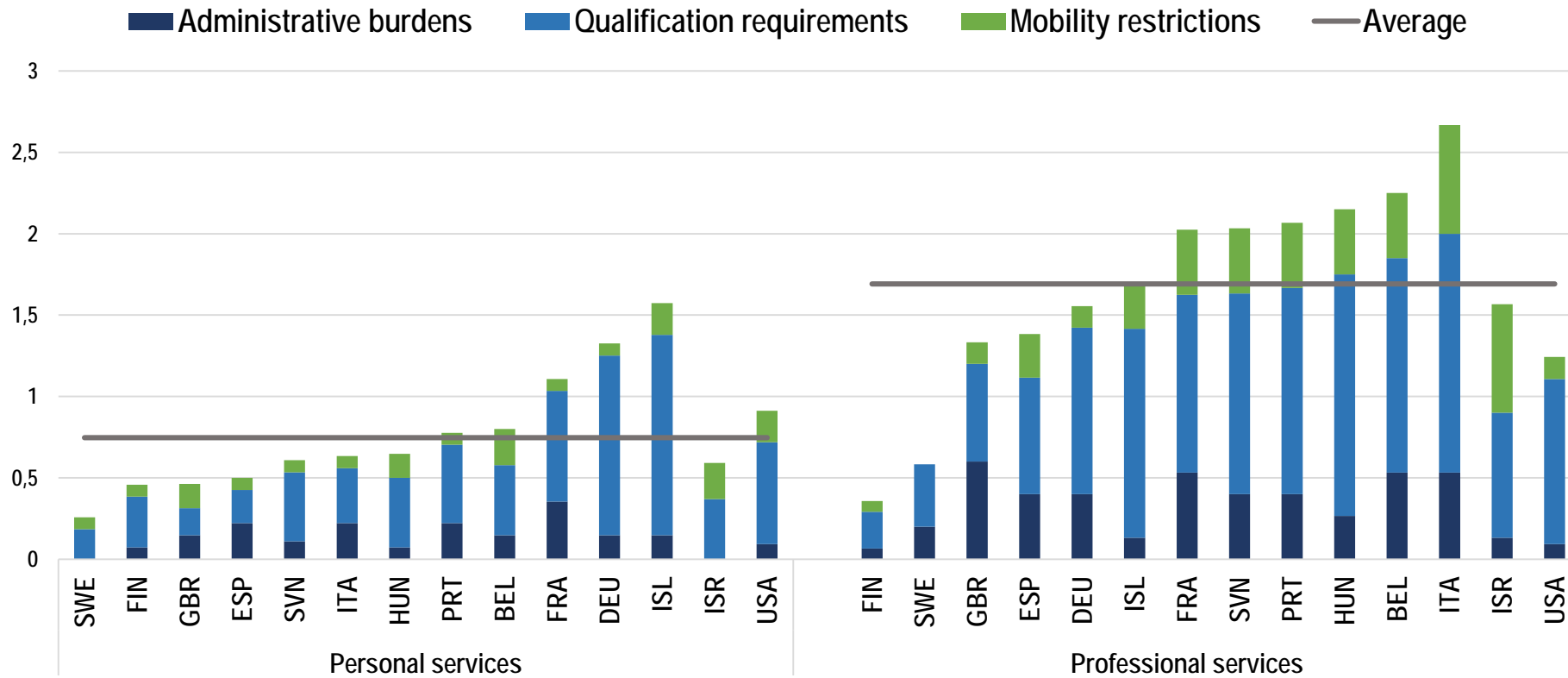
— Ongoing extension of coverage

Countries			Occupations		
European		Non-European	Personal		Professional
Belgium	Portugal	India (Delhi)	Aesthethician	Hairdresser	Accountant
Finland	Slovenia	Israel	Baker	Painter-decorator	Architect
France	Spain	United States (state-level)	Butcher	Plumber	Civil Engineer
Germany	Sweden	Canada (province-level)	Taxi driver	Nurses	Lawyer
Hungary	United Kingdom		Driving instructor		Real-estate agent
Italy	Iceland		Electrician		
Austria	Switzerland				

Most countries and occupations included in the indicator at this pilot stage were chosen among those well covered in ORBIS to allow empirical analysis

