University systems: beyond league tables
Engines of growth or ivory towers?

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University systems and the sub-national level

- *Why go sub-national?*
  - National policies ←→ **HEIs' autonomy**
  - **Heterogeneity within countries**
  - **Proximity matters for knowledge diffusion => business and academia agglomerate in clusters**
  - **The assessment of the connection between university systems and the labour market is most meaningful at the sub-national** (=regional) **level**

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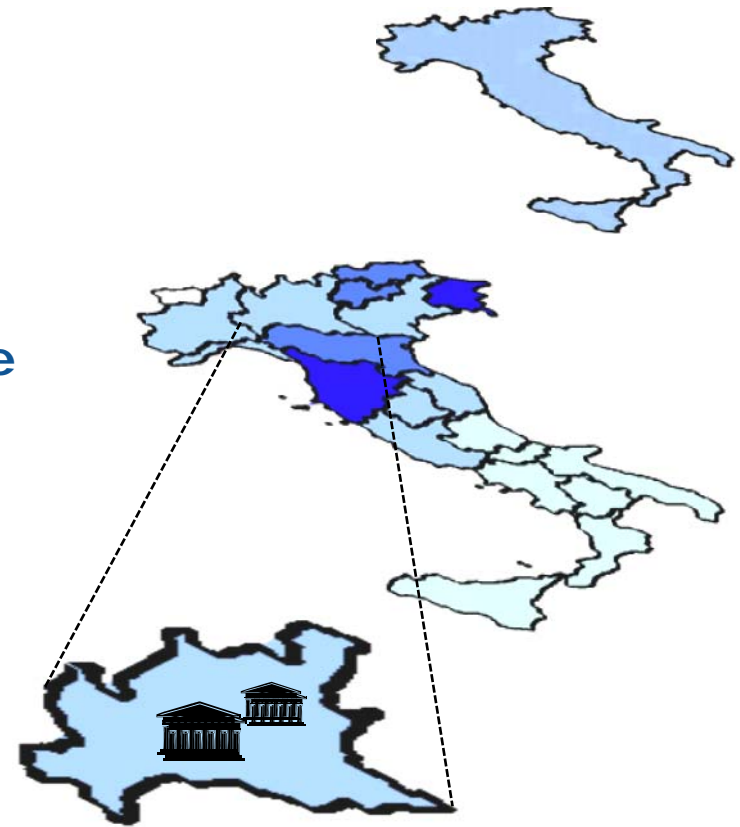
HEI system performance

- *Aim: comprehensive, multi-dimensional measure of university system performance*

- *The use of the EUMIDA dataset*
  - **25 EU member states**
  - **Census of all HEIs from 25 EU member states (2,400 HEIs)**
  - **2008**

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Computing variables at the regional level

- *Intensity measures*
   - **relevant population cohort used** (i.e., ISCED5 students ~ 18-26 year olds in the region)


- Regional averages computed, not weighted by HEI size

- *Special considerations:*
    - commuting patterns
    - HEIs with multiple locations

Overview of Variables

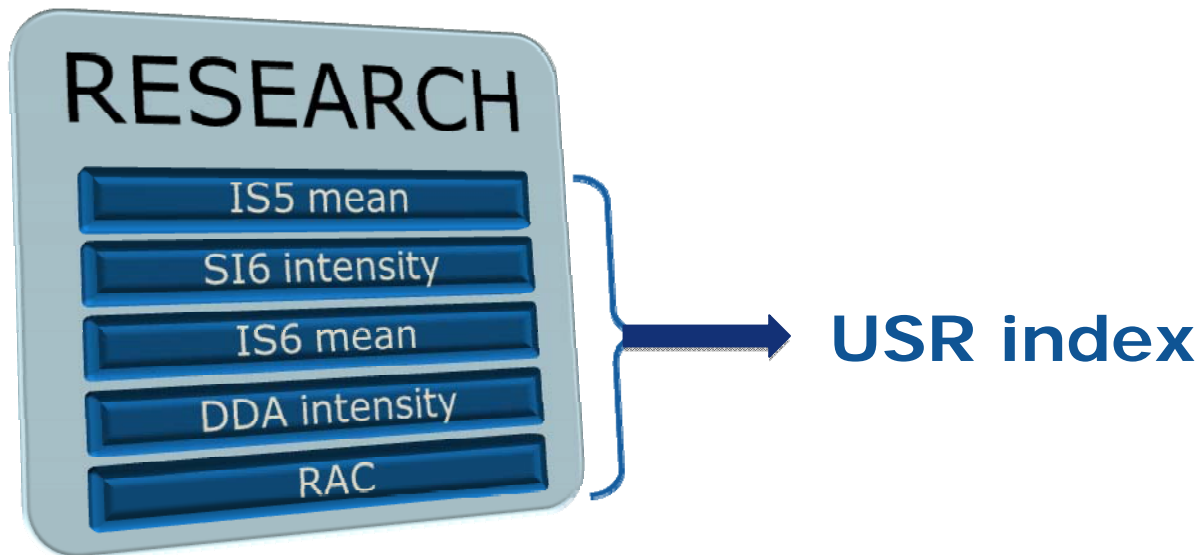| CODE	VARIABLE NAME
HEI density	Higher education density (Nr. of HEIs / pop. aged 18-30)
SI5 intensity	ISCED5 student intensity (Nr. of ISCED5 Students / pop. aged 18-26)
IS5 mean	Regional average of international students share (ISCED5) per HEI
SI6 intensity	Doctoral student (ISCED6) intensity (Nr. of ISCED6 Students / pop. aged 22-30)
IS6 mean	Regional average of international doctoral student share (ISCED6) per HEI
RAC	Ratio of HEIs defined as research active
DDA intensity	Intensity of Doctoral Degrees Awarded (DDA per region)/(pop. age 22-30) * 1000
SSR mean	Regional average of student to staff ratio per HEI

