Competitive Funding in North Rhine-Westphalia: A Novel Delivery System for Cluster Policies

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Outline

1) NRW's Regional Economy: A Snapshot
2) Research Questions & Methodology
3) A Novel Policy Delivery System in NRW
4) RCE Programme Performance
5) Conclusion & Outlook
NRW’s Regional Economy: A Snapshot

- NRW is the largest German federal state
  - 17.4 million inhabitants = approx. 22% of German total population
  - Approx. 22% (4%) of German (EU-27) GDP (€ 599.8bn in 2014)

- Pronounced socio-economic disparities between the Ruhr and other sub-regions
  - Average GDP per capita in 2014: 33,621 € in NRW
  - Considerable standard deviation: 9,158.22 €
  - EU GDP per capita in 2013: 25,700 €
  - Euro-Zone GDP per capita in 2013: 28,600 €

Sources: Bross/Walter 2000, IT.NRW 2014; MWEBWV 2012

NRW’s Regional Economy: A Snapshot

GDP per Capita in 53 NUTS-3 Regions in NRW (in €, 2014)

Source: Own calculations based on IT.NRW 2014; GDP in NUTS-3 (2014); Population in NUTS-3 (2011)
Background and Research Questions

- Regional policy in NRW was traditionally **regionalized** promoting economic development in the structurally weak **Ruhr**
  - Low performance in promoting growth
  - Pronounced regional disparities (e.g., Huggins/Thomalla 1995; Danielzyk/Wood 2004)
- **New approach**: Fostering growth in the highest-performing areas in all of NRW through **competitive allocation** of funds

Research questions

- Which factors explain the **regional distribution** of structural funds in NRW?
- How has this new approach **performed** in the 2007-2013 European Regional Development Fund (ERDF) funding period?
  - Participation / Target Precision:
    - Does the programme reach the **intended beneficiaries**?
    - Appropriate representation of **private sector**?

Hypothesis & Methodology

- **Working Hypothesis**: High-performing regions will attract a disproportionate share of funds from competitions
  - Lagging regions are characterized by deficiencies in economic structure, innovation inputs and outputs
    - Traditional (low-tech) industries, dominance of large incumbents
    - R&D-investments, R&D-personnel
    - Low patenting activity, lack of new products
      - **Innovation paradox** (cf. Oughton et al. 2002)
  - Empirical studies confirm growth orientation of funding contests (cf. Eickelpasch/Fritsch 2005)

- **Methodology / Data**
  - Statistical analysis (descriptive, regression) of the list of beneficiaries (> 2,900 project participants as of Dec 31st, 2013)
  - eight interviews with key stakeholders (cf. Kahl 2011)
Novel Policy Delivery System

- Key challenge for regional policy in 2007-2013: Reconciling equity and growth
  - Mobilisation of endogenous resources to promote economic restructuring in old-industrialized regions
  - Fostering economic growth in highest performing areas

- New elements
  - Competitive selection procedure: Contests for funding
  - Territorially open approach: Co-operative innovation projects in all sub-regions
  - New target groups: Universities and ‘regional actors’ (local public authorities)

16 state-wide clusters serve as thematic intervention areas to channel ERDF money
- Structural framework for the cross-departmental coordination and delivery of cluster policy
  - Ministry of Economic Affairs
  - Ministry of Innovation and Science
  - Ministry of Climate Protection and Agriculture
  - Ministry of Health

Growth: State-wide contests for the distribution of funds to leverage funding

Cohesion: Part of the RCE-programme is not allocated via state-wide funding contests (e.g. some infrastructure projects)
Selection Mechanism: A Two-Stage Approach

**Two-Stage Approach**

- Financial incentives
- Cooperation
- Project tender
- Network formation
- Concept proposal
- Evaluation by juries of independent experts
- Full application
- Interregional competition
- Funding decision

**Strengths**
- Quality of selected projects
- Quality of selection procedure
- Self-organised division of labour: pretence of knowledge (Hayek 1975) ⇒ discovery procedure (Hayek 1968)
- Mobilisation of innovation potential
- Mobilisation effects among "losers"
- Learning effect for policy and administration

**Weaknesses**
- High administrative costs in terms of time and resources for applicants and public authorities
- Discouragements and discrimination of "losers"
- Demands high degree of flexibility from administration

⇒ Quality of selection procedure is decisive!

