

Techniques and methods of knowledge transfer in post socialist central Europe

Insights from analysing a polish region and the development of a new research agenda

Prof. Dr. Michael Woywode

Dr. Niclas Ruffer



Motivation

Embeddedness of Innovation

Innovations are not created in isolation but are embedded in regional systems.

Different theoretical streams have developed in the literature in order to better understand the phenomenon of embeddedness of innovation. E.g.:

- cluster literature, most prominently associated with the Michael Porter (Porter, 1998),
- new economic geography associated with Nobel Prize winner Paul Krugman (Baldwin and Krugman, 2004; Fujita and Krugman, 2004; Krugman, 1998) or the literature on
- Innovative Milieus (e.g. Crevoisier, 2004).

Our focus in this study was knowledge and technology transfer in a particular polish region - Voivodship Opole. Therefore we chose the Regional Innovation System approach (e.g. Cooke et al., 2004).

Research question

What are the specific features of post-socialist Regional Innovation Systems –

What is the status quo regarding university/industry relationships?

Can we apply the same tools we use for analysing regional systems at the technological frontier?

Research Design

Simultaneous analysis of international Best Practices and a regional innovation system in Southern Poland

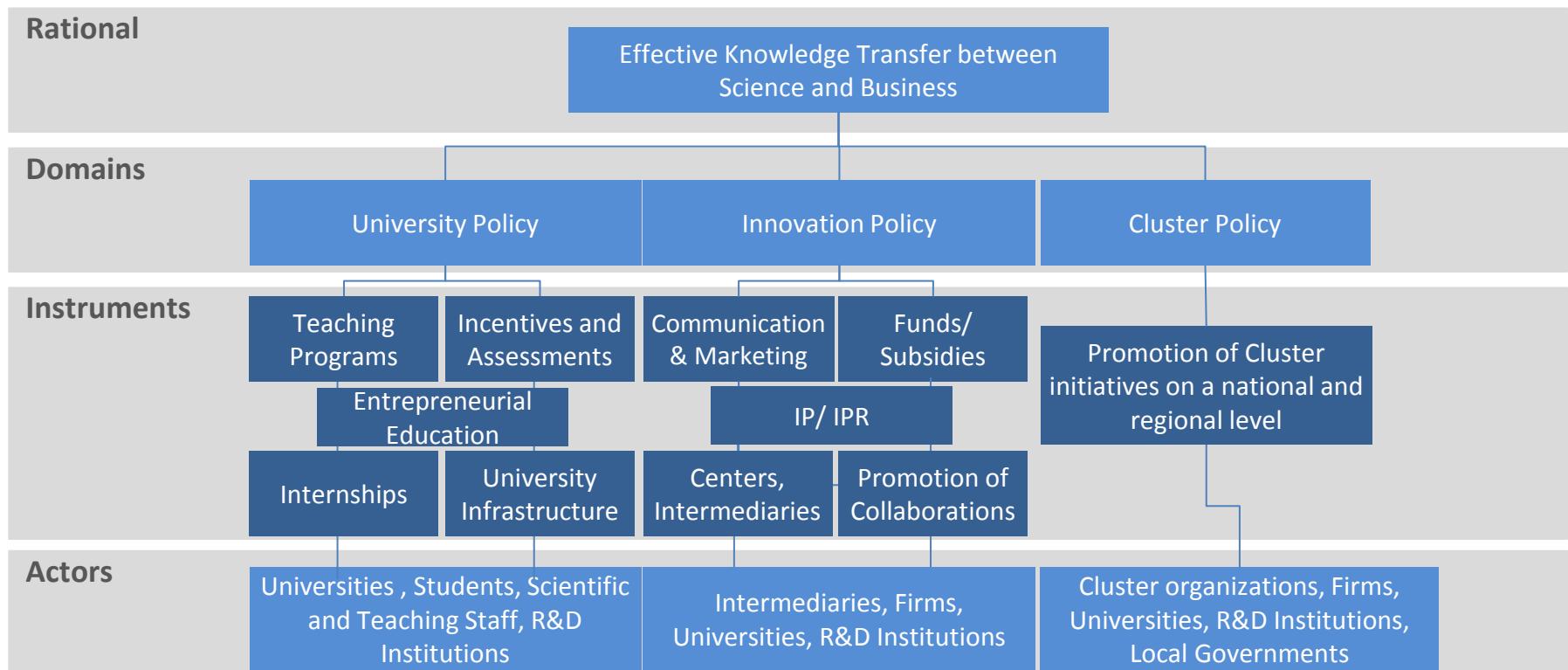
- Our Analysis is rooted in the literature on National (Freeman,1987; Lundvall,1992; Nelson,1993) and Regional Innovation Systems (Cooke et al.,2004; Klein, Woolthuis et al. 2005; Bergek et al. 2008 and Magro, Wilson 2013)

