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INTER-REGIONAL COLLABORATION IN RESEARCH AND INNOVATION STRATEGIES FOR SMART SPECIALISATION (RIS3)

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Abstract

The objective of this Smart Specialisation (S3) Platform Working Paper is to examine the role of inter-regional collaboration in national or regional Research and Innovation Strategies for Smart Specialisation (RIS3). It provides a conceptualisation of inter-regional collaboration within the framework of RIS3. It draws from the literature on innovation policy to develop an analytical framework to better understand the multiple dimensions of inter-regional collaboration, namely the why, what, where, who and how of collaboration; and explores how inter-regional collaboration varies according to the six steps of the RIS3 process. Finally, it looks at experiences of inter-regional collaboration for innovation in the Baltic Sea region within this framework.

Keywords: Inter-regional collaboration, Smart Specialisation, innovation policy, regional development, Baltic Sea Region, dimensions of collaboration, transnational collaboration.

[a] The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

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CONTENT

1. Introduction

Research and innovation networks are increasingly global, as evidenced by growing shares of international R&D projects, co-patenting and co-publications (see e.g. Wagner and Leydesdorff, 2005). This global dispersion of knowledge is likely to continue as research further internationalises (Edler, 2010) and companies continue to expand their value chains and resort to open innovation strategies to source knowledge globally (Chesbrough, 2003). While proximity and place contribute to knowledge spillovers and local buzz (Bathelt et al., 2004); innovation networks are rarely contained within regional boundaries and often transcend regional, even national borders.

The importance of global innovation networks calls for a type of regional innovation policy that goes beyond regional borders and takes into account the degree to which actors in a region are able to connect to, and benefit from, such networks and resources (Bathelt et al., 2004). This contrasts sharply with the dominant practice of designing and implementing regional innovation policies solely within the restricted boundaries of administrative regions (OECD, 2013). An 'outward looking' approach to innovation policy, including collaboration in the design and implementation of policy instruments with other regions, may help regions, particularly lagging ones, overcome fragmentation and lack of critical mass and facilitate access to research capacity, production expertise and finance that can be locally scarce.

Policy cooperation across borders is a long-standing practice and has since the 1990s widened considerably, partly as a result of macro-regional integration in Europe and financial support for cross-border initiatives (Perkmann, 2003), including the recent development of macro regional strategies such as the EU Strategy for the Baltic Sea Region (EUSBSR) and the Danube Strategy. However, as the OECD (2013) acknowledges, there are still significant untapped opportunities in inter-regional collaboration for innovation and innovation-driven growth, beyond the traditional focus on the challenges and barriers affecting cross-border regions.

The recent advocacy for place-based approaches to regional development (Barca, 2009) and the development of regional strategies for smart specialisation have further reinforced this need. Within the new Cohesion Policy framework, smart specialisation is an ex-ante conditionality: every Member State and region will need to have a national or regional research and Innovation Strategy for Smart Specialisation (RIS3[1]) in place before they can receive financial support from the European Structural and Investment Funds (ESIF). Defined by the European Commission Smart Specialisation Platform (S3P)[2] as "a strategic approach to economic development through targeted support to Research and Innovation", smart specialisation aims at concentrating resources on key priorities based on a region's economic potential and is articulated around six steps, namely: regional analysis, governance, shared vision, priority setting, policy mix and evaluation (European Commission, 2012).

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[1] Research and Innovation Strategies for Smart Specialisation (RIS3) are also sometimes referred to as Smart Specialisation Strategies (S3)

2 The S3 Platform is hosted by the Joint Research Centre's Institute for Prospective Technological Studies in Seville. The Platform was established by the European Commission to provide professional advice to EU countries and regions for the design of their research and innovation strategies for smart specialisation (RIS3). See S3 Platform website: http://s3platform.jrc.ec.europa.eu.

Inter-regional collaboration is a key component of the implementation of RIS3. The RIS3 guide (European Commission, 2012) indeed emphasises the need for regional strategies to adopt an 'outward looking' approach in terms of their orientation towards global value chains, the assessment of priorities vis-à-vis other regions, as well as the consideration of cross regional projects and networks. In its conclusions on the Innovation Union, the Council of the European Union underlined this outward looking dimension of smart specialisation, "with each region building on its own strengths to guide priority-setting in national and regional innovation strategies, as well as cross-border cooperation where appropriate".[3] In support of this, up to 15% of the total amount of the ESIF can now be allocated in an Operational Programme (OP) for inter-regional and cross-border activities.

However the potential for regions to engage in transnational and inter-regional policy collaboration remains so far underexploited. This calls for greater efforts to clarify its use, associated challenges and potential benefits in the context of smart specialisation. This working paper aims to address this gap by exploring the multiple rationales and dimensions underpinning inter-regional collaboration within the framework of RIS3. We draw from the literature on innovation policy to develop an analytical framework to better understand the multiple dimension of inter-regional collaboration, which we then connect to the six steps of the RIS3 process.

More specifically, the paper explores this theme in the case of macro-regional strategies. The experiences of the Baltic Sea Region (BSR) provide an illustrative example of how regions can leverage existing collaborative arrangements in the context of RIS3. The paper briefly introduces the context of inter-regional collaboration in the context of the BSR and presents the main key issues that emerged out of a two-day workshop exploring macro regional collaboration[4] that took place in November 2013 in Malmö, which will be seen in light of this framework as a first illustration. The findings from this workshop provide some evidence of how regions perceive opportunities and challenges for inter-regional collaboration. While incomplete, they provide some insights on areas for further exploration in further studies suggested at the end of this paper.

The paper is organised as follows: Section 2 first reviews the concept of Smart Specialisation and collaboration in research and innovation policy in Europe. Section 3 elaborates a theoretically informed framework for inter-regional collaboration. Section 4 connects this framework to the different phases of RIS3. Section 5 considers the context of the BSR and more specifically the issue of inter-regional collaboration between RIS3 in the BSR in the light of this framework. Conclusions and policy implications are offered in section 6.

3 Council Conclusions on Innovation Union for Europe, 3049th Competitiveness Council meeting. Brussels, 26 Nov. 2010.

4 The workshop was co-organised by the S3 platform, Region Skåne, and the Swedish national institutions VINNOVA and Tillväxtverket. A summary of the workshop can be found on the webpage of the S3 Platform http://s3platform.jrc.ec.europa.eu/documents/10157/287101/WORKSHOP%20report_MALMO_NOV2013final.pdf.

2. Inter-regional collaboration in the context of Smart specialisation

2.1 The origins of smart specialisation

The concept of smart specialisation was first introduced in a policy brief prepared by an independent advisory group to the European Commissioner for Research and Innovation (Foray and Van Ark, 2007). The group was primarily concerned with developing strategies aimed at addressing the transatlantic gap in R&D investment. Foray et al. (2009) further developed the concept, and argued that research investment in Europe suffered from fragmentation, poor co-ordination and insufficient critical mass. They also noted a clear 'me-too' syndrome: regions tended to make investments in the same fashionable areas, such as information and communication technologies (ICT), nano- and bio-technologies. Their recommendation was therefore to support structural change and enable the emergence of new activity sectors or industries by investing in areas of strategic potential in each of Europe's regions, acknowledging that these differ with respect to areas of strength and potential. Later contributions like the "Barca Report" (Barca, 2009) contributed to the development of the concept through recommendations for the post-2013 programmes, such as the need to focus on fewer priorities and for better coordination of place-based policies. This transformed Smart Specialisation from a sectoral concept to a place based one more attuned to regional policy (McCann and Ortega-Argilés, 2011).

RIS3 draws on past policy experiences, most notably from Regional Innovation Strategies (RIS and RITTS) but incorporates significant novelties. Firstly, one key building block of RIS3 resides in the idea that smart specialisation emerges out of an 'entrepreneurial process of discovery' (Foray et al., 2009), a 'bottom up' learning process aimed at identifying 'domains' for future specialisation building on a region's existing capabilities and connections. This is related to the idea of the self-discovery process (Hausmann and Rodrik, 2003), and represents a move away from the stylised model of top down planning of previous regional innovation strategies where public authorities were expected to steer innovation processes. In this new model, priorities are supposed to emerge out of the entrepreneurial discovery process and the role of public authorities is rather to create the right conditions for and support the entrepreneurial process of discovery. Entrepreneurial knowledge naturally involves more than knowledge of science and technology, and includes knowledge of market growth potential and innovation needs (Foray et al., 2009)

Secondly, Smart Specialisation incorporates a more dynamic view of place-based economic transformation. Research on related variety and regional branching (Neffke et al., 2011), suggests that regions' structural change builds on pre-existing industries that are technologically related, in other words it considers that new industries branch out of related local industries from which existing capabilities are exploited and recombined in novel ways. Regional branching through related diversification can lead to path development and renewal, including the upgrading of a mature path, the diversification through exploiting synergies between an existing path and a new one, or the creation of a new path. Regional renewal is thus contingent on the competences and assets present in the region, and the number of industries that are technologically related in a region (related variety), will increase the likelihood of regions diversifying and developing new growth paths (Frenken et al., 2007).

