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# Economic integration, structural change and uneven development in the European Union

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# Outline

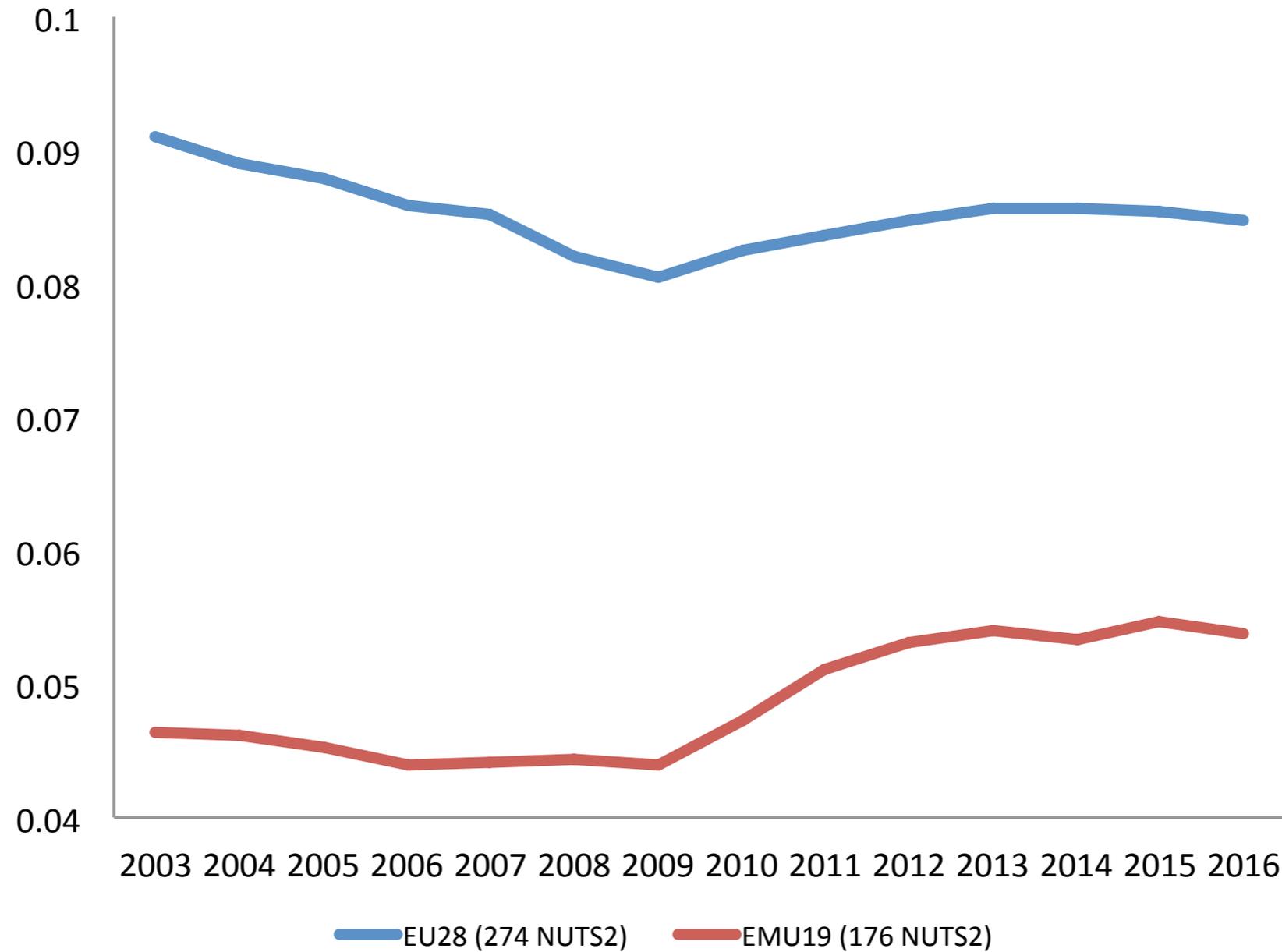
- Introduction
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- Method
- Results
- Policy implications

# Introduction

- Regional disparities in Europe
- Structural change: transition to services and de-industrialization
- International productive networks - The Second Unbundling (Baldwin, 2016)