Method:

- Collection of evidence from existing studies in the literature on technology transfer in leading regional innovation systems
- Qualitative in depth benchmark study of the highly innovative regional system of Baden-Württemberg to serve as a role model
- Qualitative study of the RIS of Opole Voivodship (35 qualitative interviews, about 20 visits to firms, technology parks, focus groups with local scientists and policy makers, participation in conferences, etc.)
- Continuous evaluation of 200 innovation projects initiated between researchers from two universities and local companies in the region of Opole

Theoretical Background

We follow Magro & Wilson (2013) with regard to analysing RIS with the focus on
“Effective Knowledge Transfer between Science and Business”



Baden-Württemberg (BaWü) - Overview

BaWü key figures

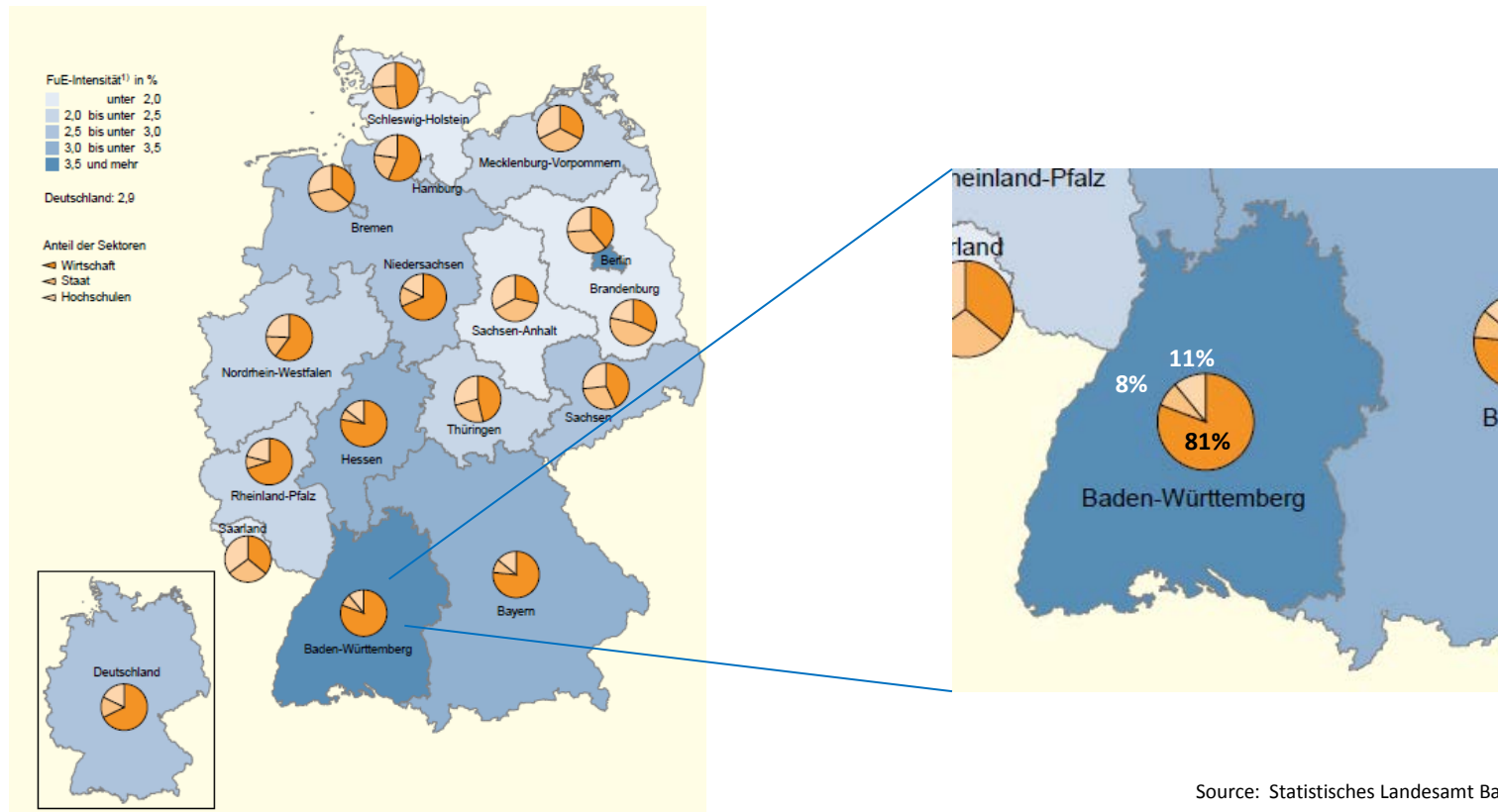
- 10.6 Mio. inhabitants (2014)
- GDP per worker of 72 805 Euro (2014)
- R&D expenditures of 19.5 bn. € (2011)
- Unemployment rate 3.8 % (as of May 2015)
- Strong higher education landscape
 - 14 Universities (thereof 5 operated privately)
 - 43 Universities of Applied Science
 - 1 Baden-Wuerttemberg Cooperative State University (*Duale Hochschule Baden-Württemberg / DHBW*)
 - 8 Colleges of Art of Music
 - 6 Colleges of Education

