

# Knowledge transfer via cooperative research

*How Universities and Universities of Applied Science* are positioned in the German research network

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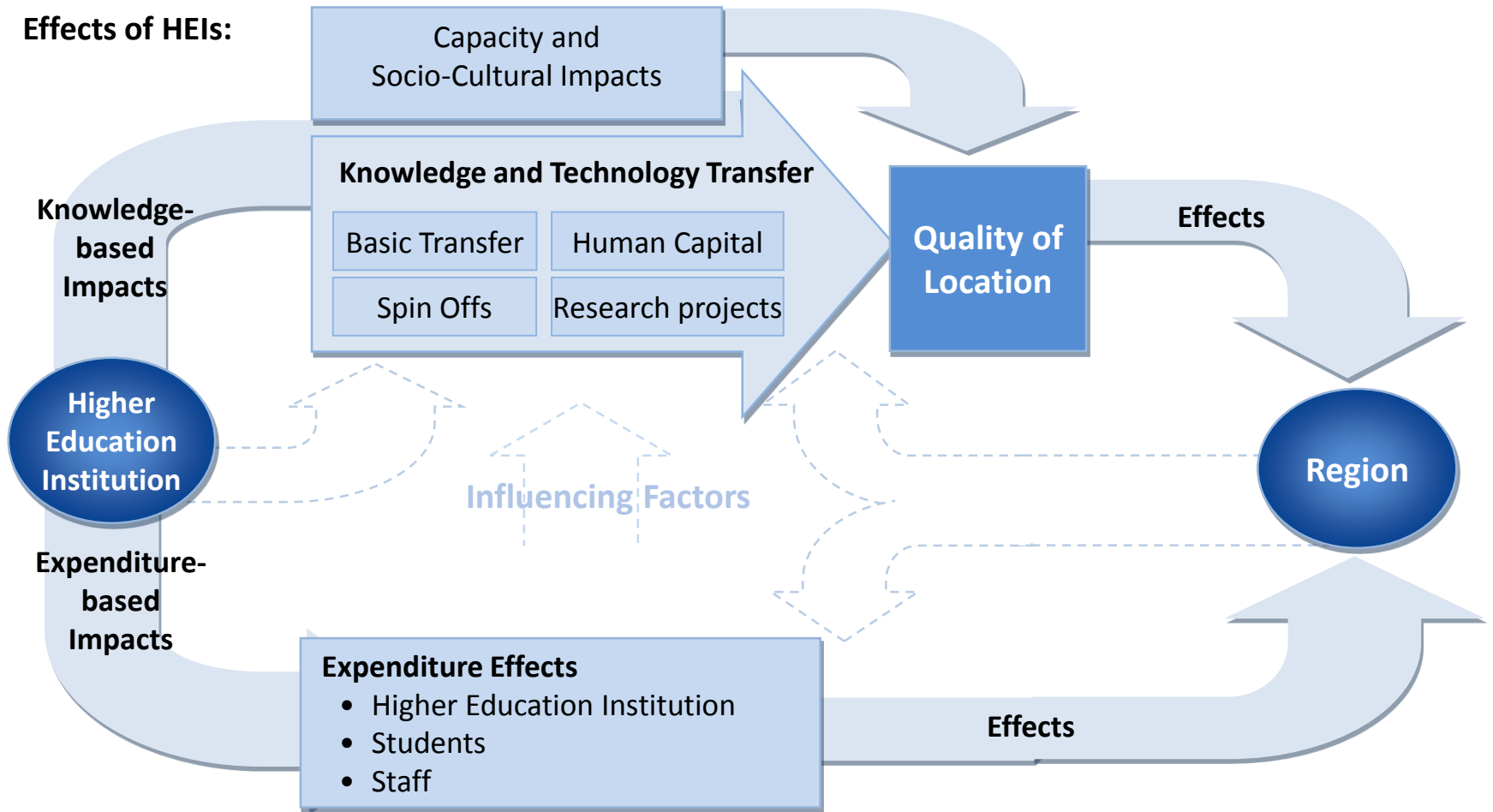
# Agenda

- RegTrans – regional transfer effects:  
a comparative study of universities and  
universities of applied science
- a model of knowledge transfer mechanisms
- cooperative research
  - data: the FÖKAT
  - intensity of transfer
  - network position
  - spatial dimension of network linkages
- results and future prospects

# RegTrans

- presented work is part of the research project: „RegTrans“, funded by the German ministry of education and research
- goals: (1) revealing differences between universities and universities of applied science regarding knowledge transfer mechanisms and (2) identifying room for improvement

