Spatial Distribution and Dynamics of innovation-related Employment in Germany

REAL CORP 2011

Change for Stability: Lifecycles of Cities and Regions

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Background Spatial Distribution and Dynamics of innovation-related Employment in Germany
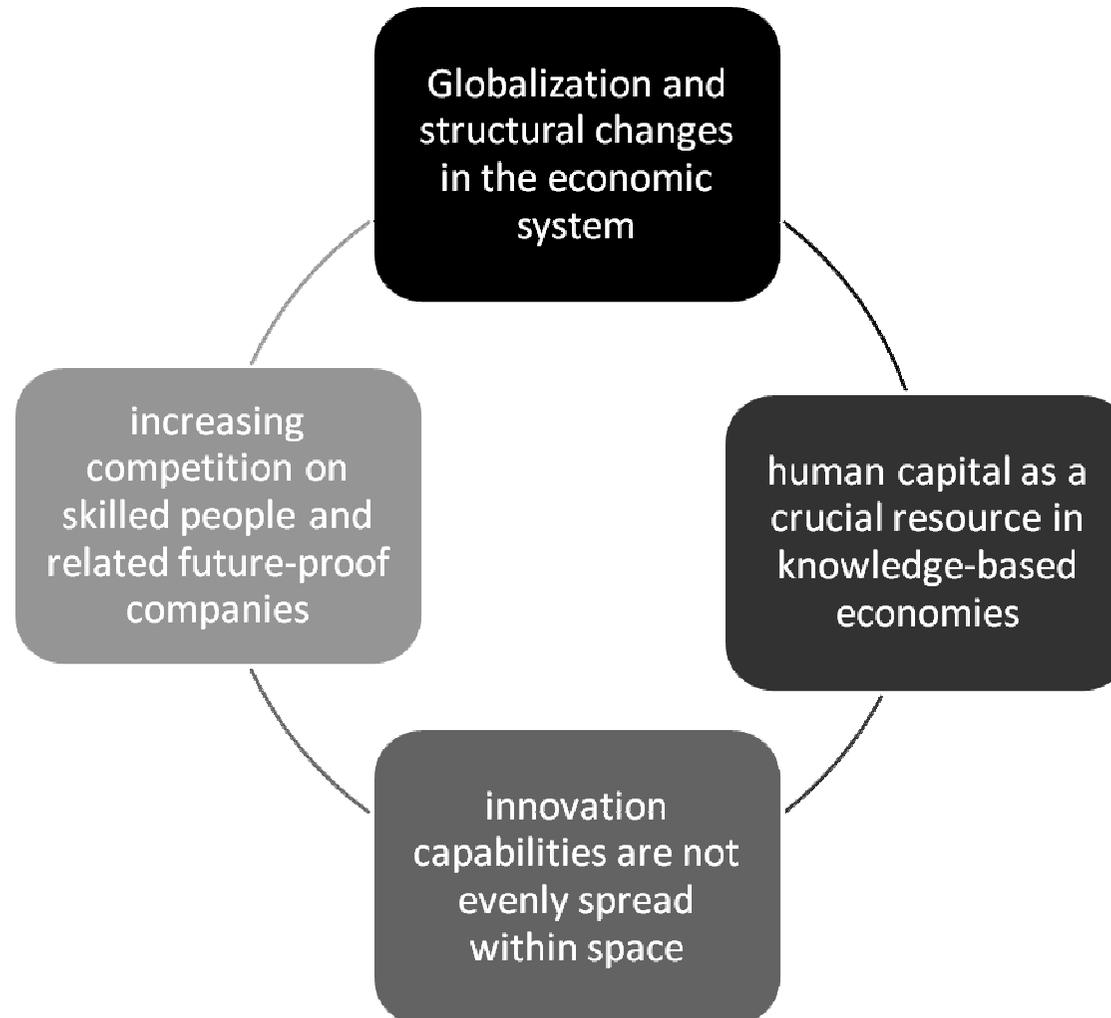
Innovation-related Employment in Germany

Questions:

To what extent is there a **concentration of innovation-related employment** in Germany? Where are the **main centres of innovative activity**?

What about **rural areas**? Do there exist **large-scale disparities** within Germany?

Which **trends** can be observed concerning innovation-related employment - regional convergence or divergence?

Innovations as a driving force of economic development

"In Germany, the proportion of value-added products and services based on research is higher than in any other industrialized country. The export of technological goods makes up one fifth of our country's economic output. **Hence, research and development are very important to the economic power and economic growth in Germany."**

Annette Schavan,
German Federal Minister for Education and Research

Federal Ministry
of Education
and Research

Federal Report on Research
and Innovation 2010
Abstract

RESEARCH   Igniting ideas !

Innovations as a driving force of economic developement

Lisbon-Strategy/ Europe 2020
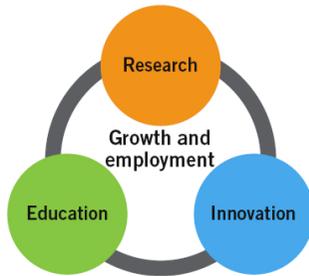
Source: RTD Info 06/2007