Source: Statistisches Landesamt Baden-Württemberg (2015)



Baden-Württemberg occupies a leading position in the German innovation landscape

R&D in Germany 2011 – Sources of R&D money in BW



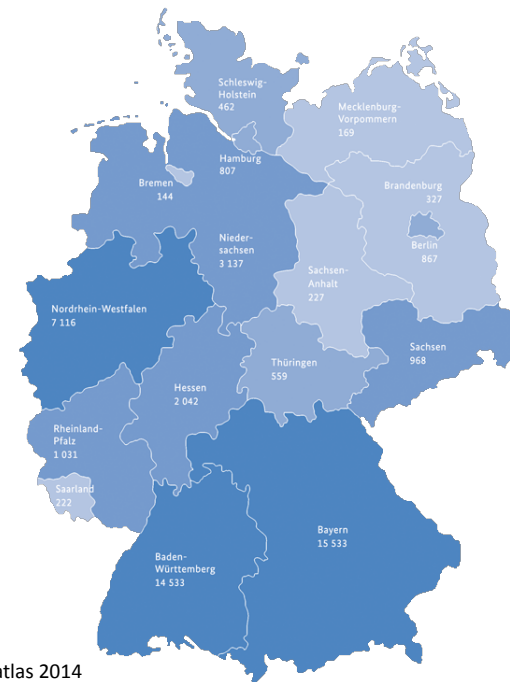
Majority of R&D expenditures in BaWü is conducted by industry

Patent applications by German federal

Applications per inhabitants

German federal states	Applications	%	Applications per 100tsd. inhabitants
Bavaria	15,533	32.3	123
Baden-Württemberg	14,533	30.2	137
North-Rhine/Westphalia	7,116	14.8	40
Lower Saxony	3,137	6.5	40
Hesse	2,042	4.2	34
Rhineland-Palatinate	1,031	2.1	26
Saxony	968	2.0	24
Berlin	867	1.8	25
Hamburg	807	1.7	46
Thuringia	559	1.2	26
Schleswig-Holstein	462	1.0	16
Brandenburg	327	0.7	13
Saxony-Anhalt	227	0.5	10
Saarland	222	0.5	22
Mecklenburg-Western Pomerania	169	0.4	11
Bremen	144	0.3	22
Total	48,144	100	Ø 60

