

Advances in Spatial Science

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Randall Jackson • Peter Schaeffer
Editors

Regional Research Frontiers - Vol. 2

Methodological Advances, Regional Systems
Modeling and Open Sciences

 Springer

Editors

Randall Jackson
Regional Research Institute
West Virginia University
Morgantown
West Virginia, USA

Peter Schaeffer
Division of Resource Economics
and Management
Faculty Research Associate
Regional Research Institute
West Virginia University
Morgantown, WV, USA

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Preface

The idea for this book emerged as we prepared the celebration of the 50th anniversary of the Regional Research Institute (RRI) at West Virginia University in 2016. The Institute was founded in 1965, and the personalities who helped shape it include founding director William Miernyk, Andrew Isserman, Luc Anselin, Scott Loveridge, and Randall Jackson. The Institute reflected the research focus and personalities of each of these directors, flavored by the diversity of personalities and scholarship of others with RRI ties. Yet throughout its history, the primary mission remained: engaging in and promoting regional economic development research, with a special emphasis on lagging and distressed regions. RRI scholars have come from economics, geography, agricultural and resource economics, urban and regional planning, history, law, engineering, recreation and tourism studies, extension, etc. Over the half century of RRI's existence, regional research has grown and developed dramatically, with members of the Institute contributing to scholarship and leadership in the profession. Reflecting on the history of the RRI made us wonder about the next 50 years of regional research, so we decided to ask colleagues in our field to share their thoughts about issues, theories, and methods that would shape and define future regional research directions. Many responded to our call for contributions, and in the end we accepted 37 chapters, covering many aspects of regional research. Although the chapters are diverse, several share common ideas and interests, so we have grouped them into seven parts. As with most groupings, of course, there are chapters whose content would have been appropriate in more than one part.

The large number of contributions resulted in a much greater number of pages than planned, but their quality made us reluctant to cut some or to significantly shorten them. We are, therefore, grateful to Johannes Glaeser, Associate Editor for Economics and Political Science at Springer, and to the Advances of Spatial Sciences series editors, for suggesting that we prepare two volumes instead of only one, as initially proposed. We also thank Johannes Glaeser for his advice and support throughout the process of preparing the two volumes. Volume 1 carries the subtitle "Innovations, Regional Growth and Migration" and contains 20 chapters in its four parts. In addition to the topics named in the subtitle, Volume 1 also contains

three chapters on disasters, resilience, and sustainability, topics that are of growing interest to scholars, policy makers, and agency and program administrators alike. The subtitle of Volume 2 is “Methodological Advances, Regional Systems Modeling and Open Sciences.” Its 17 chapters are organized into the three parts named in the volume’s subtitle. The two volumes are roughly equal in length.

The chapters reflect many of the reasons why research methods and questions change over time. A major reason for recent developments in regional research is the digital revolution, which made vastly increased computational capacities widely available. This made possible methodological advances, such as spatial econometrics or geographic information systems (GIS), but perhaps more importantly, it changed fundamentally the way empirical modeling is conducted. Furthermore, it has become possible to integrate different tools, such as spatial econometrics and GIS, and generate graphical displays of complex relationships that enrich our analyses and deepen our understanding of the processes that underlie empirical patterns. Overall, the impact of technological changes on regional research has been pervasive and, judging by the contributions to this volume, will likely continue to be so, and this can be seen in most book parts. In *Modeling Regional Systems*, the chapters’ authors rely on recently developed methodological tools and approaches to explore what future research directions could be. In the part *Disasters and Resilience*, Yasuhide Okuyama proposes a future modeling system that would be unthinkable without modern computational tools. All contributions in the part *Spatial Analysis* depend heavily on computational spatial analytical tools, including visualization (e.g., Trevor Harris’ contribution on exploratory spatial data analysis). Particularly interesting in this context is the part *Open Source and Open Science*, because it is dealing with aspects of the computational revolution and the Internet that are only now starting to become a major force in our fields, and the collective development and integration of software proposed by Jackson, Rey, and Járosi is still in its infancy.

The evolution of technologies not only drives much of societal change but also has changed how we look at economic growth. While early models of economic growth focused on the capital-labor ratio and treated technology as an exogenous variable, current research in economic growth includes technology as an endogenous variable and stresses entrepreneurship. It is, therefore, not surprising to see an entire part focused on technology, innovation, and entrepreneurship. This part confronts gender issues explicitly in the chapter by Weiler and Conroy, further reflecting changing social attitudes. Gender issues are also addressed in the *Regional Growth, Regional Forecasts, and Policy* part. As Chalmers and Schwarm note, gender is still a relatively neglected topic in regional research, but social trends and forces will likely increase the attention it receives in the future.

