

SECTION I: INTRODUCTION TO THE SUBJECT**1. Networks in Innovation Research and Innovation Policy –
An Introduction***Knut Koschatzky*

| | | |
|-----|---|----|
| 1.1 | Introduction | 3 |
| 1.2 | Theoretical Aspects of Innovation Networks | 5 |
| 1.3 | Innovation Networking in Europe: Some Empirical Evidence | 9 |
| 1.4 | Promotion of Innovation Networking by Innovation and Technology Policy | 10 |
| 1.5 | Structure and Objectives of this Volume | 16 |
| 1.6 | References | 20 |

2. Innovation by Networking: An Economic Perspective*Michael Fritsch*

| | | |
|-----|--|----|
| 2.1 | Introduction | 25 |
| 2.2 | Impediments to a Division of Innovative Labour | 25 |
| 2.3 | What is a "Network"? | 27 |
| 2.4 | Advantages of Network Relationships | 28 |
| 2.5 | Conclusions and Policy Implications | 32 |
| 2.6 | References | 33 |

**SECTION II: KNOWLEDGE AND LEARNING IN INNOVATION
NETWORKS****3. Knowledge, Innovation Processes and Regions***Emmanuel Muller*

| | | |
|-----|--------------|----|
| 3.1 | Introduction | 37 |
|-----|--------------|----|

| | | |
|-----|--|----|
| 3.2 | From Knowledge to Regions: a Theoretical Overview | 37 |
| 3.3 | An Illustration of the Influence of Spatial Patterns on Knowledge Interactions | 44 |
| 3.4 | Conclusion: Research and Policy Agenda | 48 |
| 3.5 | References | 49 |

4. Innovation Processes and the Role of Knowledge-Intensive Business Services (KIBS)

Simone Strambach

| | | |
|-----|---|----|
| 4.1 | Introduction | 53 |
| 4.2 | What Are Knowledge-Intensive Services (KIBS)? – Some Remarks about the Definition | 53 |
| 4.3 | Changing Perspective on Innovation and the Firm – Towards a Systemic Understanding of Innovation | 56 |
| 4.4 | Spatial Dimension: Growth Features of KIBS in Europe – National, Regional, Functional, and Sectoral Diversity | 56 |
| 4.5 | The Contribution of KIBS to Innovation within National and Regional Innovation Systems: Direct and Indirect Effects | 60 |
| 4.6 | Conclusions – Some Implications for Innovation Policy | 66 |
| 4.7 | References | 67 |

5. Institutions of Technological Infrastructure (ITI) and the Generation and Diffusion of Knowledge

Antoine Bureth, Jean-Alain Héraud

| | | |
|-----|--|----|
| 5.1 | Introduction | 69 |
| 5.2 | An Endogenous Approach to the Local Dimension, Based on Learning Processes | 70 |
| 5.3 | The Structure of Knowledge | 75 |
| 5.4 | Managing the Institutional Landscape of the Regions: the Functional Approach of the ITIs | 79 |
| 5.5 | Conclusion | 89 |
| 5.6 | References | 90 |

6. Innovative Links between Industry and Research Institutes – How Important Are They for Firm Start Ups in the Metropolitan Regions of Barcelona, Vienna and Stockholm?

Javier Revilla Diez

| | | |
|-----|--|-----|
| 6.1 | Introduction | 93 |
| 6.2 | Data Base - The European Regional Innovation Survey (ERIS) | 94 |
| 6.3 | Empirical Analysis | 96 |
| 6.4 | Conclusion | 106 |
| 6.5 | References | 107 |

SECTION III: INNOVATION NETWORKS IN TRANSITION

7. Implementation of a Network Based Innovation Policy in Central and Eastern European Countries – Slovenia as an Example

Günter H. Walter

| | | |
|-----|--|-----|
| 7.1 | Introduction | 111 |
| 7.2 | Strategy: Bottom-Up, Endogenous Growth | 112 |
| 7.3 | Creation of Networks in Central and Eastern Europe | 115 |
| 7.4 | FhG-ISI Scheme of Transfer of Institutional Know-How | 121 |
| 7.5 | German Transitional Assistance for Slovenia | 122 |
| 7.6 | Looking Ahead | 124 |
| 7.7 | References | 125 |