High-Tech Strategy 2020 for Germany

Spatial Planning and Regional Policy

Source: BMBF

Theoretical Framework and empirical studies focus on agglomerations

- evolutionary theory (Nelson/Winter 1982; Dosi et al. 1988),

- creative milieus (Camagni 1991),

- learning regions (Florida 1995; Asheim 1996),

- clusters (Porter 1990),

- regional innovation systems (Cooke 2001)

agglomeration economies

face-to-face contacts

„local buzz and global pipelines"

spatially bounded knowledge spillovers

routines, trust and local networks

Theory emphasises the role of geographical proximity and the concentration of different innovation-related actors

transaction costs

transfer of tacit knowledge

risk reduction

Theory
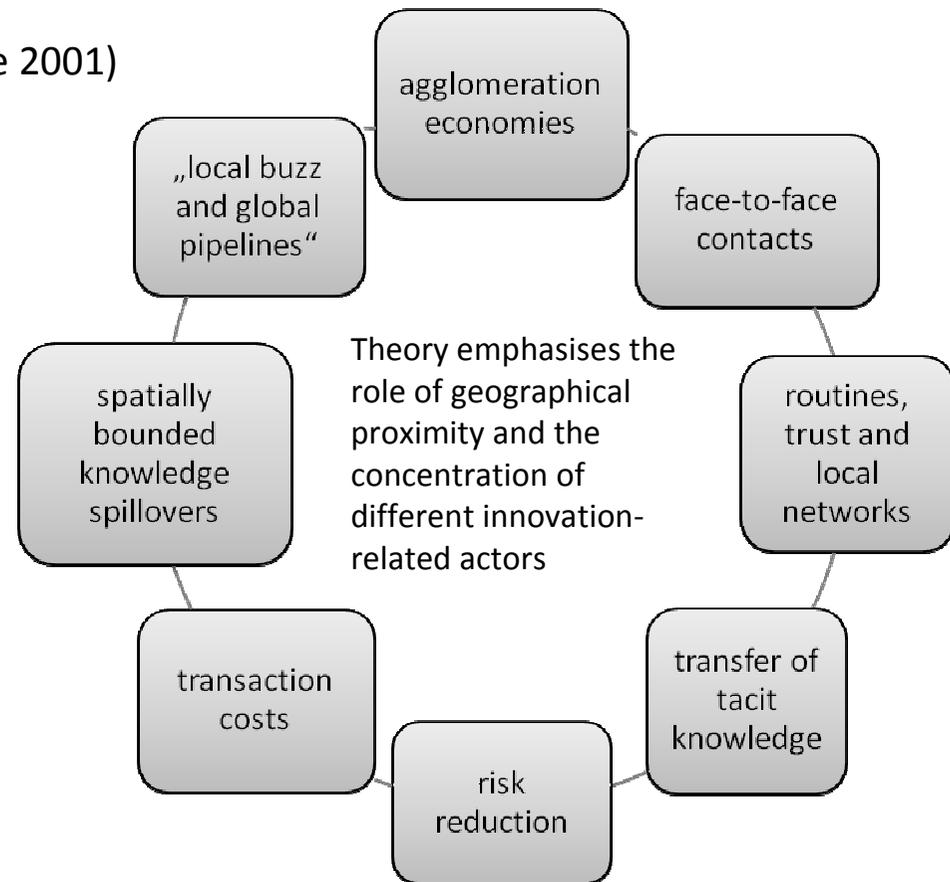
Distribution of innovation-related Employment

Lorenz curve
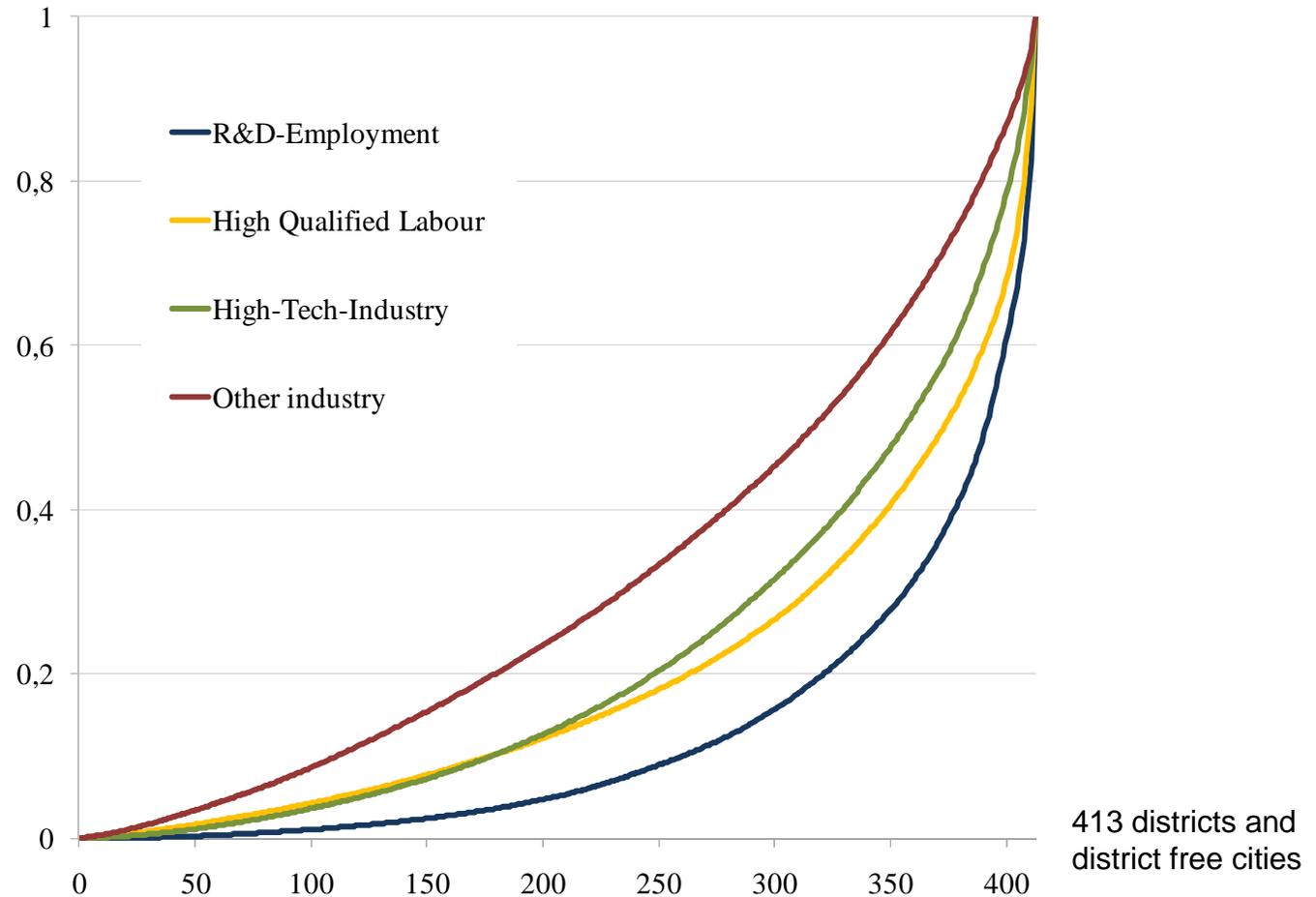
Legend:
- R&D-Employment
- High Qualified Labour
- High-Tech-Industry
- Other industry