# Public policy objectives are pursued in very different ways

OER indicator – increasing in stringency



## Main findings:

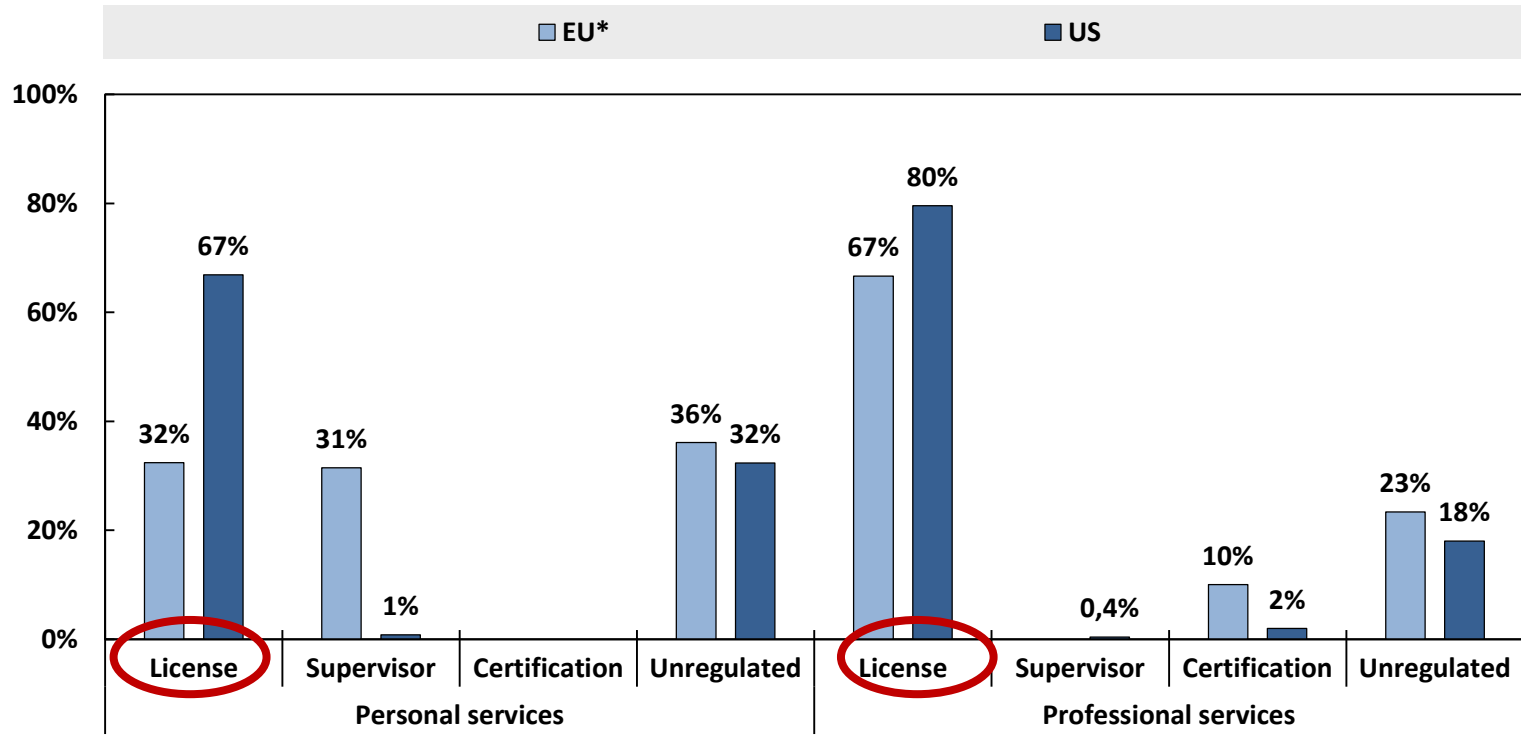
Stringency and the mix of requirements vary a lot across countries

The average regulatory stringency is lower in personal services than professional services



# Public policy objectives are pursued in very different ways

OER indicator – increasing in stringency  
Percentage of occupations by country group