A related key dimension is the acknowledgement of the importance of regional connectedness and the interdependent and multi-level nature of regional policies. It acknowledges that a lot of

networks relevant for innovation may be extra-regional, indeed extra-regional links via e.g. trade of goods and services or outflows of people have been found to be a key source of related variety (Boschma and Iammarino, 2009). According to the RIS3 guide, cross-border and trans-regional cooperation are a means to achieve "more critical potential and related variety" (European Commission, 2012). It also recognises that regional performance is affected by policies implemented at different levels of governance and in other regions, indeed regional territories can be both deliberate targets of national policies but also places where the unintended impacts of policies made at other levels of governance are felt (Uyarra and Flanagan, 2010). This includes spillover effects of certain policies such as the building of large scientific infrastructure beyond regions' administrative borders (OECD, 2013). Finally, developments in a region will be affected by what happens in other regions (Charles et al, 2013), e.g. as a result of competition for talent and resources if focusing on similar areas of specialisation (Dilaver Kalkan et al, 2014).

In relation to this, RIS3 adopts a more open perspective to innovation policy compared with previous strategic approaches, focused mainly on internal linkages within regional innovation systems with little attention to international and trans-regional networks (see e.g. Charles et al., 2000). RIS3 calls advocates an 'outward orientation', for instance by assessing opportunities and the comparative advantage of the region with respect to other EU and non-EU regions, enhancing synergies with projects under way in other EU regions, and facilitating international research and innovation research partnerships and cross-border mobility of personnel (European Commission, 2012).

To support this emphasis on cooperation with other EU countries and regions, in the upcoming programming period regions can use up to 15% of the total amount of the ESIF allocated under an Operational Programme (OP) outside the OP area (but within the EU), provided that it is for the benefit of the OP area (EU, 2013). The arrangements for inter-regional and transnational actions within the OP need to be specified, with beneficiaries located in at least one other Member State (MS) where MS and regions participate in macro-regional strategies and sea-basin strategies, as well as the contribution of the planned interventions to such strategies.

2.2 Leveraging existing EU mechanisms for interregional collaboration

While enhancing collaboration among regions is high on the agenda of RIS3, different forms of cooperation are already extensively supported by EU programmes. There are indeed already a number of other EU tools available for inter-regional collaboration that smart specialisation could benefit from and incorporate.

Under cohesion policy, in the period 2007-13 cooperation is mainly supported by the European Territorial Cooperation programmes (former Interreg) and, beyond cohesion policy, by other thematic EU programmes such as Horizon2020. Related to the latter there are a number of tools and programmes to support inter-regional collaboration on research and innovation, such as ERA-Nets, Joint Technology Initiatives (JTIs), Knowledge and Innovation Communities (KICs), Public-Public-Partnerships, Joint Programming Initiatives (JPIs), European Innovation Partnerships (EIPs), ERA Chairs, Teaming and Twinning for excellence and innovation.

While European Structural and Investment Funds (ESIF) and H2020 pursue different objectives and follow different logics, synergies between them are increasingly being encouraged[5]. An important difference between ESIF and H2020 is that H2020 funds are won mainly by companies or research institutions through transnational competitive calls based on excellence criteria, while ESIF funds are distributed to regional authorities based on predefined criteria. Therefore regions cannot rely on H2020 funds for regional development, but can use ESIF to drive structural change and the building of knowledge-based capabilities. ESIF can fund *upstream* projects (i.e. the building of knowledge generating capabilities that in the future can become eligible for H2020 funding) and also *downstream* projects (i.e. more direct innovation supporting activities that support innovation outcomes from H2020 projects and other activities); whereas H2020 is more focused on supporting research and innovation excellence projects.

This funding can also be combined with some of the aforementioned new funding opportunities under H2020 such as twinning and teaming actions and the ERA chairs. Teaming aims to support the creation of centres of excellence in under-performing regions, while Twinning supports links (e.g. staff exchanges, expert visits, workshops and training activities) in a particular field of research between emerging institutions and at least two internationally-leading institutions. EU regions can furthermore benefit from several EU networks of regions like ERRIN, EURADA and EuroCities, EARTO and initiatives such as the European Cluster Observatory.

Finally, macro-regional strategies such as the EUSBSR launched in 2009 and the Danube Strategy launched in 2010, seek to further enhance economic development in Europe through innovation in territorial cooperation and cohesion. A 'macro-regional strategy' is an integrated framework set up to address common challenges faced by a defined geographical area.

There is therefore a range of collaborative policy tools that can be leveraged by regional authorities in their RIS3, and that could be further aligned. For instance Smart Specialisation can contribute to the integrated approach of macro-regional strategies by stimulating regional related diversification, connecting and aligning the various RIS3 in a macro region, as well as developing critical mass to tackle major common challenges. In turn, macro regional strategies have the potential to facilitate synergies among programmes, regions and member states to improve economic, social and territorial cohesion, including coordination of RIS3s, collaboration in thematic activities (INTERREG B), policy support measures (such as cluster cooperation), joint policy development and preparation for application for Horizon2020 projects.

Given this policy imperative, it is important to address the nature, various dimensions and rationales for inter-regional policy collaboration, and its relevance to the RIS3 agenda. The next sections will unpack the dynamics of inter-regional collaboration and further explore how Smart Specialisation strategies can be supported by inter-regional policy collaboration.

[5] *http://ec.europa.eu/regional_policy/sources/docgener/guides/synergy/synergies_en.pdf.*

3. Unpacking inter-regional policy collaboration: towards a framework and a taxonomy

3.1 Definitional issues

As mentioned in the previous section, 'outward orientation' is one of the key features of RIS3. But what does it actually mean? The RIS3 guide refers to a range of activities under this broad heading, including the assessment of comparative advantages of the region vis-à-vis other EU and non-EU regions, the benchmarking of regional support schemes, the exploitation of synergies with projects under way in other EU regions, and the support for the circulation of knowledge, cross-border mobility of personnel and international collaboration in research and innovation activities.

'Outward orientation' in the context of RIS3 therefore refers to a wide spectrum of transnational and inter-regional forms of policy engagement. It conflates different several aspects related to policy coordination that we will refer in this paper under the broad label of 'collaboration', or 'outward orientation' but which entail different mechanisms and associated risks.

There is a rich literature on policy coordination, which is beyond the scope of this paper (see e.g. Peters, 1998). Braun (2008) reviews some of this literature and offers useful heuristics to understand the concept. He distinguishes for instance between 'policy' or 'functional' coordination, namely coordination at the level of policy formulation, and 'administrative' coordination, which concerns efficiency issues at the level of policy implementation. Following Peters (2006), Braun also draws a distinction between 'negative' and 'positive' coordination; while the former refers to the mutual adjustment of actors aimed at avoiding, at least minimising, duplication and overlap of initiatives, the latter involves specific cooperation or concerted action. Braun (2008) discusses two additional, more advanced, stages of policy coordination, namely 'policy integration' or the coordination of policy goals, and 'strategic coordination', which implies the coordination of visions and strategies. In turn, coordination can be articulated in different ways (Braun, 2008) e.g. via top-down steering, the creation of a separate coordinating structure, via interdepartmental coordination, or at the level of agencies.

Edler (2010) also differentiates between the notions of 'coordination', 'collaboration' and 'integration' in science and technology policy. Whilst 'coordination' involves bringing different elements into a 'harmonious' or efficient relationship, he defines 'collaboration' as two or more partners working "together on a concrete, distinct project on the policy level in order to achieve common goals" (Edler, 2010; p.135). In the case of policy coordination and collaboration, competencies and autonomy remain within each collaborating policy actor. By contrast, 'integration' refers to a process of combining activities or structures that involves a transfer of competencies and loyalty from one level to the integrated level, with the various parts of the new whole to arrange for a common governance structure (Edler, 2010). This means to delegate authority and assign the new integrated structure its own actor capabilities.

When translated into inter-regional collaboration in the context of RIs3, we can similarly identify a range of scenarios, a continuum of possible forms of 'outward orientation', from one-off cooperation for specific purposes to the development of integrated innovation strategies (Trippl, 2010). More intense cooperation tends to involve an explicit strategy and a broad scope of co-

operation in multiple policy areas, even some form of legal arrangement and/or a common permanent secretariat (Perkmann, 2003).