413 districts and district free cities

Data Source: Bundesagentur für Arbeit and Stifterverband der Deutschen Wissenschaft

Empirical Findings

Distribution of R&D-Workers 2007 (absolute numbers)

Distribution of total Workforce

11,8

11,4

37,9

38,9

6,2

5,7

46,1

42,0

- Core cities
- Urbanised surroundings
- Rural surroundings
- Rural areas
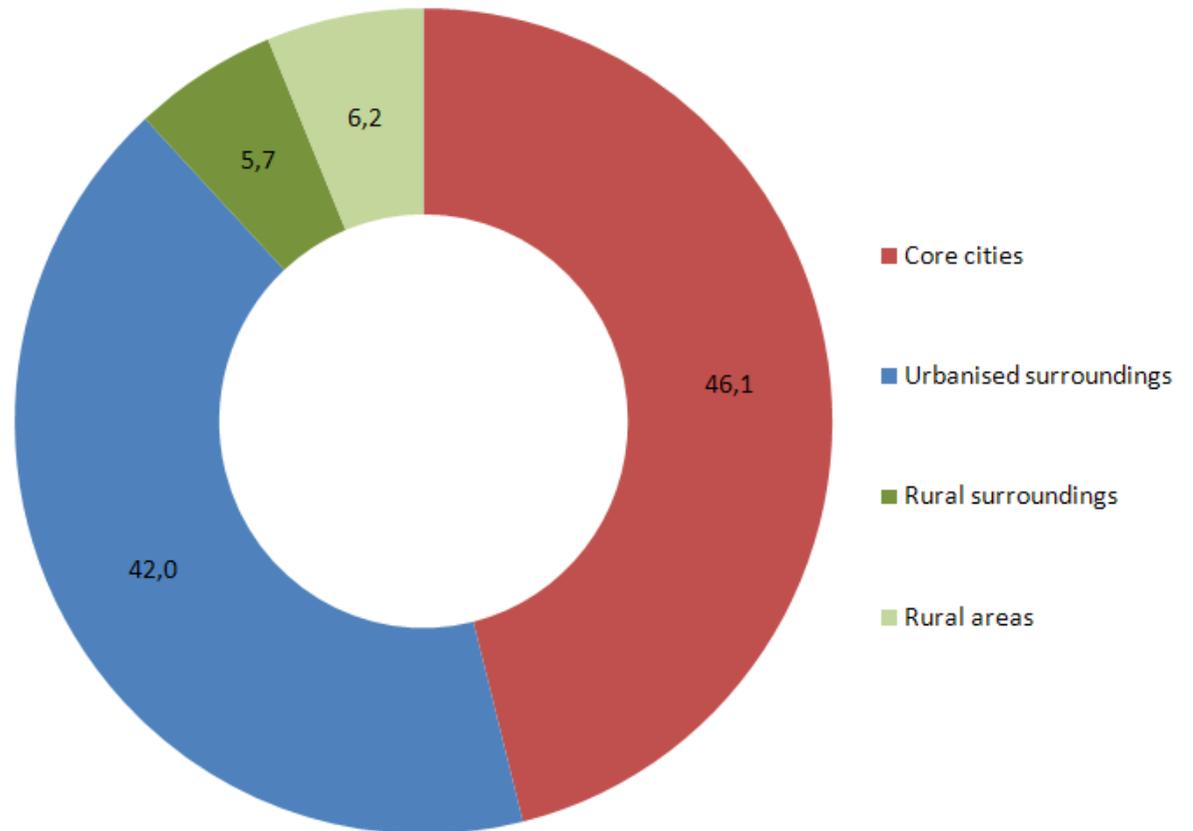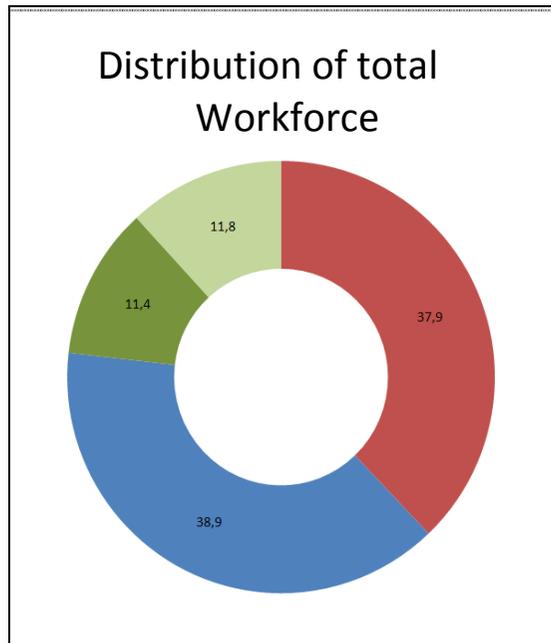
50 % of the R&D staff is concentrated in just about 24 of the 413 overall districts.