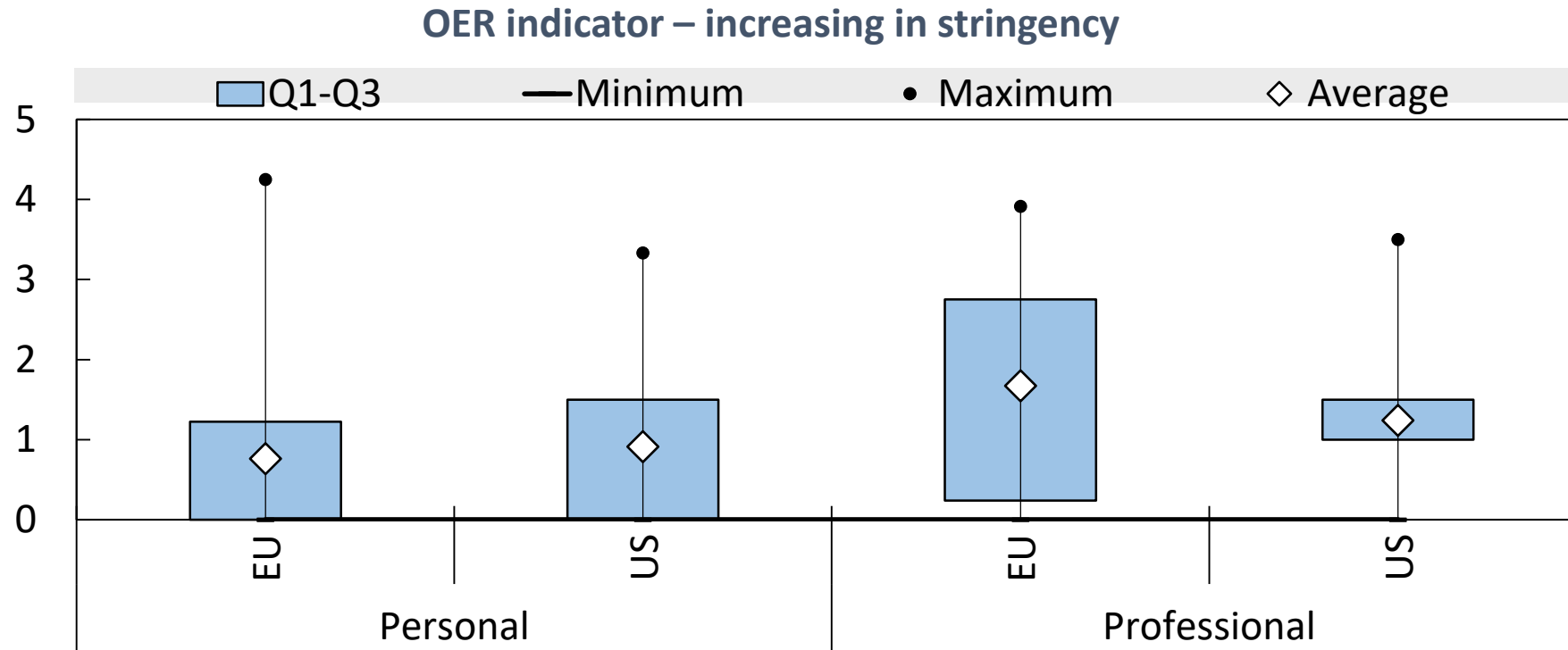


## Main findings:

Occupational regulations typically take the form of licensing requirements.

More diverse (and less restrictive) arrangements are more common in the EU than in the US

# Public policy objectives are pursued in very different ways



## Main findings:

- Stringency varies widely across countries and states within occupations
- In personal services, regulatory variance is surprisingly similar across EU and US, suggesting market segmentation
- The EU single market for professions is still a long way ahead

Part 2:

## Occupational licensing and productivity

# Data

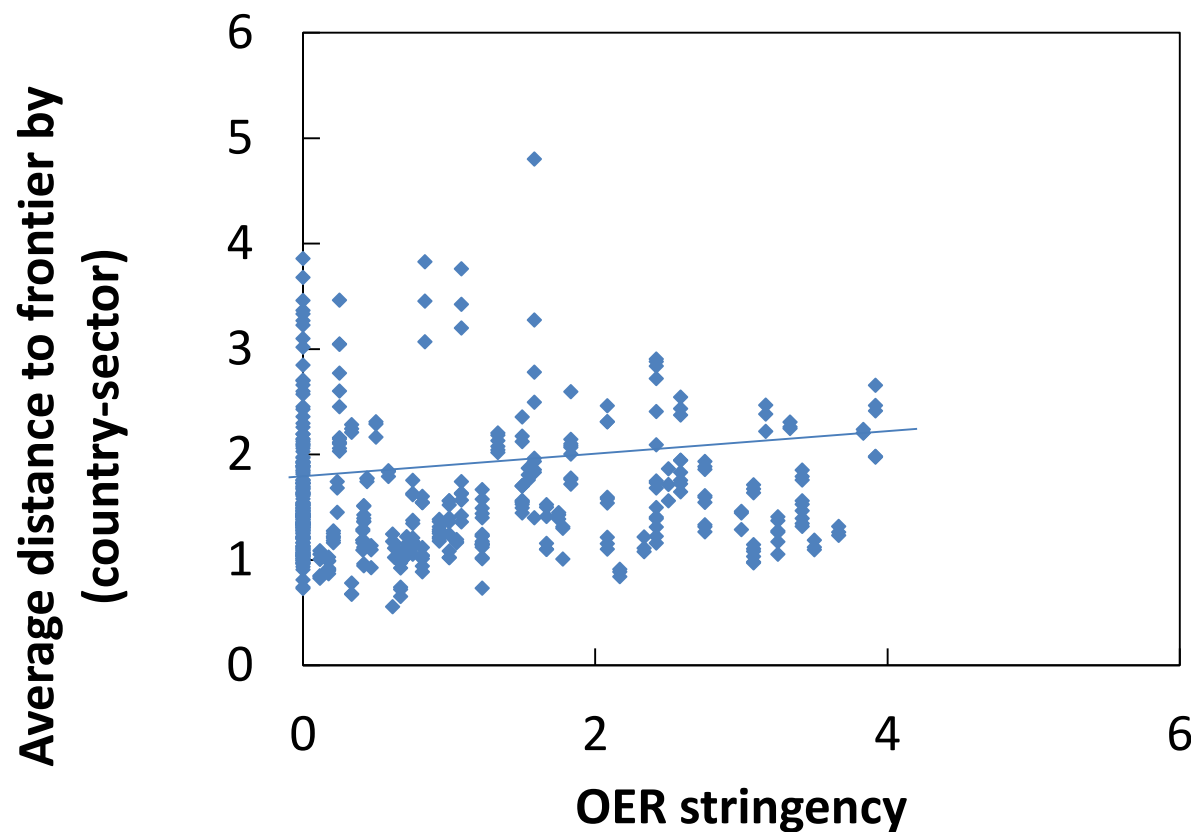
- 400K firms: 4-digit ORBIS sector; 2014-2016; unconsolidated accounts; at least 2K per sector/country; all sizes (special treatment of self-employed); focus on labour productivity
- 11 countries: Belgium, Finland, France, Germany, Hungary, Italy, Portugal, Slovenia, Spain, Sweden, United Kingdom
- 11 occupations: Aesthetician, Baker, Butcher, Driving instructor, Electrician, Hairdresser, Painter-decorator, Plumber, Architect, Civil Engineer, Lawyer

# Exploring the effects of OER on productivity

## The Within Channel

OER may affect the ability and incentives of firms to adopt production techniques adopted at the frontier and innovate by

- limiting firms' capabilities due to shortages of skilled workers
- curbing firms' incentives due to lower competitive pressures



# Exploring the effects of OER on productivity

## The Within Channel

$$\Delta LP_{isct} = \beta_1 \Delta LP_{st}^{Leader} + \beta_2 Gap_{isct-1} + X_{icst} + \beta_5 Regulation_{cs} + \delta_{ct} + \delta_s + \varepsilon$$