8. Innovation Networking in a Transition Economy: Experiences from Slovenia

Knut Koschatzky, Ulrike Bross

| | | |
|-----|---|-----|
| 8.1 | Problems of System Transformation and of the Development of Innovation Networks in Slovenia | 127 |
| 8.2 | Basic Data | 130 |
| 8.3 | Co-Operation Patterns of Slovenian Companies | 133 |

| | | |
|-----|--|-----|
| 8.4 | Types of Co-Operation | 138 |
| 8.5 | Spatial Reach of Co-Operation Relationships | 139 |
| 8.6 | Innovation Co-Operation with Companies from the Point of View of Research Institutions | 141 |
| 8.7 | Summary and Conclusions for Innovation Policy | 147 |
| 8.8 | References | 150 |

9. Integration through Industrial Networks in the Wider Europe: An Assessment Based on Survey of Research

Slavo Radosevic

| | | |
|-----|--------------------------------|-----|
| 9.1 | Background | 153 |
| 9.2 | Financial Integration | 155 |
| 9.3 | Trade Integration | 156 |
| 9.4 | Foreign Direct Investments | 158 |
| 9.5 | Non-Equity Production Networks | 161 |
| 9.6 | Industry Studies | 164 |
| 9.7 | Firm Studies | 167 |
| 9.8 | Conclusions | 168 |
| 9.9 | References | 169 |

10. East German Industrial Research: Improved Competitiveness through Innovative Networks

Franz Pleschak, Frank Stummer

| | | |
|------|---|-----|
| 10.1 | Formulation of the Problem | 175 |
| 10.2 | Requirements of Innovation Activity | 175 |
| 10.3 | Joint Operation of Innovative Potential in Networks | 178 |
| 10.4 | Final Remarks | 187 |
| 10.5 | References | 188 |

11. Innovation Networks and Regional Venture Capital Companies in Germany – Experiences for Central and Eastern European Countries

Marianne Kulicke

| | | |
|------|---|-----|
| 11.1 | Introduction | 191 |
| 11.2 | Transaction Costs and the Venture Capital Market | 193 |
| 11.3 | The Role of Regional Venture Capital Companies in Germany | 194 |
| 11.4 | Integration of Regional Venture Capital Companies into Innovation Networks | 198 |
| 11.5 | Conclusions from German Experience which Is Relevant for Transition Countries | 201 |
| 11.6 | References | 203 |

SECTION IV: INNOVATION NETWORKS AND REGIONAL INNOVATION POLICY

12. Innovation, Interaction and Regional Development: Structural Characteristics of Regional Innovation Strategies

Andrea Zenker

| | | |
|------|---|-----|
| 12.1 | Introduction | 207 |
| 12.2 | Regional Innovation Systems | 208 |
| 12.3 | Regional Innovation Initiatives – Concepts, Strategies, and Elements of Success | 211 |
| 12.4 | Conclusion | 218 |
| 12.5 | References | 219 |

13. Innovation Networks and Industrial Research in the New Federal States: Perspectives of Economy and Structural Policy

Herbert Berteit

| | | |
|------|---------------------|-----|
| 13.1 | Introduction | 223 |
| 13.2 | Innovation Networks | 225 |

| | |
|---|-----|
| 13.3 Statistical Indicators for Innovation Networks | 235 |
| 13.4 Perspectives of Economic and Structural Policy | 238 |
| 13.5 References | 241 |

14. Innovation Networks and Regional Policy in Europe

Mikel Landabaso, Christine Oughton, Kevin Morgan

| | |
|--|-----|
| 14.1 Introduction: Innovation and Regional Policy | 243 |
| 14.2 Regional Innovation Systems and Learning Regions | 247 |
| 14.3 RIS: Towards Collective Learning in Less Favoured Regions | 256 |
| 14.4 The Impact of RIS Projects | 261 |
| 14.5 Conclusions | 269 |
| 14.6 References | 270 |

| | |
|-----------------------------|------------|
| List of Contributors | 275 |
|-----------------------------|------------|

| | |
|--------------|------------|
| Index | 277 |
|--------------|------------|