Histograms of variables
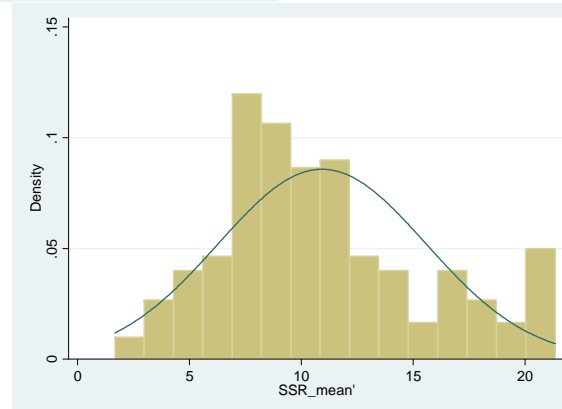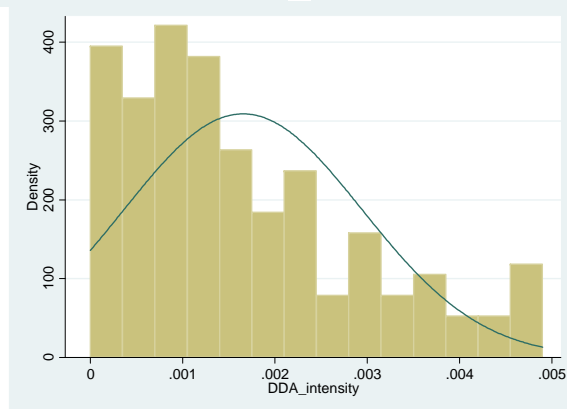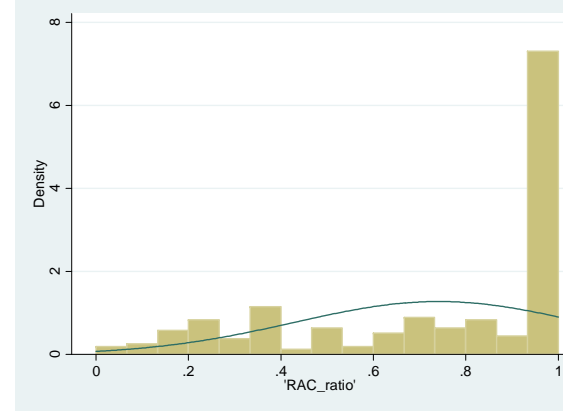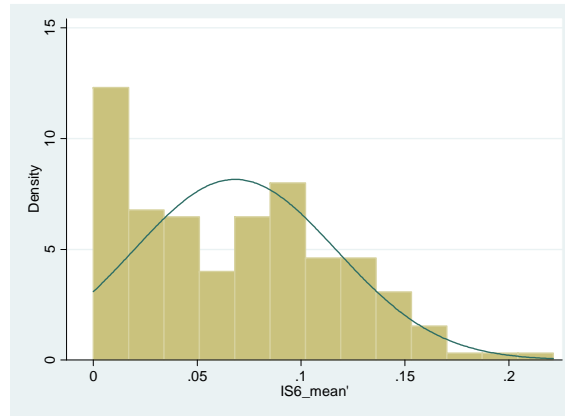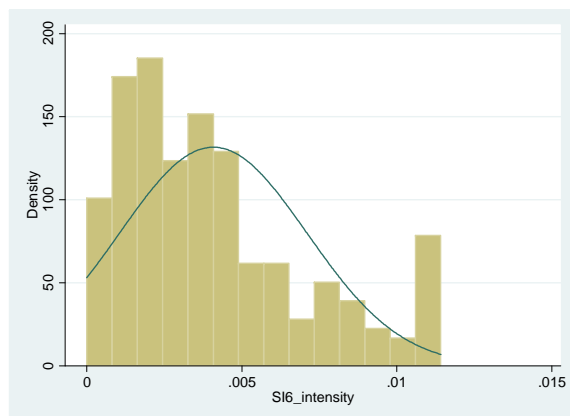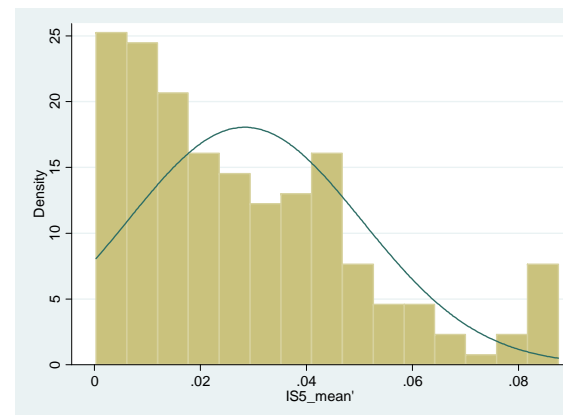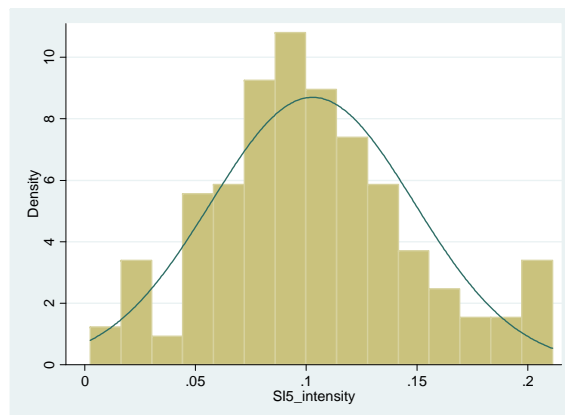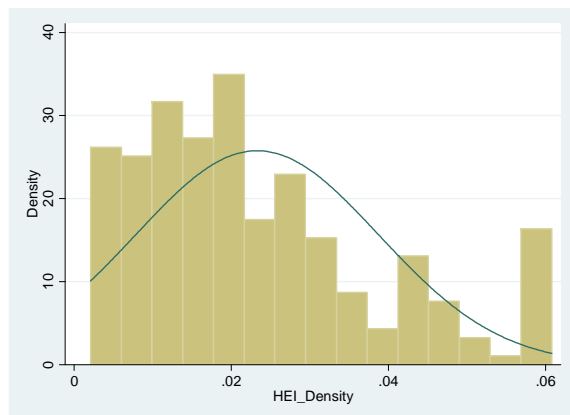
What do we learn from the regional variables?