Overview

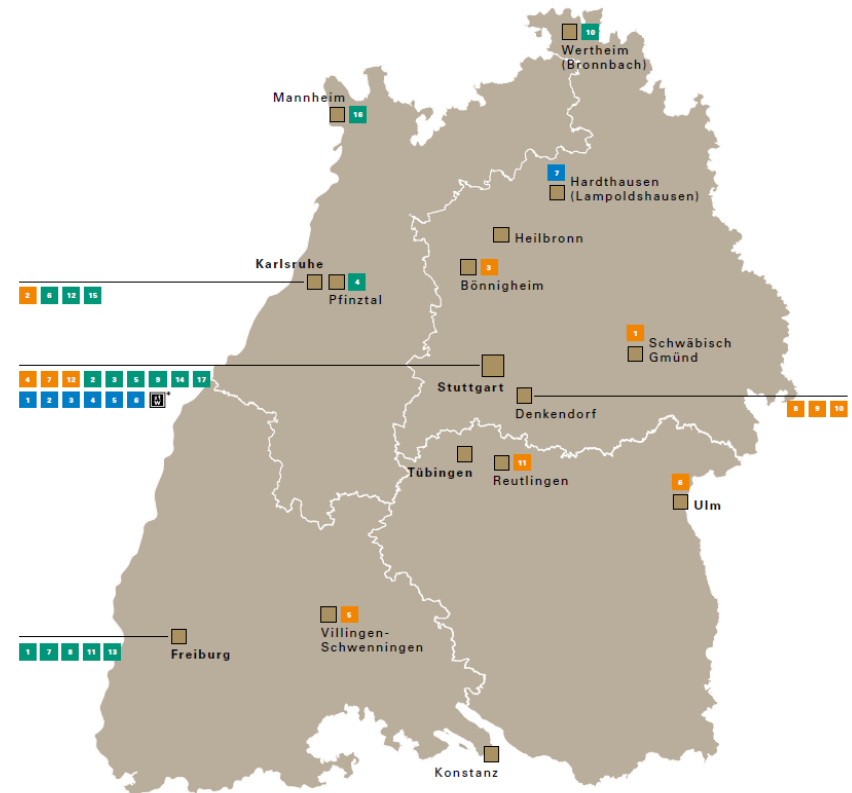


Source: Patentatlas 2014

Baden-Württemberg has the highest number of patent applications per 100.000 inhabitants

Overview – Industrial research institutions and locations in Baden-Württemberg

- Industrial research is targeted towards the **implementation of innovative approaches within enterprises**
- Sponsoring of industrial research organizations within the states **technology policy**
 - **12** institutes of the **Innovation Alliance**
 - **17 Fraunhofer organizations** including 13 institutes, one branch office and 3 project groups
 - **7** institutes of the German Aerospace Center (DLR)
- Almost **600 transfer centers of the Steinbeis Foundation** for Economic Promotion in Baden-Württemberg
- Coverage of almost all **key technologies** that are of critical importance for the future technological development and competitiveness of BaWü's industry



Source: Baden-Württemberg Ministry of Finance and Economics (2014)



In BaWü university/industry relationships are pretty well developed and so is knowledge transfer – the triple helix is working

R&D and innovation

- R&D and innovation take place as a multi-faceted process in the **research, industry and government** sector
- Findings of basic research and applied research generated in public and private research institutes such as universities have to be **translated** to innovative products and processes
- **Knowledge and technology transfer** between research and industry sector **central for the implementation of innovations**
- **Interaction** between actors of the three sectors as a crucial mechanism to increase a regions innovativeness
- High importance of “**industrial**” research