'Outward orientation' in RIS3 can therefore be limited to 'negative coordination', for instance a mutual adjustment of regions in their identification of strategic priorities and policy mixes as a result of public authorities being more aware of the relative position and unique strengths internationally. This can be facilitated by information exchange on e.g. innovation policy initiatives, actor mappings, research programmes, market intelligence, etc. Other modalities of interaction go beyond mutual adjustment and enter the realm of 'positive coordination' (Peters, 2006), for instance aligning funding programme conditions and other schemes such as mobility incentives for researchers, sharing of programmes or structures across borders, joint delivery of specific services, and other concrete, ad hoc, collaborative projects. More active policy collaboration (or policy integration) may take the form of longer-term programmes or actions involving joint funding to address common problems. Finally, collaboration may be more far-reaching and involve broader policies or even joint regional innovation strategies that are commonly designed, funded and implemented by the partner regions, and which inform a mix of policies and actions. One of example of the latter is the joint research and innovation strategy of the regions of Berlin-Brandenburg (European Commission, 2013a).

According to Lundquist and Trippl (2013), the different forms of cross regional collaboration are generally sequential and respond to different rationales or motivation (they also have different associated risks and preconditions as elaborated in section 3.3). Cross-border projects usually begin on a bottom-up basis involving exchange of data and information, and then move on to experiment with one-off collaborative projects, open up programmes to allow collaboration with firms or universities located across the border, or work towards a more comprehensive strategic innovation policy approach for the cross-border area. Lundquist and Trippl (2013) argue that while low degrees of integration would be driven mainly by cost, further stages tend to be associated with knowledge sharing objectives and innovation.

Having discussed the multiple meanings and forms of 'outward orientation' in RIS3, it is important to understand the what, why and how of such endeavours. Edler (2010) reminds us that there are four major conditions that have to be met for successful international policy coordination, namely awareness of the multitude of *goals* in collaboration, a clear understanding of the *rationales and contexts* of all the *actors* that participate, systematic understanding and conscious choice of *coordination functions and modes* and understanding of the challenges and prerequisites for successful collaboration. To these conditions we would add an additional one, namely an understanding of the geographical dimension of these engagements and the importance of (various types of) proximity.

Table 1 captures these dimensions and the next sections further discuss their relevance in the context of RIS3.

Table 1: The dimensions of collaboration

Why?	What are the rationales for collaboration? How are these rationales related to the smart specialisation agenda?
What?	What are the broad areas or goals of collaboration - common problems, opportunities or learning?
Who?	Who are the partners and what are the criteria for choosing them?
Where?	What are the geographical boundaries of collaboration? Is geographical proximity an important criteria ? What other types of proximity are necessary?
How?	What mechanisms for collaboration are being used? What are the preconditions?

3.2 Why collaborate? Different rationales and their relevance for RIS3

One key aspect for effective policy collaboration involves a clear understanding of the rationales and contexts of the actors that engage in coordination (Edler, 2010). Policy action may be justified by a variety of theoretical rationales, understood as scholarly ideas that articulate the need for government intervention and outline the 'logic' through which an intervention ('means') is expected to lead to the intended outcomes or 'ends' (Laranja et al., 2008). The 'ends' are linked to the specific policy objectives or goals (the 'what' question), whereas the 'means' are the concrete instruments or policy tools ('how'). Many of the rationales commonly put forward for research and innovation policy can also be applied to joint policy interventions. Here we are mainly concerned with the rationales underpinning inter-regional and cross border policy collaboration among public authorities in order to advance the RIS3 objectives of achieving economies of scale, scope and increased spillovers in knowledge production and use.

A first set of rationales for inter-regional collaboration in research and innovation policies relates to the aforementioned aspiration of overcoming fragmentation and lack of critical mass in public investment for research and innovation (European Commission, 2012). This is linked to the idea of market failures (Arrow, 1962) hindering investment in innovation and the smart specialisation objectives of enabling economies of scale and local spillovers. A related rationale is associated with enabling economies of scope and accessing *complementary assets*. Innovation is sometimes inhibited or slowed down if complementary assets required to transform technological knowledge into commercial products are lacking. In this instance, not enough actors may find investment in a particular type of discovery attractive since they may be perceived as having low profitability (Foray, 2013). According to Rodrik (2004), *coordination externalities* arise as a result of network externalities or the need for complementary goods. Interregional policy collaboration may address such externalities by providing complementary assets, or developing upstream or downstream activities in order to incentivize investment. *Upstream developments* may include investment in human capital or knowledge infrastructure to anticipate particular knowledge needs, including the development of general-purpose technologies (GPT). Collaborative *downstream* efforts can involve the use of demand side policies such as public procurement or standardisation.

Policy coordination and strategic collaboration across regions may also compensate for *competence or capability failures* hindering innovation in certain regions (Klein et al, 2005), for

instance as a result of poor access to specialist services or specialist infrastructure. This is particularly important to SMEs, who may find it more difficult to scan and source these services compared to large firms (Pinto et al., 2013). Research shows that specialist knowledge providers such as knowledge intensive business services (KIBS) tend to cluster in core regions (Corrocher and Cusmano, 2012; Pinto et al, 2013). Business angel networks and venture capital funds tend to be also highly concentrated geographically (Chen, 2010). Peripheral regions may lack the scale and specialist skills and expertise to provide these services. Inter-regional collaboration can guarantee sufficient scale and enable specialisation, and therefore enhance the pool of services and resources available to firms across regions. Collaboration may similarly allow for the sharing of costs (and risks) associated with investment in infrastructure and facilitate the development of *public* or *club goods* (OECD, 2013). Sharing the funding and management of knowledge infrastructure can lead to larger and better offering to firms, ensure greater profitability and guarantee an optimal use of these facilities, while avoiding duplication and unnecessary fragmentation of infrastructure investment. The joint branding of infrastructure such as scientific installations or technology parks may also increase their visibility, and thus the attractiveness of the broader area for firms and skilled labour.

Another rationale for collaboration among public authorities in RIS3 relates to *lock-in and learning failures* (Smith, 1997) that arise due to excessive specialization and insufficient *connectivity* of actors in terms of interactions within the innovation system but also globally (Bathelt et al., 2004). Policy collaboration can increase variety by enabling spaces for experimentation, such as test beds and living labs, by connecting new types of niche users and applications, the results of which that can be then rolled out more widely. Mechanisms associated with related diversification and regional branching, such as spin-off processes, labour mobility and innovation networks linking different but related industries can also be supported across regions through the use of collaborative instruments in support of entrepreneurship, labour mobility and clusters (Boschma and Gianelle, 2014).

A related rationale for inter-regional collaboration in RIS3 is associated with improving the general conditions for *entrepreneurial self-discovery*, by expanding the market base and removing entry and other institutional and non-institutional barriers that inhibit or restrict entrepreneurial processes of discovery and imitation, including barriers to labour mobility. This is important for lagging regions, as it can partly offset the relative undersupply of local entrepreneurs in their territory. Collaboration can lead to the mobilisation of entrepreneurial expertise in other regions which can be a source of self-discovery at home, for instance, fostering links with expatriate workers, using their experience or even encouraging their return (Rodrik, 2004).

Finally, inter-regional policy coordination and policy learning may prevent *government and institutional failures* associated with myopia, inertia, policy capture and imperfect information, factors which are likely to undermine the "drive for resource prioritization and concentration" of smart specialisation (McCann and Ortega-Argilés, 2011, p.9). Policy experimentation as advocated by the RIS3 agenda requires good knowledge of the effectiveness of a particular intervention, so that it is not prolonged unnecessarily over time or interrupted too early. Such emphasis heightens the need for good systems for policy evaluation, benchmarking and assessment and a high degree of capacity and competency on the part of regional governments (Rodriguez Pose et al., 2014). Collaboration for policy learning and policy intelligence could be particularly important for lagging regions, since intelligence gathering and building indicators for decision-making can be a costly and

difficult exercise. Collaboration can also help identify possible partners for entrepreneurs, define common areas for collaboration and even implement integrated actions.

3.3 What to collaborate on and associated challenges

A second aspect to consider in collaboration for research and innovation policy, following from the rationales outlined above, relates to a clear understanding of the 'what' question, namely in which instances or what type of goals are being pursued collaboratively and what types of benefits are expected. Bearing in mind associated challenges and costs, it is only sensible to pursue collaboration when it adds value in terms of solving particular problems or exploiting certain opportunities (OECD, 2013).