Data Source: Stifterverband der Deutschen Wissenschaft

Empirical Findings

Distribution of R&D-Workers 2007 (relative numbers)

Category	Value
Rural areas	6,3
Rural surroundings	6,0
Urbanised surroundings	12,8
Core cities	14,4

Data Source: Stifterverband der Deutschen Wissenschaft

Empirical Findings
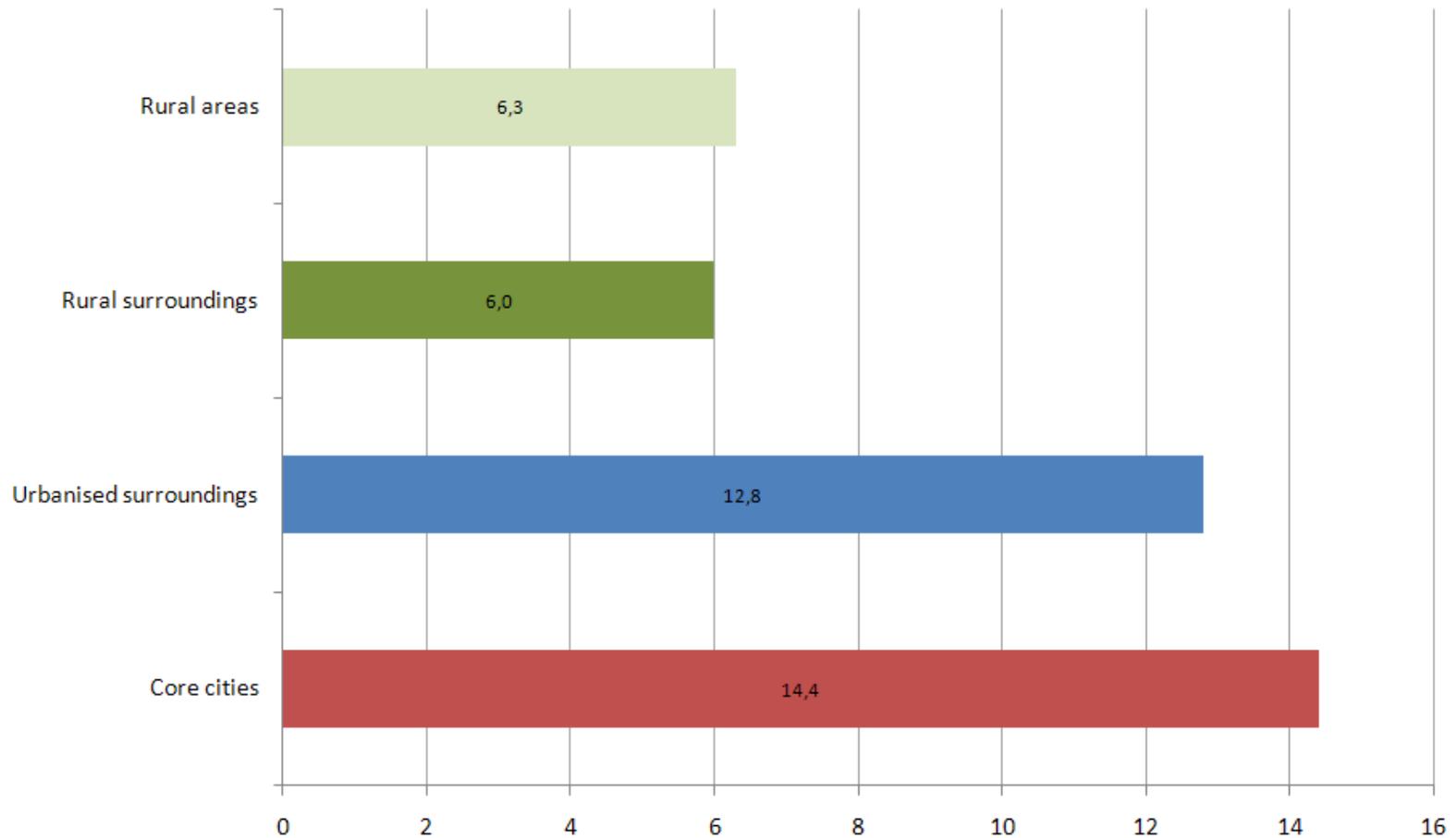
Share of R&D personnel
per 1.000 employees subject to social insurance contributions, 2007

settlement types

Legend (settlement types):
- core cities
- urban surroundings
- rural surroundings
- rural areas

Legend (R&D personnel):
- 0 to under 5 per mille
- 5 to under 10 per mille
- 10 to under 15 per mille
- more than 15 per mille

