

# RSAI NEWSLETTER

THE REGIONAL SCIENCE ASSOCIATION INTERNATIONAL

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## FROM THE EDITOR



The newsletter of the Regional Science Association International (RSAI) appears two times a year and contains information about upcoming conferences and meetings, recent events and publications, and short contributions on current themes.

The editorial team has an open position! I (Martijn) would very much appreciate a second pair of eyes to help with both the gathering of contributions, and the proofreading of the final product. Applications from the global South or from those with a good range of contacts there would be particularly welcome, as would being a native speaker of English. Please contact me at [m.j.smit@uu.nl](mailto:m.j.smit@uu.nl) by Friday 23 July 2021 if you're interested, enclosing a CV and a half-page statement of purpose, indicating why you feel you're a good fit for editing the newsletter and how involved you have been and plan to be in RSAI and its supranationals. Andrea Caragliu, the Executive Director, and the remaining editor will decide together.

Text contributions for the newsletter are always welcome, and can be submitted directly to Martijn Smit ([m.j.smit@uu.nl](mailto:m.j.smit@uu.nl)). Deadline for the next issue is 15 October. In particular, short contributions on your current research are most welcome, as well as proposals for a piece in the *Center of Excellence* series.

*Martijn Smit*

*Utrecht University, the Netherlands*

## RSAI MEMBERSHIP INFORMATION

All RSAI members have online access to Papers in Regional Science (PiRS) and Regional Science Policy and Practice (RSPP): journals of the Regional Science Association International. Members will need to log in to access full text articles online.

In addition to the RSAI publications, members are offered an opportunity to purchase other regional science journals at reduced rates and participate in the national and international conferences at reduced rates.

For details on how to become a member, contact the Executive Director, Andrea Caragliu at [andrea.caragliu@polimi.it](mailto:andrea.caragliu@polimi.it), or visit [www.regionalscience.org](http://www.regionalscience.org).



be disappointed: the use of computers was then in its infancy. Perhaps more surprisingly, there is very little coverage of matters to do with data, especially since this was something that loomed large among those participating in the early discussions about regional science).

#### **FINDING OUT MORE ABOUT THE HISTORY OF REGIONAL SCIENCE**

*Batey, P and Plane, D, (2020) (Eds), Great Minds in Regional Science, Volume 1, Switzerland: Springer Nature, including Boyce, D, "Walter Isard (1919-2010): Founding Father of Regional Science."*

*Fischer, M and Nijkamp, P (2021), (Eds), The Handbook of Regional Science: Second, Enlarged Edition, Switzerland: Springer Nature. This book contains eight chapters on the History of Regional Science, including Batey, P "Regional Science Methods in Planning" from which this article is an extract.*

*Isard, W (2003), History of Regional Science and the Regional Science Association International: The Beginnings and Early History, Switzerland: Springer Nature.*

trade policy and the impacts of cohesion policies.

He loved to attend meetings and seminars where he enjoyed asking penetrating, imaginative questions; one sensed that he enjoyed being a scholar and the enthusiasm for his work resonated strongly in his publications.

#### *References*

*Johannes Bröcker (1985) "Partial equilibrium theory of interregional trade and the gravity model," Papers of the Regional Science Association 66, 7- 18.*

*Johannes Bröcker (1995) "Chamberlinian spatial computable general equilibrium modelling: a theoretical framework," Economic Systems Research, 7, 137-149.*

*Johannes Bröcker (1998) "Operational Spatial Computable General Equilibrium Modelling," Annals of Regional Science, 32, 367-387.*

*Johannes Bröcker and Jean Mercenier (2011) "General Equilibrium Models for Transportation Economics," in André de Palma, Robin Lindsey, Emile Quinet, and Roger Vickerman (eds.) Handbook of Transport Economics Vol. 1, Cheltenham, Edward Elgar, pp. 21-45.*

#### **OBITUARY JOHANNES BRÖCKER**

Johannes Bröcker, a long-time member of RSAI, passed away after a short illness on January 19, 2021 at the age of 70. He was an active member of ERSA and a regular participant in the German-speaking section. He served on the editorial boards of several journals, most prominently the Annals of Regional Science and Spatial Economic Analysis. His undergraduate degree was from Freiburg and his master and doctoral degrees and habilitation were from Kiel. With the exception of the period from 1990-2000 when he served as the Chair in Macroeconomics and Regional Science at the University of Dresden, his career was centered in Kiel. His last appointment, dating from 2000 until he retired in 2015, was as Chair in International and Regional Economics.