Acknowledging that problems don't stop at the borders of individual regions, interregional policy cooperation is often associated with solving common problems such as transport, health or sustainability. Indeed, the main goal of inter-regional collaboration is often solving common problems or challenges affecting regions that share similar socio-economic characteristics, or a common border (OECD, 2013). These may revolve around 'border problems' like planning, transport and environmental considerations, common problems associated with e.g. urban infrastructure, social inclusion or environmental concerns (such as the Eurocities network), and other challenges of economic development faced by particular regions (e.g. rural or peripheral regions).

Collaboration may also seek to exploit opportunities by bringing together complementary assets or common specialisms in science and technology in order to exploit synergies and reach critical mass in knowledge production and use. This is for instance one of the aims of initiatives such as ERANets in research, seeking to coordinate the research efforts of a group of countries that share common research strengths. Another example is the Vanguard initiative, promoting inter-regional cooperation in industrial strategies in order to develop 'world class clusters'[6].

Finally, policy collaboration can also be conceived more broadly and on the basis of inter-regional policy learning (Hassink and Lagendijk, 2001). In this case regional partnerships are of a supportive, rather than merely strategic, nature. These may be directed at assisting lagging regions in their strategies to more quickly adopt good practices and build knowledge based capabilities, although caution is needed when adopting policy lessons from elsewhere (Dolowitz and Marsh, 2000). Policy benchmarking initiatives and dissemination networks as well as certain new instruments in H2020 such as Teaming and Twinning fall into this category.

As has become evident so far, multiple rationales and goals underpin the pursuit of inter-regional collaboration in research and innovation in the context of RIS3. Equally important is to consider some key *challenges and prerequisites* for successful coordination, including a range of geographical, cultural, institutional, political and economic factors. Studies have for instance identified constraints such as socio-cultural distance (see Trippl, 2010; Koschatzy, 2000), including differences in working cultures, language barriers, low levels of trust[7], fears of competition and other cultural and institutional barriers; and cognitive or functional distance due to for instance uneven levels of innovation (Lundquist and Winther, 2006; Maggioni and Uberti, 2009).

[6] *http://www.s3vanguardinitiative.eu*

[7] *Although as Trippl (2010) points out, trust can be built as a result of networking*

Opportunities for collaboration may also be limited by differences in national regulations and institutional systems. For instance, cluster collaboration may be affected by differences in national systems shaping specific sectors such as health and energy (OECD, 2013). More generally, collaboration could be constrained by national differences in the rules governing intellectual property protection, technology transfer, the evaluation of academic research, and funding for R&D (including different eligibility conditions). Different education laws and labour market regulations (including pensions, taxes and benefit schemes) may also influence efforts to promote sectoral and geographical mobility of researchers and skilled workers.

Challenges have also been identified in relation to lack of political commitment, shared vision and/or engagement from key stakeholders. Policy inertia and policy path dependencies in individual regions, particularly those not accustomed to cross-regional policy collaboration, may impede an effective implementation of these initiatives. Lack of political commitment may be due to pressures on policy makers to ensure that benefits from investments are captured in their region (OECD, 2013). Finally, collaboration can be hindered by lack of data and indicators suitable for the monitoring and evaluation for these activities.

Articulating inter-regional collaboration involves additional challenges associated with the setting up of governance structures and coordination vehicles, which may entail a formal structure or some form of secretariat with dedicated staff and/or representatives of partner organisations. A related challenge relates to public authorities being sufficiently endowed with the competences and skills necessary to work at cross-border and inter-regional levels.

These costs and challenges linked to cultural, cognitive, institutional and political conditions, need to be weighed against expected benefits from collaboration (OECD, 2013). The benefits are however often uncertain and unbalanced, posing questions about the incentives to collaborate, and the alignment of those incentives across all stakeholders.

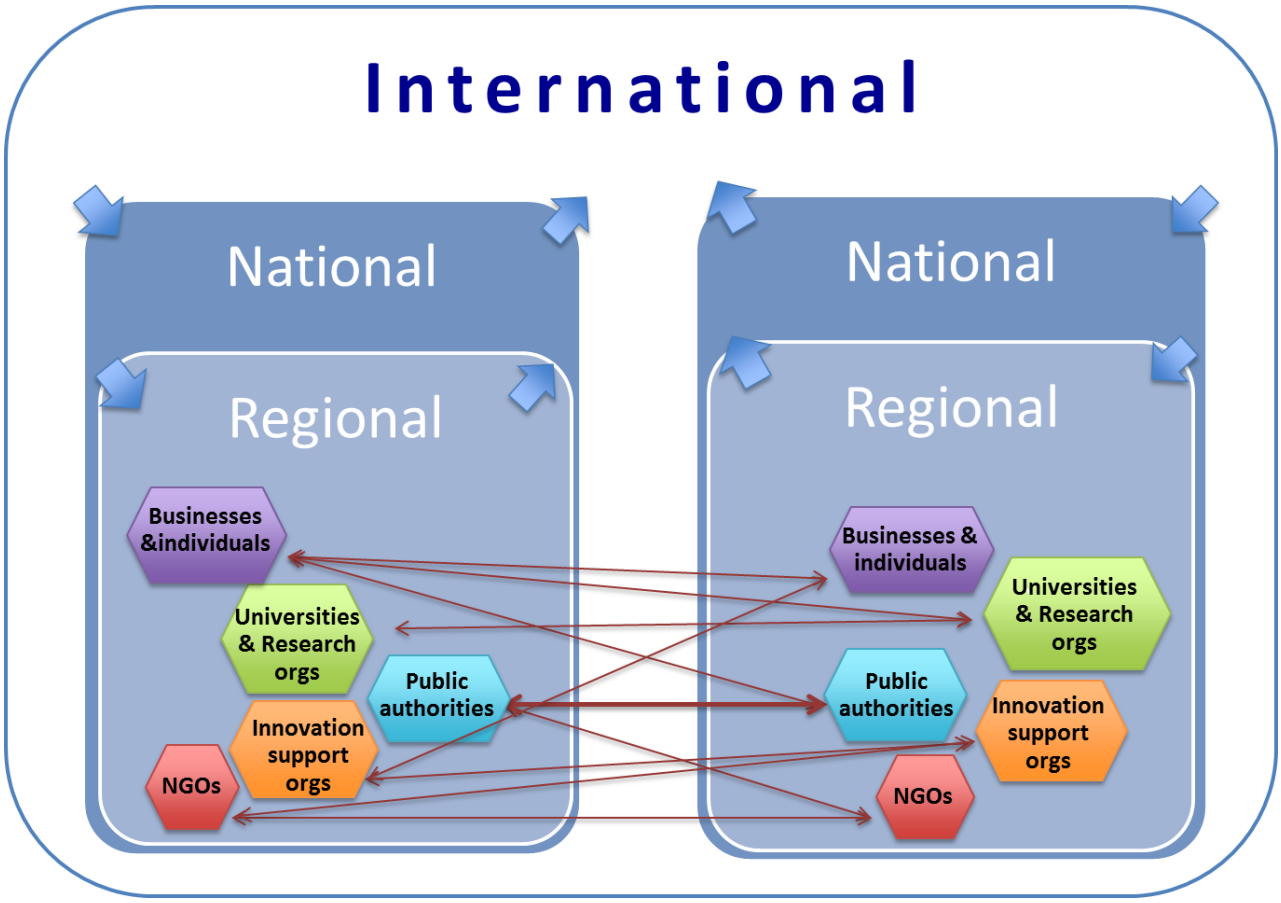
3.4 Who to collaborate with: inclusive governance

RIS3 is an exercise that involves a range of policy areas and organizations at local, regional and national levels (as well as EU level). This multi-level dimension implies the need for wider stakeholder involvement at various levels, which increases complexity in the governance of collaborations. It also implies that, in the spirit of RIS3 and in order to promote processes of entrepreneurial discovery, stakeholder involvement should include not only the so-called triple helix of academic, public, and business spheres but also wider users and civil society (quadruple helix). As mentioned earlier, the smart specialisation concept places entrepreneurs (broadly understood as individuals and organizations both in the market and non-for-profit realm) at the core of the identification process of domains for future specialisation of regions. Indeed, the identification of opportunities for inter-regional collaboration in RIS3 may not necessarily come from regional authorities. According to the OECD (2013), private firms are often the first to spot the potential for cross-border collaborations. The role of regional authorities is in this case to assist entrepreneurs in their search and identification of opportunities, some of which will require an inter-regional collaboration dimension, and to broker "new connections and conversations in the regional economy" (European Commission, 2012; p.41).

The outward looking orientation involves being aware of, coordinating and exploiting synergies with policy initiatives, instruments and infrastructure in other regions and at multiple levels of governance. It requires the involvement of various stakeholders within and beyond the region in the consultation process, in governance structures (steering group, working groups) and in the design, implementation and evaluation of policy instruments (see section 4).