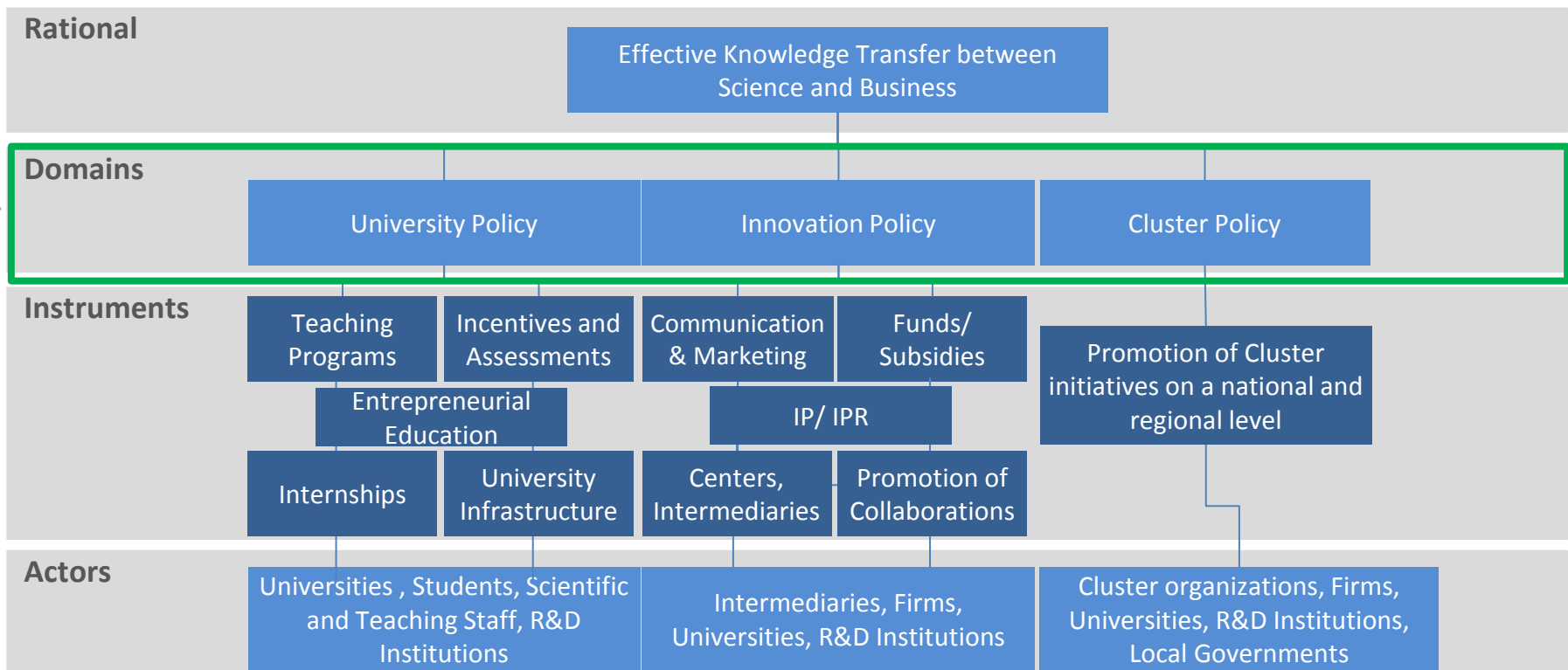
The triple helix



Focus on industrial R&D and intersectoral interaction as a driver for strong knowledge and technology transfer

Focussing on university/ innovation/cluster policy

Is the triple helix in Opole working as well?



University Policy – Multidimensional Regional Involvement of Universities (via Teaching)

Teaching requirements

- Orientation of teaching towards regional needs
- University Policy as head of „Educational Supply Chain“
 - Active promotion of graduates towards the regional labor markets & active labor market research with regard to labor demand
- Supply of regional specific teaching
- Advanced training for regional labor force

Results Opole

- Teaching is only partly adjusted to regional labor market needs
- Companies are rarely involved when an academic curriculum is designed
- Few Bachelor and Master theses with practical relevance (in cooperation with business)
- Internships often only after graduation
- Only few active „Entrepreneurial Education“ courses at university level
- So far no lifelong learning programs (MBA, EMBA, company specific programs) in place

University Policy – Multidimensional Regional Involvement of Universities (via Research)

