Micro-founded measurement of regional competitiveness in Europe

Mapcompete – Bruegel Blueprint #2 chapter

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Regional competitiveness

- Enhancing competitiveness is a popular target in economic policy making - both at the national and regional level.
- While a huge amount of development funds are allocated for serving this purpose, the concept of regional competitiveness is still rather a mysterious and often debated issue.
- There is neither a single accepted framework and definitions, nor strong agreement on measurement.

Why we care

- Large regional disparities, often beyond cross-country differences
  - Countries: Romania has a per capita (at PPP) GDP of 32% of Germany,
  - Regions: Poorest Romanian region (North-East) has a per capita GDP just 26% of the richest one (Bucharest).

- As a result of regional disparities, people living in depressed regions may have much fewer opportunities, less access to education and healthcare, especially when services are financed by local and regional governments.

- Firm level approach - when it comes to regional policy, a lot of ‘competition’ among regions is about attracting ‘competitive firms’

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Thinking about perfomance at regions

1) Proximity matters – agglomeration externalities
2) Granularity - a few large firms matter regionally more than in countries
3) Externalities decay fast

Proximity – agglomeration externalities

- Broad evidence on agglomeration premium
- Transport cost, knowledge spillovers, matching
- Innovation, regional concentration and growth – cumulative causation
- 50%-50% sorting and causal effect
- Impact especially on larger, more productive, trading firms

Granularity and the Happy Few

Dominant few

- TFP, exports → large firms matter.
- There are only a few of them -- Granularity is present
  - Gabaix(2011) 100 firms in USA, 25% of output, 1/3 of business cycles, Mayer-Ottaviano (2008) Happy Few
- Few firms will have great impact on small spatial units, such as regions

Million dollar plants

- The importance of such large fimrs affect public policy
- Million- dollar plant subsidies

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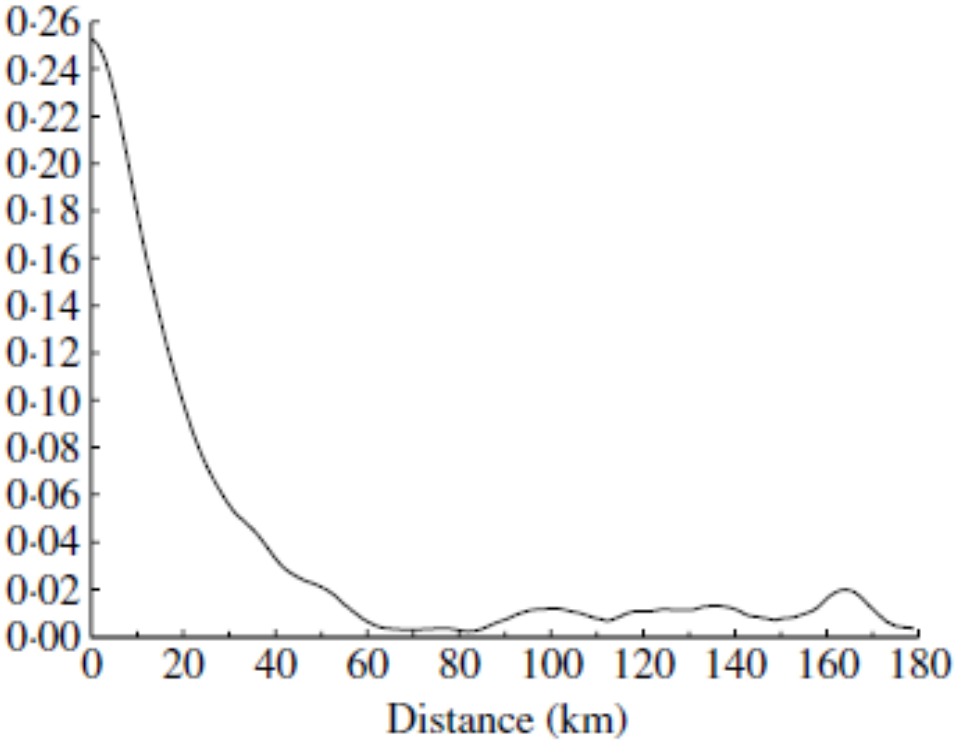
Fast decay – typical regional size key

