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4.4.

RIS3 in macro-regional strategies: tools to design and monitor integrated territorial development paths²²*Margherita Russo, Francesco Pagliacci, Pasquale Pavone²³ and Anna Giorgi²⁴*

Key words: integrated territorial development, EU macro-regional strategies, RIS3, data classification with non-supervised techniques

i) Introduction

In the current debate on post-2020 EU Cohesion Policy, it is important to capitalise on two pillars of ongoing policy programmes: macro-regional strategies (MRSs) (European Commission 2017a) and the Research and Innovation Smart Specialisation Strategy (RIS3) (Foray et al. 2012; Foray 2015; McCann 2015; McCann and Ortega-Argilés 2015). If the EU macro-regions are considered relevant territorial units to enhance bottom-up policy planning in support of development policies across sectors, how can integrated territorial development be supported?

The EU MRSs initially launched in the 2007–13 programming period, align with the EU goals of inclusive and sustainable development, which would be realised by enhancing synergies among neighbouring regions. So far, four MRSs have been designed, one for regions in the Baltic area (EU Strategy for the Baltic Sea Region (EUSBSR)), along the Danube (EU Strategy for the Danube Region (EUSDR)), surrounding the Adriatic and Ionian Sea (EU Strategy for the Adriatic-Ionian Region (EUSAIR)), and in the Alpine area (EU Strategy for the Alpine Region (EUSALP)), respectively approved in 2009, 2011, 2014 and 2015²⁵.

The core aim of all four strategies is to enhance complementarities and synergies among regions in the macro-region, with a bottom-up regional policy design across the many countries involved (European Commission 2017a). MRSs provide opportunities for cross-fertilisation across countries and domains of interventions, from education to health and social innovation. “The added value of macro-regional strategies is characterised by its cross-sectoral approach, its transnational dimension (including the participation of non-EU countries) and its contribution to better multi-level governance. But this is an ambitious concept that needs time to be consolidated and to bear fruit” (European Commission 2017b). With significantly different durations so far, the four strategies are at various stages of maturity in terms of policy programmes. This appears to be a critical issue in the further implementation of the strategies in the next Cohesion Policy programming period (2021–27), with the aim of “investing in all regions” with “a tailored approach to reduce disparities and help low-income and low-growth regions catch up”, and “locally-led development strategies”²⁶.

The development path of such policy design might leverage on the regions’ implementation of RIS3, characterised by the identification of strategic areas for intervention, based both on the analysis of the strengths and the potentials of the local economy and on an entrepreneurial discovery process (Foray 2015).

22 This paper builds on Pagliacci et al. (2019) and Pavone et al. (2019). It is part of work package T-3 “Enhancing shared Alpine Governance project” of the project “Implementing Alpine Governance Mechanism of the European Strategy for the Alpine Region” (AlpGov) of the Interreg Alpine Space Programme – Priority 4 (Well-Governed Alpine Space), SO4.1 (“Increase the application of multi-level and transnational governance in the Alpine Space”). For a discussion of the topics presented in the paper, the authors wish to thank all members of EUSALP’s Action Group 1.

23 Dipartimento di Economia Marco Biagi and CAPP (Centro Analisi Politiche Pubbliche), Università degli Studi di Modena e Reggio Emilia, Italy.

24 Leader, Action Group 1, EUSALP Lombardy Region representative, and Gesdimont Research Centre, University of Milan, Milan, Italy.

25 Official documents are available online at https://ec.europa.eu/regional_policy/it/policy/cooperation/macro-regional-strategies/

26 http://ec.europa.eu/regional_policy/en/newsroom/news/2018/05/29-05-2018-regional-development-and-cohesion-policy-2021-2027

Building on this broad and diverse picture of strategic interventions at regional and at meso-level (i.e. the macro-regions), this paper aims to answer the following research questions:

- Is it possible to outline a comparative framework that could help policy-makers and stakeholders improve their innovative performance by learning from other regions?
- What can we learn from such a comparative framework in terms of identifying which synergies and complementarities can be enhanced within the MRSs?