Labour productivity growth      Growth of global leader      Gap to the global leader      Age, size      OER Indicator      Fixed effects

### Refinements:

- Accounting for heterogeneity: non-linearity, productivity quartiles, size classes
- Subindicators of the OER
- National instead of global leader
- Sector-time FE, sector-country controls
- Reverse causality test

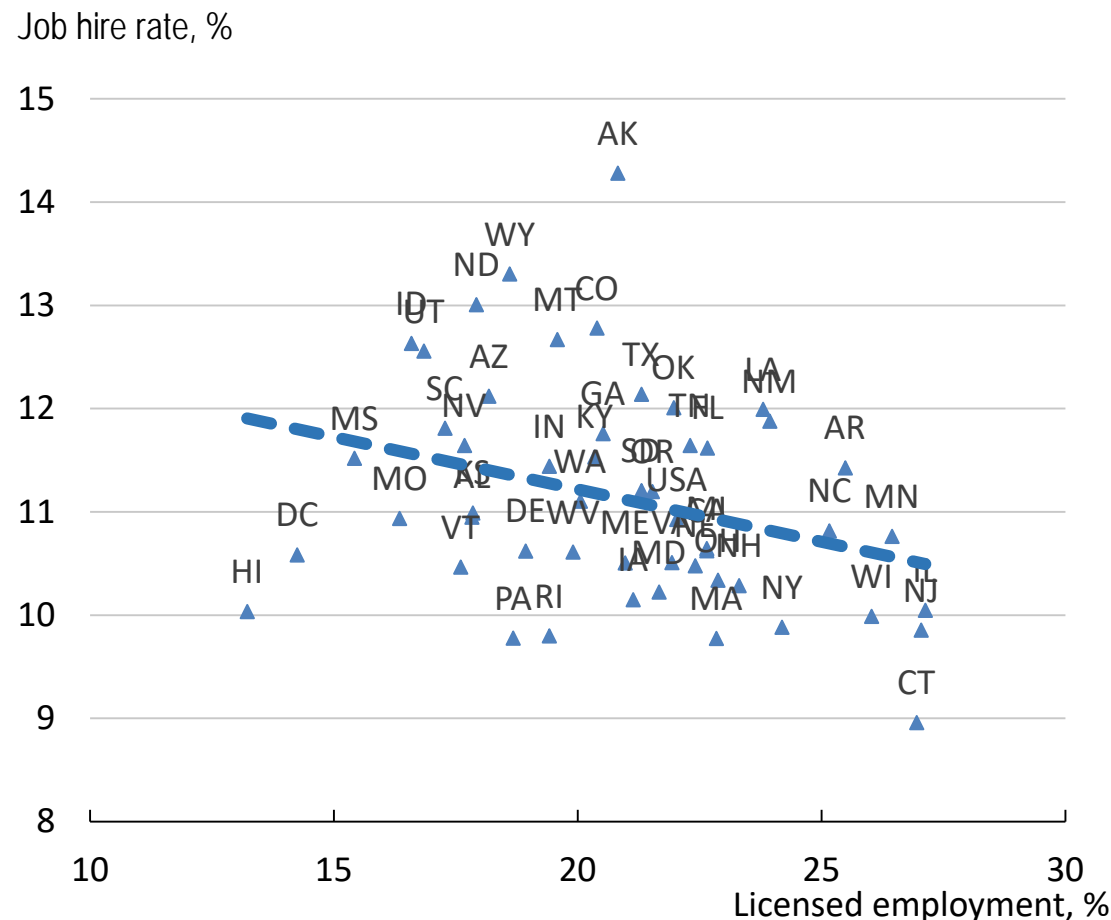
# Exploring the effects of OER on productivity

## The Between Channel

OER may hinder the most productive firms from attracting the best workers.

- Qualification requirements hinder workers from switching professions (or just upskill) and thus move to more productive firms.
- Geographic mobility constraints (e.g. territorial validity constraints or mobility restrictions) prevent workers from physically moving to work in a productive firm.

Total job hire rate, average 2012-2018



Source: Hermansen (2019)

# Exploring the effects of OER on productivity

## The Between Channel

Following Decker et al. (2016)

$$\underbrace{\Delta Empl}_{\text{Employment growth}}_{isct} = \beta_1 \underbrace{LP}_{\text{Labour productivity}}_{isct-1} + \beta_2 \underbrace{LP}_{\text{Labour productivity}}_{isct-1} * \underbrace{Regulation}_{\text{OER indicator}}_{cs} + \underbrace{X}_{\text{Age, size}}_{icst} + \underbrace{\delta}_{\text{Fixed effects}}_{cst} + \varepsilon$$

Refinements:

- Subindicators of the OER
- Including firms transitioning from self-employed to employer status