The specific constellation of actors would be determined by the specific goals being pursued and the policy instruments employed. In general, however, inter-regional policy collaboration may be facilitated at and from different (administrative) levels and from actors from different societal spheres (economic, scientific, political, civic society). Regions would generally be the most appropriate scale for policy collaboration, however the degree of decentralisation of innovation policies varies across countries and thus some policy areas may be dealt with at a higher administrative level.

Figure 1: Potential levels of policy coordination.



The political levels under consideration therefore include the level of the national government, the regional level (particularly the management team responsible for RIS3), and within that universities, support organisations with more or less operational autonomy such as cluster organisations or science parks, and other stakeholder groups. However, it is also possible that coordination is brokered at different levels within and across partner regions/countries, leading to a complex architecture of institutional coordination. For instance responsibilities or competencies

allocated to regional level in one country are to be found at national level in another country, making regional-national collaboration the most appropriate. Alternatively, regional authorities managing the RIS3 may establish a strategic link with a science park or cluster association in another region. Equally, collaborative policy instruments may target a variety of actors and organizations within and beyond the region.

3.5 Where? Geographies of collaboration

Another dimension underpinning inter-regional collaboration in research and innovation policy is the geographical delimitation of these activities. Several forms of collaboration across borders at different spatial scales have been identified in the literature. For instance, Perkmann (2003) characterizes collaborative partnerships according to whether they are small or large and whether the collaboration is between contiguous or non- contiguous territories.

Cross-border regional collaboration involves linkages between neighbouring regions with adjacent borders from at least two countries. Lundquist and Trippl (2013) note however that within this broad definition there is considerable heterogeneity between different cross-border areas, as it includes regions located in densely populated economic core areas, such as the Centrope region (encompassing 8 federal Regions including Vienna and Bratislava) as well as cross-border areas comprising two peripheral, sparsely populated, neighbouring regions such Haparanda (Finland) and Torneå (Sweden). *International or inter-regional networks* of regions are collaborations between a small number of non-contiguous territories that may share certain common characteristics. An example of such arrangement is the "Four motors of Europe" network, created in 1988 to build links between several highly industrialised regions in Europe. *Transnational macro-regions* in turn are collaborative initiatives involving a large continuous set of regions from different countries, as well as entire countries, covering a wide territorial area. Perkmann (2003) also refers to a fourth category, namely trans-European *peak associations* which are large networks among non-contiguous territories. They may for instance represent their members' interests on the European level and/or act as network brokers or a discussion platform for members. These four forms of collaboration are not mutually exclusive (e.g. inter-regional or cross-border networks can coexist within a macro-region).

Table 2: Geographical scope of collaboration

	Small	Large
Contiguous territories	Cross-border regions *Examples: Dutch-German-Belgian Top Technology Region TTR, the Centrope region at the intersection of Austria, Slovakia, Czech Republic and Hungary, and the Danish-Swedish Oresund region*	Macro-regions *Example: Danube region, Baltic Sea region.*
Non-contiguous territories	Inter-regional and inter-urban co-operation *Example: "Four motors of Europe" network among the regions of Lombardy, Catalonia, Rhône-Alpes, Baden-Wurttemberg.*	Peak associations *Examples: Assembly of European Regions, the Association of European Border Regions (AEBR) and the Association of Regions of Traditional Industry.*

Source: based on Perkmann (2003)

When considering the boundaries for collaboration (Boschma, 2005), geographical proximity can be an important factor, for it can enable serendipity, joint learning and knowledge spill-overs through face-to-face communication and the sharing of tacit knowledge. For instance the reduction of physical distance between different parts of the cross-border area of the Öresund region has acted as facilitator of other forms of relational of functional embeddedness although key challenges for cross border integration remain (Hospers, 2006).

Geographical proximity is therefore often not sufficient, and other forms of proximity need consideration. Which geographical area is more adequate for inter-border policy collaboration is often associated with the notion of functional regions (OECD, 2013). A functional region is a territory sharing certain commonalities and linkages, displaying a high density of internal interactions in innovation-related activities. Functional proximity has been found to increase the likelihood of collaboration (Maggioni and Uberti, 2009). Further, relational proximity (Boschma, 2005), is associated with a number of intangible dimensions aiding collaborations, such as social, institutional or cognitive dimensions, for instance shared norms or common understanding, facilitating knowledge exchange. Innovation research has found that neither too close nor too distant cognitive proximity is good for innovation (Noteboom, 2002). Some cognitive proximity is needed in enabling collaboration, but for innovation to happen different kinds of knowledge bases need to be incorporated (Hollingsworth, 2007; Heinze et al., 2009).

However, the delimitation of the area for collaboration is not fixed but should instead remain flexible, given different regional specialisations and differences in the scope, objectives and tools of policy intervention (OECD, 2013).

3.6 How? Policy instruments for science and innovation policy collaboration

In terms of specific instruments, there are many research and innovation policy instruments that can be devised on a collaborative basis for the advancement of RIS3, including the *joint provision of research infrastructure, technology transfer, provision of joint funds for private R&D and innovation support,* as will be detailed below. In fact, most of the policy instruments that are suggested in the context of RIS3 are susceptible to use on a collaborative basis. In turn, many of these instruments can present different strengths of collaboration as indicated in section 3.1. (namely policy coordination or alignment, active collaboration or more integrated/joint provision). For instance, inter-regional collaboration in cluster policy may just involve mutual alignment across cluster initiatives and the sharing of good practices, or it can involve joining forces for the provision of services, collaborative projects across cluster actors or joint marketing and branding.

- *Collaboration to promote joint research and education programmes:* These are collaborations among public authorities with the primary goal of strengthening particular areas of scientific or industrial research. They can do so by aligning funding conditions and priorities for research or combining funding to promote joint research, even the setting up of a joint research funding body. They may involve agreements across universities and research groups in different regions to share information, encourage mobility of researchers, coordinate activities and degree offering or collaborate in the joint provision of dedicated programmes.

- *Joint provision of research infrastructure*: Two or more regions may decide to co-sponsor particular research facilities in order to share cost, improve their quality and/or make them accessible to a greater number of researchers and firms. Regional authorities can collaborate in the funding and/or the operation and management of the facilities. A good example of large scale shared research infrastructure is the partnership of 17 European countries to build and manage the European Spallation Source located in Lund.

- *Collaborative schemes to support R&D investment in firms*. Collaboration may entail joint financing of projects in selected areas or for specific target groups (SMEs). Alternatively it can align the rules of existing schemes in terms of eligibility and other programme conditions, or create virtual 'common pots' of funds that firms in several regions can tap into.

- *Technology transfer infrastructure*: In the last decades there has been a proliferation across Europe of technology centres around different areas of specialisation and technology parks offering a range of technology transfer and incubation services. Regional governments can align the provision of this offering or collaborate by sharing facilities, or co-investing in the development and management of this infrastructure in order to avoid duplication, save costs, enable greater technological specialisation and improve visibility.

- *Innovation support services.* These include advisory services for SMEs, technical services, and other knowledge transfer services such as mobility schemes between industry and research, graduate placement schemes and innovation vouchers. Shared provision of innovation support services guarantees a critical mass that improves their profitability and quality and facilitates access to specialist knowledge by SMEs in less favoured regions. One example is collaboration in the provision of innovation vouchers, schemes whereby firms (generally SMEs) are able to buy innovation services from specific knowledge providers. Innovation vouchers are generally perceived as easy to apply on a cross-border basis, and successful examples include the TTR-ELAt cross-border innovation vouchers (OECD, 2013).

- *Access to finance*: Regions can engage in the joint development of venture capital funds and business angel networks to overcome the small scale and fragmentation often associated with SME access to seed and venture capital funding. The creation of networks of investors, or 'funds of funds', can be an appropriate mechanism of cross regional cooperation to favour economies of scale and greater specialisation in regions. One example is the Baltic Innovation Fund (BIF), created in 2012 to support equity investments into start-ups with high growth potential, and jointly sponsored by the European Investment Fund, and the governments of Lithuania, Latvia and Estonia.

- *Cluster policy*. Fostering collaborative networks and clusters is at the core of smart specialisation strategies (European Commission, 2012; Ketels et al., 2013). As mentioned earlier, collaborative cluster policies may help overcome inertia and lock-in and enable greater global visibility and branding. Inter-regional cluster collaboration can take different forms, from sharing information, joint cluster mapping and benchmarking of policy instruments to align strategies, to joint provision of cluster support services, funding of innovation projects between the clusters, or joint branding and common cluster strategies. However collaboration can be hampered by differences in levels of innovation across the

regions (functional distance) and differences in national systems influencing specific sectors (OECD, 2013).