The digital revolution that made mobile phones ubiquitous has also had another important effect, namely the emergence relatively recently of “big data” (e.g., the chapters by Newbold and Brown, and Harris). Even more importantly, vastly improved communication technologies and faster means of transportation are changing the nature of agglomeration. Timothy Wojan reminds us that Alfred Marshall anticipated some of these changes more than a century ago, a remarkable

feat of foresight. Because of improved communication technologies, the gap between geographic and social distance is likely to widen in the future, particularly among the highly skilled. Those of us working in research settings at universities or institutes are already experiencing this phenomenon, as it has become common to collaborate with distant colleagues, a sharp contrast to the case until the late twentieth century. It seems certain that the impact of digital technologies on traditional views of geographical space as separation and differentiation will raise new regional research questions. Woodward provides a complement to Wojan's chapter when he speculates about the effects of the interplay of agglomeration and automatization, which is yet another example of the pervasive influence of technology on the future of spatial organization of our societies.

Wojan is not the only one looking to the past to glance into the future. David Bieri studies neglected contributions in regional monetary economics of such foundational scholars of regional research as Lösch and Isard. His chapter presents a genealogy of regional monetary thinking and uses it to make a strong case for renewed attention over the next 50 years to this neglected branch of our intellectual family tree.

While most regional scholars are well aware of the impacts of the digital revolution, there is less awareness of the impacts of an ongoing demographic revolution. This may be because the revolution is far advanced in the economically most successful countries, mostly the members of the Organisation for Economic Co-operation and Development (OECD). But while England became the first country to be more urban than nonurban in the mid-nineteenth century, the world as a whole has reached this threshold less than 10 years ago. Indeed, urbanization in the southern hemisphere is proceeding at a very rapid pace that poses significant policy challenges in the affected nations. As part of industrialization and urbanization, the world is also experiencing a dramatic decline in effective fertility, with the number of births per female of child-bearing age declining. Since longevity is increasing, this is resulting in demographic structures unlike any in the past. This phenomenon is most advanced and dramatic in places such as Germany, Japan, and most recently China—where government policies contributed mightily to demographic restructuring—and challenges the future of public social safety programs, particularly provisions for the financial security of the elderly and their healthcare. In such cases, immigration may be seen as a way to slow the transition from a predominantly young in the past to a much older population. Franklin and Plane address issues related to this unprecedented demographic shift.

Migration, domestic and international, is also of growing importance because of the disruptions caused by industrialization in many countries. The "land flight" that once worried today's industrial powers is now occurring in the southern hemisphere. Migration is also fueled by political change in the aftermath of the end of colonialization. The new nations that emerged were often formed without regard for historic societies and traditions, and tensions that had been held in check have sometimes broken out in war between neighboring countries or civil war. As a result, the world as a whole has seen an increase in internally displaced persons as well as refugees who had to leave their home countries. In an overview of directions

in migration research, Schaeffer, therefore, argues for more work on migrations that are rarely completely voluntary because traditional models have been developed primarily for voluntary migrations.

Demographic shifts are also driving reformulations and advances in *Regional Systems Models*, as evidenced by new directions in household modeling within the chapter on household heterogeneity by Hewings, Kratena, and Temurshoev, who touch on these and enumerate a comprehensive research agenda in the context of dynamic interindustry modeling, and Allen and his group identify pressing challenges and high potential areas for development within computable general equilibrium models. Varga's chapter contributes to this part's topic and to technological change, as his Geographic Macro and Regional Impact Modeling (GMR) provides explicit mechanisms for capturing the impacts of innovation and technology.

The chapters in these volumes reflect the changing world that we live in. While some new directions in regional research are coming about because new technologies allow us to ask questions, particularly empirical questions that once were beyond the reach of our capabilities, others are thrust upon us by political, economic, social, demographic, and environmental events. Sometimes several of these events combine to effect change. A primary task of a policy science is to provide guidelines for the design of measures to address problems related to change. So far, regional researchers seem to have been most successful in making progress toward completing this task in dealing with environmental disasters, addressed in the *Disasters and Resilience* part. Rose leverages decades of research in regional economic resilience to lay the foundation for this part.

These chapters will certainly fall short of anticipating all future developments in regional research, and readers far enough into the future will undoubtedly be able to identify oversights and mistaken judgements. After all, Kulkarni and Stough's chapter finds "sleeping beauties" in regional research that were not immediately recognized, but sometimes required long gestation periods before becoming recognized parts of the core knowledge in our field, and Wojan and Bieri also point to and build upon contributions that have long been neglected. If it is possible to overlook existing research, then it is even more likely that we are failing to anticipate, or to correctly anticipate, future developments. Nonetheless, it is our hope that a volume such as this will serve the profession by informing the always ongoing discussion about the important questions that should be addressed by members of our research community, by identifying regional research frontiers, and by helping to shape the research agenda for young scholars whose work will define the next 50 years of regional research.

Morgantown, WV

Randall Jackson
Peter Schaeffer

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Editors and Contributors

About the Editors

Randall Jackson is professor, Department of Geology and Geography, West Virginia University (WVU), and Director of the Regional Research Institute. His primary research interests are regional industrial systems modeling; energy, environmental, and economic systems interactions; and regional economic development. He is an adjunct professor in WVU's Department of Economics and Division of Resource Management, and in Geography at the Ohio State University (OSU). Previous faculty positions were at OSU and Northern Illinois University. Dr. Jackson earned his PhD in geography and regional science from the University of Illinois at Urbana-Champaign in 1983.