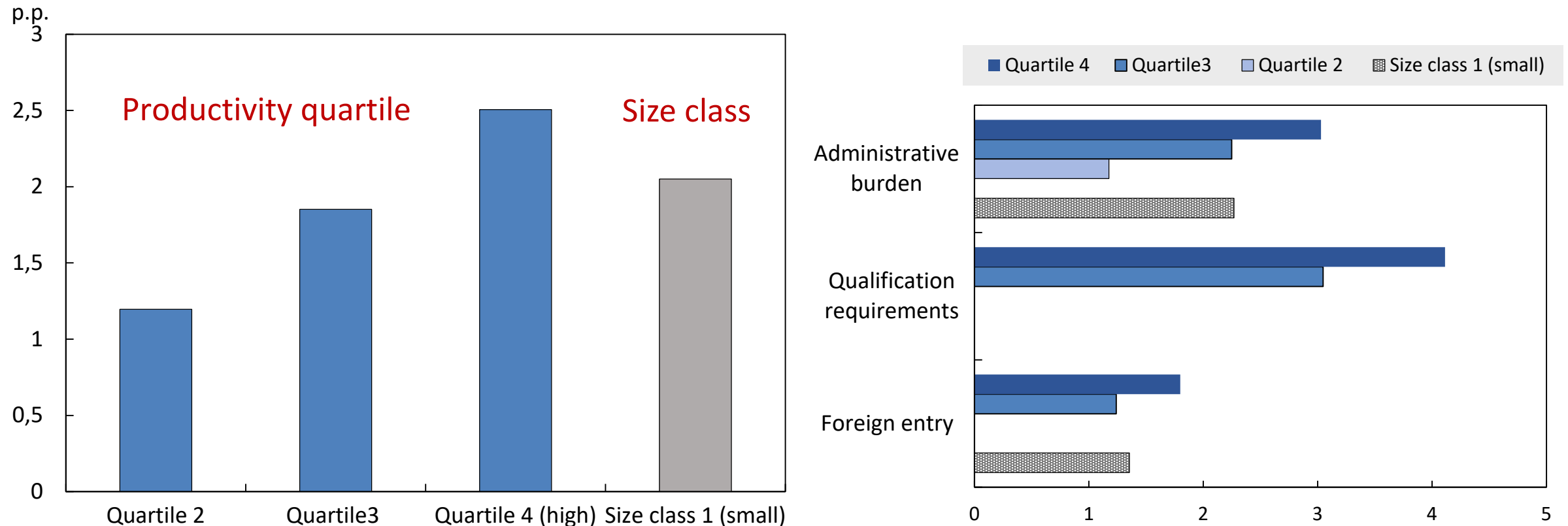
# Catch-up results

Model	I	II	III	IV
Frontier growth	0.239*** (0.0576)	0.238*** (0.0576)	0.241*** (0.0580)	0.154*** (0.0564)
Gap to frontier (lag)	0.326*** (0.0122)	0.327*** (0.0121)	0.337*** (0.0148)	
Employees (log)	0.0375*** (0.00285)	0.0371*** (0.00294)	0.0372*** (0.00297)	0.0296*** (0.00234)
Age	4.91e-05 (0.000235)	5.05e-05 (0.000235)	7.45e-05 (0.000242)	-0.000105 (0.000193)
Indicator		-0.0166** (0.00823)	-0.0162** (0.00814)	
Indicator x lagged gap to frontier			-0.0111 (0.00882)	
Productivity quartile 1 (lowest)				0.452*** (0.0167)
Productivity quartile 2				0.195*** (0.00849)
Productivity quartile 3				0.109*** (0.00516)
Indicator x productivity quartile 1				-0.0130 (0.0113)
Indicator x productivity quartile 2				-0.0115* (0.00655)
Indicator x productivity quartile 3				-0.0178*** (0.00607)
Indicator x productivity quartile 4				-0.0241***
Observations	254,380	254,380	254,380	254,380
R-squared	0.181	0.182	0.182	0.180

# The productivity consequences of too stringent regulations can be sizeable

## Within firm-channel

Productivity gains from reducing regulation from most to least regulated country in each occupation



