A THEORETICAL VIEW ON PUBLIC-PRIVATE PARTNERSHIPS IN RESEARCH AND INNOVATION IN GERMANY

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Introduction and objective

- Public-private partnerships (PPP) are a way to organise long-term oriented strategic research between universities and industry
- A PPP is a public service and/or a private economic activity, which is jointly financed and operated by the public sector and industry on the basis of a contract which regulates financing and operation.

Objectives

- Integration of the funding initiative of the German Federal Ministry of Education and Research (BMBF) "Research Campus - partnership for innovation" (Forschungscampus - Partnerschaft für Innovationen) in the theoretical context of research cooperations between academia and industry
- Analysis of significant characteristics of the 'Forschungscampi' in their build-up phase with regard to a theoretical framework
Theoretical framework: Transaction costs

**Transaction costs approach** (Williamson 2002):

- Circumstances under which cooperation agreements are most efficient form of organization (transaction cost efficiency)
- Science-industry linkages: with increasing vertical disintegration, necessity for exchange processes increases and thus the number of required transactions
- Network and partnership structure is a form of coordination (flexible access to external resources, saving internal resources (Hunt/Morgen 2000, Aldrich/Zimmer 1986, Becker/Dietz 2004)).
- Transactions include: risk of fraud and opportunistic behaviour (IPR) → coordination, control and regulation.
Theoretical framework: Innovation economics

- Innovation: non-linear, interactive and systemic process that creates novelties
- Major aspects: **complexity** and **uncertainty**
- Strategy: **collective technological and financial risk minimization**.
- Distributed knowledge sourcing and combining process between different agents (Coombs et al. 2003) → **Open innovation** (Chesbrough et al. 2006)
- **Integration** of customers, users, external experts in all phases of the innovation process = coordination of **distributed partners**
- Joint search for a solution; **interactive value creation** (Reichwald/Piller 2009)
- **Substitution effects** by external research
- Joint **capacity and competence building** (Dahlander/Gann 2010)

Source: Chesbrough et al. 2006
Theoretical framework: Economic geography

Economic geography (Boschma and Martin 2010):

- **Proximity** is a relevant factor in knowledge generation and innovation (Boschma 2005, Carrincazeaux and Corris 2011).

- Geographical and social proximity are the most relevant. **Geographical proximity** = spatial or physical distance between economic actors; **social proximity** = embeddedness of economic relations in a social context (Boschma 2005: 66-69)

- No strict rule about the importance of each proximity dimension

- Depending on the content of innovation processes (technological, social, incremental, and radical) and the used and newly generated knowledge, **different proximity configurations emerge**
# Heuristic approach: Analytical aspects

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<tr>
<th>Approach</th>
<th>Analytical focus</th>
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<td><strong>Transaction cost economics</strong></td>
<td>coordination, control, governance, regulation</td>
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<td>hierarchy versus market, cost efficiency</td>
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<td>trust, opportunistic behaviour</td>
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<td>absorptive capacity</td>
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<tr>
<td><strong>Innovation economics</strong></td>
<td>distributedness, open innovation, interactive process, uncertainty</td>
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<td>knowledge generation and exploitation</td>
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<td><strong>Economic geography</strong></td>
<td>spatial and social proximity</td>
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<td></td>
<td>kind of knowledge, relevance of face-to-face contacts</td>
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<td>regional potential and attractiveness</td>
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<td>local/regional impacts and visibility</td>
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Source: own draft
Research Campus

- **Central characteristics:** mandatory public-private partnership, development of new research fields, pooling of activities in one place

- In September 2012, **10 Research Campus projects** were selected

- Most entered **main phase at the end of 2014. Nine** are still operating.