To answer these questions, we suggest endowing policy-makers with a set of comparative tools on RIS3 priorities (to outline the development path that regions intend to follow) and on socio-economic conditions (to describe the structural features as they emerge from Eurostat data). Taken together, these tools, developed in two companion papers by Pavone et al. (2019) and Pagliacci et al. (2019), help to address the multidimensional perspective on similarity across regions. Identifying what these similarities are is essential in a comparative analysis that aims to measure and monitor the impact of integrated investments on the development of the territory across sectors.

Given the limited space for a summary of the literature on RIS3 and MRSs, as presented in Pagliacci et al. (2019), this paper summarises only the tools and the results in relation to RIS3 data and socio-economic data in Sections ii) and iii), respectively. Section iv) returns main results that combine RIS3 priorities and socio-economic characteristics of regions, focusing on EUSALP. Section v) discusses the implications of the methodology proposed in the paper, with suggestions for policy-makers.

ii) Classification of RIS3 priorities

Information about RIS3 can be accessed with the online tool “Eye@RIS3: Innovation Priorities in Europe” (European Commission 2018)²⁷. Although it is not intended to be used as a source of statistical data, the broad coverage in terms of territorial entities and the large homogeneity of information at sub-national level suggest that information in the Eye@RIS3 platform can be considered suitable for supporting a robust comparative analysis of RIS3’s priorities across the EU-28. On the basis of this information²⁸, Pavone et al. (2019) classified RIS3’s priorities by using both the descriptions provided in free-text format and the series of related codes for economic domains, scientific domains and policy objectives. With regard to regions, similarities are not identified by browsing the words in the descriptions entered in the database or by the exact combination of codes: each category of descriptions refers to a statistically significant semantic domain, in which the words used by regions are associated with, and each category of codes embraces, a statistically significant combination of the various sets of codes. The dictionaries associated with each category help in checking for nuances (and also in controlling for ambiguity and misinterpretation). As a result of this priority classification, we not only have categories and related dictionaries to name these categories, but are also able to automatically classify regions according to the categories of priorities identified.

The cross-tabulation of the two classifications reveals that regions show a coherent attribution of codes to descriptions (Table 4.4.1). In particular, categories of codes in the cluster “Agrofood, forestry and tobacco” are also associated with descriptions in other related domains (e.g. bio-economy, tourism, leisure and sustainable energy), while categories in the macro-groups of codes referring to “Health & Life Science”, “New economy & Leisure industry”, “Logistic & Manufacturing” are largely associated with descriptions within the same domain. In the case of the macro-category “Bio Economy, Blue Economy & Energy”, the groups of records relate to many diverse descriptions, with a significant overlap with descriptions in the macro-group “Production & Transport, Manufacturing & Energy”²⁹. In general, the results of

27 As stated on the website <http://s3platform.jrc.ec.europa.eu/map>, “The tool has been fully upgraded in September 2018. Data are continuously updated based on inputs from European regional and national authorities and their stakeholders (also called the ‘entrepreneurial discovery process’ in the literature on smart specialisation)”.

28 In the Eye@RIS3 platform, regions entered their own record descriptions, from a minimum of 1 to a maximum of 15 priorities.

29 This result is due to the highest cut-offs being used in clustering the two classifications, one referring to descriptions and the other referring to codes: a similar set of macro-groups emerges, but in the case of codes a better cut-off is with five macro-groups, instead of four (as in the case of descriptions), with a split of “Bio Economy & Energy” from “Logistic & Manufacturing”.

cross-tabulation provide hints about the specific priorities emerging both within and outside the overlapping of the same categories of descriptions and codes³⁰.