- *Multivariate analysis indicates 2 distinct components:*
  - <u>Our</u> interpretation: **research** / **education** performance
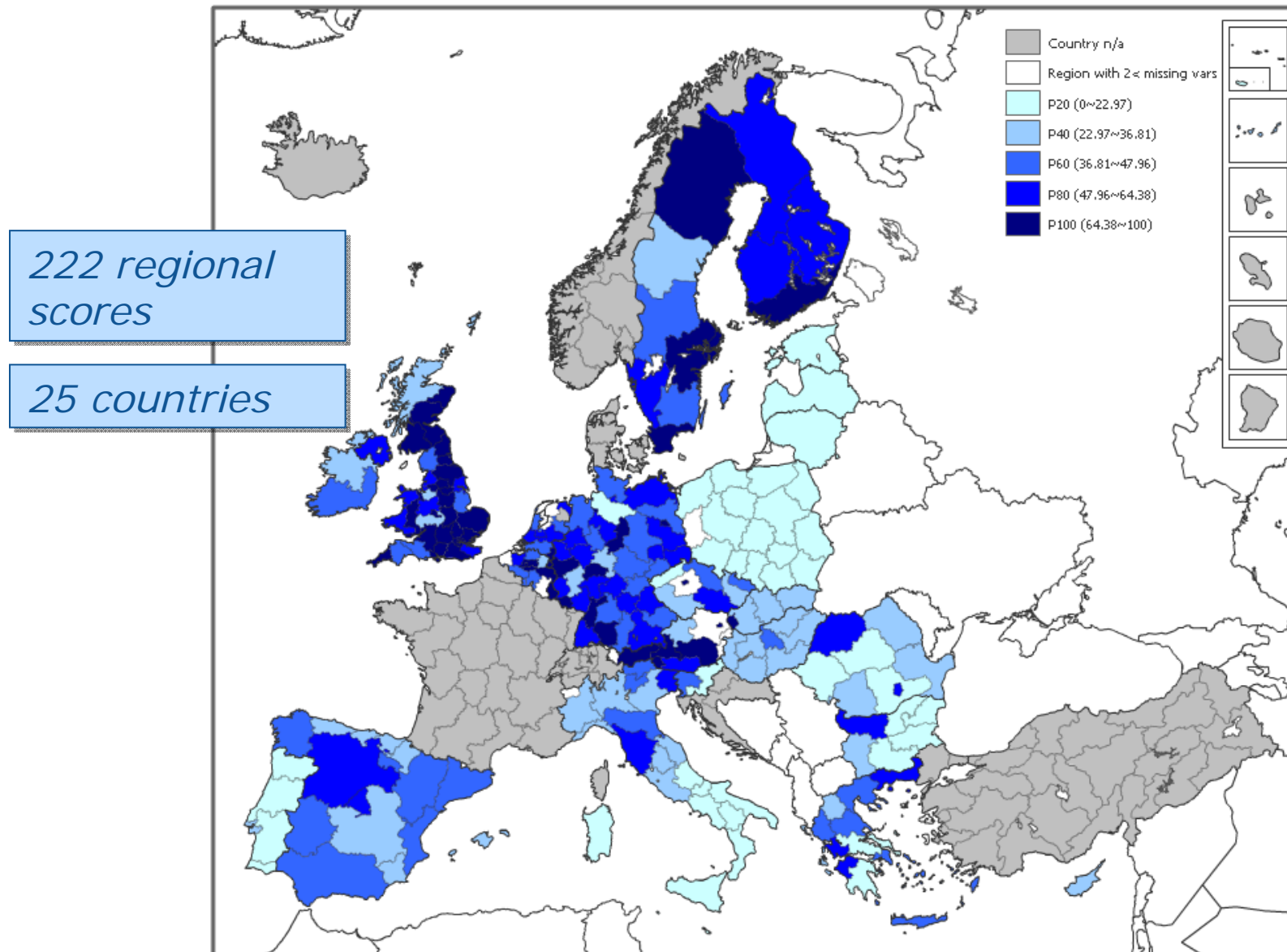 - But: education performance insufficiently described by these 2
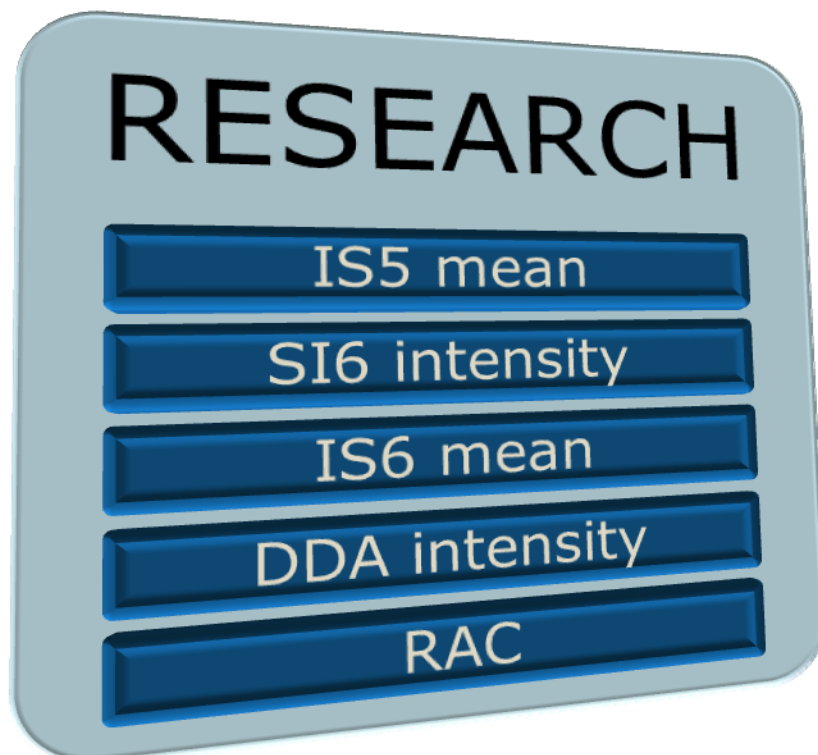