Data Source: Stifterverband der Deutschen Wissenschaft

Empirical Findings
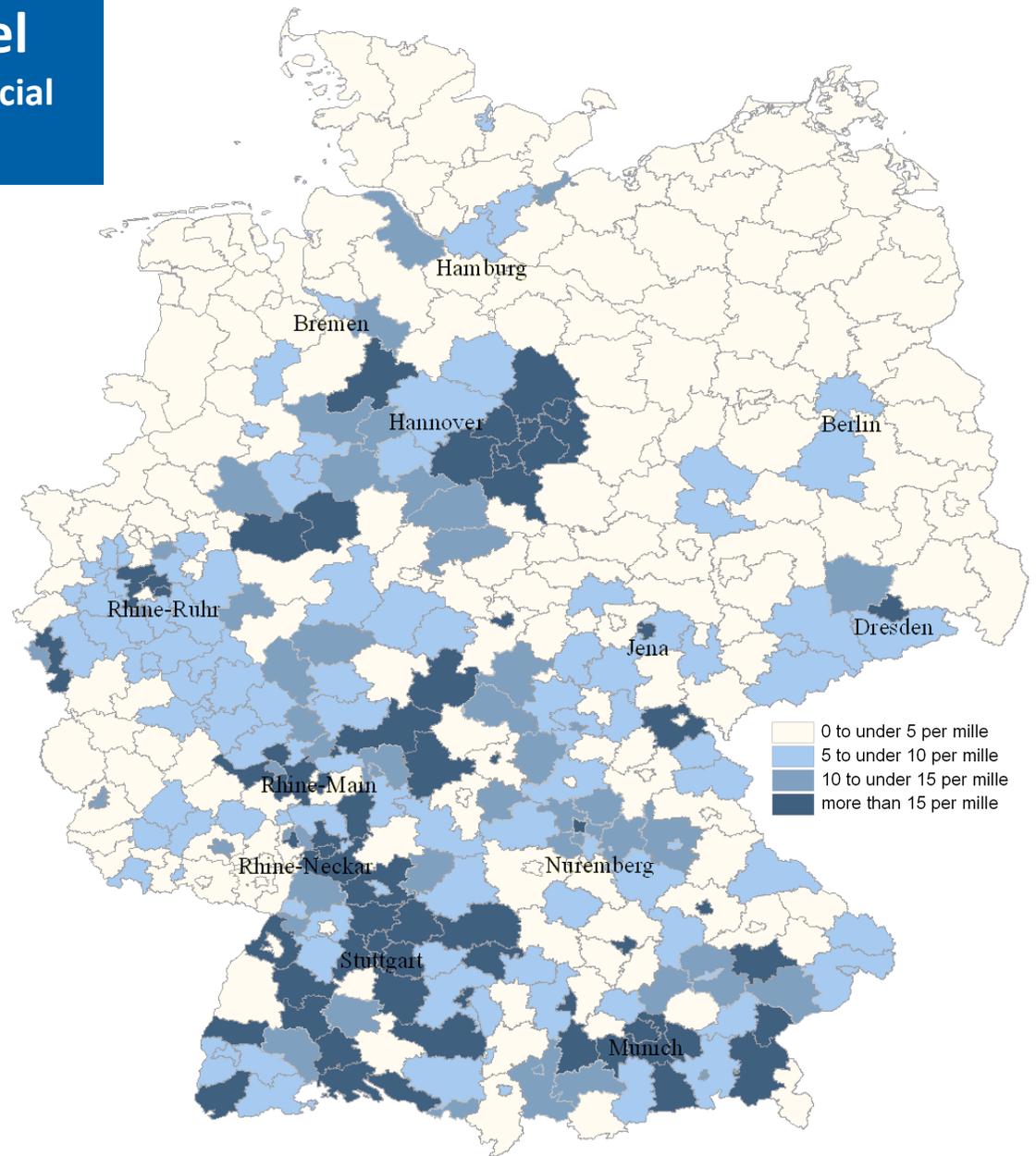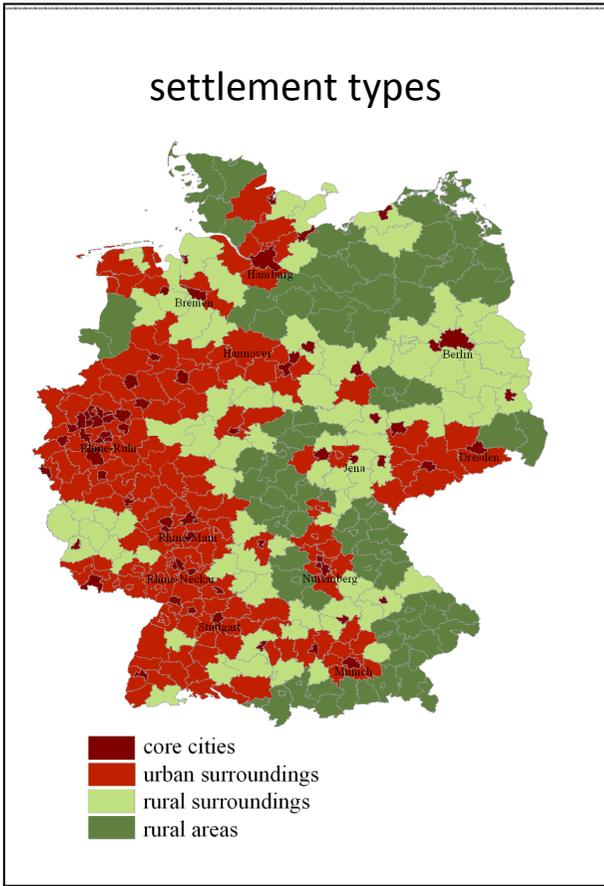
What about rural areas?