# A model of knowledge transfer mechanisms (1)



Source: Hamm et al., 2012

# A model of knowledge transfer mechanisms (2)

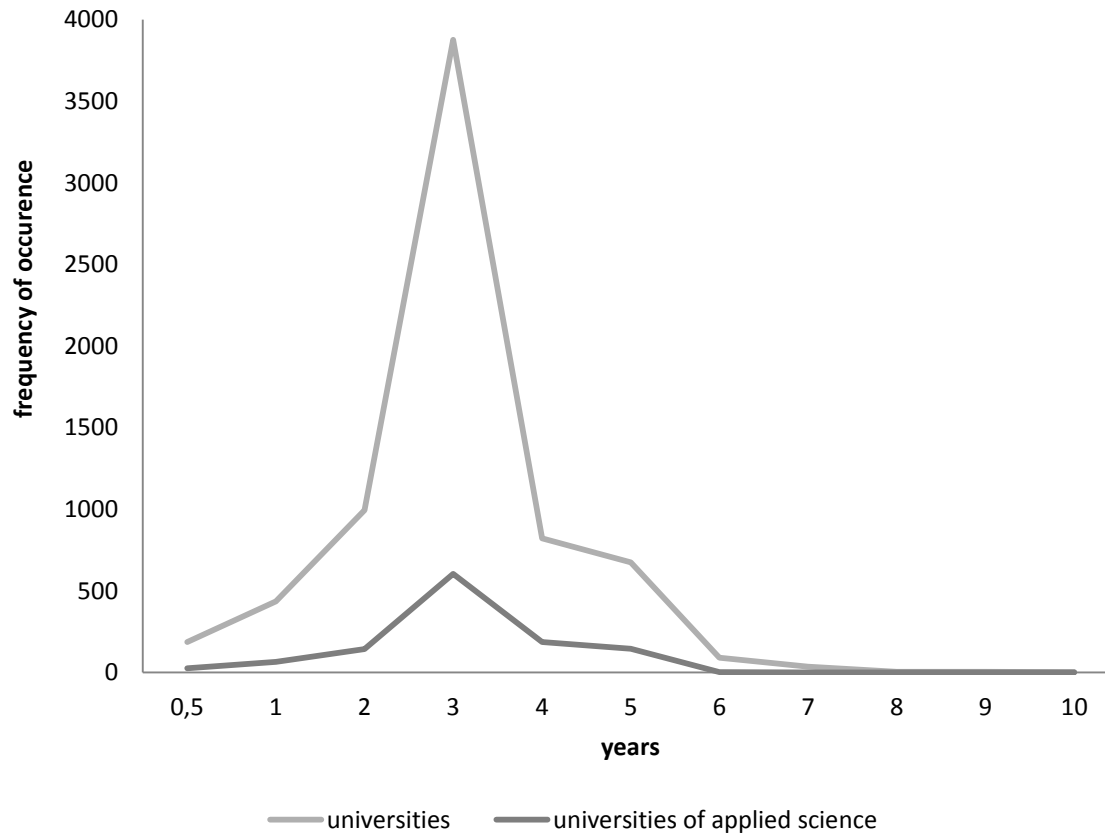
- 4 mechanisms are differentiated:
  - basic transfer e.g. publications,
  - human capital e.g. graduates,
  - formation of enterprises, in this case spin offs and
  - via research, e.g. especially cooperative research
- questions:
  - differences regarding the intensity of knowledge transfer
  - differences regarding the spatial dimension of knowledge transfer

# Cooperative research: The FÖKAT

- FÖKAT → *Förderkatalog* (an online catalogue containing information about nearly 110.000 research projects funded by the German government)
- using all currently funded projects
- cooperative projects have been used to unveil the network

# Time length of projects

Frequency distribution – length of projects



# The research network (1)

## 4 centrality measures have been used

- degree:
  - number of direct linkages
  - cooperative activity
- closeness:
  - average path length to every other actor
  - efficient information spreading/gathering
- betweenness:
  - probability of being located on the shortest path between other actors
  - gatekeeper-position
- eigenvector:
  - Central position, when directly connected to other central actors (circular logic → Algorithm in the used PAJEK software)
  - contacts to important actors



# The research network (2)

- the (reduced) network unveiled by the FÖKAT data
- 62 UoAS and 85 universities
- 1139 actors altogether and 3622 linkages between them