Aggregation: University System Research performance index (USR)
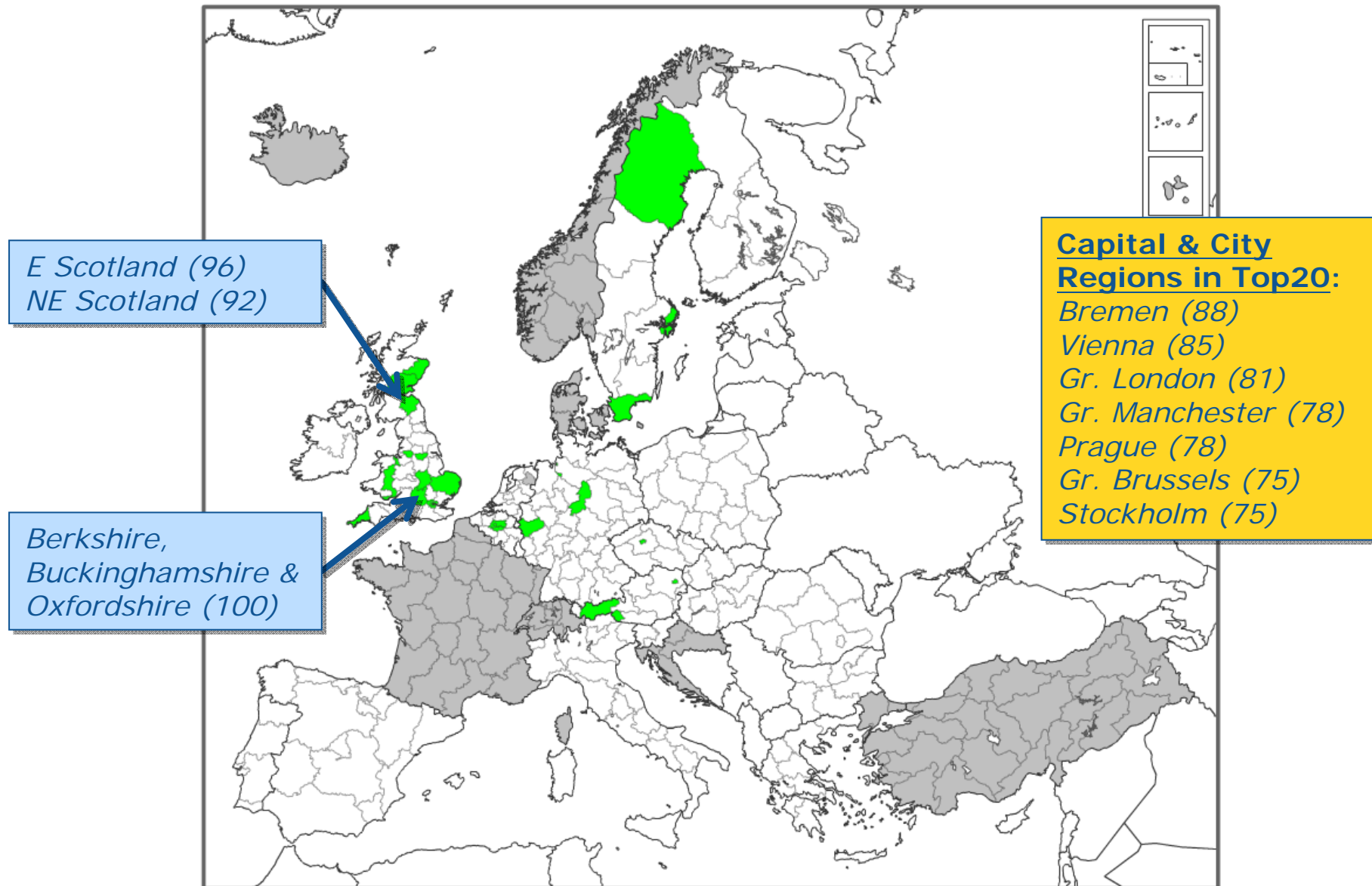
- *5 variables (z-score normalized)*
- *Linear aggregation with equal weights*
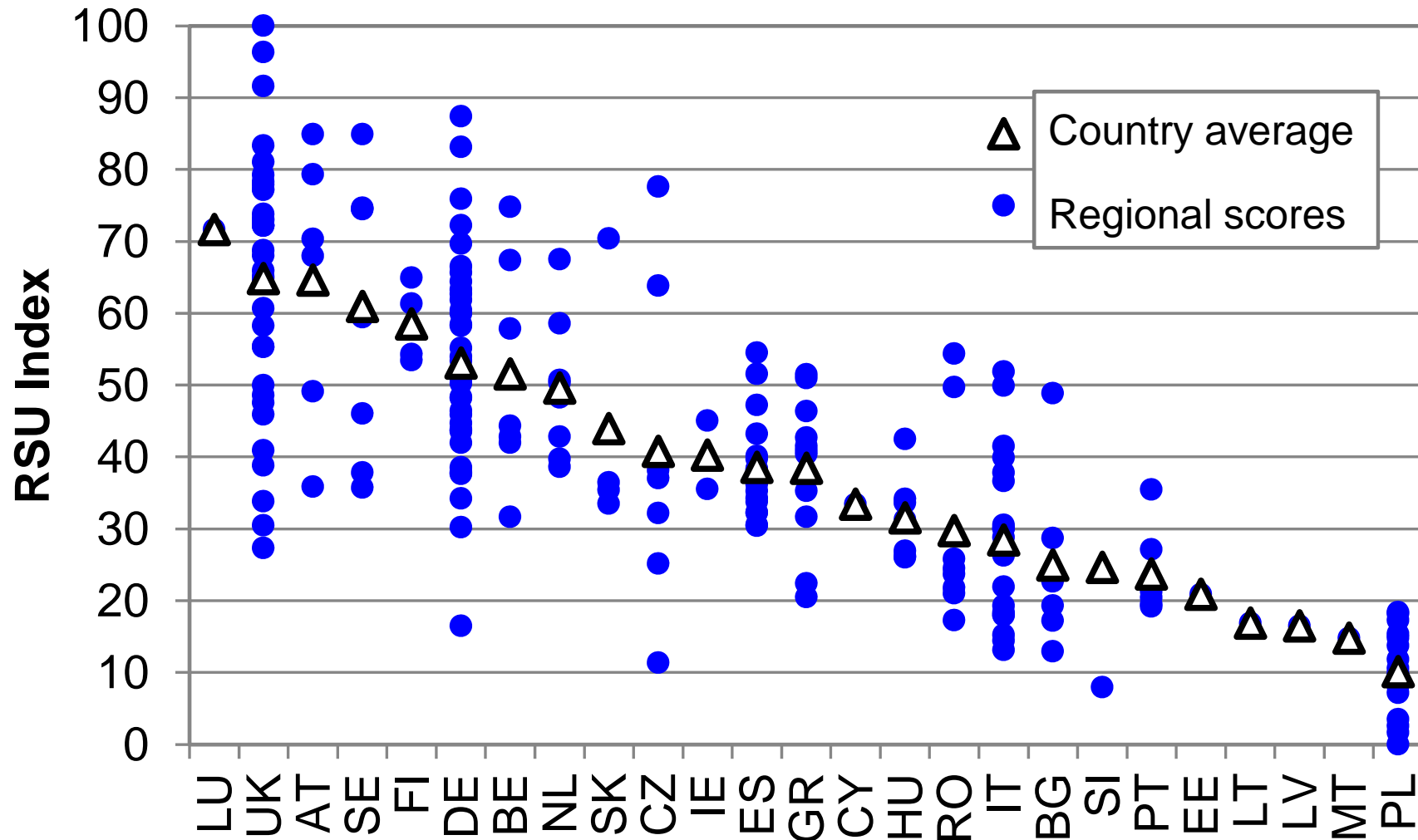- *Min-max normalized final scores (0-100)*