Our main research question: is uneven development related to structural change, **after the global financial crisis?**

# Regional inequality in GDP per head



Theil index of absolute concentration

# Literature review on regional inequality in Europe

- **Before the Great Recession:**

- Evidence of increased regional income inequality within countries even before the crisis (e.g. Marelli and Signorelli, 2010; Doran and Jordan, 2013), The return of regional inequality started around 1980 in Europe (Rosés and Wolf, 2018)
- [Club convergence across countries](#) (e.g. Apergis et al., 2010; Fritsche and Kuzin, 2011; Monfort et al., 2013; Borsi and Metiu, 2015) and [across NUTS2 regions](#) ([Bartkowska and Riedl, 2012](#); [Lyncker and Thoennesen, 2017](#))

- **After the Great Recession:**

- [the regional characteristics](#) ensuring [resilience](#) (Martin, 2012; Martin *et al.*, 2016) and the role of [structural change](#) for regional growth and convergence (e.g. O' Leary and Webber, 2015; Rosés and Wolf, 2018)
- [vulnerability](#) in the context of the lack of a common automatic stabilization mechanism and limited geographical mobility of factors [in a single currency area](#) (e.g. Fingleton et al., 2015)

# Literature review on the emergence of a Central European Manufacturing Core

On the spatial distribution of manufacturing activities and asymmetric structural change:

- the emergence of a “Central European Manufacturing Core” (e.g. IMF, 2013; Stehrer and Stöllinger, 2014; Landesmann and Stöllinger, 2018; IBRD, 2017)
- Central European Manufacturing Core: Germany, Austria, Czech Republic, Slovakia, Hungary and Poland
- The structural shift out of manufacturing was less pronounced in the EU Core countries than in other EU Member States – or it was even positive due to the integration in global value chains (Stehrer and Stöllinger, 2014)
- The agglomeration of manufacturing activities in CE core was mirrored by a significant decline in the share of the other EU Member States, in particular high-income countries, such as Nordic and Benelux countries, and above all France and the United Kingdom

# Method

A two-step methodology:

- Phillips and Sul (2007, 2009) clustering approach
- Ordered logit regressions and associated marginal probabilities to assess the importance of certain variables ([specialization/structural change](#)) in determining club membership

# The novelty with respect to previous studies

- **Clustering approach:** We use a larger dataset (regional data for 27 countries) and a time span -from 2003 up to 2016- encompassing the post-crisis period
- **Ordered logit regressions:** We consider the issue of different structural changes to underpin club divergence—  
>we select specific explanatory variables to capture **within-services specialization (high/low value added categories)**

# Results: overall divergence and the identification of four clubs

The log t test applied to the whole panel suggests that the null hypothesis of overall convergence is rejected at the 1% significance level (-30.86).

**Table 1- Cluster analysis. Sample 2003–2016**

Club	N. of regions	$\hat{b}(SE)$	$t_{\hat{b}}$	$\hat{\alpha}$	Average income	
					2008	2016
1	20	0.332 (0.059)	5.601	0.166	49675	57035
2	89	-0.084 (0.061)	-1.433	-0.042	28322	32421
3	141	-0.086 (0.060)	3.034	-0.043	21770	23356
4	22	0.288 (0.095)	-64.2	0.144	16295	14845