## Difference of centrality values

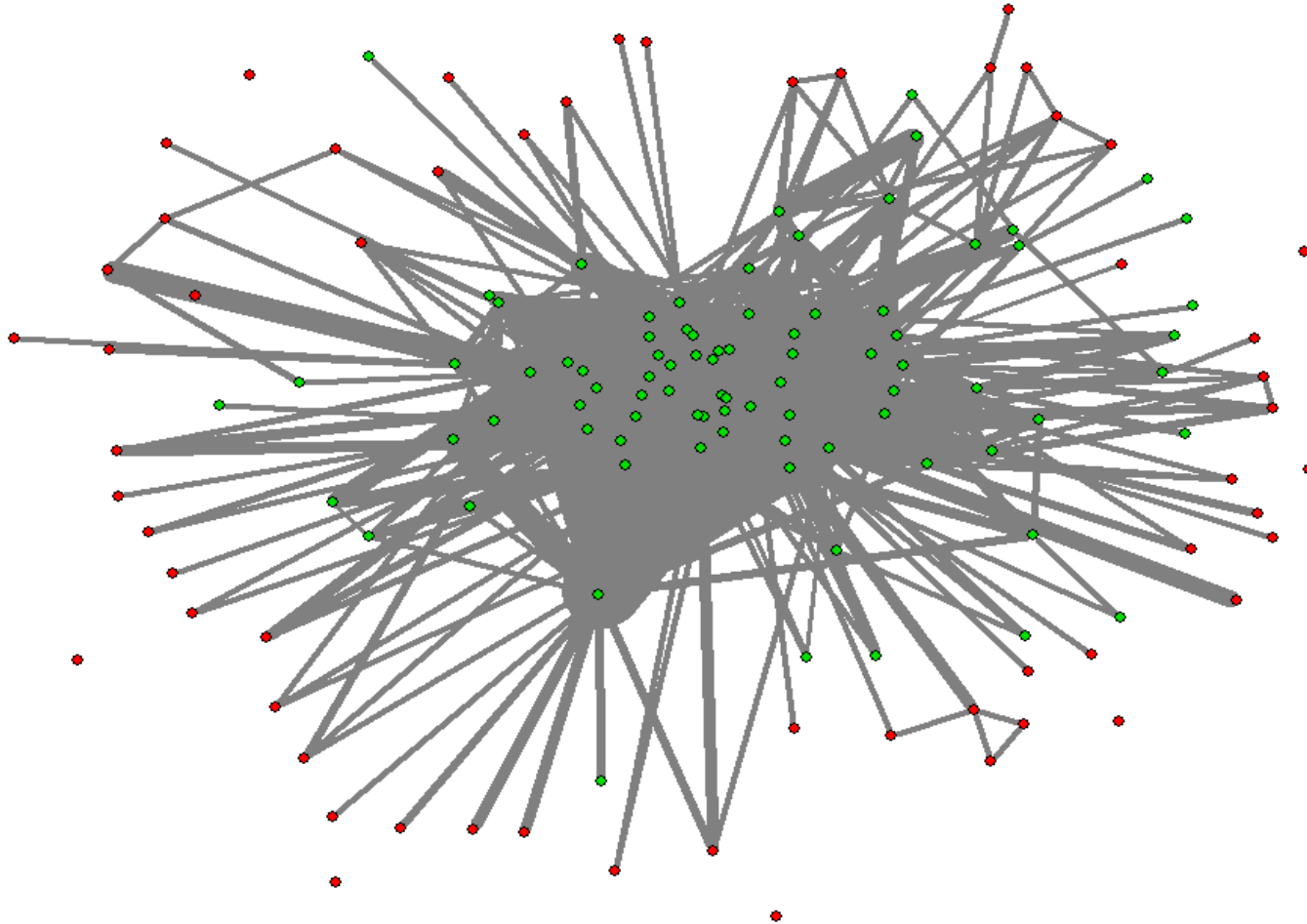
variable	1=universities; 0=universities of applied science	mean	difference statistically significant at 1 percent level
closeness	0	.3432	yes
	1	.3828	
betweenness	0	.0008	yes
	1	.0074	
degree	0	3.593	yes
	1	23.70	
eigenvector	0	.0053	yes
	1	.0347	