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- IS5 mean
- SI6 intensity
- IS6 mean
- DDA intensity
- RAC

→ **USR index**

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Research performance of European regional university systems

222 regional scores

25 countries

Legend:
- Country n/a
- Region with 2< missing vars
- P20 (0~22.97)
- P40 (22.97~36.81)
- P60 (36.81~47.96)
- P80 (47.96~64.38)
- P100 (64.38~100)

The top 20 best performing regions:

E Scotland (96)
NE Scotland (92)

Berkshire, Buckinghamshire & Oxfordshire (100)

Capital & City Regions in Top20:
Bremen (88)
Vienna (85)
Gr. London (81)
Gr. Manchester (78)
Prague (78)
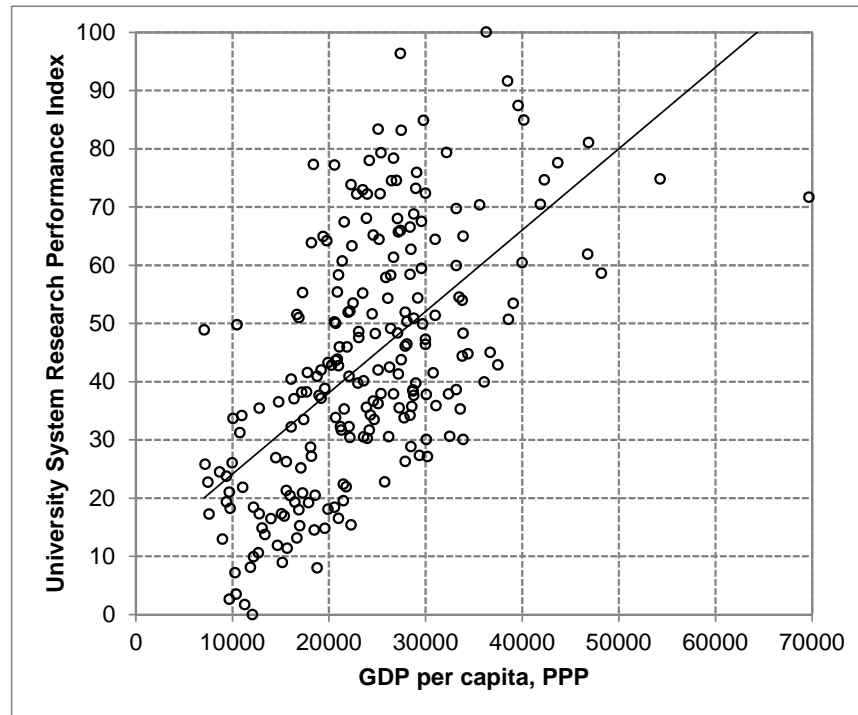Gr. Brussels (75)
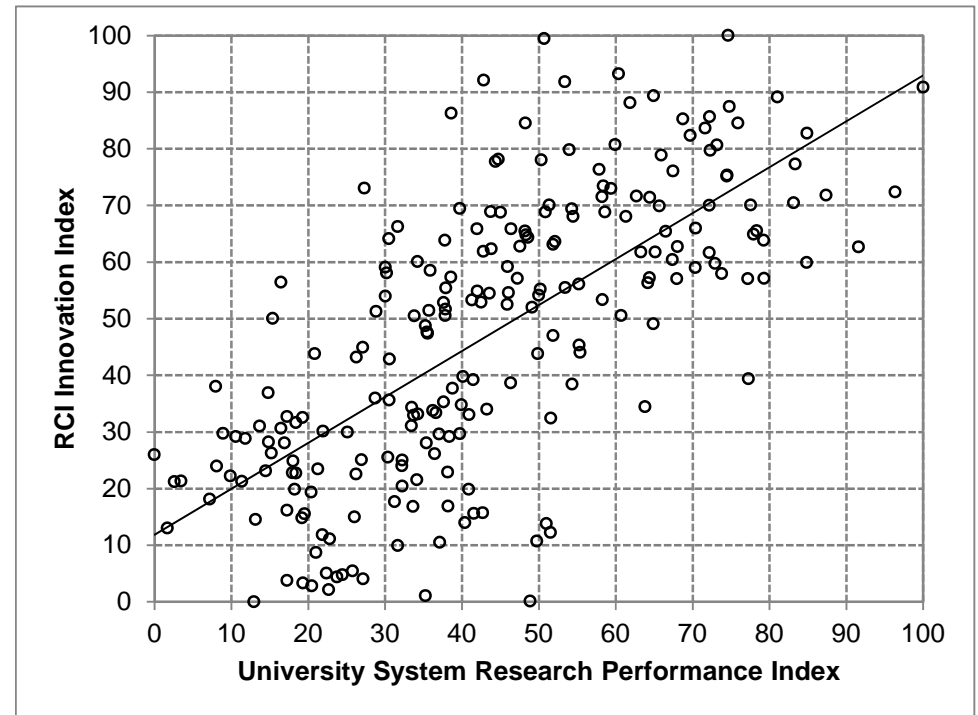Stockholm (75)

Regional variance within countries

The USR index in comparison:
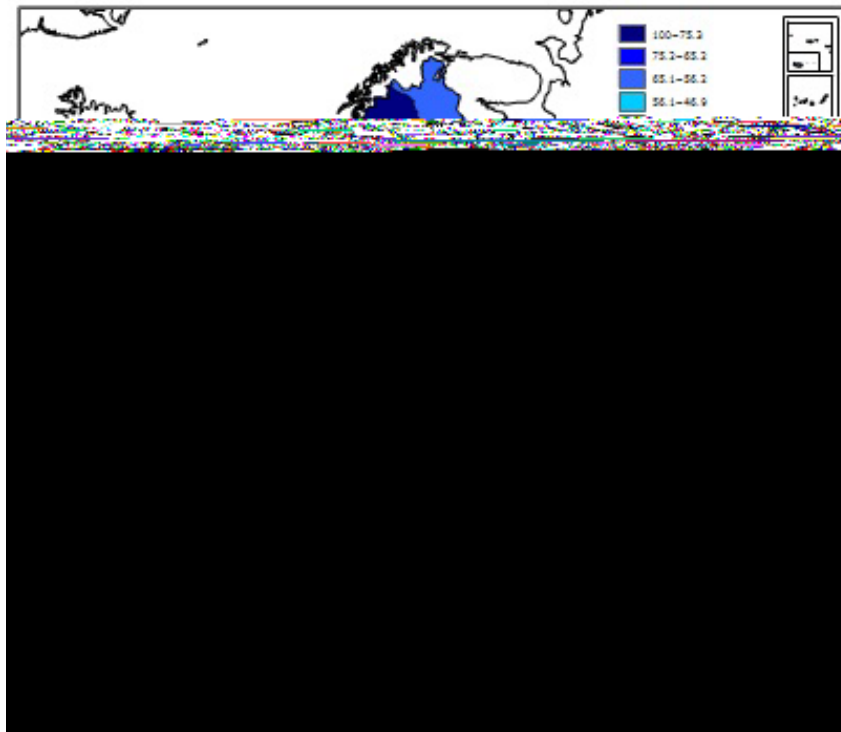
USR vs. GDP