- *Public procurement.* Joint procurement can contribute to enlarging the market for innovative goods and services and promote innovations for the advancement of commonly identified priorities or societal challenges. It can also be employed to pilot technologies and services, whereby certain regions can be used as test bed for products before their introduction in the wider international market. Finally, it can also improve efficiency in the use of resources and facilitate access to finance and expertise (Georghiou et al., 2013). Collaboration in public procurement can take different forms. For instance public procurers may come together to coordinate specifications, share good practices, organise training activities or staff exchanges. A more integrated form of collaboration may take the form of joint purchasing, or the setting up of a third party to conduct the procurement. Each of these forms entails different risks and preconditions (Uyarra, 2010). Joint procurement by contracting authorities from different Member States has not been used very often due to legal difficulties associated with differences in national laws[8]. Additional barriers include lack of incentives for collaboration, lack of suitable data on procurement to identify opportunities for joint purchasing, variable market and technical competences of procurement officials, and lack of political commitment (Uyarra, 2010; Uyarra et al, 2014).

- *Other demand side innovation policies:* Public authorities can collaborate on setting standards and regulatory measures to promote innovation, reduce trade barriers and contribute to other policy goals such as health and sustainability. Standards can facilitate the diffusion of innovations (Swann, 2010) by demonstrating best practice, increasing competition and enabling interoperability with existing infrastructure. Regulation, on the other hand, has the potential to drive innovation (Blind, 2012) by shaping user preferences for particular technologies or products. It can enable suitable market conditions for the development of certain technologies and markets.

- Last but not least, a number of additional instruments can contribute to the development of regional policies and strategies. Intelligence gathering exercises including the mapping of clusters, competence areas and *joint foresight exercises* may provide regions with better evidence for decision making and the identification of partners for cross-border collaboration. Benchmarking of policies and peer review exercises are also collaborative tools aimed at fostering cross regional policy learning on the design and implementation of specific instruments as well as the identification of priority areas for investment. Caution is needed however on the choice of metrics for benchmarking and in terms of choosing similar regions to benchmark against.

[8] The EC acknowledges this in the Proposal for a Directive of the European Parliament and of the Council on public procurement COM/2011/0896 final - 2011/0438 (COD): "Contracting authorities from different Member States may be interested in cooperating and in jointly awarding public contracts in order to derive maximum benefit from the potential of the internal market in terms of economies of scale and risk-benefit sharing, not least for innovative projects involving a greater amount of risk than reasonably bearable by a single contracting authority. Therefore new rules on cross-border joint procurement designating the applicable law should be established in order to facilitate cooperation between contracting authorities across the Single Market." To address this, the proposed Directive on public procurement includes specific provisions to facilitate cross-border joint procurement.

In this section, we have provided a non-exhaustive inventory of possible policy instruments that can be employed collaboratively in the context of RIS3. However, there is often a tendency to overestimate the relevance of specific instrument choice, neglecting other important dimensions such as the actors involved, the goals and targets associated with these instruments, the policy style and implementation modes, and how these instruments work together in a 'mix' (Flanagan et al., 2011; Rodrik, 2004). In other words, instrument choice may be less important than how instruments are used. Indeed, instruments may differ markedly in their outcomes as a result of differences in styles of implementation. Finally, policy instruments generally come in 'mixes', with the consequent need to pay attention to potential interactions (and conflict) between goals, rationales, instruments and implementation approaches of different instrument at different levels (Flanagan et al., 2011). As the table below illustrates, there are different possible dimensions of policy interactions, and therefore it is important to consider coherence of the different elements of the policy mix in the collaborating regions, namely its consistency across governance levels, policy areas or sectors and over time. Possible interactions can be positive and complementary, negative or neutral (Nauwelaers et al., forthcoming), but interactions might not be the same in regions collaborating with the same instruments.

Table 3: policy mix interactions: dimensions, types and potential sources of tension.

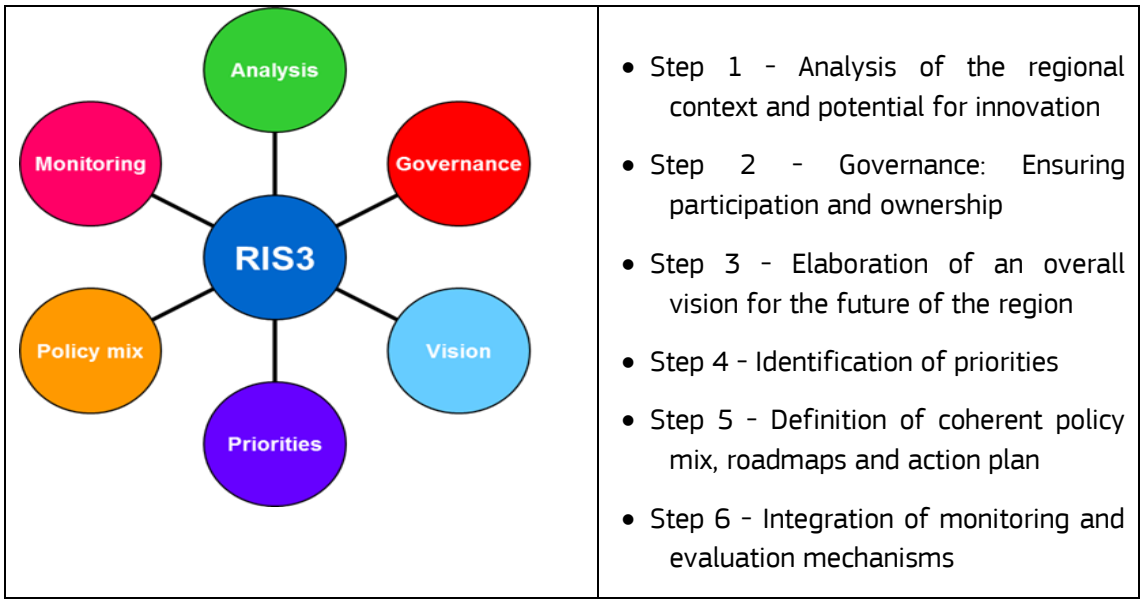
Dimensions of interaction	**Forms of interaction**	**Possible sources of tension between instruments in the policy mix**
Policy domains (*e.g.* education policy, innovation policy, health policy, environment policy, etc.). **Governance** (*e.g.* interactions between Ministries, agencies, promoting coordination/synergies). **Geography** (*e.g.* interregional coordination). **Time**	Between '**different' instruments targeting:** - *The same actor or group* within or across dimensions (*e.g.* universities targeted by research policy and by economic policy). - *Different actors/groups* involved in the same process within or across dimensions (*e.g.* funding for researchers mobility and direct support to spin-off companies). - *Different processes* in a broader 'system' within or across dimensions (*e.g.* different layers of institutional funding for technology centres and funding for cooperative R&D, accumulated over time). Between nominally **'the same' instruments** – within or across dimensions– (*e.g.* funding for clusters in neighbouring regions).	**Conflicting:** - *Rationales* (*e.g.* market failures, coordination failures, and systemic failures). - *Goals* (*e.g.* focus on high-tech versus innovation in traditional sectors) - *Implementation approaches* (*e.g.* positive and complementary; negative and interfering destructively; neutral).

Source: Flanagan et al (2011)

4. Inter-regional collaboration in the RIS3 Steps

Having tackled in previous sections the multiple dimensions of collaboration (why, what, how, with whom/where?), this section elaborates how is this 'outward looking' dimension is reconciled with the six steps of the RIS3 process (see figure 2). The RIS3 process is not a linear process in practice, but for explanatory purposes it is described here as a process of six steps. In reality many of those steps will happen at the same time and some regions will go back and forth between them in their strategy process and as time moves on reiterate the steps of the process.

Figure 2: The six steps of a RIS3 process as outlined by the RIS3 guide



Source: The RIS3 guide (European Commission, 2012); http://s3platform.jrc.ec.europa.eu/s3pguide

The first step of the RIS3 process consists of the analysis of the regional potential for innovation. This step involves the identification of regional strengths and capabilities and the assessment of existing regional assets, which implies looking 'inside' the region but also adopting a national and global perspective in terms of comparing and benchmarking these strengths and specialisations with those of other, similar, regions. During this phase regions could benefit from collaboration with other regions on sharing data, but also in defining methods for data gathering and analytical frameworks. Regional authorities could collaborate on the development of both quantitative and qualitative tools for analysis, including foresight and forecasting exercises. Regions developing their strategies can also benefit from having an outsider's perspective from a peer region that is familiar with the issues either in bilateral interactions or in peer review meetings.