- **Preparation** and up to three **main phases of five years** will be supported up to altogether **15 years** with a maximal amount of 2 mill. Euro per year

- Public funding must be **complemented by private contributions**

Source: own figure
Theoretical perspectives on "Forschungscampus"

**Transaction costs perspective**

- Long-term mandatory partnership based on reliable, contractually regulated relations
- Coordination is regulated, but differently (campus offices, board of directors, campus coordinators)
- Hierarchy exists, depending on scientific excellence and financial abilities
- Organisational status is different (association, limited liability company, non-profit company)
- Trust through previous cooperation experiences and common objectives with binding investments
- Increased absorptive capacities through partnerships between firms and academic organisations
Theoretical perspectives on "Forschungscampus"

**Innovation economics**

- Knowledge flows openly between the partners, even though it is regulated by confidentiality agreements.
- Inherent tendency to focus on the stabilisation of the existing network and not to open it up too quickly to other organisations, especially possible competitors.
- Objective is to generate innovation in new (technological) fields.
- Human resource development is a major objective: teaching, master theses, Ph.D. students involved in project work.
- Creation of new markets and applications is an overall objective.
Theoretical perspectives on "Forschungscampus"

**Economic geography**

- Geographical proximity ("under one roof") is a mandatory funding principle
- Majority of partners is confident that close personal exchange in one laboratory or one building is a success factor
- Social proximity complements geographical proximity because of close personal exchange and collaboration in mixed project teams
- Other proximity dimensions are gaining in importance: cognitive proximity (common knowledge base), institutional proximity (experiences with joint regulations)
- Face-to-face contacts are necessary because of sensitive character of newly created knowledge
- Research campuses are attractive for researchers, students, firms and increase attractivity potential and visibility of regions
Conclusions regarding analytical approach

- **Transaction costs**: Partner constellations differ, although not too much. Explicit governance modes are a necessary element of the PPP. Absorptive capacities of the partners are sufficiently developed. Trust is essential and present. Hierarchy and power are obvious.

- **Innovation economics**: Open innovation is a core assumption in all PPP-models. Tasks are distributed among the partners. Degree of openness depends on the interests of all partners. Human resource development, learning and qualification are key elements. New markets should be created.

- **Economic geography**: Spatial proximity is important, but not always. Social and institutional proximity matters and develops further. PPP have a high regional or sometimes national visibility. They are used as policy instrument to support organisational reorientation and regional specialisation.
Conclusions regarding 'Forschungscampus'

- Forschungscampus as a **new form of spatially focused collaboration in strategic networks**
- **Diverse organizational models** and forms of partner involvements
- Different regulations of cooperation, but realised at "eye level"
- **Implementation of open innovation processes** in the context of partner constellations
- **High transaction costs** in the preliminary phases in anticipation of subsequent efficiency and competitive advantage
- **Large companies** (absorptive capacity, human and material resources) currently dominant among core partners in the networks
- **Network hierarchies** in the Forschungscampi with strong governance function of the central partners
- **Geographical and social proximity** are regarded as important success factor by the partners
Thank you for your attention!

Public-private partnerships in research and innovation: Trends and international perspectives

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# Subjects of the Research Campus

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<th>Campus</th>
<th>Subject</th>
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<tr>
<td>ARENA 2036</td>
<td>Development of multifunctional composite materials</td>
<td>Stuttgart</td>
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<tr>
<td>Digital Photonic Production</td>
<td>3D-printing and construction of composites</td>
<td>Aachen</td>
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<tr>
<td>Electrical Nets of the Future</td>
<td>Direct current voltage for power transmission</td>
<td>Aachen</td>
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<tr>
<td>EUREF</td>
<td>E-mobility and mobility and urban concepts</td>
<td>Berlin</td>
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<tr>
<td>INFECTOGNOSTICS</td>
<td>Efficient and rapid on site proof of infection agents</td>
<td>Jena</td>
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<tr>
<td>M2OLIE</td>
<td>Medical intervention environment regarding cancer</td>
<td>Mannheim</td>
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<tr>
<td>MODAL AG</td>
<td>Mathematical optimization of complex processes</td>
<td>Berlin</td>
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<tr>
<td>Open Hybrid LabFactory</td>
<td>Hybrid light construction for automobiles</td>
<td>Wolfsburg</td>
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<tr>
<td>STIMULATE</td>
<td>Screening of minimal-invasive methods in medicine</td>
<td>Magdeburg</td>
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