Innovation vs. USR

Pearson corr.: GDP: 0.597; Inn: 0.698

University System Research vs. Labour Market Performance
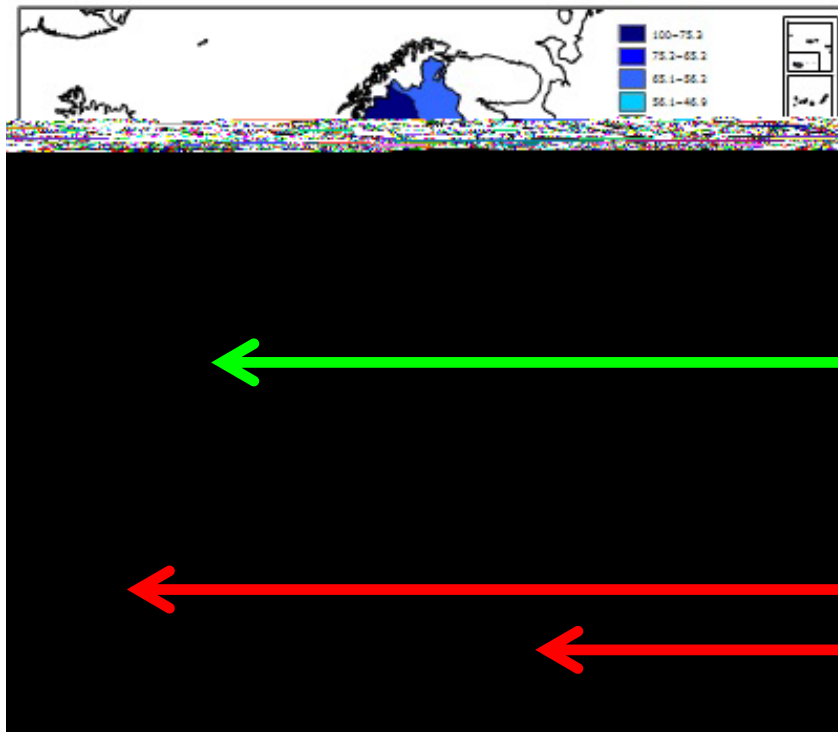
RCI-Labour market performance index
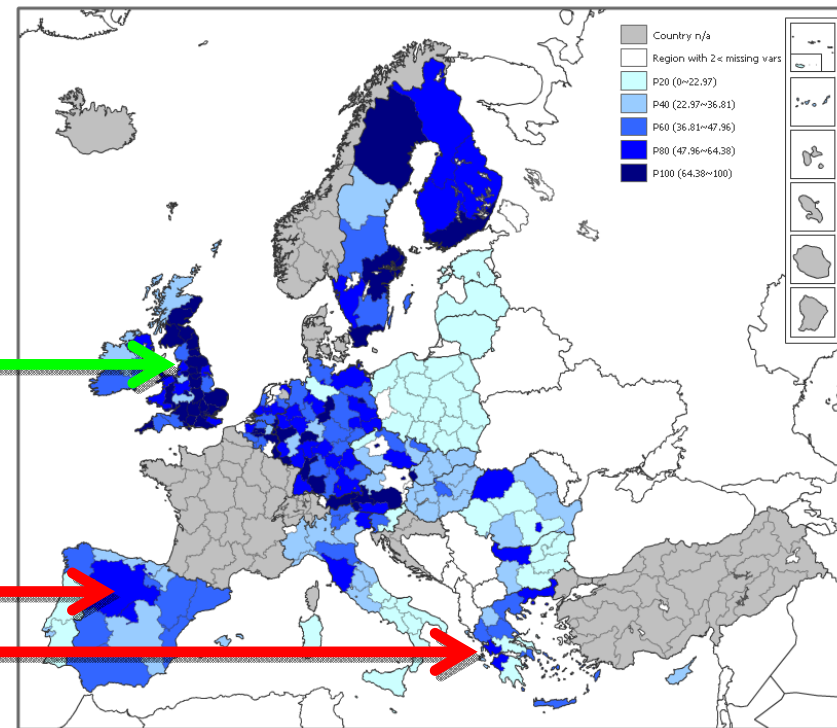

EU Regional competitiveness index (2010)

• recent measure of territorial competitiveness;

• **labour market efficiency** is one pillar out of 11

• Composite indicator, which includes variables on employment, short- and long-term unemployment, employment gender gap