# The research network (3)

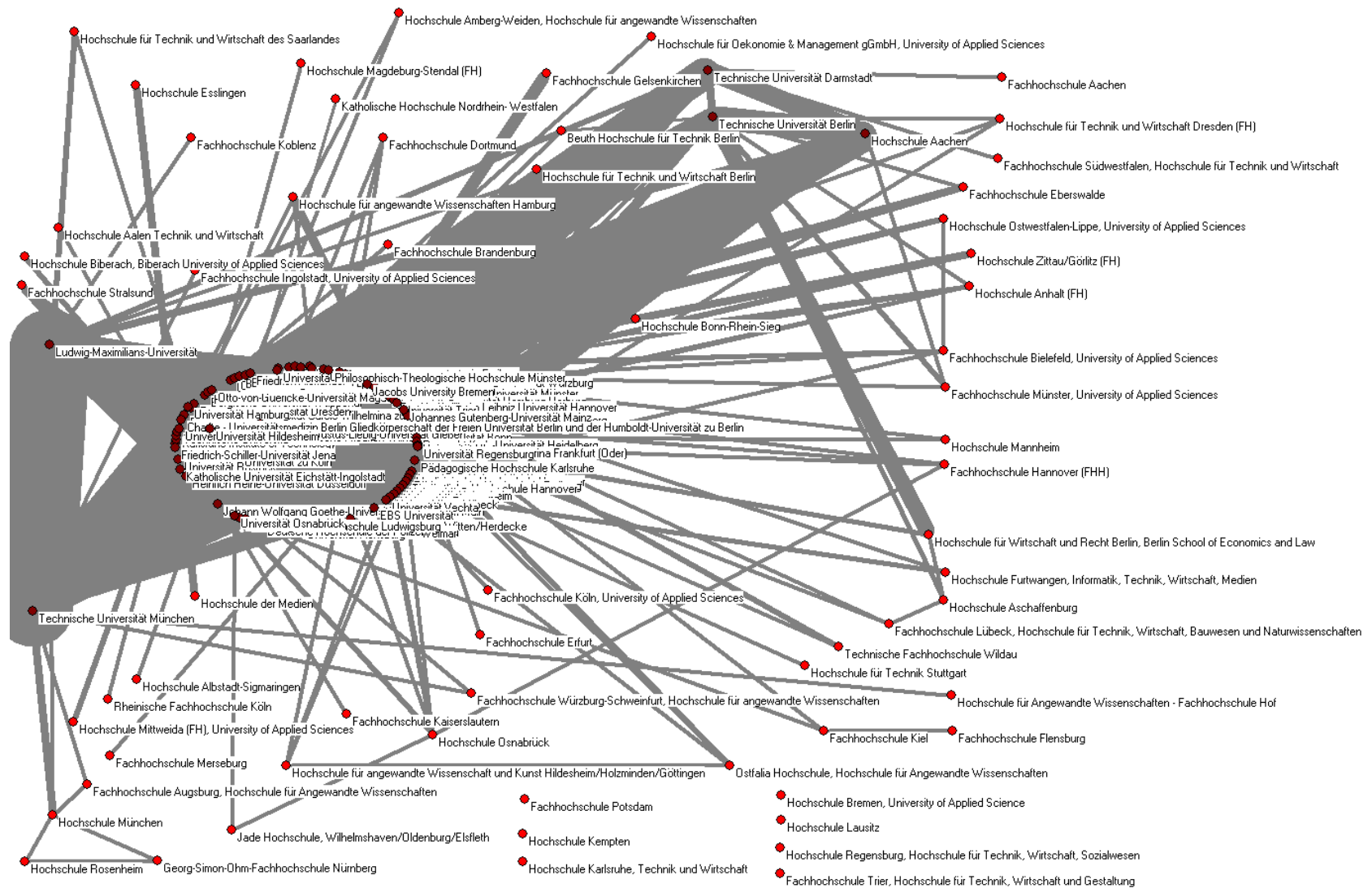
- shown are 85 universities and 62 UoAS
  - not shown: the 992 remaining actors
  - A dense network between universities
  - UoAS in more peripheral positions and nearly unconnected among each other
- UoAS connected to the network of universities via the local university
- the intensity of cooperation of universities and UoAS with the remaining actors
  - 992 actors and the 85 universities
  - 992 actors and the 62 UoAS