The second step consists of setting up a governance structure that ensures participation and ownership. During this stage regional strategies can benefit from active participation outside their borders through involving representatives from other regions into their governance mechanisms. This approach can also serve to compensate for a lack of any of the stakeholder categories of the quadruple helix. Furthermore regional activity is dependent on what happens at the national and EU levels, therefore RIS3 strategies need to take into account multi-level governance perspectives and align policy to processes at other administrative levels. As mentioned in section 3.4 this requires a

governance system which is open to external stakeholder involvement. One example is the Swedish national operational program, which encourages and supports regions to collaborate in the Baltic Sea Region because it gives value added to other institutional levels.

Step 3 involves the production of a shared vision about the future of the country/region. The visions and objectives for RIS3 (*step 3*) are often connected to societal challenges and goals. Many of these grand challenges do not stop at regional borders, but can only be effectively tackled at international scales, both in problem solving level and implementation level.[9] Hence in order to develop the visions and objectives, as well as to anchor these processes with the relevant stakeholders and align their activities, there is a need for collaboration across borders.

The outward looking dimension is key during Step 4 (identification of unique niches and priorities). Policy makers should avoid both a too narrow focus on existing strengths and spreading resources too thinly across too many areas. In the past, many regions failed to adequately define priorities, instead resorting to mimetically copying successful neighbours, leading to unnecessary duplication and fragmentation of resources. Benchmarking and comparison of strategies with similar regions can assist the identification of unique niches, which can in turn lead to the identification of opportunities for inter-regional collaboration with similar regions. The S3P provides different tools and services to help regions identify other regions with similar specialisation that could act as benchmarks and/or potential partners. These include the Eye@RIS3[10] database and various networking activities and events, such as the Malmö workshop and follow up events documented in section 5.

The action plan and the policy mix for the RIS3 (step 5) can incorporate a number of collaborative policy instruments such as those enumerated in section 3.6. The external dimension in this phase entails paying attention to synergies in the policy mix across regions and across regional, national and European levels as well as across other dimensions as summed up in table 3. The new regulations (art 55-8) encourage cooperation through the financial instruments and emphasis is put on maximising the synergies between ESIF and H2020, different but complementary sources of funding and up to 15 % of the ESIF funding is allowed to leave the region. During this stage pilot projects may be launched, allowing testing mixes of policy instruments at a small scale (accompanied by evaluation mechanisms enabling a sound appraisal of its effectiveness), before deciding on implementation at a larger and more expensive scale (EU, 2013).

Also for monitoring and evaluation (step 6) inter-regional collaboration is relevant, both for joint development of relevant indicators and benchmarking purposes, in order to better understand what can be expected and what to follow upon, and possibly for joint data collection when the strategy is being implemented. One could also involve peer regions to evaluate activities and strategies.

[9] *http://www.vr.se/download/18.7dac901212646d84fd38000336/1264064126033/Lund_Declaration.pdf*
[10] *The Eye@RIS3 database contains data on regional and national RIS3 priorities, which can be searched in order to find potential partners or competitors. http://s3platform.jrc.ec.europa.eu/eye-ris3.*

5. Exploring the potentials for collaboration trough RIS3 in the BSR. Insights from the EUSBSR workshop in Skåne.

As mentioned earlier, inter-regional collaboration among regions in their RIS3s is high on the agenda of the European Commission, many Member States and regions. To increase the knowledge of how to connect RIS3s one can draw upon the experiences in cross-regional and inter-regional collaboration in macro regions and particularly the Baltic Sea Region (BSR), most notably through the pilot projects of the BSR programme and other collaborative initiatives within INTERREG and ERA-NETS in the areas of cluster policy, innovation support, research collaboration and public procurement.

The Baltic Sea Region is a highly heterogeneous region of 57.6 million inhabitants and €1.3 million GDP. It includes the Baltic countries (Estonia, Latvia, and Lithuania), the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden), northern Germany (Hansestadt Hamburg, Mecklenburg-Vorpommern, and Schleswig-Holstein), northern Poland (Pomorskie, Warminsko-Mazurskie, and Zachodnio-Pomorskie), and most parts of Russia's Northwestern Federal District.

The BSR comprises very diverse mix of regions, with different education and research systems, different innovation intensities and industrial strengths. While such diversity calls for different policy mixes and investment priorities, there are at the same time a number of common specialisations in the BSR around key technology fields in ICT and biotech as well as common challenges which offer the potential for BSR wide technology programmes. There also appear to be important opportunities for the exchange of policy good practice and know-how in relation to the use of ESIF funding for RTDI from more advanced regions to convergence regions, as well as for the pooling of research resources and infrastructure (Technopolis, 2011).

It was also in the BSR that the EU adopted its first macro-regional strategy in 2009 - the EU strategy for the Baltic Sea Region (EUSBSR) (European Commission, 2013b).[11] With a total budget of €236m from ERDF (later ESIF) and Norwegian national funding, EUSBSR aimed at promoting cooperation between stakeholders in the BSR. The EUSBSR Action Plan adopted at the end of February 2013 promotes regional development through transnational cooperation in projects alongside three objectives – 'Save the Sea', 'Connect the Region', and 'Increase Prosperity'. The EUBSR Action Plan comprises 17 priority areas and 5 horizontal actions that in turn are translated into detailed actions and flagship projects.

The priority area "Innovation – Exploiting the full potential of the region in research and innovation" is translated into the action 'Establishing a common Baltic Sea Region innovation strategy' and includes several flagship projects in the area of clusters and SME networks, funding for transnational innovation and research, knowledge infrastructure, and research infrastructure. From the experiences of Macro regional work in Europe like the EUSBSR so far a number of advantages have been brought forward (European Commission, 2013*c*; Council of the European Union, 2013):

- Better coordination of efforts and resources aiming at different regional, national and EU level programmes and improved policy development.
- Facilitating an increased outward looking dimension in regional development.

[11] *http://www.balticsea-region-strategy.eu.*

- Tackling regional inequality and promoting territorial cohesion.
- Exploiting joint opportunities, where increased cooperation is of mutual interest, with joint initiatives, networking, sharing of experience, pooling of funding (e.g. research, innovation, business, capacity-building).
- Better possibilities to address grand challenges, such as environmental issues, transportation, energy, research, health.
- Mobilisation of dispersed resources in collaborative development of innovative solutions (Wise, 2014).

Despite this potential, the opportunities for collaboration are not fully exploited. According to the assessment undertaken by Technopolis (2011), collaboration in research and innovation in the BSR tends to be more project-based and less based on joint strategic programming or with a view to structuring innovation capacity or setting up permanent joint activities. Interaction has also tended to be bilateral or cross-border rather than multilateral across the BSR.

In this context the S3P has facilitated work on synergies between RIS3 within the Baltic Sea region. The first initiative was at the EUSBSR workshop in Vantaa (FI) in April 2013,[12] which was followed up by a workshop organised in the region of Skåne (SE) in November 2013 called "Get smarter together in the Baltic Sea Region", co-organised by the S3P, Region Skåne, and the Swedish national institutions VINNOVA and Tillväxtverket[13]. In the latter workshop there were almost 200 representatives from all the 10 Baltic Sea cooperation countries, exploring possible ways to collaborate within the frame of RIS3. The work was carried out in three parallel sessions (two with a thematic focus, Smart Cities and eHealth, and one open session) where possible areas for collaboration were identified (12 topics), as well as the five key dimensions of collaboration from the previous sections were explored; the motives or rationales (WHY) for collaboration, WHO the actors needed to be involved are, HOW they need to work together, WHAT they could or should achieve and WHEN the next steps were to be taken. The seeds sown for future collaboration will be followed upon in a future workshop in Vilnius in 2014. The workshop and the results are presented in a workshop report.[14]

As an empirical illustration of the previous sections, we will in the following sections present some suggestions for collaboration that came up in the workshop in Malmö and the rationale behind these ideas. The findings are divided into four sections, i) the added value of macro regions, ii) what to collaborate on, iii) who to involve, and iv) instruments. Finally, there is a summarizing table of the experiences from collaborating within the EUSBSR and the ideas suggested at this workshop.

5.1 Added value of macro regions

The participants of the workshop discussed the rationale for and the added value of collaboration within the Baltic Sea Region. The perceived benefits of the BSR are to some extent linked to the region being defined as a macro region by the European Commission with a macro regional strategy and the funds being made available within this framework. This administrative arrangement makes it obvious for some actors to search partners in the macro region as it both

[12] *http://www.balticsea-region-strategy.eu/pages/4thwmeusbsr.*
[13] *http://s3platform.jrc.ec.europa.eu/ris3-in-bsr.*
[14] *http://s3platform.jrc.ec.europa.eu/ris3-in-bsr.*

increases the opportunities of EU financing and improves possibilities for influencing the policy agenda and the policy fields of the European Commission.