• Developed in-house

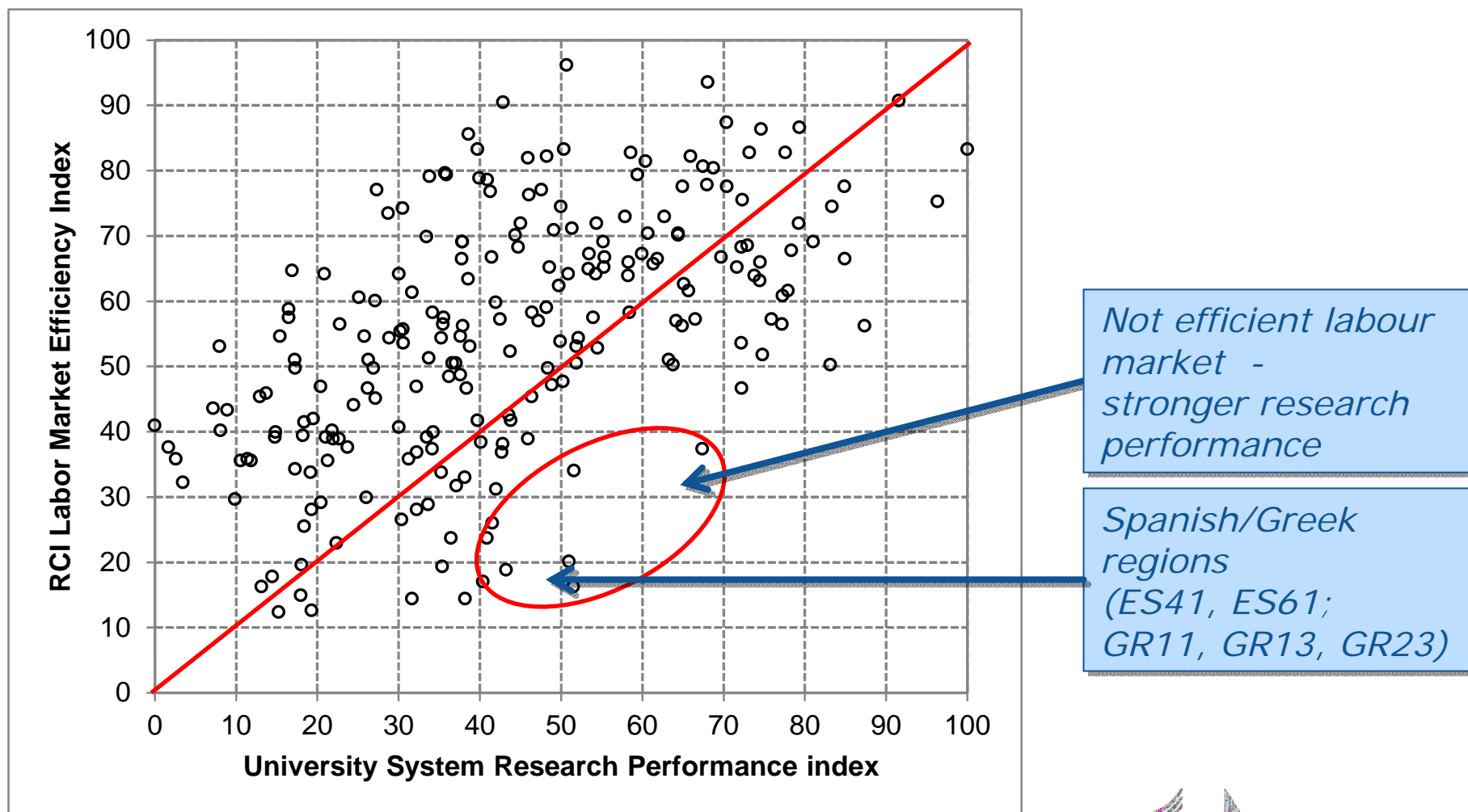# University System Research vs. Labour Market Performance

RCI-Labour market performance index

University System Research Index

University System Research vs. Labour Market Performance

Not efficient labour market - stronger research performance

Spanish/Greek regions (ES41, ES61; GR11, GR13, GR23)

Pearson corr.: 0.559

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Ivory towers or poles of excellence?

- *How can we explain the discrepancy between research performance and labour market performance?*
    - **Not doing the right kind of research?**
    - **Labour market cannot absorb knowledge produced by the universities?**
      (Universities = ivory towers?)
    - **Or, does university system research strength in regions with low labour market performance indicate an emerging pole of excellence?**

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Disconnected University Systems
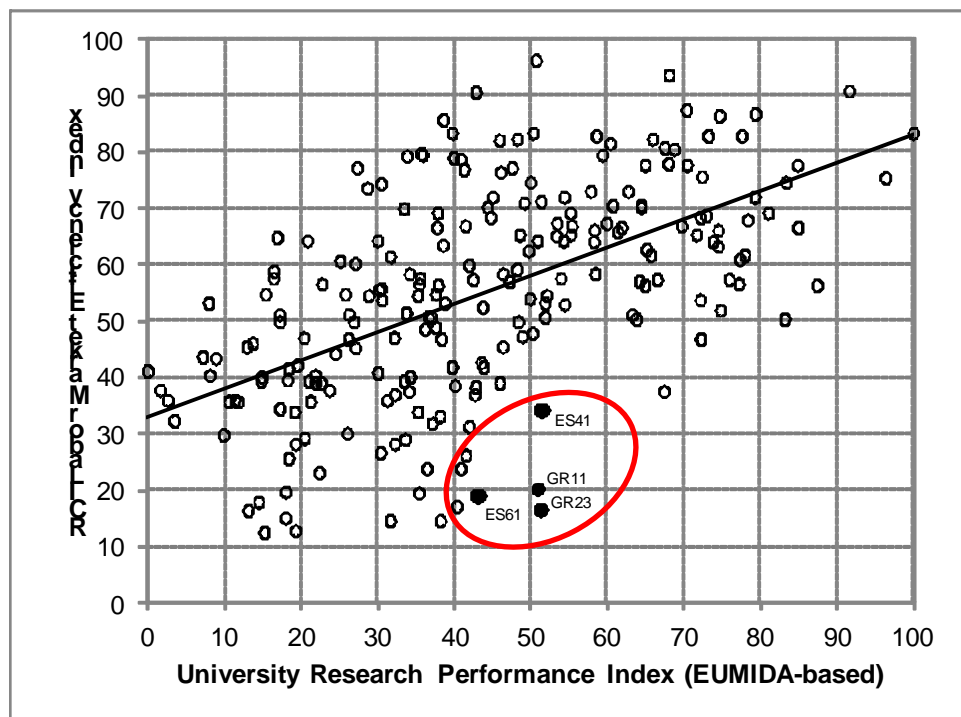
USR vs. Innovation