Johannes was a brilliant theoretical and applied spatial economist; his advisor, Karin Peschel, (who sadly passed away in June 2020) had worked with Andreas Predhöl on her doctorate and with Rolf Funck on her habilitation and she imbued that strong German location theory tradition in Johannes' work that later included his support and active participation in the August Lösch Prize committee. Johannes was the progenitor of the development of spatial computable general equilibrium models and the work reflected his firm foundation in location theory (Bröcker, 1995) where he drew on the work of Lösch and Chamberlin and in the formulation of flows in multi-economy models (Bröcker, 1989). Subsequently, he provided some integration of general equilibrium and transportation systems (Bröcker and Mercenier, 2011). However, one of his most highly cited articles (Bröcker, 1988) developed an operational spatial computable equilibrium model building up from Arrow-Debreu equilibrium under perfect competition. The model was promoted as one that was both transparent and parsimonious (in terms of the number of equations) and perfectly illustrated Johannes' ability to move effectively from strong theoretical foundations through empirical implementation. This model and subsequent version were used in a wide variety of applications assessing the impacts of infrastructure investment (especially transportation), transport and

#### **CALLS FOR PAPERS**

The Universidad Javeriana and the Banco de la República jointly organize their Third Urban and Regional Economics Workshop in June - virtually instead of in Bogotá. Among the keynote speakers and presenters are RSAI Fellows Vernon Henderson and Janet Kohlhase. After the workshop, Diego Puga and Jorge de la Roca host a class. The deadline to submit a full paper and join is 1 June. More information can be found at <https://www.regionalscience.org/>, and the registration form at [this page](#).



Pontificia Universidad  
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Colombia



## SEQUENCE ANALYSIS AS A NEW TOOL FOR ANALYZING DYNAMICS ON REGIONAL LABOUR MARKETS

THE ANALYSIS OF the differences in the performance of regional labour markets has evolved over time. In the old days the dominant type of approach was the analysis of data aggregated at the regional level for variables on the number of jobs, unemployment, income etc. In the last decade, the analysis switched more and more to longitudinal micro-data at the level of individuals, preferably combined with firm-level data and information about the spatial environment where the individual or the firm is located. These data permit detailed analysis of linked employee-employer data at one point in time or changes between two points in time by comparing outcomes early and later in the career.

A relatively new statistical technique, hardly used in Regional Science, is Sequence Analysis (SA) that can capture the differences between individuals' trajectories by analysing the (dis)similarity between sequences of experienced labour market states. As such, it provides a more meaningful and holistic alternative to the more common approaches that use single transitions, outcomes at a certain point in time, or summaries of states over a certain period. SA combines a form of sequence alignment with cluster analysis. It can be used in an explorative manner (to understand which patterns occur, and how they differ) or, by applying regression analyses on SA cluster outcomes, to test hypotheses (which factors increase the likelihood of a particular trajectory). Trajectories can be of various types depending on the states that are identified. In labour market studies, career trajectories can be analysed with SA applying it to sequences of one's position at the labour market (in school, work, unemployed or inactive),

job mobility trajectories through analysing how long persons work for a firm or in sectors, but also spatial trajectories using migration or commuting data.

In this short article, we will illustrate the usefulness of SA by means of an analysis of career patterns after a spell of unemployment. Episodes of unemployment, particularly long-term unemployment, are known to have a severe impact on further career development. Most empirical studies therefore focus on explaining differences in unemployment duration, that is, how long it takes someone who became unemployed to regain employment. But returning to employment is no guarantee for avoiding subsequent periods of unemployment. An episode of unemployment is known to lower future employment security: it increases the risk of repeated unemployment spells and long-term unemployment. Policies aimed at reducing the negative effects of unemployment thus need to look beyond single transitions from unemployment to work and explore further career development after re-entering employment. While one person may return to a stable employment situation after a period of unemployment, the other may end up in a cycle of short-term jobs interrupted by new periods of unemployment. These examples illustrate that understanding who is more likely to find a long-term escape route out of unemployment requires a detailed study of the career development of formerly unemployed over a longer period, taking into account differences in job quality and the timing of transitions.