Cf. Eickelpasch/Fritsch 2005: 1275-1279
Regional Distribution of RCE Funds (2007-2013)

- Alongside parts of the Ruhr, RCE-funds cluster in the South (esp. Aachen)
- Low amount of funds in rural areas (corresponding to lower population density)
- No indication of marginalisation of less prosperous regions

RCE Funding by Region & Type of Beneficiary

- Highly varied performance across regions
- Overwhelming share of semi-public organisations and research institutions (51.5%, 30.5%)
- Low participation of private sector
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07.12.2016

Funding Contests: Share of Project Participants

- Strong clustering of project participants in selected NUTS-3 regions within and outside the Ruhr (growth objective)

Key Metrics of 25 Major Funding Contests

<table>
<thead>
<tr>
<th>Source: Own Calculations based on MWEIMH-NRW 2015</th>
</tr>
</thead>
</table>

- Linear regression model shows that **cluster contests** and **high-tech focus** are positive and significant predictors of the regional concentration funds within funding contests.

- High-tech focus is positively and significantly associated with the share of universities & research organisations.

### Coefficient of Variation [dir., Funds in NUTS-3]

<table>
<thead>
<tr>
<th>No. of Project Participants</th>
<th>Funds (€)</th>
<th>Cluster Contest</th>
<th>High-Tech Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>InnoMet.NRW</td>
<td>7.16</td>
<td>32</td>
<td>12,137,740</td>
</tr>
<tr>
<td>Create.NRW</td>
<td>4.06</td>
<td>23</td>
<td>6,181,901</td>
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<tr>
<td>WissensWirtschaft.NRW</td>
<td>3.92</td>
<td>19</td>
<td>2,123,368</td>
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<tr>
<td>Medien.NRW</td>
<td>3.54</td>
<td>38</td>
<td>7,154,285</td>
</tr>
<tr>
<td>StandortInnenstadt.NRW</td>
<td>3.35</td>
<td>18</td>
<td>6,234,598</td>
</tr>
<tr>
<td>Permed.NRW</td>
<td>3.32</td>
<td>28</td>
<td>10,583,623</td>
</tr>
<tr>
<td>Automotive.Product.NRW</td>
<td>3.14</td>
<td>47</td>
<td>13,190,891</td>
</tr>
<tr>
<td>IKT.NRW</td>
<td>3.17</td>
<td>96</td>
<td>23,832,227</td>
</tr>
<tr>
<td>FamilienUnternehmen.NRW</td>
<td>2.14</td>
<td>54</td>
<td>31,566,550</td>
</tr>
<tr>
<td>Energie.NRW</td>
<td>2.10</td>
<td>127</td>
<td>41,863,411</td>
</tr>
<tr>
<td>RegionCluster.NRW</td>
<td>2.03</td>
<td>35</td>
<td>12,606,990</td>
</tr>
<tr>
<td>Gründer.NRW</td>
<td>1.96</td>
<td>120</td>
<td>28,978,014</td>
</tr>
<tr>
<td>Technologie.NRW</td>
<td>1.90</td>
<td>40</td>
<td>7,940,533</td>
</tr>
<tr>
<td>Technologie.NRW</td>
<td>1.80</td>
<td>92</td>
<td>40,282,946</td>
</tr>
<tr>
<td>Elektro.NRW</td>
<td>1.51</td>
<td>111</td>
<td>86,663,688</td>
</tr>
</tbody>
</table>