- Duranton and Overman (2005) Index of co-location – 50km radius is key

- Ample evidence – e.g. Indonesia: 90% of the TFP spillover is observed at the firm's close (100km); US: education externalities mostly within 5 / 15km, US R&D - Knowledge spillovers in within 200km

Duranton and Overman index



Our approach: Relative regional exports to non-European markets

Using regionally and industry aggregated micro data

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Our approach: Firms compete

- Firms compete and not regions or countries…
- Competitiveness = firm outperforms its ‘competitors’ in terms of size (employment, ouput, revenue) and profitability
- Output =our focus
- … thanks to everything that affects the perceived quality of the firm’s products and its cost-effectiveness in supplying them.
- Inputs =drivers

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What *should* a measure cover?

- Micro-based, capture firm competitiveness
- Grounded in research on exceptional performance
- Outcome focus
- Comparable across EU regions and over time
- Computable with data available (today vs near future)
- Straightforward computation advantage

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Our proposed measure

Normalized Export Share (for extra-Europe destinations)

Setup

- Consider the export activities of firms located in different EU regions and active in some sector s.
- Consider a EU origin region o and
- Consider non-European export destinations

Destination group should be fair game for EU countries

- China
- Here: all non-European (EU, Swiss, Ukraine, etc)

Normalized non-EU Export Share

- $L_{o,s}$ denote employment by sector s in region o
- $X_{o,s}$ denote exports of sector s from region o to extra Europe destinations
- L_s denote total EU employment in sector s and
- X_s denote total EU exports to d in sector s.
- Index: ***Share*** of region o in total EU exports normalized by the share of region o in total EU employment in the sector.
- Normalized Export Share (for extra-Europe destinations)

$$NXS_{o,s} = \left(\frac{X_{o,s}}{X_s}\right) \Big/ \left(\frac{L_{o,s}}{L_s}\right)$$

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NXS: extensive and intensive

NXS allows for further decomposition, analysis

Denote the numbers of *exporters* and *producers* in region o (in the EU) by $n_{o,s}$ (n_s) and $N_{o,s}$ (N_s) respectively. $x_{o,s}$ (x_s) denotes average export per *exporter* and $l_{o,s}$ (l_s) denotes average employment per producer in region *o* (in the EU) respectively.

Decompose the NXS into two multiplicative components as 'extensive' and the 'intensive' normalized export shares

$$NXS_{o,s} = \left(\frac{n_{o,s}x_{o,s}}{N_{o,s}l_{o,s}}\right)\Big/\left(\frac{n_s x_s}{n_s l_s}\right) = \left[\left(\frac{n_{o,s}}{N_{o,s}}\right)\Big/\left(\frac{n_s}{N_s}\right)\right] \times \left[\left(\frac{x_{o,s}}{l_{o,s}}\right)\Big/\left(\frac{x_s}{l_s}\right)\right]$$

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Data need

Data needs are high

- A firm's export sales per destination
- per broadly defined industry (10-15 aggregated industry is realistic)
- Regional location of the firm (NUTS2)

Presently not available

- But Mapcompete data mapping exercise shows it is fully possible for about 20 countries, and possible with some limitations for all but Croatia

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Illustrative exercise 1 Hungary

	food	Chemicals and chemical	Machinery and equipment n.e.c.
Central (incl Budapest)	121%	61%	101%
West-Center	21%	20%	178%
West	113%	34%	142%
South-West	21%	25%	9%
North	16%	281%	61%
North-Center	55%	217%	44%
South-East	216%	13%	36%
weights (SUM EMP)	86,630	29,139	79,434