Each cell in the cross-tabulation of the categorisation of priority descriptions and codes returns either no region or one or more regions associated with those priorities. Regions are also characterised by other features, but the features summarised in Table 4.4.1 may guide regions to explore which other regions have similar priorities.

iii) Socio-economic comparison of regions

Building on Eurostat data, Pagliacci et al. (2019) adopted both a principal component analysis, to reduce the number of dimensions under analysis, and a cluster analysis, to single out groups of EU regions with relatively similar socio-economic features. Their methodology resulted in a picture of significant regional heterogeneity in terms of socio-economic features. They classified the socio-economic features of NUTS 2 EU-28 regions³¹ based on a set of 31 input variables covering 3 domains: population and other demographic features (6 variables); the regional economy and the labour market (3 variables); and sectoral structure, covering both sections (agriculture, industry, construction, wholesale and trade) and the division of manufacturing (22 variables).

Map 4.4.1 displays the maps of the resulting 19 clusters of regions of the 4 existing macro-regions.

30 For instance, in the case of NL2-Eastern Netherlands, the text description “development of robotics for transcranial Magnetic Stimulation” is classified as “Mechatronics” in the “Description Classification” and as “Health & Life Science” in the “Codes Classification”.

31 The analysis uses data at NUTS 2 level according to the EU classification. The authors are aware that, for some countries (e.g. the Baltic states), this level overlaps with the national level.

Table 4.4.1.
Eye@RIS3 records by category of RIS3 priorities: descriptions and codes

	Agro	H&L	New Economy & Leisure industry			Bioeconomy, Blue Economy & Energy			Logistic & Manufacturing			Total
	Agro	H&L	Crea	ICT	S&E	Bio-Econ	Blue-Econ	Ener	Aero	Manu	T&L	
AGROFOOD												
Agrofood	7,92	0,16				0,57		0,08	0,16			8,90
Healthy Food	1,22	0,16										1,39
HEALTH & LIFE SCIENCE												
Health	0,16	5,63	0,08	0,16	0,16	0,33			0,24			6,78
Life Science	0,08	5,71										5,80
NEW ECONOMY & LEISURE INDUSTRY												
Bioeconomy	0,57	0,33	0,41	0,33	0,98	1,14	0,41	0,08	1,22	0,24		5,71
Creative industry			0,16	1,22								1,39
Digital & ICT	0,08	0,65	8,08	0,33	0,57	0,57	0,08		0,41	0,08	0,16	11,02
Fashion				0,08					0,73			0,82
Growth & Welfare	0,08	0,65	0,41	0,33	1,22	0,24	0,08		0,49	0,08	0,08	3,67
ICT & Tourism			0,08	1,96	0,08	0,08			0,08			2,29
Tourism	0,41	0,33	0,33	4,49	0,16	0,16						5,88
PRODUCTION & TRANSPORT MANUFACTURING & ENERGY												
Automotive & Aerospace	0,08		0,16		0,16	0,73	0,16	0,08	3,59	1,06	1,06	7,10
Energy Production						0,49	2,69	0,08	0,16			3,43
Manufacturing	0,33	0,08				0,65	0,08		4,24	0,33	0,08	5,80
Marine & Maritime						0,41	0,65	1,39	0,41	0,41		3,27
Mechatronics		0,08	0,08			0,16	0,08		2,78	0,16	0,08	3,43
Optics		0,08				0,08			0,24			0,41
Photonics		0,08	0,41			0,16		0,08	1,88		0,16	2,78
Sustainable Energy	0,49					6,69	4,33		0,57	0,24		12,33
Transport & Logistics			0,16			0,16	0,08		0,73	2,78	0,73	4,65
Water jet cutting									0,08			0,08
No Description												
	0,33	0,08	0,08		0,57	0,16	0,24	0,16	1,31	0,16		3,10
	11,76	14,04	10,45	8,90	3,92	12,82	8,90	1,96	19,35	5,55	2,37	100,00