**Club 1** (n = 20): AT(2), BE(1), CZ (1), **DE(5)**, DK(1), FR(1), IE(1), NL(2), PL(1), RO(1), SE(1), SK(1), UK(2)

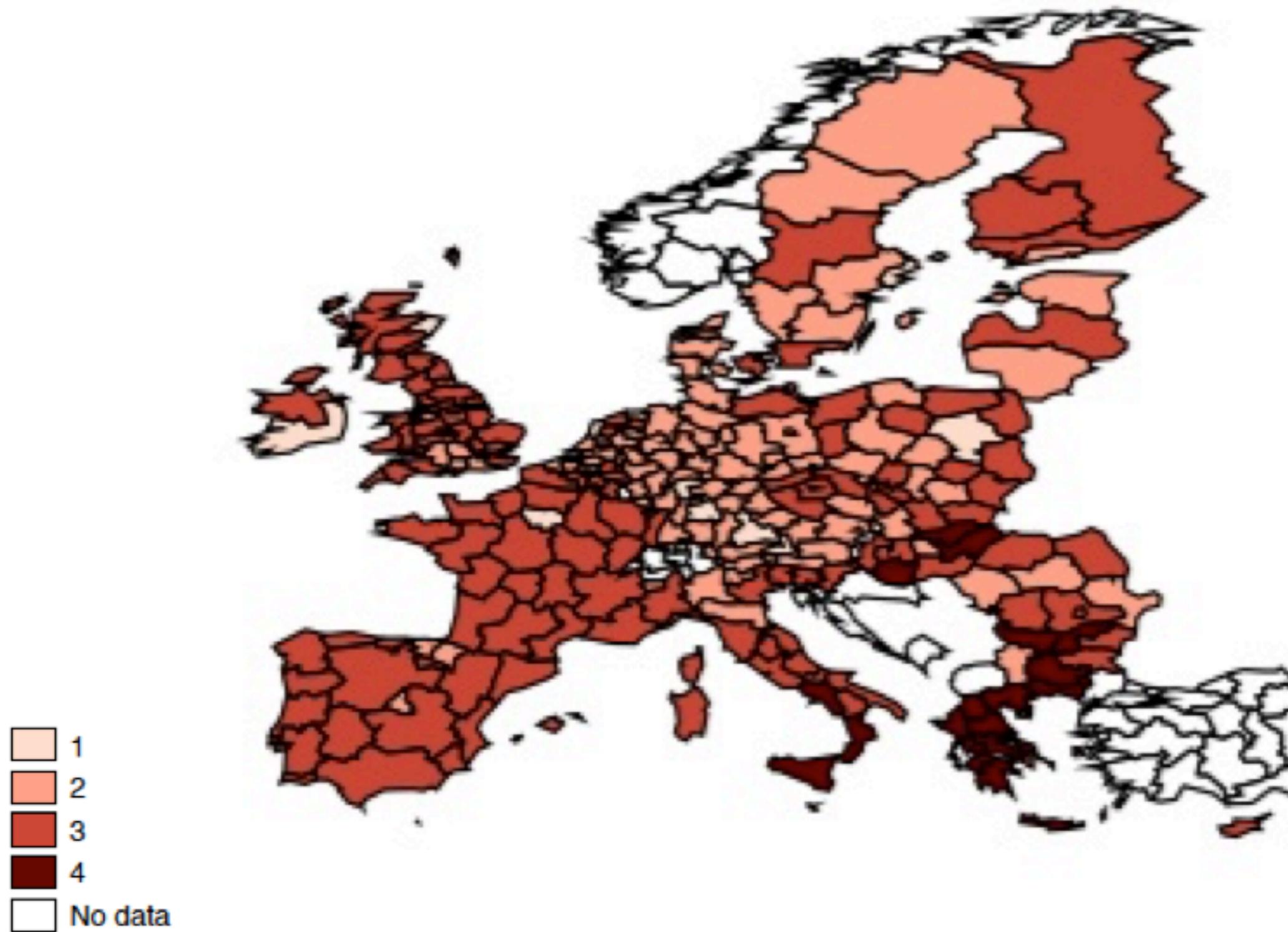
**Club 2** (n = 89): **AT(6)**, **BE (5)**, BG(1), CZ (1), **DE (32)**, DK(3), EE(1), ES(3), FI(2), HU(1), **IT(5)**, LT(1), MT(1), NL(6), **PL(6)**, RO(3), SE(5), SK(1), UK(6)

**Club 3** (n = 141): AT(1), **BE(5)**, BG(2), CY(1), **CZ (7)**, DE(1), DK(1), EL(2), **ES(15)**, FI(3), **FR(25)**, HU(3), IE(1), **IT(13)**, LV(1), NL(4), **PL(9)**, **PT(7)**, RO(4), SE(2), SI(2), SK(2), **UK(31)**

**Club 4** (n = 22): **BG(3)**, **EL(11)**, ES(1), FR(1), **HU(3)**, **IT(3)**

**Not converging regions** (n = 2): Inner London – West and Luxembourg

# Club clustering in the EU-28 panel 2003–2016



# Results in a nutshell

- **4 economic clubs:**

1. “Metropolitan areas and capital regions” (Club 1)

2. The “Central European Manufacturing Core” (Club 2)

3. “De-industrializing regions with intermediate average per capita income levels” (Club 3)

4. “Mediterranean lagging-behind regions” (Club 4).