# Reallocation results

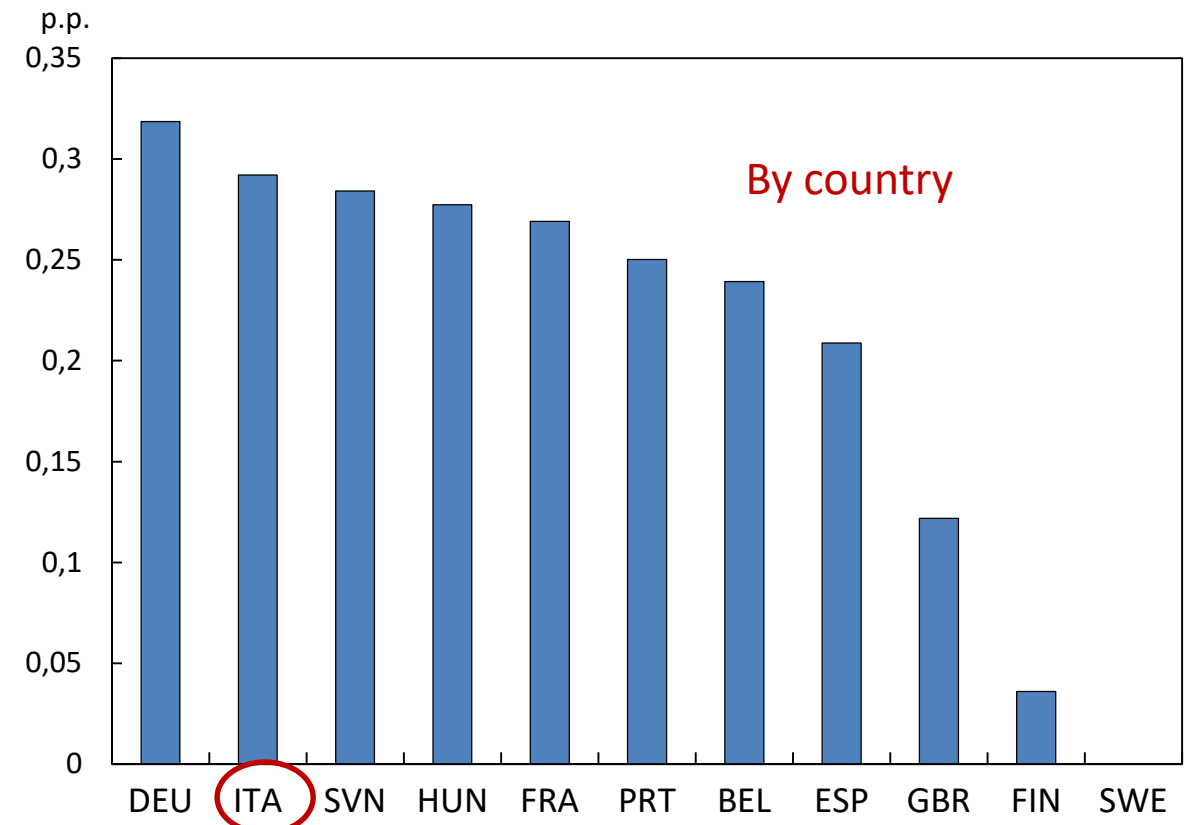
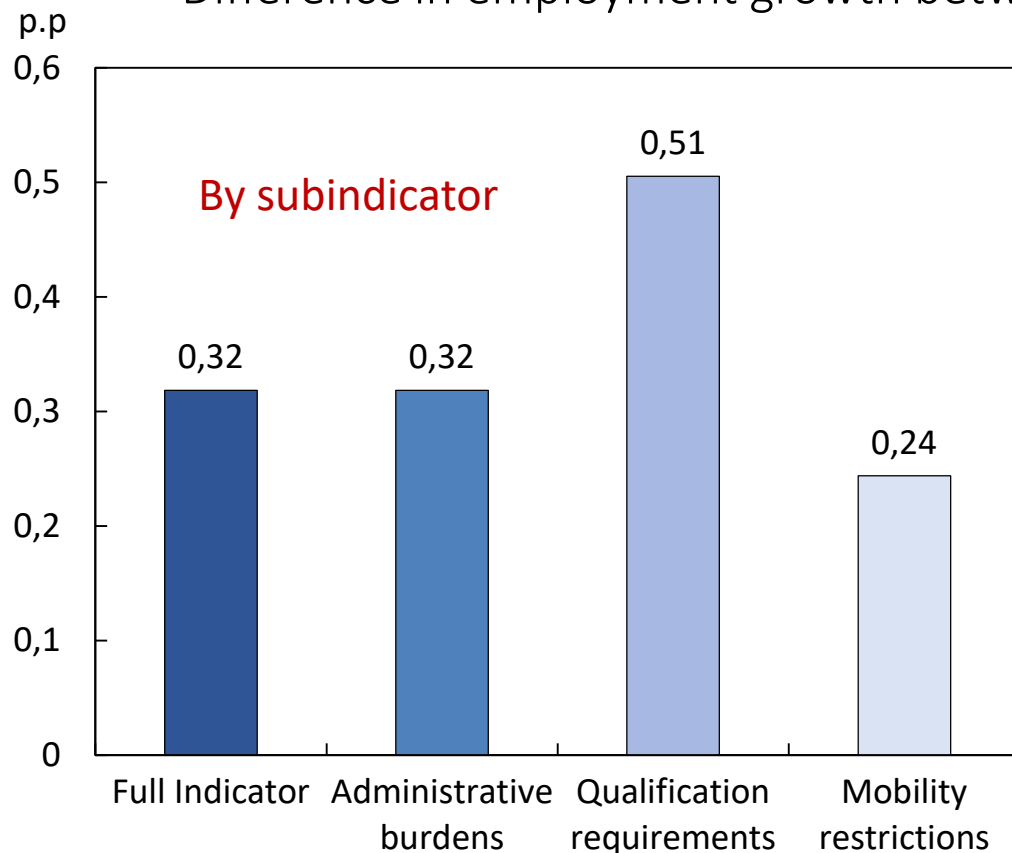
	Baseline	Full Indicator	Administrative burdens	Qualification requirements	Mobility restrictions
<b>Labour productivity (lagged)</b>	0.0823***	0.0862***	0.0862***	0.0872***	0.0843***
	(0.00342)	(0.00465)	(0.00465)	(0.00492)	(0.00381)
<b>Labour productivity (lagged) x Indicator</b>		-0.00455**	-0.00455**	-0.00902**	-0.0145***
		(0.00207)	(0.00207)	(0.00407)	(0.00522)
<b>Employees (log)</b>	0.0270***	0.0269***	0.0269***	0.0269***	0.0270***
	(0.00213)	(0.00214)	(0.00214)	(0.00214)	(0.00214)
<b>Age</b>	-0.0050***	-0.00501***	-0.00501***	-0.00501***	-0.00501***
	(0.000199)	(0.000199)	(0.000199)	(0.000199)	(0.000199)
<b>Observations</b>	275,933	275,933	275,933	275,933	275,933
<b>R-squared</b>	0.061	0.061	0.061	0.061	0.061

# The productivity consequences of too stringent regulations can be sizeable

## Between firm-channel

Gains to efficiency of labour reallocation of reducing regulatory level to sample minimum