In an empirical study, registry microdata provided by Statistics Netherlands is analysed to identify the career trajectories of formerly unemployed in the Netherlands and subsequently estimate which individual and regional factors contribute toward having one of the identified career trajectories. The study focuses on the group who became dependent on unemployment benefits as their

main source of income in the period 2007 to 2009 and regained employment within one year (the latter applying to about two thirds of the total group). Sequence analysis is used to identify typical career patterns for this group of formerly short-term unemployed over a period of five years after they re-enter the labour market. During this period, their labour market position is measured on a monthly basis distinguishing between four labour market states: employed in a standard job (permanent contract for at least 20 hours a week), employed in a non-standard job (any other type of employment), unemployed or inactive. To measure the dissimilarity between the career paths of formerly short-term unemployed, optimal matching is used to determine the distance between their sequences in occurrence and duration of the four labour market states in all 60 months during the five-year period after re-employment. The distance is calculated as the minimal cost to align individual sequences through insertion and deletion (indel), and substitution of states. Next, cluster analysis (Ward's method) is used to identify ideal-typical trajectories by grouping similar sequences, that is, those sequences sharing dissimilarity with all other sequences. As Ward's method is a form of

*Figure 1: Transversal state distribution by career path of formerly short-term unemployed.*



Data apply to all persons who became dependent of unemployment benefits as main source of income in the period 2007 – 2009

Source: Statistics Netherlands 2020; adapted by PBL

agglomerative hierarchical clustering and there are no theoretical grounds for deciding on a particular number of clusters, Average Silhouette Width (ASW) and visual inspection of the resulting partitioning are used to decide on the appropriate number of clusters.

Using this approach, three typical career trajectories of formerly short-term unemployed are identified over a period of five years after their return to employment: 1. stable standard employment; 2. stable non-standard employment and 3. intermittent employment. As Figure 1 shows, these trajectories differ substantially in the occurrence and length of spells of standard, non-standard and non-employment.

The first trajectory, displayed in the left graph of Figure 1, is characterised by being employed in a standard job for the majority of time. This pattern fits with the career sequences of 42% of those re-entering employment within the imposed period of one year. Although 66% of all formerly unemployed assigned to this career trajectory starts off in a non-standard job, most of them eventually work in a standard job and after five years 80% has a standard job. Most transitions to standard employment occur within the first year after re-employment although some workers first have two or more non-standard employment spells before having a standard job. The second trajectory, which applies to the career path of 15% of all formerly short-term, has a long spell of non-standard employment as its most salient feature. As Figure 1 shows, many persons in this group experience a change in their career trajectory 3 years after re-employment which corresponds with the maximum duration of temporary job contracts in the Netherlands at the time of observation. Finally, 43% of the re-entrants has a career trajectory characterised by intermittent employment. This trajectory is clearly more unstable than the previous two trajectories with multiple subsequent spells of non-standard employment often interspersed with periods of unemployment. Only 10% of the formerly unemployed in this trajectory is employed the whole five-year period after re-entry and almost half of them has at least one unemployment spell of more than 12 months. Also, the share persons that is inactive gradually increases and is 20% at the end of the period.

For regional scientists, it is interesting to study regional heterogeneity in the occurrence of the trajectories. Figure 2 shows that there are substantial regional differences in the share of formerly unemployed that have a career pattern in line with the three trajectories as identified by the SA analysis. As can be expected, a larger share of the formerly unemployed living in the economic core, the Randstad, has a standard employment trajectory compared to those living in the national periphery in the North and South. In the latter regions, more end up in the least stable trajectory (the intermittent trajectory), while a relatively high share of the re-entrants living in the intermediate zone have a stable non-standard career pattern. With multinomial regression analysis the probability of having one of the three career trajectories can be estimated. This analysis shows that the differences in individual characteristics of the formerly unemployed only partially explain the regional differences shown in figure 2. This indicates that a successful re-entry in the labour market after unemployment also depends on the conditions in the regional labour market where a person lives.