List of Figures

Page

| | | |
|-------------|--|-----|
| Figure 1-1: | Regional innovation networks..... | 8 |
| Figure 3-1: | The pyramid of knowledge..... | 39 |
| Figure 3-2: | The chain-linked model..... | 40 |
| Figure 3-3: | A context of expanding knowledge..... | 41 |
| Figure 3-4: | The surveyed regions..... | 45 |
| Figure 3-5: | The wheel of knowledge interactions involving KIBS and SMEs | 46 |
| Figure 4-1: | Common characteristics of knowledge intensive business services..... | 54 |
| Figure 4-2: | Share of business service employment in total employment in Europe 1996 | 57 |
| Figure 4-3: | Share of business services in total service employment in European regions 1996..... | 59 |
| Figure 4-4: | Contribution of KIBS firms in innovation systems..... | 60 |
| Figure 4-5: | Knowledge production and knowledge diffusion in the interaction process of business services and their clients..... | 64 |
| Figure 5-1: | Possible actions of ITI..... | 80 |
| Figure 8-1: | General map of the Republic of Slovenia | 128 |
| Figure 8-2: | Co-operation with different partners according to employment size-classes and export shares | 135 |
| Figure 8-3: | Innovative co-operation with external partners according to input factors | 137 |
| Figure 8-4: | Spatial reach of co-operation relationships of Slovenian companies..... | 139 |
| Figure 8-5: | Kinds of co-operative relationships of research institutes with firms | 144 |
| Figure 8-6: | Kind of co-operative relationships with firms according to type of institute..... | 145 |
| Figure 8-7: | Spatial pattern of research co-operation according to type of institute..... | 146 |

| | | |
|--------------|---|-----|
| Figure 8-8: | Spatial pattern of firm co-operation according to type of institute | 147 |
| Figure 11-1: | Regional orientation and profit orientation of investors on the German venture capital market | 196 |
| Figure 13-1: | Networks dominated by companies | 227 |
| Figure 14-1: | The Networked Economy..... | 247 |
| Figure 14-2: | A fragmented regional innovation system: less favoured regions | 249 |
| Figure 14-3: | A learning region: An efficient regional innovation system | 254 |

List of Tables

Page

| | | |
|-------------|---|-----|
| Table 1-1: | Characteristics of RITTS and RIS projects | 14 |
| Table 6-1: | Metropolitan innovation survey | 95 |
| Table 6-2: | Year of foundation of the questioned industrial companies | 95 |
| Table 6-3: | Composition of the interviewed plants according to industrial sector | 96 |
| Table 6-4: | Technology areas of the interviewed industrial companies | 97 |
| Table 6-5: | Characteristics of the interviewed industrial companies | 98 |
| Table 6-6: | Sources of information for the realisation of product innovations | 99 |
| Table 6-7: | Co-operation links shown by the industrial companies interviewed | 100 |
| Table 6-8: | Co-operation relationships according to the different stages of an innovation process - Vienna | 101 |
| Table 6-9: | Co-operation relationships according to the different stages of an innovation process - Barcelona..... | 102 |
| Table 6-10: | Co-operation relationships according to the different stages of an innovation process - Stockholm | 103 |
| Table 6-11: | Reach of the interviewed companies' co-operative links | 104 |
| Table 6-12: | Regional turnover distribution of the interviewed industrial companies..... | 105 |
| Table 6-13: | Reach of co-operative links between the interviewed industrial companies and research institutions..... | 105 |
| Table 8-1: | Composition of the industrial survey according to branches..... | 131 |
| Table 8-2: | Composition of the industrial survey according to size classes | 132 |
| Table 8-3: | Composition of the sample according to types of research institutes | 133 |
| Table 8-4: | Co-operation partners according to branches | 136 |

| | | |
|-------------|--|-----|
| Table 8-5: | Intensity of research institutes' co-operation with firms and other partners | 143 |
| Table 10-1: | Frequency of contacts between the technology centre of Thuringia and other technology actors | 180 |
| Table 10-2: | Advantages of working in innovative networks | 181 |
| Table 10-3: | Frequency of R&D co-operation between companies and institutions and other innovative actors | 184 |
| Table 10-4: | Frequency of areas of R&D co-operation | 185 |
| Table 10-5: | Pre-requisites for the successful performance of innovative networks | 186 |
| Table 13-1: | Total R&D expenditure and R&D personnel of the companies in 1993 and in 1995, according to selected economic branches and to the companies' headquarters | 232 |
| Table 14-1 | Ten structural factors affecting the Regional Innovation Systems in LFRs..... | 250 |
| Table 14-2: | Member States and their regions involved in the RIS action | 257 |
| Table 14-3: | Most common RIS generated action in order of priority | 263 |