- **Our guiding hypothesis is verified:** different structural changes are at the root of growing regional inequality

# Results in a nutshell

## 1. Metropolitan areas and capital regions

- It is mainly composed by metropolitan and capital cities of North and Central Europe, such as Vienna, Bruxelles, Praha, Paris, Dublin, Bratislava, Bucarest, Stockholm, London, Amsterdam, Hamburg, Stuttgart.
- This is the group of regions with the lowest share of manufacturing employment (18% on average)

## 2. The Central European Manufacturing Core

- It comprises regions from a variety of EU countries, but regions belonging to the Central European manufacturing core are highly represented in this cluster.
- This cluster has the **highest share of manufacturing employment (31% on average) and the lowest rate of de-industrialization (-1% on average).**

# Results in a nutshell

## 3. De-industrializing regions with intermediate average per capita income levels

- It is the largest cluster with more than **half of the sample's** regions.
- **Most of them are Italian, British, French, Spanish, Polish and Czech regions.**
- This club encompasses all Portuguese regions while only one Austrian region and one Deutsch region, the rest of Austrian and Deutsch regions being included in the first two clusters.
- Belgium regions are equally spitted between Club 2 and Club 3. Also, most Polish, Romanian and Hungarian regions belong to Club 2 and Club 3, while Slovak regions are scattered among the first three clusters.

## 4. Mediterranean lagging-behind regions

- It is composed by regions with sluggish economic growth, mainly belonging to **Mediterranean and South Eastern countries.**
- **85% of all Greek regions** end up in this cluster. It also includes **southern Italy,** and the remaining regions of **Spain, Hungary and Bulgaria.**

# Structural characteristics by clubs

## *Average values*

Variable	Whole sample	Metropolitan and capital (Club1)	Central European Core (Club2)	Intermediate regions (138)	Med. periphery (22)
	(270)	(20)	(89)	(138)	(22)
Gdp per head, PPS, 2008	25724	49675	28322	21770	16295
Manufacturing share, 2008	0.29	<b>0.18</b>	<b>0.31</b>	0.29	0.26
Information and communication share, 2008	0.04	<b>0.09</b>	<b>0.05</b>	<b>0.03</b>	<b>0.02</b>
Accommodation and food services share, 2008	0.10	<b>0.08</b>	<b>0.08</b>	<b>0.10</b>	<b>0.13</b>
Manufacturing, rate of change, 2008-2015	-0.10	<b>-0.02</b>	<b>-0.01</b>	<b>-0.15</b>	<b>-0.21</b>
Information and communication, rate of change, 2008-2015	0.06	<b>0.11</b>	<b>0.16</b>	<b>0.00</b>	<b>-0.09</b>
Accommodation and food services, rate of change, 2008-2015	0.09	<b>0.25</b>	<b>0.21</b>	<b>-0.02</b>	<b>0.12</b>
Employment rate of educated young population (20-34), rate of change 2008-2016	-0.03	-0.01	0.01	<b>-0.04</b>	<b>-0.14</b>
Metropolitan area	0.40	<b>0.84</b>	<b>0.47</b>	0.34	0.09