With the example described above, we try to make

clear that sequence analysis is a powerful method to unravel individual career patterns. It helps to better understand career development after an event, and allows us to study spatial differences in career patterns and how this can be related to the situation on regional labour markets. The outcomes provide useful insights to develop more effective regional labour market policies. More information about the method and how to use it, can be found in the following publications:

- Weterings, Anet, Marten Middeldorp & Arjen Edzes (2020). Transitions out of unemployment and subsequent employment security Individual and regional determinants? Draft paper.
- Weterings, Anet, Marten Middeldorp & Martijn van den Berge (2018). Regionale verschillen in carrièreverloop na de WW, Den Haag: PBL Planbureau voor de Leefomgeving.
- Weterings, Anet, Marten Middeldorp & Martijn van den Berge (2019). Werkzekerheid na werkloosheid: de rol van de arbeidsmarktregio, Den Haag: PBL Planbureau voor de Leefomgeving.
- Middeldorp, Marten, Arjen Edzes and Jouke van Dijk (2019). 'Smoothness of the School-to-Work Transition: General versus Vocational Upper-Secondary Education', *European Sociological Review*, Volume 35 (1), p.81-97, DOI: 10.1093/esr/jcy043.

*Marten Middeldorp | Atlas voor Gemeenten & Faculty of Spatial Sciences, University of Groningen | middeldorp@atlasvoorgemeenten.nl*

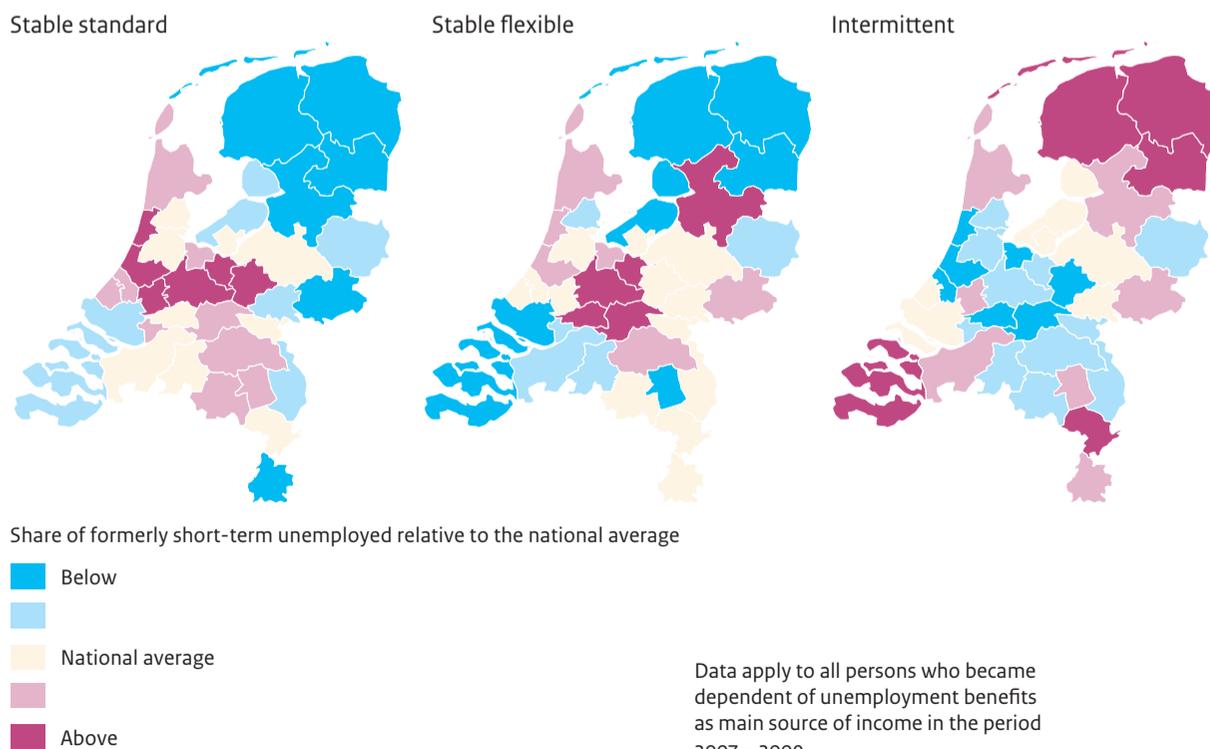
*Anet Weterings | PBL Netherlands Environmental Assessment Agency | anet.weterings@pbl.nl*

*Martijn van den Berge | PBL*

*Arjen Edzes | University of Groningen | a.j.e.edzes@rug.nl*

*Jouke van Dijk | University of Groningen | jouke.van.dijk@rug.nl*

*Figure 2: Share of formerly short-term unemployed relative to the national average*



Source: Statistics Netherlands 2020; adapted by PBL