# The research network (4)

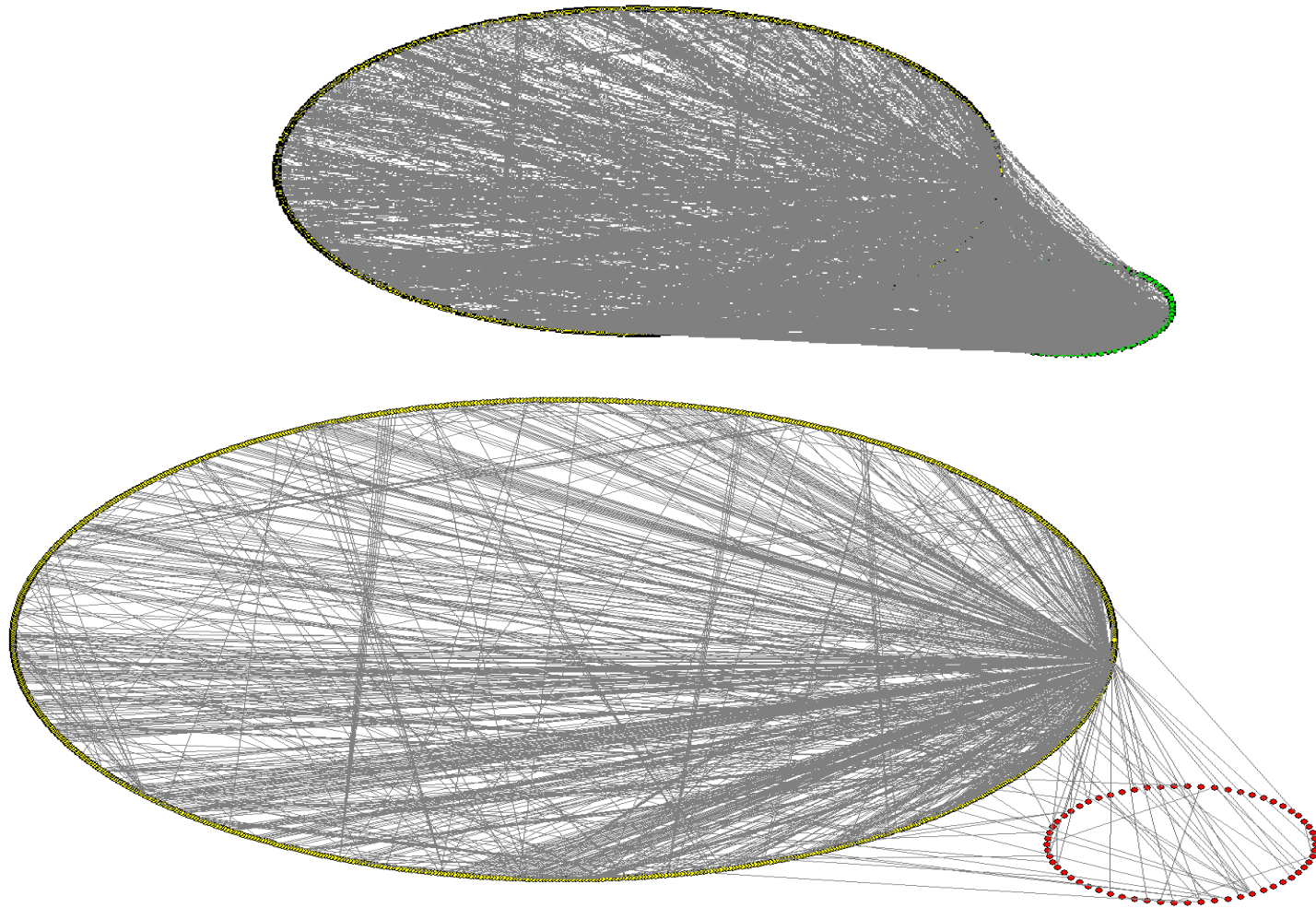
Universities (green dots) and UoAS (red dots)



# The research network (5)



# The research network (6)



# The spatial dimension

- Looking at the *Main Component* of the network
- average distance of cooperation partnerships for 62 UoAS and 85 universities in the component

Av_dis_km		mean	median
hei_type	UoAS	282	264
	Universities	329	311

# Conclusion

- Universities are much more involved in cooperative research (based on FÖKAT data)
- Universities are in more central positions within the research network (regarding every used measure)
- Universities cooperate with each other more than UoAS do
- Cooperation links of universities are more spatially dispersed, ...but the links to partners of UoAS show a greater distance than expected

# Further research

- awaiting results of three surveys
  - Online questionnaire → 3000 professors
    - Formation of cooperation linkages
    - Spin-Offs
    - Publications, etc.
  - Online questionnaire → graduates
    - Tracking graduates: residence, 1<sup>st</sup> job, actual job, location of the university
    - Reasons for choices: regarding university, UoAS, job, region and so on
  - By postal service → about 23000 companies
    - Awareness of located HEIs
    - Reasons and intensity of cooperation with (non-)local HEIs
    - Valuation of effects of HEIs on a region
    - Valuation of graduates (e.g. more practical experience in case of graduates from UoAS?)



# Thank you very much for your attention

For more information visit the following the homepages:

<http://www.ruhr-uni-bochum.de/wiwi-forschung/drittmittel/RegTrans.html.de>

<http://www.hs-niederrhein.de/forschung/niers/forschungsprojekte/regtrans/>