# Ordered logit regressions

## *Definition of explanatory variables*

Variable	Definition	Source
<b><i><u>Initial conditions (in 2008)</u></i></b>		
Log income p.c., 2008	Per capita GDP pps, 2008	Eurostat
Manufacturing share, 2008	Employment in manufacturing (C) divided by employment in <i>total manufacturing and non-financial private service activities*</i>	SBS data by NUTS 2 regions and NACE Rev. 2 (from 2008 onwards) -Eurostat
Information and communication share, 2008	Employment in Information and Communication (J) divided by employment in <i>total manufacturing and non-financial private service activities*</i>	
Accommodation and food services share, 2008	Employment in Accommodation and food service activities (I) divided by employment in <i>total manufacturing and non-financial private service activities*</i>	
<b><i><u>Structural change variables, rate of change (2008-2015)</u></i></b>		
Manufacturing, rate of change	Rate of change of employment in manufacturing between 2008 and 2015	SBS data by NUTS 2 regions and NACE Rev. 2 (from 2008 onwards) -Eurostat
Information and communication, rate of change	Rate of change of employment in Information and communication between 2008 and 2015	
Accommodation and food services, rate of change	Rate of change of employment in Accommodation and food service activities between 2008 and 2015	
Human capital, rate of change	Rate of change of employment rate for population from 20 to 34 years with upper secondary, post-secondary non-tertiary and tertiary education (levels 3-8), between 2008 and 2015	Employment rates of young people not in education and training by sex, educational
<b><i><u>Geographic controls</u></i></b>		
Metropolitan region	Dummy variable based on the presence of one or more NUTS-3 metroregion. Own elaborations on Eurostat data on typologies and local information corresponding to NUTS3 - Urban-rural typology	Eurostat, JRC and European Commission Directorate-General for Regional Policy

# Ordered logit regressions

## *Marginal effects on probabilities*

	Club 1	Club 2	Club 3	Club 4
<u>Initial conditions (in 2008)</u>				
Log income p.c., 2008	0.0260** (0.0114)	1.173*** (0.155)	-1.172*** (0.157)	-0.0266** (0.0122)
Manufacturing share, 2008	0.0217* (0.0127)	0.980** (0.408)	-0.979** (0.408)	-0.0222 (0.0136)
Information and communication share, 2008	0.131** (0.0666)	5.907*** (1.923)	-5.904*** (1.912)	-0.134* (0.0787)
Accommodation and food services share, 2008	-0.0340 (0.0241)	-1.531* (0.864)	1.530* (0.864)	0.0347 (0.0247)
<u>Structural change variables, rate of change (2008-2015)</u>				
Manufacturing, rate of change, 2008-2015	0.0107* (0.00630)	0.482** (0.208)	-0.481** (0.208)	-0.0109 (0.00677)
Information and communication, rate of change, 2008-2015	0.0150** (0.00729)	0.676*** (0.151)	-0.676*** (0.152)	-0.0154** (0.00756)
Accommodation and food services, rate of change, 2008-2015	-0.00374 (0.00362)	-0.169 (0.138)	0.169 (0.138)	0.00383 (0.00339)
Human capital, change 2008-2016	0.0380** (0.0189)	1.712*** (0.406)	-1.711*** (0.409)	-0.0389** (0.0194)
<u>Geographic controls</u>				
Metropolitan region	0.00192 (0.00238)	0.0864 (0.103)	-0.0864 (0.103)	-0.00196 (0.00245)
Observations	263	263	263	263

A one-unit increase in the initial manufacturing or ICT service share is associated with a higher probability of belonging to Club 1 or 2, and a lower probability of belonging to the lower-income clubs.

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
 NOTE: All predictors at their mean value  
 LR chi2(9) = 274.98  
 Prob > chi2 = 0.0000  
 Pseudo R2 = 0.4751

# A summary of main results

- Overall, the pattern for the results suggests that initial income per capita, human capital dynamics, high-tech service specialization are the most important drivers of club membership.
- The probit analysis confirms the different structural change paths of the CE manufacturing core and metropolitan regions compared to the rest of Europe that is lagging behind
- Manufacturing and knowledge-intensive services -both their initial specialization and dynamics- matter for regional wealth/income growth ([what about wellbeing?](#))
- The mix “industrialization and high-tech services’ specialization” is more apt to absorb the well-educated and younger workforce
- These findings corroborate that [agglomeration processes are cumulative](#) and lead to [drainage of skilled personal and purchasing power](#) from other regions, thus explaining the widening of regional disparities (**CUMULATIVE CAUSATION**).

# Policy implications for regional and industrial policies

- Should we be worried about the return of regional inequality?
  - Yes, if we want to avoid populist backlash
- So, what kind of policies?
- Not “the same size fits all” approach
- Policy interventions more sensitive to different paths of recovery and structural transformations