Difference in employment growth between the average firm at the 1st and 4th productivity quartile





# Some policy implications

1. Regulations need to be reviewed in the light of changing public interests, technological developments and international experience.
2. Market segmentation should be reduced by allowing for effective mutual recognition regimes
3. Entry barriers should be proportionate to public policy aims
4. The focus of regulations should shift from inputs to outputs, wherever possible.
5. Competition policy should scrutinize the legitimacy of entry regulations

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**ANNEX**

# Firms by size class and occupation

	NACE 2	1 employee	2-10 employees	11-50 employees	51-250 employees	250+ employees	TOTAL
Electrician	4321	18190	58123	16699	1522	3468	98002
Plumber	4322	15245	47460	12046	900	1586	77237
Painter	4334	5509	16491	3463	299	465	26227
Butcher	4722	2932	12066	1956	78	185	17217
Baker	4724	1612	7282	1607	93	279	10873
Lawyer	6910	7202	13599	1928	639	403	23771
Architect	7111	8058	10886	1345	182	265	20736
Engineer	7112	25792	39015	10058	1753	3566	80184
Engineer	7120	3910	9022	2849	495	822	17098
Driving Instructor	8553	2014	7611	787	17	94	10523
Aesthetician /Hairdresser	9602	10921	30808	2711	88	361	44889
<b>TOTAL</b>		101385	252363	55449	6066	11494	426757
<b>Percentage of total</b>		23%	59%	12%	1.4%	2.9%	100



# Summary statistics: balance sheet data, by sector

		LP		LP growth (%)		Employees		Employment growth (%)		Wages		K/L ratio	
Occupation	Nace Rev 2	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
Electrician	4321	10.3	0.6	0.8	42.5	10.2	28.6	6.0	33.9	10.2	0.6	30.5	373.0
Plumber	4322	10.3	0.6	0.7	40.5	9.5	16.9	5.4	30.7	10.1	0.6	21.2	94.5
Painter	4334	10.2	0.6	0.0	39.9	9.6	24.2	5.5	32.3	10.1	0.6	15.5	49.1
Butcher	4722	10.2	0.8	2.5	42.3	6.8	11.3	5.1	29.9	10.0	0.6	30.8	62.8
Baker	4724	10.1	0.8	2.3	41.6	8.7	23.8	6.1	34.1	10.0	0.6	31.9	108.5
Lawyer	6910	11.1	0.8	-2.9	40.9	12.3	42.2	5.0	28.4	10.7	0.6	118.3	3248.2
Architect	7111	10.6	0.9	-1.6	51.2	7.2	18.0	9.4	34.7	10.4	0.7	87.1	1339.1
Engineer	7112	10.8	0.8	-1.5	45.5	12.2	40.6	8.5	33.2	10.5	0.7	214.3	6866.9
Engineer	7120	10.7	0.7	0.7	39.4	13.8	37.0	7.8	30.5	10.4	0.6	52.5	261.4
Driving Instructor	8553	9.9	0.8	0.7	42.1	5.5	7.3	4.6	29.5	9.8	0.6	25.0	86.2
Aesthetician/Hairdresser	9602	9.7	0.8	2.2	43.1	5.3	11.2	5.3	31.6	9.8	0.6	18.6	83.6
	Total	10.37	0.8	0.3	43	9.7	27.8	6.3	32.2	10.2	0.7	67.1	3028.5

# Summary statistics: OER indicator, by sector

		Full indicator		Administrative burdens		Qualification requirements		Mobility restrictions	
		mean	sd	mean	sd	mean	sd	mean	sd
<b>Electrician</b>	4321	0.4915	0.63	0.4915	0.633	0.41133	0.4841	0	0
<b>Plumber</b>	4322	0.2786	0.45	0.2786	0.449	0.23246	0.401	0	0
<b>Painter</b>	4334	0.3633	0.47	0.3633	0.471	0.27992	0.3981	0	0
<b>Butcher</b>	4722	0.1849	0.33	0.1849	0.329	0.18493	0.329	0	0
<b>Baker</b>	4724	0.0617	0.21	0.0617	0.214	0.06173	0.2138	0	0
<b>Lawyer</b>	6910	3.07	1.03	3.07	1.028	1.56547	0.4817	0.83283	0.5021
<b>Architect</b>	7111	1.828	0.92	1.828	0.924	1.1496	0.5801	0.12278	0.2584
<b>Engineer</b>	7112	0.9611	0.95	0.9611	0.946	0.64047	0.5333	0.13582	0.3586
<b>Engineer</b>	7120	1.7782	1.31	1.7782	1.306	0.93391	0.5262	0.49727	0.6232
<b>Driving Instructor</b>	8553	1.2772	0.38	1.2772	0.377	1.22144	0.3272	0.05333	0.1809
<b>Aesthetician/Hairdresser</b>	9602	0.2433	0.29	0.2433	0.285	0.20249	0.2227	0	0
<b>Total</b>		0.7264	0.98	0.7264	0.981	0.49597	0.5748	0.09039	0.3047

# Data: Cross-country firm-level data Orbis

- **Wide coverage**
  - 24 OECD countries, 1997-2015
  - Both manufacturing and services
  - Large and small firms
  - Balance sheets and income statements  
from **several million company accounts**
    - Collected and harmonized by Bureau van Dijk
- **Limitation:**
  - Coverage of (small) firms uneven across countries