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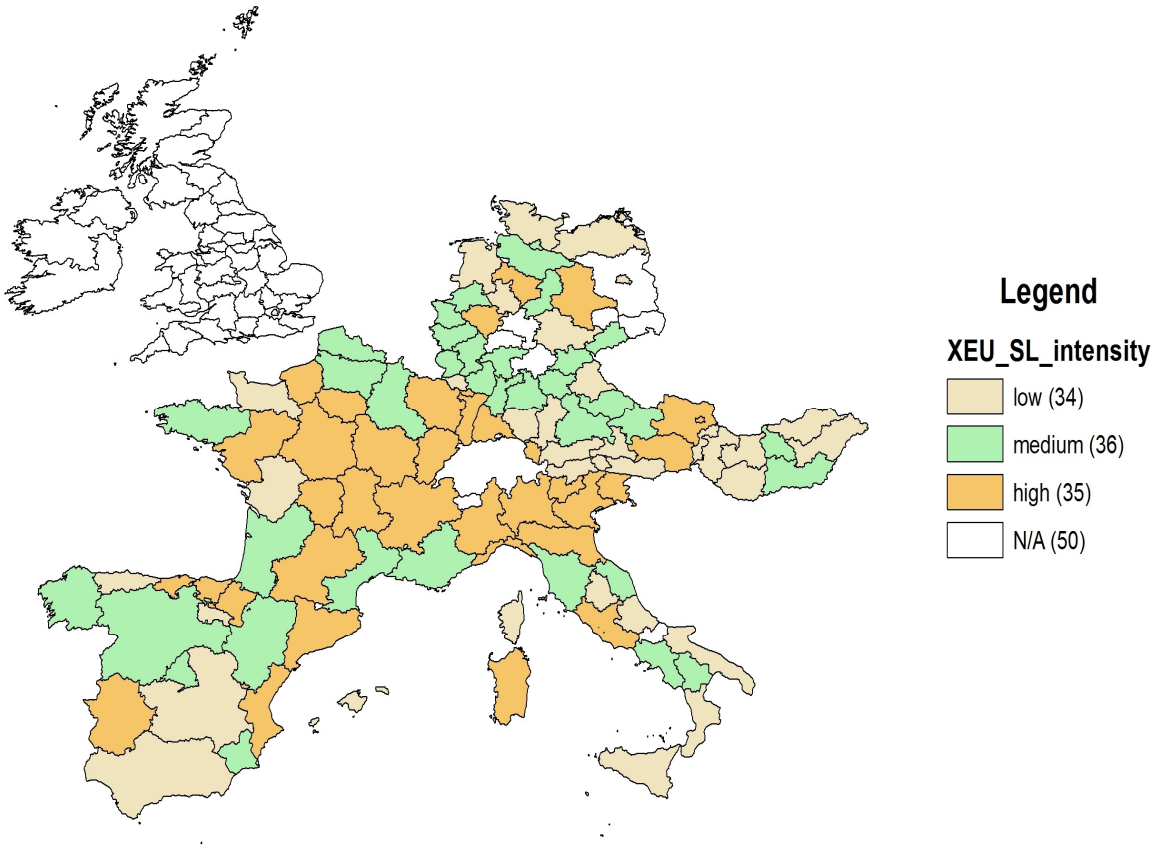
Illustrative exercise 2

Use of EFIGE data

Calculate for 111 regions in 6 countries

Suggests good performance of Central French, NW German, NC Austrian and North Italian regions

Not representative, it's an illustration!!!



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RCI index versus NSX

- EC 'Regional Competitiveness Index' (**RCI**)
  - "the index is based on eleven pillars describing both inputs and outputs of territorial competitiveness". Eg, infrastructure, education, IT innovation.
  - Bundling outputs and inputs of the process together as 'pillars' creates a taxonomy that may be useful to someway rank regions. But it's a magic black box of limited practical use.

- Our **NSX index of relative non-EU exports**
  - focused on output and is micro-based
  - Should data allow, it can be related to inputs (infrastructure

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- Comments welcome

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