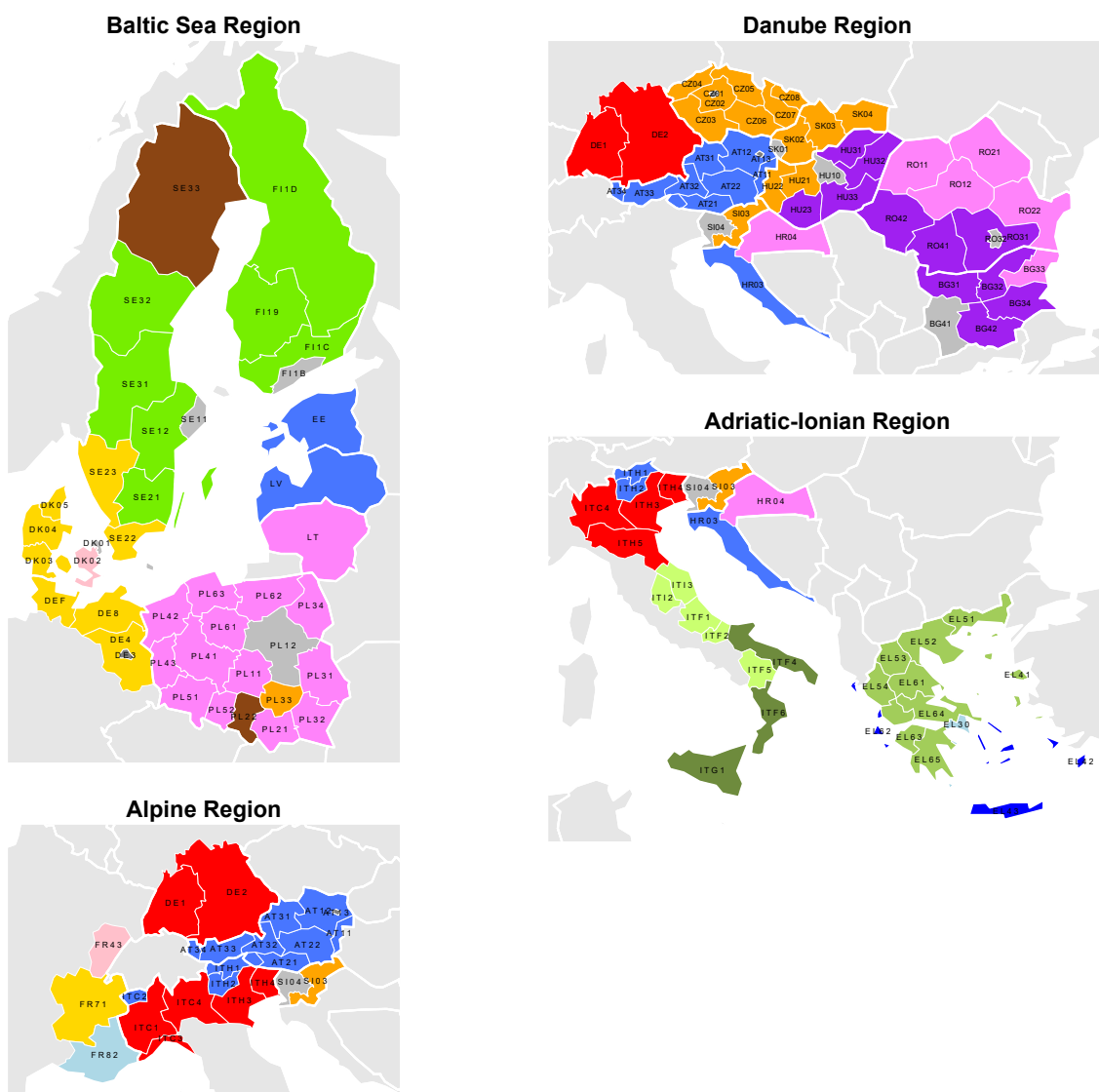
Legend

Agro	Agrofood, forestry and tobacco	Bio-Econ	Bioeconomy & Waste collection, treatment, etc
H&L	Health & Life Science	Blue-Econ	Blue Economy
Crea	Creative industry, Tourism & cultural and recreative services	Ener	Energy Production, Efficiency & Sustainability
ICT	ICT & digital transformation	Aero	Aeronautics, Aerospace & Automotive industry
S&E	Social innovation & Education	Manu	Manufacturing
		T&L	Transport & Logistics

Note: Data refer to 1 225 records (covering 206 territorial entities) in the database Eye@RIS3 and were retrieved on 1 October 2018.