While big agglomerations usually cover various technological fields most rural districts and even regions show a relatively strong dependence on single branches or even firms.

Rural surroundings and Rural areas featuring high R&D-intensities are…
- nearly all located in the western part of Germany
- feature higher densities
- are situated in the direct surroundings of agglomerations or urbanised areas
- benefit from large-scale cluster structures or spillover effects
- developed their own innovative clusters
- are home to headquarters or main research centres of a dominant of firm

Rural surroundings and Rural areas featuring low R&D-intensities are…
- located in the eastern part or more peripheral parts of Germany
- feature lower densities

R&D personnel (per 1.000 employees subject to social insurance contributions, change 2003-2007 in %)

Settlement Type	West/East	Share of R&D personnel 2003	Share of R&D personnel 2007	2003 – 2007 (%)
Core cities	West	16,2	15,9	-2,8
	East	9,0	8,8	-2,7
Urbanised surroundings	West	11,0	13,4	22,5
	East	3,8	4,9	23,0
Rural surroundings	West	7,9	7,3	-6,8
	East	3,1	3,6	13,5
Rural areas	West	6,2	7,6	24,5
	East	2,8	3,8	28,6

Data Source: Stifterverband der Deutschen Wissenschaft

Empirical Findings

Typification of German districts (R&D employment and highly qualified workers)

a) Proportion (2007) of R&D employment and highly qualified workers above or below German average?

b) Development (between 2003 and 2007) of R&D employees and highly qualified workers above or below German average?

This leads to the following typification of German districs in each case for both R&D and highly qualified staff:

1) Leading districts (above-average proportion and above-average development)
2) Matured districts (above-average proportion and below-average development)
3) Catching-up districts (below-average proportion and above-average development)
4) Lagging districts (below-average proportion and below-average development)

Typification of German districts (R&D employment and highly qualified workers)

R&D employment

highly qualified workers
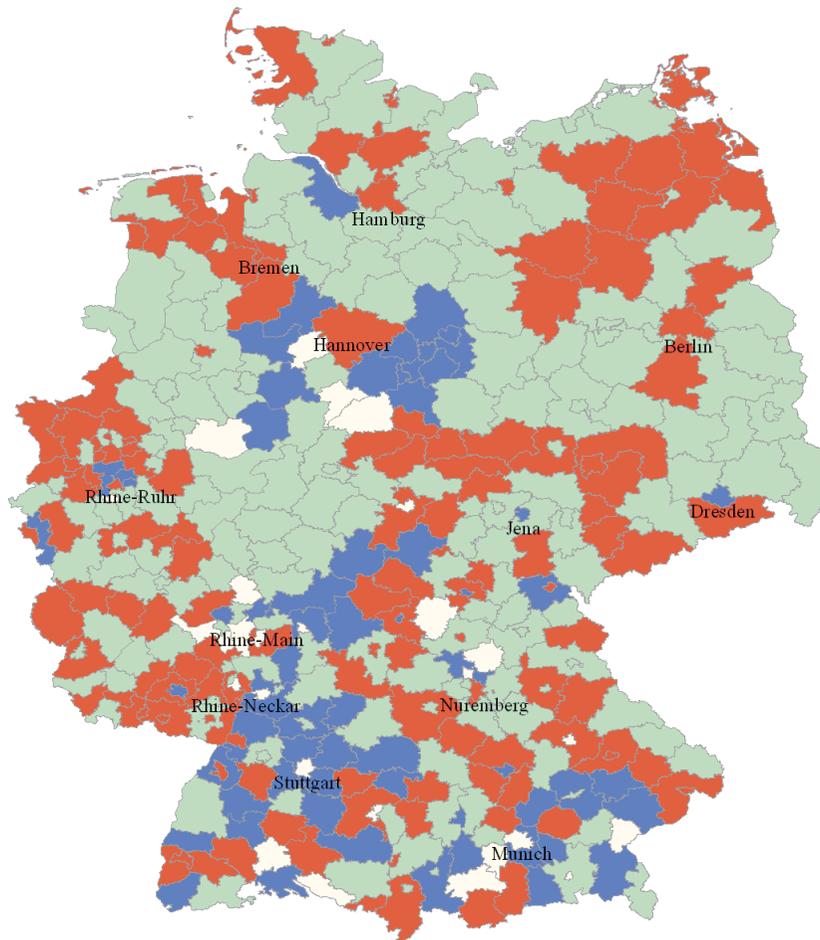
Leading districts Matured districts Catching-up districts Lagging districts
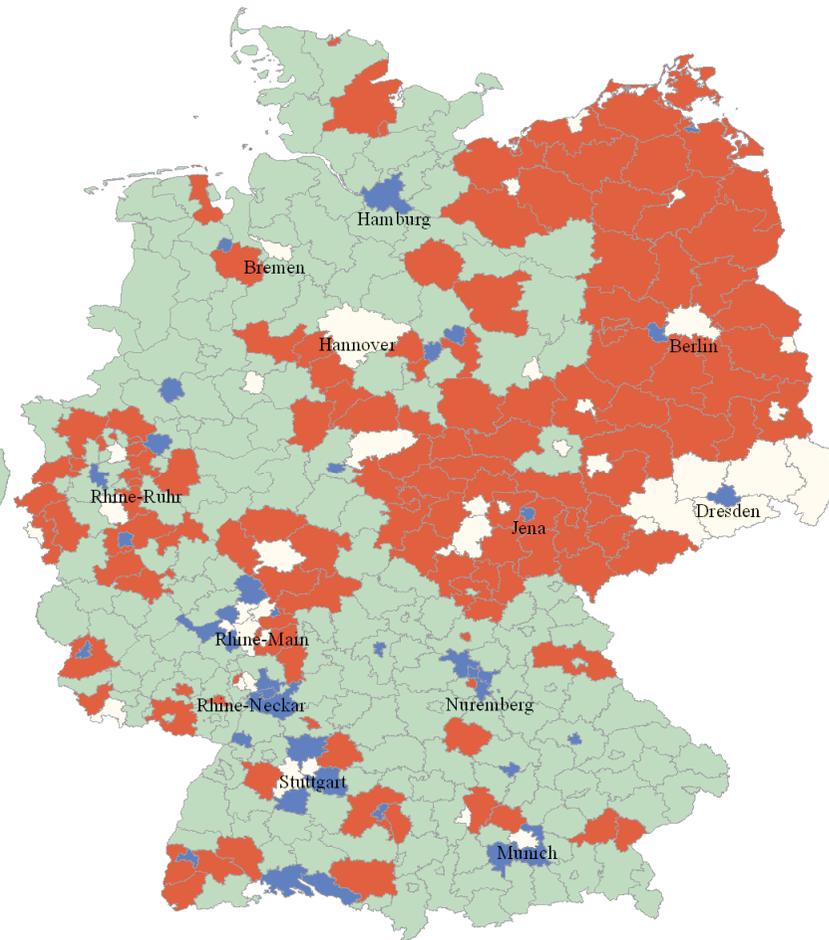
Empirical Findings