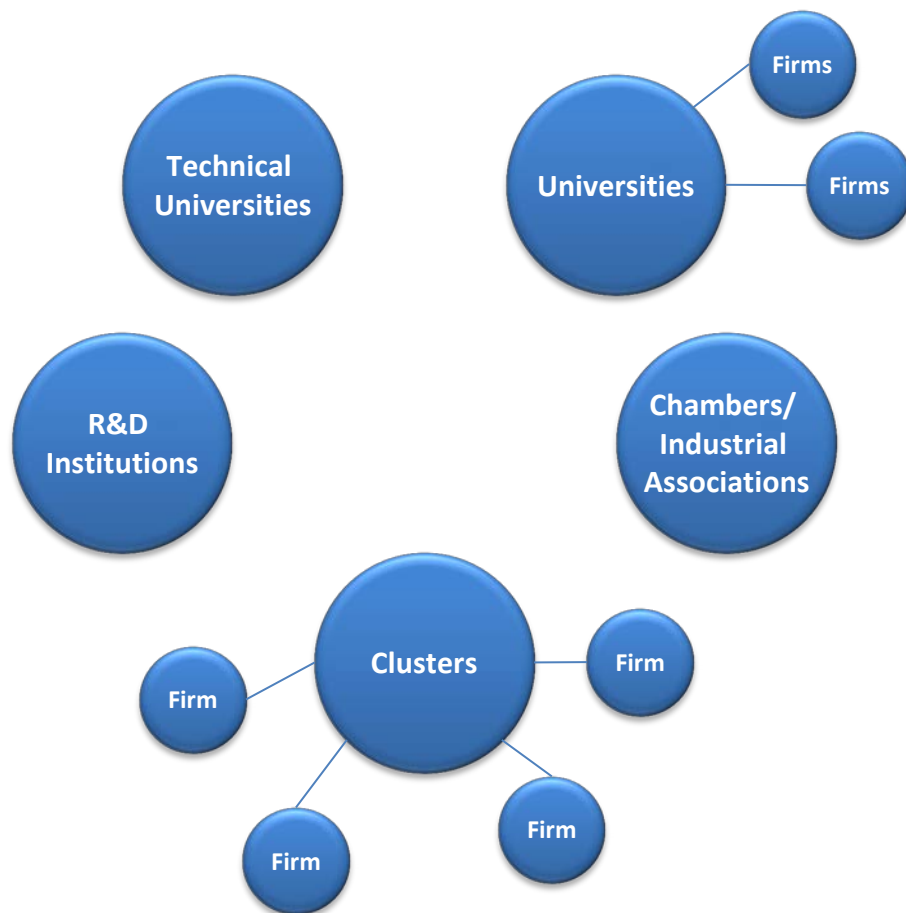
Research

- Expansion towards regional R&D centers and technology parks
- Adjustment of Research towards local needs
 - E.g. Initializing of Clusters
 - supporting cluster initiatives
- Promotion of technology transfer through various channels
 - Regional Networks
 - Incubators, Spin-Offs, Promotion of Start-ups, Graduates

Results Opole

- Current funding of research facilities often does not allow commercial use
- Research facilities meet demand only partly
 - Sufficient facilities for instance in chemistry & machine tool industry related research
 - Insufficient facilities for instance in wood industries
- Research only partly oriented towards regional demand
- Some clusters do not work in a satisfactory manner
- Insufficient personal networks between business and science (lack of information, ignorance, mistrust) hinder smooth collaboration

Innovation Policy – Collaboration and Networks



Research

- Collaboration and Networks between actors in the regional innovation system are essential for the generation of innovation
- Network structure influences diffusion of knowledge and technology innovative capabilities