Abbreviations

| | |
|---------|---|
| BAV | Business Angels Venture |
| BJTU | Beteiligungskapital für junge Technologieunternehmen (Business Investment Capital for New Technology-Based Firms) |
| BMBF | Bundesministerium für Bildung und Forschung (Federal Ministry for Education and Research) |
| BVK | Bundesverband deutscher Kapitalbeteiligungsgesellschaften - German Venture Capital Association e.V. (BVK) |
| CEE | Central and Eastern Europe |
| CEECs | Central and Eastern European Countries |
| CRITT | Centre régional d'innovation et de transfert de technologie |
| DFG | Deutsch Forschungsgemeinschaft (German Research Council) |
| DG | Directorate-General |
| EC | European Commission |
| EDP | Electronic data processing |
| EFRE | Europäischer Fonds für regionale Entwicklung (European Regional Development Fund) |
| ERDF | European Regional Development Fund |
| ERIS | European Regional Innovation Survey |
| EU | European Union |
| FDI | Foreign Direct Investments |
| FhG-ISI | Fraunhofer Institute for Systems and Innovation Research |
| GDP | Gross Domestic Product |
| GDRs | Global Depositary Receipts |
| GREMI | Groupe de Recherche Européen sur les Milieux Innovateurs |
| ICT | Information and Communication Technology |
| IER | Institute for Economic Research |
| IMA | Institut für Materialforschung und Anwendungstechnik GmbH |
| IR | Innovation Services and Regional Development |
| ISO | International Organisation for Standardisation |
| IT | Information Technology |
| ITI | Institutions of Technological Infrastructure |
| JVs | Joint Ventures |
| KIBS | Knowledge-Intensive Business Services |
| KISSIN | Knowledge intensive services in Europe |
| LFR | Less Favoured Regions |
| M&A | Mergers and Acquisitions |
| MBG | Mittelständische Beteiligungsgesellschaft (Middle Class Venture Capital Company) |
| MIT | Massachusetts Institute of Technology |
| MNCs | Multinational Companies |
| MNE | Multinational Enterprises |
| NACE | Statistical Classification of Economic Activities |

| | |
|---------|---|
| NIS | National Innovation Systems |
| NTG | Network for Technological Expertise |
| NUTS | Nomenclature des unités territoriales statistiques |
| OECD | Organisation for Economic Cooperation and Development |
| OEM | Original Equipment Manufacturer |
| OPT | Outward Processing Traffic |
| R&D | Research and Development |
| R&TD | Research and Technological Development |
| R&TDI | Research, Technological Development and Innovation |
| RINNO | Regional prosperity through Innovation help from the European Commission |
| RIS | Regional Innovation Strategies |
| RIS | Regional Innovation System |
| RITTS | Regional Innovation and Technology Transfer Strategies |
| RKW | Rationalisierungskuratorium der deutschen Wirtschaft (Rationalisation Curatorium for German Industry) |
| RTD | Research and Technological Development |
| RTP | Regional Technology Plan |
| S&T | Science and Technology |
| SIA | Slovenian Innovation Agency |
| SIC | Standard Industrial Classification |
| SME | Small and Medium-Sized Enterprises |
| SOEs | State-owned enterprises |
| SÖSTRA | Institut für Sozialökonomische Strukturanalysen Berlin |
| SURS | Slovenian Office for Statistics |
| TGZ | Technologie- und Gründerzentren (Technology and Incubator centres) |
| TOU | Technologieorientierte Unternehmensgründungen (New Technology-Based Firms) |
| TOU-NBL | Technologieorientierte Unternehmensgründungen in den neuen Bundesländern (New Technology-Based Firms in the New Federal States) |
| TIPIK | Technology and Infrastructures Policy in the Knowledge-based Economy |
| TRIPS | Trans Regional Innovation Projects |
| TSER | Targeted Socio-Economic Research |
| UK | United Kingdom |



<http://www.springer.com/978-3-7908-1382-1>

Innovation Networks

Concepts and Challenges in the European Perspective

Koschatzky, K.; Kulicke, M.; Zenker, A. (Eds.)

2001, XVIII, 284 p., Softcover

ISBN: 978-3-7908-1382-1

A product of Physica-Verlag Heidelberg