Conclusion

Critical Remarks

- Innovation-related Employment: Input factor

- Incremental Innovations (in Low-Tech-Sectors)

- other determinants of the innovation process

Role of Regional Policy

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Development of high-qualified jobs (settlement types, 1999-2007, 1999 = 100)

core cities   urbanised surroundings   rural surroundings   rural areas
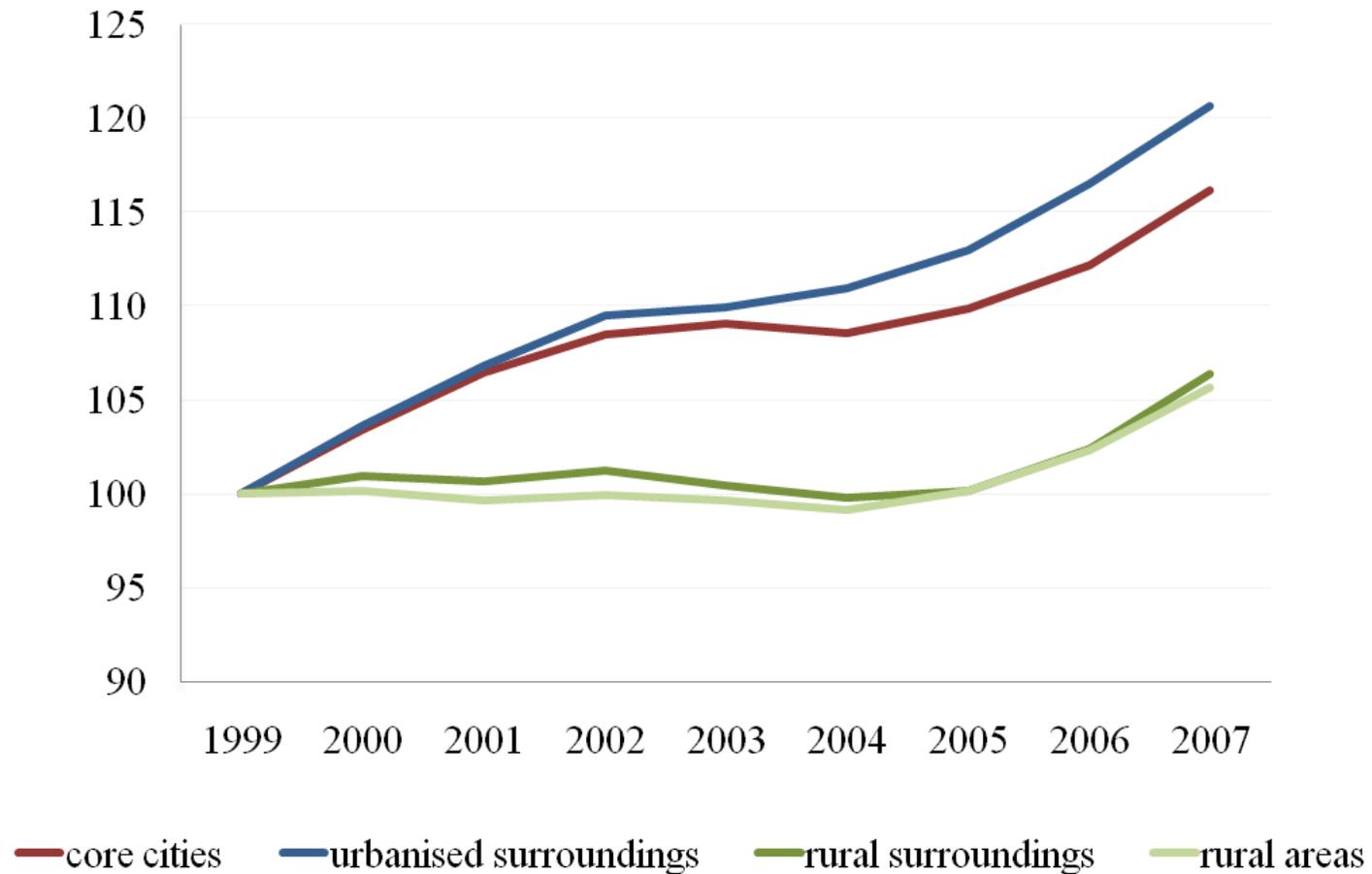
Data Source: Bundesagentur für Arbeit and Stifterverband der Deutschen Wissenschaft