Source: Pavone et al. 2019.

Map 4.4.1.
Maps of socio-economic clusters of regions, by macro-region



North-Western EU regions

- Very-high income; high-density city-regions; high-employment; highly educated; touristic
- Very-high income; capital city-regions; diversified services
- Very-high income; financial centres; foreigners
- Very-high income; large urban regions; high-employment; highly educated
- Urban regions; high-income; poorer employment conditions; touristic
- Very-high income; manufacturing; population imbalances
- High-income; high-employment; low-manufacturing; services & public sector
- Medium-income; employment imbalances; low-manufacturing; services & public sector
- Medium-income; high-employment; manufacturing & private services
- Medium-income; high-employment; highly educated; manufacturing: mining & quarrying
- High-income; sparsely populated; public sector; highly educated
- High-income; low-population density; tourism

Eastern manufacturing regions

- Low-income; high-employment; manufacturing; no foreigners; very highly educated
- Very low-income; manufacturing; no foreigners; highly educated
- Very low-income; agricultural; manufacturing: textile, electric, transport; low-population density

Mediterranean traditional-economy regions

- Medium-income; employment & population imbalances; manufacturing: textile, basic metal, transport; very-low educated
- Low-income; high-density; high unemployment; agriculture; food & drinks; very-low educated
- Very-low income; agriculture; sparsely populated; very high unemployment; traditional services (G-I)
- Low-income; high-unemployment; touristic; food & drinks; traditional services (G-I); very-low educated

Source: Authors' own elaboration

iv) Focus on EUSALP

The results of applying cross-tabulation to EUSALP are shown in Table 4.4.2. This example supports the comparative analysis of specific policy measures and projects implemented by regions within the same domain of priority. For instance, “New technologies for health” (third category of codes in columns) is relevant for 10 territorial entities in 4 countries, with a specific focus on health and life science, but also tourism. What matters in this comparison is the potential of comparing projects in terms of these priorities, in regions with similar or different socio-economic conditions. In learning from other regions, it is important to tailor policy interventions based on an awareness of structural differences, as they emerge from socio-economic benchmarking.

This tool would be of particular use for, for instance, Action Group 1, namely the group that elaborates on actions “To develop an effective research and innovation ecosystem”. The ingredients for such actions are within the RIS3 already implemented by the MRS regions. Some options for orienting the activities are now available so that the selection of projects can begin and making progress on the further implementation of smart specialisation strategies in MRSs can be made.

v) Discussion

This paper proposes an analytical framework of several dimensions, characterising both socio-economic features of regions in the EU-28 and their RIS3 priorities. This multidimensional perspective has been adopted to highlight similarities across regions.

The resulting information can be used by local stakeholders interested in the further implementation of their own RIS3 and to consider their territory from a comparative perspective, finding potential partners for collaboration (European Commission 2018). To enhance the effective use of the two sets of results, on the priorities of RIS3 and on the socio-economic features of regions, their implementation in the Platform of Knowledge (EUSALP 2018)³², as well as in the Eye@RIS3 platform (European Commission 2018), is advocated.

In addition, this methodology may strongly support instances of participation in the coordination and implementation of macro-regions (e.g. national coordinators, policy area coordinators, policy area focal points, thematic steering groups or action groups) in the design of more integrated territorial strategies, which could take advantage of the capitalisation of both intra- and inter-MRS multidimensional comparisons with RIS3 (the development path that the regions intend to follow) and socio-economic conditions (summarising the current structural features).