Total (25 Contests) 33,938,932
25 Major Funding Contests: Beneficiaries

<table>
<thead>
<tr>
<th>Contest</th>
<th>No. Project Participants</th>
<th>Small Firms (%)</th>
<th>Medium-sized Firms (%)</th>
<th>Large Firms (%)</th>
<th>Universities &amp; Research Organisations (%)</th>
<th>Semi-Public (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innomet.NRW</td>
<td>32</td>
<td>6.49</td>
<td>12.87</td>
<td>6.57</td>
<td>73.09</td>
<td>0.00</td>
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<tr>
<td>Create.NRW</td>
<td>23</td>
<td>53.85</td>
<td>0.00</td>
<td>0.00</td>
<td>18.00</td>
<td>28.15</td>
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<tr>
<td>DigitalDesign.NRW</td>
<td>39</td>
<td>83.58</td>
<td>3.83</td>
<td>0.00</td>
<td>12.59</td>
<td>0.00</td>
</tr>
<tr>
<td>WissensWirtschaft.NRW</td>
<td>38</td>
<td>22.63</td>
<td>5.55</td>
<td>11.30</td>
<td>59.64</td>
<td>0.88</td>
</tr>
<tr>
<td>Medien.NRW</td>
<td>42</td>
<td>41.95</td>
<td>4.40</td>
<td>5.78</td>
<td>12.71</td>
<td>31.09</td>
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<tr>
<td>Landesentwicklung.NRW</td>
<td>18</td>
<td>3.77</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>96.23</td>
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<tr>
<td>Permed.NRW</td>
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<td></td>
<td></td>
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<tr>
<td>Energieforschung.NRW</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive Production.NW</td>
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<td></td>
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<td>DeinCore.NRW</td>
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<tr>
<td>NanoMicro.NRW</td>
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</tr>
<tr>
<td>Clean.NRW</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT.NRW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EfFo.NRW</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energie.NRW</td>
<td>127</td>
<td>5.43</td>
<td>14.45</td>
<td>27.88</td>
<td>45.59</td>
<td>6.60</td>
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<tr>
<td>RegioCluster.NRW</td>
<td>35</td>
<td>4.48</td>
<td>0.00</td>
<td>0.00</td>
<td>48.18</td>
<td>47.34</td>
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<tr>
<td>Logistic.NRW</td>
<td>120</td>
<td>13.07</td>
<td>6.12</td>
<td>12.57</td>
<td>57.44</td>
<td>10.79</td>
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<tr>
<td>Gründung.NRW</td>
<td>40</td>
<td>0.99</td>
<td>0.00</td>
<td>0.00</td>
<td>45.32</td>
<td>53.70</td>
</tr>
<tr>
<td>BesuhNrw.NRW</td>
<td>92</td>
<td>16.34</td>
<td>26.00</td>
<td>42.97</td>
<td>12.59</td>
<td>3.46</td>
</tr>
<tr>
<td>Erlebnis.NRW</td>
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<td>3.78</td>
<td>0.00</td>
<td>0.00</td>
<td>7.19</td>
<td>86.19</td>
</tr>
<tr>
<td>Share of Project Participants</td>
<td>19.10</td>
<td>8.70</td>
<td>13.70</td>
<td>42.40</td>
<td>16.20</td>
<td></td>
</tr>
<tr>
<td>Weighted Share of Funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Compared to the complete RCE-programme, universities and research organisations play an even more important role, whereas semi-public organisations are less important.
| The share of funding attracted by SMEs is rather low.

