Exploring interregional trade networks in Europe:

Towards a new tool for supporting regional strategies for smart specialisation

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Context

NEED TO DEVELOP ADEQUATE ANALYTICAL TOOLS TO ASSESS OUTWARD ASPECTS OF REGIONAL ECONOMIES AND SUPPORT STRATEGIC PRIORITIES

- ***RIS3 GUIDE***

  STEP 1: Importance of thorough analysis of regional context, including outward dimension:

  - Analysis of regional positioning in EU and global markets
  - Value chain perspective
  - Regional competitive advantages

  STEP 4: Select priorities for RIS3 on the basis of the analysis phase

- ***RECENT LITERATURE*** on regional competitiveness: Bristow (2005); Thissen, van Oort et al. (2011)

- ***EC-OECD*** project on smart specialisation: need for more and better indicators for regional profiling

Objectives

PRESENT TIME

- Provide a ***tool for analysis of outward dimension*** of regional economies using ***network techniques***
  - Build an inter-regional trade network of agriculture and food products in EU25
  - Measure topological characteristics: global features, regional positions within the system
- Elaborate a ***comprehensive methodology*** and produce ***user-friendly regional indicators to help policy makers*** in the design phase of RIS3 strategies and subsequent updates
  - Presentation of results and policy implications for a limited number of industries and products, with a value chain perspective

FUTURE

- ***Extend analysis to other sectors***, thus extending scope for prioritisation process!
- ***Add more dynamics*** by analysing evolution of indicators over years, including the evolution during the crisis

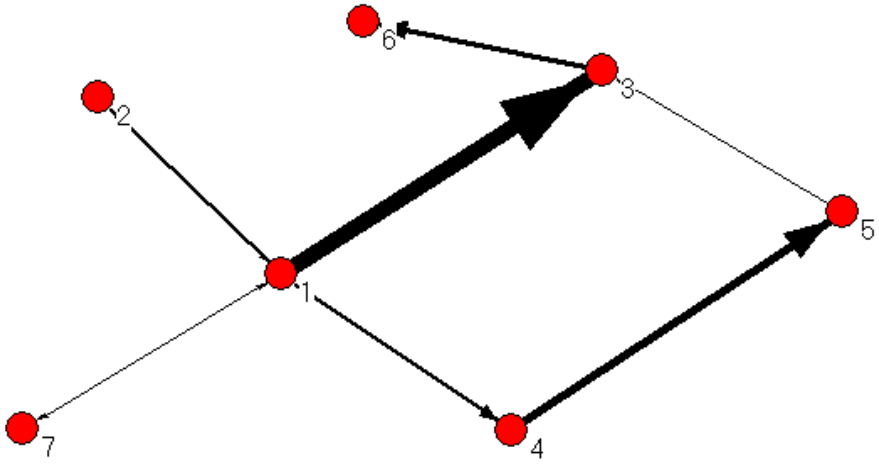
Network setup

- Regional Data on Clusters and Economic Networks (trade) from ***PBL –Netherlands Environmental Assessment Agency***:

  - 250 regions in EU25
  - Agriculture products and Food processing industry
  - Years 2000 and 2007 (pre crisis)
  - Only flows >10 Millions Euros

- Define a ***weighted directed graph*** where nodes are NUTS2 regions, and links are flows of traded goods

- A network allows to consider both ***direct*** and ***indirect effects*** through ***chains of links***



Global characteristics: integration and cohesion

	2000		2007	
	AGRI prod	***FOOD***	***AGRI prod***	***FOOD***
Nodes	250	250	250	250
Links	3 604	10 651	4 239	14 114
Density	0.0579	0.1711	0.0681	0.2267
WCC (%)	225 (90)	249 (99.6)	249 (99.6)	250 (100)
SCC (%)	167 (66.8)	242 (96.8)	219 (87.6)	242 (96.8)
APL_{SCC}	3.1086	2.1320	3.0958	1.8603
APL_{RANDOM}	2.3471	1.9834	2.2278	1.8855
ACC	0.6269	0.5664	0.5725	0.5080
ACC_{RANDOM}	0.0581	0.2955	0.0666	0.3140

Results I

- Both AGRI and FOOD networks, in both years, are characterized by ***integration***, ***practicability***, and ***robustness to disconnection***
  The AGRI network is also ***sparser → small world***

- Between 2000 and 2007, there is an increase in trade flows and integration and a simultaneous decrease in average distance → ***higher level of integration and cohesion***

…now look at regional position within this system

Regional position within the system

- Calculate different network indicators of ***centrality*** and then rank regions accordingly → rankings grasp different dimensions of regional positioning:

Out-degree or number of export destination	→	Diversification and sophistication of export strategy
Strength of export links	→	Total magnitude of export flows
Weighted out-degree centrality	→	Strength (total flow) + degree (preference for diversification)

- Obtain a sound policy tool to feed analysis phase and support ***RIS3 development***:
  - Good understanding of trade linkages ***(STEP 1-RIS3 Guide)*** essential to ***prioritise (STEP 4)*** wisely!

Regional positions: Weighted centrality

FIRST 5 positions

2000		*2007*	
AGRI prod	***FOOD***	***AGRI prod***	***FOOD***
Andalusia	**North Brabant**	**Andalusia**	**North Brabant**
South Holland	**Lombardy**	**South Holland**	**Lombardy**
Lombardy	**Ile de France**	**Castilla y Leon**	**Ile de France**
Castilla y Leon	**South & East IE**	**Lombardy**	**South Holland**
Aquitaine	**South Holland**	**Catalonia**	**South & East IE**

LAST 5 positions

Aland	**eszak Magyarorszag**	**Tees Valley & Durham**	**Corse**
South Yorkshire	**Malta**	**Saarland**	**Ionia Nisia**
Cyprus	**Aland**	**Aland**	**Valle d'Aosta**
Lithuania	**Del Dunantul**	**Valle d'Aosta**	**Malta**
Valle d'Aosta	**Valle d'Aosta**	**Corse**	**Aland**

Results II

- There are some elements of persistency and some variability both at the centre and periphery of the network

- A set of regions stably lead the ranking, notably Andalusia is very strong in AGRI products, not so much in FOOD industry

- At the periphery of the network there are some regions with very special features, namely being geographically far away from continental Europe. For these regions it appears very difficult to base an innovation strategy on the agro-food value chain, so will look at other types of specialisations.

Concluding remarks

- Network tool for analysis of **RIS3** outward dimension (**STEP 1**), can be a natural basis for prioritisation (**STEP 4**) as it allows identifying key activities for regional economies

- Rankings provide a **multi-dimensional analysis** of trade networks: **number of links, strength of links, and a combination of these two measures** → thorough assessment of regional positioning

- ***More to come…!***

Thank you for your attention!

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