Peter Schaeffer is professor, Division of Resource Economics and Management, West Virginia University (WVU). His primary research interests are regional economic policy, international labor migration, job mobility, natural resource management, and historic preservation. He is a faculty research associate in WVU's Regional Research Institute and adjunct professor in the Department of Economics. Previous faculty positions were at the Universities of Colorado–Denver, Illinois at Urbana–Champaign, and one year as visiting professor at the Swiss Federal Institute of Technology–Zurich. Dr. Schaeffer earned the Ph.D. in economics from the University of Southern California in 1981.

Contributors

Grant J. Allan Fraser of Allander Institute and Department of Economics, Strathclyde Business School, University of Strathclyde, Glasgow, UK

Yudhie Andriyana Statistics Department, Universitas Padjadjaran, Kabupaten Sumedang, Indonesia

Daniel Arribas-Bel Department of Geography and Planning, University of Liverpool, Liverpool, UK

Zhenhua Chen Austin E. Knowlton School of Architecture, The Ohio State University, Columbus, OH, USA

Graham Clarke School of Geography, University of Leeds, Leeds, UK

Gary Cornwall Department of Economics, Carl H. Lindner College of Business, University of Cincinnati, Cincinnati, OH, USA

Sandy Dall'erba Department of Agricultural and Consumer Economics and Regional Economics Applications Laboratory, University of Illinois at Urbana-Champaign, Champaign, IL, USA

Thomas de Graaff Department of Spatial Economics, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

Erik Dietzenbacher Professor of Economics, University of Groningen, The Netherlands

Fang Fang Graduate Interdisciplinary Program in Statistics and Regional Economics and Spatial Modeling laboratory, University of Arizona, Tucson, AZ, USA

Henk Folmer Faculty of Spatial Science, University of Groningen, Groningen, The Netherlands

Trevor M. Harris Department of Geology and Geography, West Virginia University, Morgantown, WV, USA

Kingsley E. Haynes Schar School of Policy and Government, George Mason University, Arlington, VA, USA

Kristinn Hermannsson School of Education, University of Glasgow, Glasgow, UK

Geoffrey J.D. Hewings Regional Economics Applications Laboratory, University of Illinois, Urbana, IL, USA

Randall Jackson Regional Research Institute, West Virginia University, Morgantown, WV, USA

Amir Jamali Civil Engineering Department, Montana State University, Bozeman, MT, USA

Péter Járosi West Virginia University, Morgantown, WV, USA

I Gede Nyoman Mindra Jaya Statistics Department, Universitas Padjadjaran, Kabupaten Sumedang, Indonesia

Dongwoo Kang Korea Labor Institute, Sejong, South Korea

Changjoo Kim Department of Economics, Carl H. Lindner College of Business, University of Cincinnati, Cincinnati, OH, USA

Kijin Kim Regional Economics Applications Laboratory, University of Illinois, Urbana, IL, USA

Asian Development Bank, Manila, Philippines

Tae-Jeong Kim Bank of Korea, Seoul, Korea

J. Kim Swales Fraser of Allander Institute and Department of Economics, Strathclyde Business School, University of Strathclyde, Glasgow, UK

Kara Kockelman Department of Civil, Architectural, and Environmental Engineering, University of Texas at Austin, Austin, TX, USA

Kurt Kratena Centre of Economic Scenario Analysis and Research, Department of Economics, Loyola University Andaluc a, Spain

Farah Kristiani Mathematics Department, Parahyangan Catholic University, Kota Bandung, Indonesia

Donald J. Lacombe Regional Research Institute, West Virginia University, Morgantown, WV, USA

Michael L. Lahr EJB School of Planning and Public Policy, Rutgers University, New Brunswick, NJ, USA

Patrizio Lecca European Commission, DG Joint Research Centre, Seville, Spain

Peter G. McGregor Fraser of Allander Institute and Department of Economics, Strathclyde Business School, University of Strathclyde, Glasgow, UK

Stuart G. McIntyre Fraser of Allander Institute and Department of Economics, Strathclyde Business School, University of Strathclyde, Glasgow, UK

Alan T. Murray Department of Geography, University of California at Santa Barbara, Santa Barbara, CA, USA

Olivier Parent Department of Geography, University of Cincinnati, Cincinnati, OH, USA

Seryoung Park Bank of Korea, Seoul, Korea

Sergio Rey Arizona State University, Phoenix, AZ, USA

Budi Nurani Ruchjana Mathematics Department, Universitas Padjadjaran, Kabupaten Sumedang, Indonesia

Kim Swales Fraser of Allander Institute, University of Strathclyde, Glasgow, UK

Umed Temursho Centre of Economic Scenario Analysis and Research, Department of Economics, Loyola University Andaluc a, Spain

Daoqin Tong School of Geography and Development, University of Arizona, Tucson, AZ, USA

Eveline van Leeuwen Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

Attila Varga Faculty of Business and Economics, University of Pécs, Hungary

Yiyi Wang Civil Engineering Department, Montana State University, Bozeman, MT, USA

Sang Gyo Yoon Bank of Korea, Seoul, Korea