Source: Own Calculations based on MWEIMH-NRW 2015

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Funding Contests: Leading Regions

- The five leading regions account for 43.6% of all funds allocated via the major funding contests.
- Regions with major universities
  - Aachen outperforms the other leading regions considerably.
Universities in NRW

- Univ. of applied sciences
- University
- Univ. of music and the arts
- Others

Source: BMBF 2015

Distribution of Funds: Regression Model

Regional Funding Intensity
(Funds in NUTS3 / Population in NUTS3)

Share of projects allocated to the different beneficiaries:
- Small Firms
- Large Firms
- Research Institutes
- Semi-Public Organisations
- Population Density
- Research Grants
- Objective 2 Area
- GDP per Capita
**Distribution of Funds: Regression Results**

Regional Funding Intensity  
(Funds in NUTS3 / Population in NUTS3)

- (+) Research Institutes*
- (+) Semi-Public Organisations*
- (+) Research Grants***

*** = p < 0.01; ** = p < 0.05; * = p < 0.1

---

**Variables: Descriptives and Correlation Matrix**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>STD</th>
<th>Y</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>X5</th>
<th>X6</th>
<th>X7</th>
<th>X8</th>
<th>X9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y: Funding Intensity</td>
<td>91.95</td>
<td>82.14</td>
<td>1</td>
<td>-0.23</td>
<td>-0.17</td>
<td>0.48**</td>
<td>-0.05</td>
<td>0.40**</td>
<td>0.65**</td>
<td>0.04</td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>X1: Small Firms</td>
<td>16.17</td>
<td>11.39</td>
<td>0.23</td>
<td>1</td>
<td>-0.16</td>
<td>-0.09</td>
<td>-0.33*</td>
<td>-0.09</td>
<td>-0.10</td>
<td>-0.06</td>
<td>-0.13</td>
<td></td>
</tr>
<tr>
<td>X2: Large Firms</td>
<td>13.18</td>
<td>13.03</td>
<td>-0.17</td>
<td>-0.16</td>
<td>1</td>
<td>-0.24</td>
<td>-0.22</td>
<td>0.04</td>
<td>-0.21</td>
<td>-0.16</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>X3: UROs</td>
<td>19.92</td>
<td>22.75</td>
<td>0.48**</td>
<td>-0.09</td>
<td>-0.24</td>
<td>1</td>
<td>-0.61**</td>
<td>0.24</td>
<td>0.40**</td>
<td>-0.02</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td>X4: Semi Public Organisations</td>
<td>38.94</td>
<td>21.56</td>
<td>-0.05</td>
<td>-0.33*</td>
<td>-0.22</td>
<td>-0.61**</td>
<td>1</td>
<td>-0.01</td>
<td>0.32*</td>
<td>0.12</td>
<td>-0.23</td>
<td></td>
</tr>
<tr>
<td>X5: Population Density</td>
<td>1049.45</td>
<td>878.20</td>
<td>0.40**</td>
<td>-0.09</td>
<td>0.04</td>
<td>0.24</td>
<td>-0.01</td>
<td>1</td>
<td>0.29*</td>
<td>0.29*</td>
<td>0.41**</td>
<td></td>
</tr>
<tr>
<td>X6: Research Grants</td>
<td>20.301</td>
<td>0.579</td>
<td>25</td>
<td>47,972</td>
<td>954.79</td>
<td>0.65**</td>
<td>-0.10</td>
<td>-0.21</td>
<td>0.49**</td>
<td>-0.32*</td>
<td>0.29*</td>
<td>0.10</td>
</tr>
<tr>
<td>X7: Objective 2 Area</td>
<td>0.28</td>
<td>0.45</td>
<td>0.04</td>
<td>-0.06</td>
<td>-0.16</td>
<td>-0.02</td>
<td>0.12</td>
<td>0.29*</td>
<td>-0.10</td>
<td>1</td>
<td>-0.31*</td>
<td></td>
</tr>
<tr>
<td>X8: GDP per Capita</td>
<td>31,035.09</td>
<td>9136.22</td>
<td>0.30*</td>
<td>-0.13</td>
<td>0.15</td>
<td>0.27</td>
<td>-0.23</td>
<td>0.41**</td>
<td>0.39**</td>
<td>-0.31*</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