Development of high-qualified jobs (West/East, settlement types, 1999-2007, 1999 = 100)
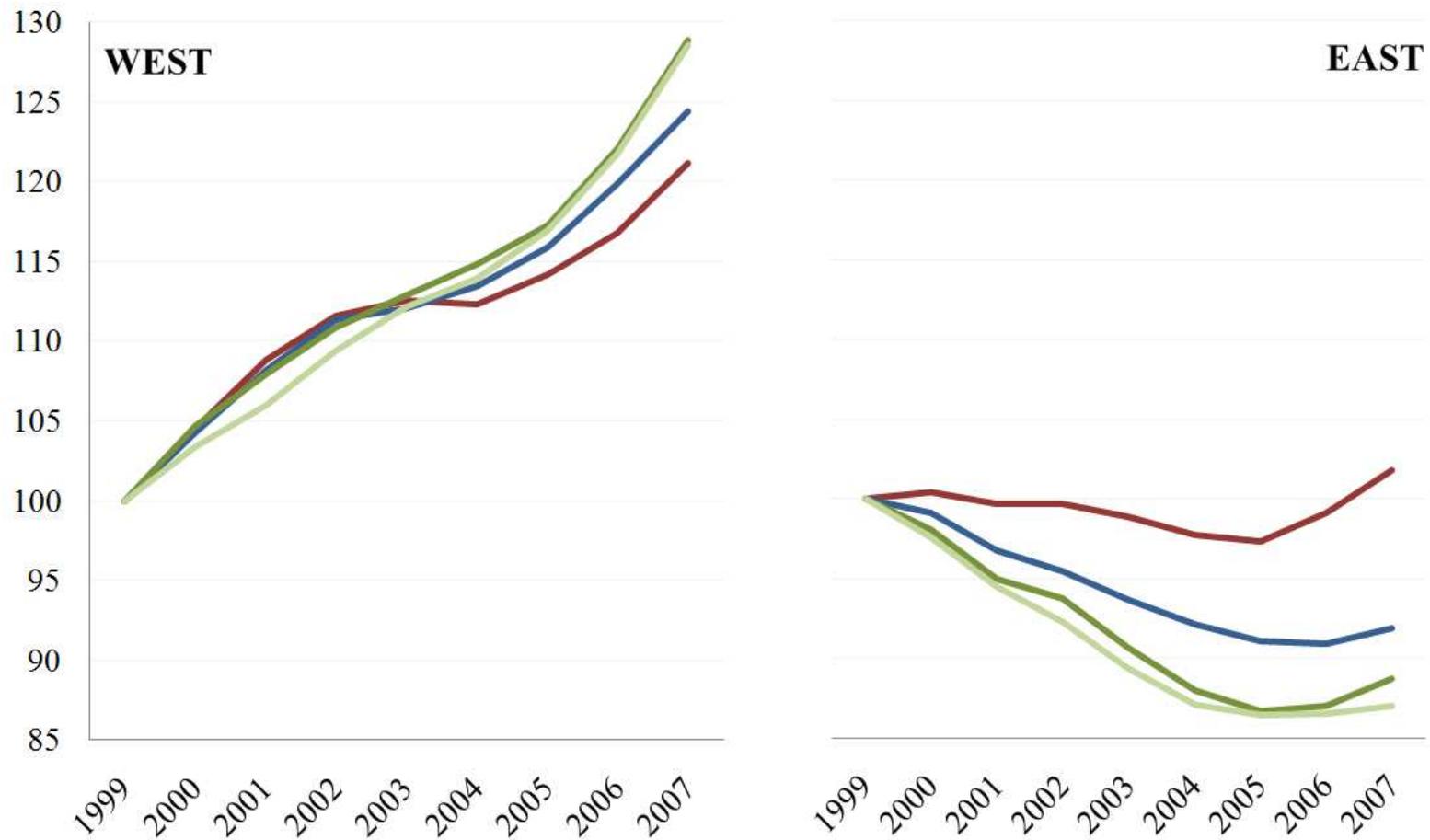
Data Source: Bundesagentur für Arbeit and Stifterverband der Deutschen Wissenschaft

Settlement Type	Distribution R&D absolute (%)	distribution High-qual. absolute (%)	distribution total workforce (%)	shares of R&D employees (per mille)	shares of High-qual. employees (%)	shares of research-int. Industry (%)	Locali-sation quotient R&D	Locali-sation quotient High-qual
Core cities	46,07	53,18	37,94	14,39	13,85	9,9	1,21	1,40
Urbanised surroundings	41,97	31,97	38,92	12,78	8,11	13,3	1,08	0,82
Rural surroundings	5,73	7,12	11,36	5,98	6,19	10,1	0,50	0,63
Rural areas	6,23	7,73	11,77	6,28	6,49	10,6	0,53	0,66

Data Source: Bundesagentur für Arbeit and Stifterverband der Deutschen Wissenschaft