As soon as that type of query is implemented online, through the Eye@RIS3 platform or the EUSALP Platform of Knowledge, regions within the same macro-region could start performing more focused analyses and more effective dialogue on potential synergies or complementarities when considering the same priorities, as they are outlined in the regions’ strategic documents.

³² <https://www.alpine-region.eu/p/dashboard>

Table 4.4.2.
Classification of EUSALP regions³³, by RIS3 priorities and socio-economic features

	Agro	H&L	New Economy & Leisure industry		
	Agro	H&L	Crea	ICT	S&E
AGROFOOD					
Agrofood	AT12, AT31, FR43, ITC1, ITC4, SI				
Healthy Food	ITH1, ITH2, ITH3, ITH4				
HEALTH & LIFE SCIENCE					
Health	AT11	AT12, AT33, DE1, ITC3, ITC4, SI		AT34	AT34
NEW ECONOMY & LEISURE INDUSTRY					
Life Science		AT13, AT31, AT32, DE2, FR71, FR82, ITC1, ITH1, ITH4			
Bioeconomy		AT22			
Creative industry			ITC4		
Digital & ICT		ITH2	AT32, FR82	AT21, AT32, AT33, DE2, FR43, FR71, ITC2, ITH1	
Fashion					
Growth & Welfare					
ICT & Tourism			AT33, ITH1, ITH4		
Tourism		AT33	AT13, FR71		SI

Legend

Agro	Agrofood, forestry and tobacco	ICT	ICT & digital transformation
H&L	Health & Life Science	S&E	Social innovation & Education
Crea	Creative industry, Tourism & cultural and recreative services		

Legend of regions' socioeconomic features, NUTS codes and names of regions

NUTS	Region	Socioeconomic features
AT11	Burgenland (AT)	High-income; low-population density; tourism
AT12	Niederösterreich	High-income; low-population density; tourism
AT13	Wien	Very-high income; high-density city-regions; high-employment; highly educated; touristic
AT21	Kärnten	High-income; low-population density; tourism
AT22	Steiermark	High-income; low-population density; tourism
AT31	Oberösterreich	High-income; low-population density; tourism
AT32	Salzburg	High-income; low-population density; tourism
AT33	Tirol	High-income; low-population density; tourism
AT34	Vorarlberg	High-income; low-population density; tourism
DE1	Baden-Württemberg	Very-high income; manufacturing; population imbalances
DE2	Bayern	Very-high income; manufacturing; population imbalances
FR43	Franche-Comté	Medium-income; employment imbalances; low-manufacturing; services & public sector
FR71	Rhône-Alpes	High-income; high-employment; low-manufacturing; services & public sector
FR82	Provence-Alpes-Côte d'Azur	Urban regions; high-income; poorer employment conditions; touristic
ITC1	Piemonte	Very-high income; manufacturing; population imbalances
ITC2	Valle d'Aosta/Vallée d'Aoste	High-income; low-population density; tourism
ITC3	Liguria	Very-high income; manufacturing; population imbalances
ITC4	Lombardia	Very-high income; manufacturing; population imbalances
ITH1	Prov.Autonoma di Bolzano	High-income; low-population density; tourism
ITH2	Prov.Autonoma di Trento	High-income; low-population density; tourism
ITH3	Veneto	Very-high income; manufacturing; population imbalances
ITH4	Friuli-Venezia Giulia	Very-high income; manufacturing; population imbalances
SI	Slovenia	

Source: Authors' own elaboration based on data from Pagliacci et al. (2019) and Pavone et al. (2019)

RIS3 priorities: categories of descriptions on rows; categories of codes on columns; socio-economic clusters highlighted by colours (see the legend below)

³³ Twenty-two regions under analysis; no information in Eye@RIS3 platform for Switzerland and for Slovenian regions (only national-level RIS3 data are available for Slovenia).

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