***Correlation is significant on the 0.01; *Correlation is significant on 0.05.
### Distribution of Funds: Regression Results

#### Table 6: Regression Results for the Distribution of BCE-Funds. (Source: IT NRW 2015; EUROSTAT 2015; MWEIMH-NRW 2015)\(^5,6,7\)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Beneficiaries (X(^1), X(^2))</th>
<th>Regional Variables (X(^3), X(^4))</th>
<th>Beneficiaries and Regional Variables (X(^5), X(^6))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-42.48 (74.72)</td>
<td>61.05 (37.19)</td>
<td>-15.56 (78.18)</td>
</tr>
<tr>
<td>X(^1): Small Firms</td>
<td>0.96 (1.19)</td>
<td>0.02 (0.01)</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>X(^2): Large Firms</td>
<td>0.76 (1.07)</td>
<td>1.01E-6 (0.0000)</td>
<td>9.79E-7 (0.0000)</td>
</tr>
<tr>
<td>X(^3): Universities and research organisations</td>
<td>2.83 (0.79)**</td>
<td>5.13 (23.39)</td>
<td>5.18 (23.63)</td>
</tr>
<tr>
<td>X(^4): Semi-Public Organisations</td>
<td>1.72 (0.89)*</td>
<td>-0.69 (0.00)</td>
<td>0.00 (0.00)</td>
</tr>
<tr>
<td>X(^5): Population Density</td>
<td>0.02 (0.01)*</td>
<td>0.01 (0.01)</td>
<td>0.01 (0.01)</td>
</tr>
<tr>
<td>X(^6): Research Grants</td>
<td>1.01E-6 (0.0000)**</td>
<td>9.79E-7 (0.0000)**</td>
<td>9.79E-7 (0.0000)**</td>
</tr>
<tr>
<td>X(^7): Objective 2 Area</td>
<td>5.13 (23.39)</td>
<td>5.18 (23.63)</td>
<td>5.18 (23.63)</td>
</tr>
<tr>
<td>X(^8): GDP per Capita</td>
<td>-0.69 (0.00)</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
</tr>
</tbody>
</table>

\(^5\)The table displays unstandardized coefficients and standard errors, \(^*p<0.01\), \(^*p<0.05\), \(^*p<0.10\)

#### Table 7: Descriptions \(^1\) (N=1924). (Source: IT NRW 2015; EUROSTAT 2015; MWEIMH-NRW 2015)

<table>
<thead>
<tr>
<th>Y: Regional Distribution (CV)</th>
<th>Mean</th>
<th>STD</th>
<th>Y</th>
<th>X(^1)</th>
<th>X(^2)</th>
<th>X(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X(^1): Cluster-Contest</td>
<td>0.70</td>
<td>0.46</td>
<td>0.21**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X(^2): High-Tech Focus</td>
<td>0.33</td>
<td>0.47</td>
<td>0.22**</td>
<td>0.05*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)**Correlation is significant on the 0.01 level; \(^*Correlation is significant on 0.05 the level.

#### Table 8: Regression Results for Regional Distribution of Projects in Funding Contexts. (Source: IT NRW 2015; EUROSTAT 2015; MWEIMH-NRW 2015)\(^8,9\)

<table>
<thead>
<tr>
<th>Dependent Variable: Regional Distribution (VC)</th>
<th>Properties of Funding Context (X(^1), X(^2))</th>
<th>Coefficient (Standard Errors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.18 (0.03)**</td>
<td></td>
</tr>
<tr>
<td>X(^1): Cluster-Contest</td>
<td>0.34 (0.04)***</td>
<td></td>
</tr>
<tr>
<td>X(^2): High-Tech Focus</td>
<td>0.36 (0.04)***</td>
<td></td>
</tr>
</tbody>
</table>

\(^8\)The table displays unstandardized coefficients and standard errors, \(^*p<0.01\), \(^*p<0.05\), \(^*p<0.10\)
Distribution of Funds: Stakeholder Perspective