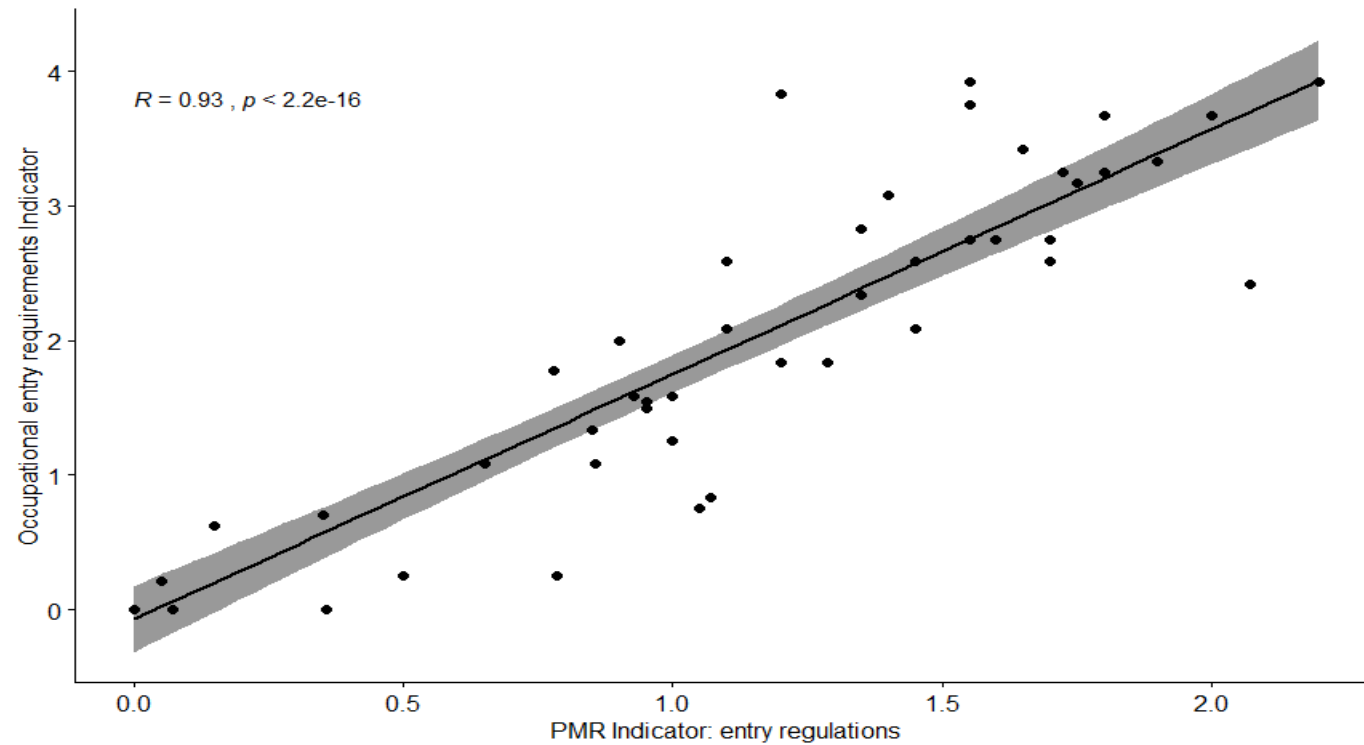
# Measurement of productivity

- Substantial work to **translate** balance sheet information to economic measures
  - Deflation, PPP conversion, capital stock estimation, cleaning
- Several **productivity measures** derived
  - Labour-productivity, MFP variants
  - Our main MFP variable of interest:
    - Semi-parametric estimation using a control factor approach based on intermediate inputs
    - This builds on Levinsohn and Petrin (2003)
    - But uses the refinement by Wooldridge (2009, see next slide for details)
- Definition of **global productivity frontier**: top 5% of firms in terms of productivity levels within each 2-digit industry

# Comparison PMR – OER

**Correlation between the Occupational Entry Requirements indicator and the PMR**

Professional services



# Limitations of the indicator

- it fails to reflect differences in the number of reserved activities associated with each occupation across countries, which may impinge on the actual stringency of entry requirements;
- it overlooks relevant aspects of occupational regulations for which comparative data were lacking (e.g. prices of licenses, grandfathering rights, regulatory powers of professional associations, etc.) as well as regulatory dimensions unrelated to market access (e.g. hygiene checks or conduct regulations);
- it does not account for differences in occupational regulations within countries or states (in the case of the US);
- it only offers a snapshot of current occupational entry regulations.



# Selected reform efforts - EU

Country	Year	Reform
Germany	2003	Amendment of the Crafts code allowing anyone to perform crafts activities as long as the supervisor is qualified
United Kingdom	2007	Legal Service Board reform – separation of regulatory and representative powers
Spain	2009	Reduction of barriers for individuals from other regulated occupations to exercise reserved activities , reduction of tariffs and restrictions on advertising
Poland	2009; 2013	Modification of the rules of entry to the profession of advocate and legal advisors
Greece	2011	Abolishment of unjustified redundant regulations related to regulated professions
Italy	2012	Relaxation of multiple restrictions including both access and conduct regulations (loosened terms for traineeships, abolition of tariffs, advertising and legal form restrictions)
Portugal	2013	Relaxation of entry requirements for occupations that were not regulated by professional bodies
Slovenia	2013	Reduction of number of craftsmen occupations required to obtain a license
Belgium	2019	Deregulation of craftsmen occupations in the Flemish region