RCI 2010 Innovation sub-index

- Captures input and output of business sector research & development activities
- Variables such as:
  - **R&D,**
  - **human resources in science and technology,**
  - **creative class employment;**
  - **scientific publications;**
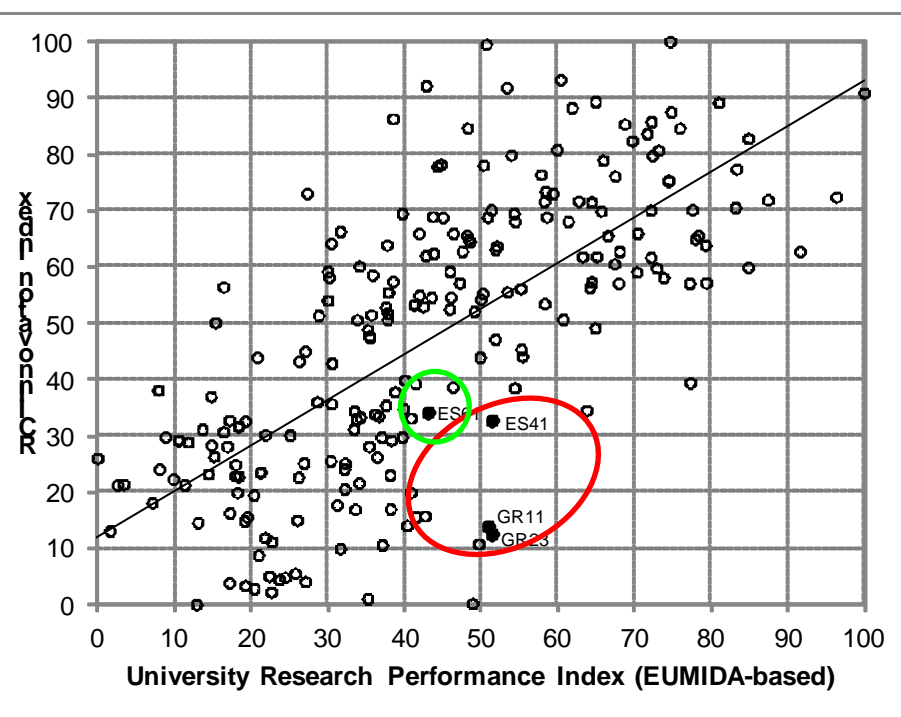 - **Patent application and inventions**
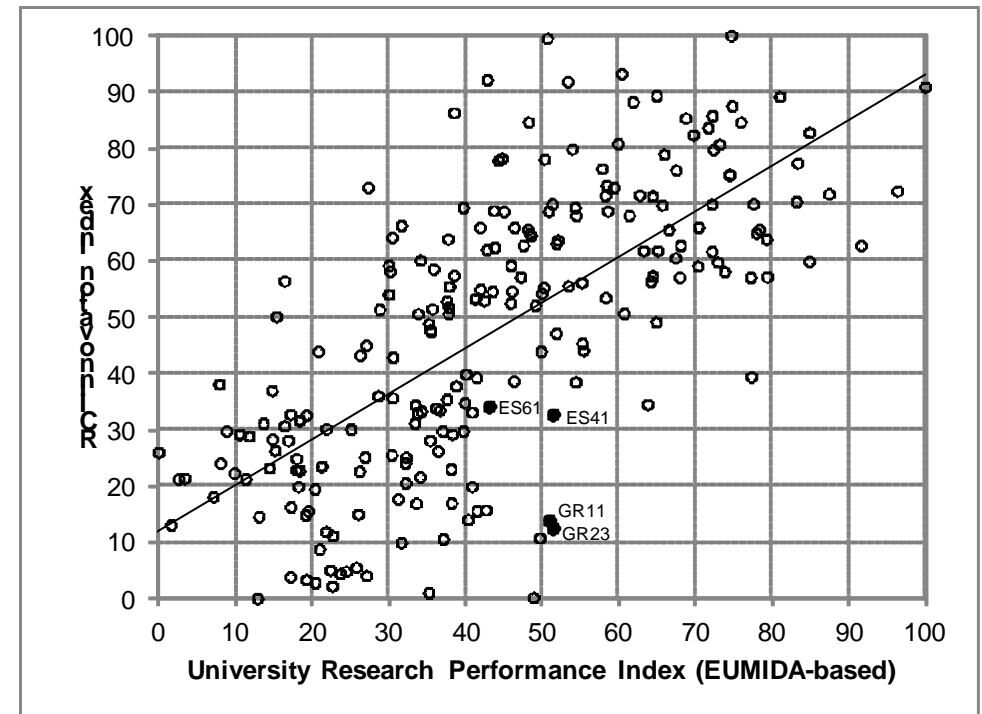
Disconnected University Systems

USR vs. Labour market

USR vs. Innovation

Regions concerned: similarly low performance in innovation

Conclusions

- *insufficient interaction with the labour market*

- *labour market inefficiency chokes innovation and impairs the links between HE and the labour market*

- *Too early to draw policy conclusions: further analysis needed on HEI system's education performance & interaction with the labour market*

- *Future Steps:*
  - Need to Measure regional **education performance**
  - Work on measuring **Innovation performance** of HEIs
  - Possible deeper analysis of "problematic regions"
  - Uncertainty analysis

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Related works
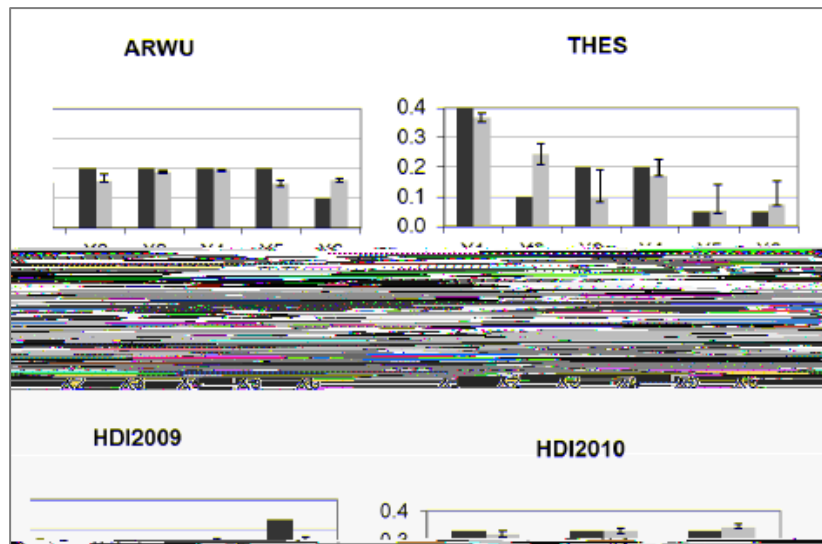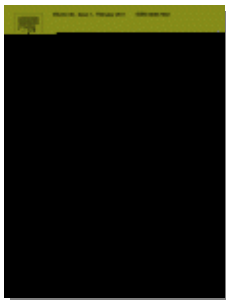
- Saisana, M., d'Hombres, B., Saltelli, A., Rickety numbers: Volatility of university rankings and policy implications, 2011, *Research Policy*, 40, 165–177.

- Paruolo, P., Saisana, M., Saltelli, A., 2011, Ratings and rankings: Voodoo or Science? Revised for the *Journal Royal Statistical Society* A, March 2011. ➔ Available on arXiv submit/0231794 [stat.AP] 15.04.2011

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