- **Funding criteria** (esp. requirement on consortia) and **level of public policy interference** explain distribution of funds
  - Highly specific and demanding funding criteria: Top-down nature; high-tech-bias
  - Dispersed actors in non-universities localities may lack the necessary prerequisites
  - Lower transaction costs in high-tech-regions with technologically specialized universities (existing spin-offs, regional networks)

Stakeholder Perspective: Process & Timing

- **Timing of contests**: Explains concentration of funds
  - Call: Tender for projects
  - Building of consortia
  - Submitting project outlines
  - Jury decision
  - Approval stage
  - Formal decision
  - 3 months
  - 6 months
  - 6 months

- **Duration of the procedure**: first-mover advantages lost
  - Short period of time available for building consortia
  - Rather than 6 months, the approval stage took 417 days on average (Burkert et al. 2013b, p. 10)
  - Main cause for delay: Complex assessment for **funding eligibility**, esp. compatibility with **EU laws on state aid**
  - Administrative complexity = strain on SMEs
NRW Funding Administration Architecture

Monitoring Committee (Begleitausschuss)
Leading personalities from ministries, parliament, regions, associations and universities

NRW Funding Administration Architecture

**Administrative Authority**

- NRW Ministry for the Economy, Energy, Manufacturing, SMEs and Crafts
- Objective 2 Office (Ziel 2-Sekretariat)
- Quality Management (NRW.Bank)
- Disbursing Authority (NRW.Bank)
- Legal Appraisal (NRW Ministry of Finance)

**Ministerial Divisions (Fachreferate)**
Intermediaries

- Executive Intermediaries
- Approving agencies, e.g., district governments (Bezirksregierungen), NRW.Bank, etc.

**Recipients**

Source: Translated from Burkert et al. 2013a, p. 28

Competitive Funding in North Rhine-Westphalia: A Novel Delivery System for Cluster Policies
MOC Affiliate Faculty Research Workshop • Harvard Business School • December 7th, 2016

NRW Funding Administration Architecture

Why so complex?

- **Legal environment** (esp. EU laws on state aid)
- **Economics of bureaucracy** (Williamson, Niskanen; cf. Kiese/Wrobel 2011)

Conclusion

- Specific features of funding contests and regional science infrastructure explain regional distribution of funds
  - Structurally weak sub-regions are not systematically disadvantaged
  - Cluster contests, High-Tech-Orientation, Research Institutes** = Regional concentration in regions with high-performing universities
  - Target precision / participation: Share of private sector low, esp. SMEs
  - Timing and complexity of funding contests
  - Lack of existing networks of small firms (spin-offs), universities and semi-public organisations in non-university sub-regions (policy blind spot?)

- High administrative burden and time-consuming procedure
  - Established consortia of universities and large firms advantaged
  - Universities welcome ERDF as another source of third party funding
  - Legal and administrative simplification needed to increase share of SMEs and to allow for the formation of new network ties, but needs law of ever-expanding bureaucracy to be overcome
Policy Implications & Discussion

- **Recommendations**
  - Accommodate **regional diversity** to facilitate participation (Tödtling/Tripl 2005)
  - More **inclusive** approach, less restrictive criteria supporting process of local self-organisation
  - More **flexible timing** of contests
  - Fostering **absorptive capacities** in lagging regions (universities?)
  - Rethinking innovation: high-tech ⇒ focus social aspects?

- **Discussion: Key driver of economic restructuring** is the entrepreneurial discovery process
  - Bottom-up, trial and error, experiment-based process: Pro-active involvement of entrepreneurial actors necessary
  - Entrepreneurial actors may include universities and quasi-public institutions particularly in regions where industry structures and entrepreneurial capabilities are weak (cf. Foray et al. 2012)

References (1/3)


References (2/3)


References (3/3)


Title Images
http://www.dortmund.de/de/wirtschaft/start_wes [28.07.2015]