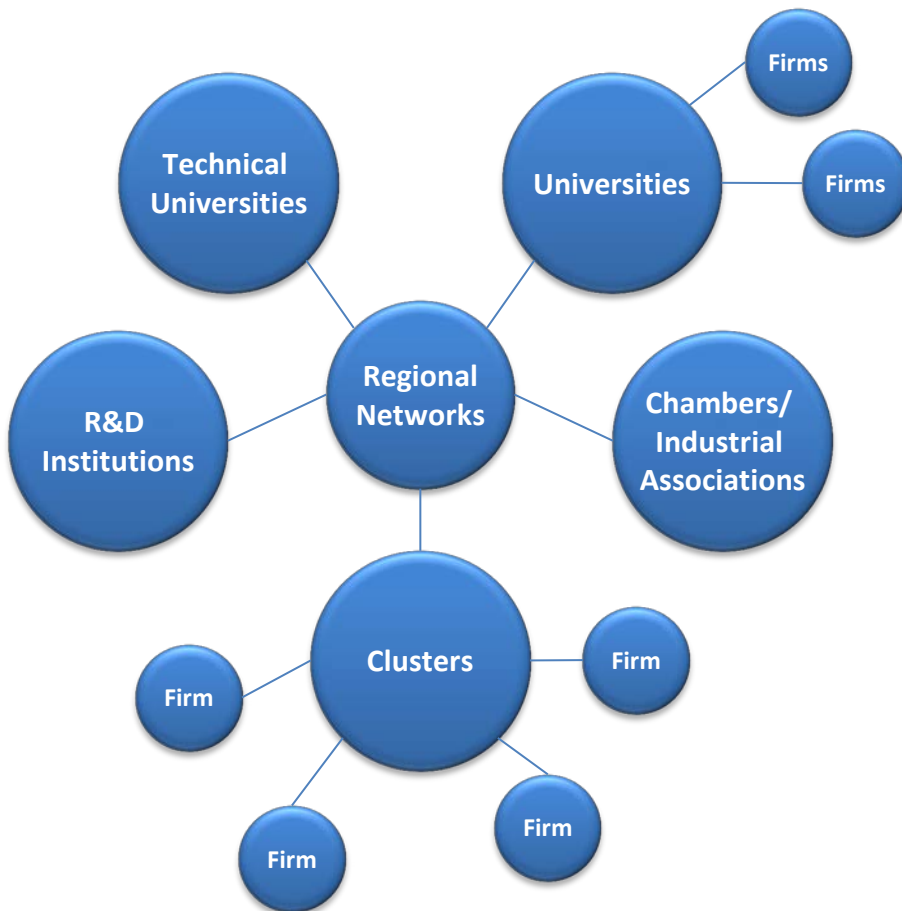
Results Opole

- Relatively low professional Management/ Innovation capabilities in firms
- Low appreciation of universities as centers for innovation and cooperation
- Little experience of university staff with regard to cooperation
- Little informal contacts between university staff and firms

Innovation Policy – Policy Recommendations

Recommendations Opole

- Holistic approach to foster collaboration and trust throughout the regional innovation system
- Create regional technology transfer networks modeled after international best practice cases (e.g. Steinbeis and Fraunhofer)
- Support Bottom-up initiatives of firm networks and foster collaboration with universities by special incentives
- Improve firm capabilities by lifelong learning programs e.g. by creation of local business schools that have the side effects to build networks between science and business
- Reform of university evaluation systems, employment models and hierarchies towards project execution
- Holistic integration of entrepreneurship promotion activities in universities and incubators



Conclusion – New Research Questions

Are the frameworks we use really adequate? Do we ask the correct questions?

Identifying and adopting best practices in knowledge and technology transfer to implement them in less developed countries might have to be complemented by a broader perspective:

Better integration of literature on culture, social capital, trust, etc. into innovation system research necessary to analyze innovation systems in post socialistic societies, e.g.

- Quality and Management in civil services
- Attitudes towards authorities
- Newly democratized countries with governments (and bureaucracies) occupied by interest groups
- Take into account the endowment of societies with social capital

Thank you for your attention

For questions please contact:



Prof. Dr. Michael Woywode

Director Centre for SME Research and Entrepreneurship
woywode@ifm.uni-mannheim.de

Dr. Niclas Rüffer

Project Leader Effective Knowledge Transfer for Opole
Voivodship at the Centre for SME Research and
Entrepreneurship
rueffer@ifm.uni-mannheim.de