Despite the differences that exist within the macro region in terms of the level of economic development, innovation performance and differences in institutional set ups, participants perceived they would find the most relevant and best regions for collaboration and benchmarking within the BSR. This was partially due to a perception of cognitive proximity and being linked together.

Geographical proximity was shown to be important for international cooperation, and even though some barriers to collaboration were acknowledged (e.g. legislative issues), these are seemingly overcome by good neighbour relations and historical common roots tying the region together. One of the presenters for instance claimed that "the BSR is joined by cultural and economic similarities – it is easy to communicate and understand each other". Another one claimed that there are "common challenges and diverse, but complementary strengths". In addition there is perception of shared strengths in knowledge bases, such as digital and electronic know-how, being global forerunners in eHealth and sharing a "good image" as Nordic Countries. This as an example gives a good foundation for co-creation of eServices. As the younger market economies develop, there should be plenty of room for exploration of further collaboration. For some, the Baltic Sea Region market can be a first and easy step towards an international market, and the proximity some of the countries have to Russia can also represent a potential to new markets.

5.2 Rationales and goals for collaboration

As suggested in section 3.3, and as reiterated by Karen McGuire (OECD) during her presentation in the workshop[15], there are different goals for inter-regional collaboration in innovation policy, namely i) common problems to be addressed ii) opportunities to be exploited and iii) learning and mentoring between regions with different stages of development.

The workshop discussions suggested that the most relevant goals for policy collaboration within RIS3 in the BSR are to exploit innovation *opportunities* and inter-regional *learning potential*. Opportunities as indicated in the workshop sessions are linked to accessing bigger markets, exploiting business synergies across borders, tapping into additional external and complementary sources for knowledge, use of standard setting for innovation and the ability to develop small scale pilot projects. Associated with realising these opportunities was also a need to *better understand* and *learn* from each other experiences. Participants were more concerned about operational or more immediate concerns than the grand and societal challenges that are given in Europe 2020 and in EUSBSR as the ultimate rationale and driver for innovation and economic growth. However, grand challenges can be split up in more manageable sizes that work together in a direction of solving bigger issues

The more concrete opportunities identified by the groups for future potential collaboration, range from eco-efficiency at a macro-level, new developed products for SME, application of new technologies, a pilot case on "smart rural areas" and a pilot test bed for eHealth solutions, through

[15] *http://www.bsrstars.se/wp-content/uploads/2013/11/Regions-and-innovation-collaboration-acress-borders-Karen-Maguire.pdf.*

strengthening RIS3s, increased research excellence and reputation and to knowledge sharing and networks.

These aims are in turn connected with and contribute to the three overarching objectives of the European Strategy for the Baltic Sea Region: "Save the Sea", "Connect the Region" and increase Prosperity" and should strengthen the potentials and value of RIS3 as a mean of collaboration for the macro region.

5.3 Who to involve: Key actors.

Collaborative activities for innovation across the Baltic Sea Region are widespread; however inter-regional collaboration has traditionally mainly consisted of bilateral business R&D collaboration or direct academic collaboration rather than across wider actors in the triple or quadruple helix. The role of regional authorities as the central actor for international collaboration for innovation is a relatively new phenomena and many regions still do not have sufficient capacity, or the capabilities, to fully undertake this task. Still, regional authorities are the ones that in most MS (except for the Baltic States) carry the responsibility for RIS3 development and implementation and are now expected to increase international collaboration.

Participants expressed that there had been limitations in previous models for Regional Innovation Support Systems in that they had been too much inward looking. They were very much in favour of the emphasis in RIS3 descriptions on the need for more outward looking approaches and embraced a wider approach to collaboration and a need to open up processes of engagement, including also regional administration in direct operational activities together with stakeholders in the region and outside of it.

Most of the working groups in the workshop identified actors in a triple or quadruple helix constellation as important stakeholders to involve in future work, internal to the region and external ones. There was an acknowledgement of the interdependency of the actors and that they have different roles to take on in collaborative efforts. At the same time, the working groups recognised that the actor landscape in the Baltic Sea Region is fragmented, and that there is therefore a need for a mapping exercise of the actors and competences in the macro region to know who the actors are, a common platform to think around common future potentials, and more intercultural exchange to build relations and trust.

5.4 Policy Instruments

As seen in sections 3.6, inter-regional policy collaboration can take many forms, including joint research and research infrastructure, innovation support, shared technology transfer infrastructure, *joint provision of innovation support,* promotion of cluster networks, market creation policies (such as procurement), *Intelligence gathering exercises* and demand side innovation policy like standards and labelling and framework policies like altering regulation.

The kind of collaboration that was most frequently mentioned by the working groups was linked to *research infrastructure, and innovation support, such as test beds, living labs and open innovation arenas*. There was also an interest in mapping activities and prestudies. *Collaborative public procurement* was also mentioned by several groups, particularly in relation to its potential to help many of the relative small domestic populations/countries/economies around the Baltic Sea to

achieve greater critical mass. The participants argued that ecosystems are difficult to create and that regions and cities can create bigger markets faster together and get better solutions through their complementarities. Market creation was mentioned in terms of expansion of rural economic base for energy, ICT and smarter jobs, but also as open platforms for collaboration.

5.5 Summary of Inter-regional collaboration in BSR

The findings presented here with regard to the possibilities for collaboration are only partial, given the mix of participants at the workshop (with an over-representation of cluster organizations which may have coloured the discussions) and the fact that the development and implementation of RIS3s are still in a very early phase.

The workshop was the first of potentially several steps, sowing seeds for potential future collaboration through connecting RIS3 in the Baltic Sea Region. What type of collaboration that eventually will materialise from this and future initiatives from the S3P to connect the RIS3 of the Baltic Sea Region is still too early to say. Henceforth the suggestions for which tools to employ may be coloured by the fact that the regions and countries are in early phases of potential collaboration, which may make them not consider more complicated and less familiar tools as a start.

Nevertheless, the experiences from the Malmö workshop and the EUSBSR, can give indications on why and how regions are considering collaboration. The experiences illustrated in previous sections are summarised in Table 4. There is clearly still much information lacking to have a full picture of how the dimensions of collaboration relate to the six steps of the RIS3 process, and the current findings need to be complemented by additional data.

As a follow up to the workshop, a survey will be sent to the stakeholders responsible for developing RIS3. This will help improve our knowledge related to regional collaboration in RIS3. The aim of the survey will be to understand the motives and conditions facilitating successful inter-regional cooperation within the RIS3 framework. An additional further step would be to understand how a supranational body as the European Commission and the S3P could support such bottom up collaboration trough different forms of services and nudging.

Table 4: The dynamics of RIS3 inter-regional collaboration in the BSR

Why?	What?	Who/Where?	How?	Relevance for RIS3 stages
Economies of scale Economies of scope Facilitating an increased outward looking dimension in the analysis	Mapping of potential partners within given fields. Exploring opportunities for complementarities and common R&D specialisations	Actors from other regions in BSR, e.g. regional authorities and statistical agencies	Learning workshops, Data sharing, mapping foresight and other qualitative processes	Step 1 - Analysis
Necessary territorial coordination due to mismatch administrative and functional regions Improved policy learning and multi-level coordination Improved capability and competences in policy making Exploit public goods and club goods	Better and more coherent EU-level implementation, more efficient use of funds.	Actors in a triple or quadruple helix constellation Macro regional collaboration, because there are established relations	Attempt to create an inter-regional and international forum for collaboration Coordination of efforts and resources aiming at different regional, national and EU level programmes	Step 2 - Governance
Align actors Support entrepreneurial discovery in the cross border area Improve connectivity	Grand societal challenges Tackling regional inequality and promoting territorial cohesion Realise joint opportunities by accessing and developing bigger markets Inter-regional policy learning	Actors in a triple or quadruple helix constellation Easy start with neighbour countries.	Networking complementary sources Collaboration with strong partners in the BSR. Joint innovation strategy	Step 3 - Vision /Goals/ Objectives
Economies of scale and scope Club goods Improved connectivity and conditions for entrepreneurial discovery Break path dependency – looking beyond regional borders for emerging potential	Policy learning Exploration of joint opportunities Eco-efficiency at a macro-level, “Smart rural areas” eHealth solutions to meet societal challenges.	External knowledge sources enabling innovation in enterprises	Support to new products, to SME, application of new technologies in Eco-efficiency a pilot in Smart rural areas a pilot test bed for eHealth solutions	Step 4 - Identification of priorities
Access to specialist and complementary capabilities and assets To promote and allow for cross border collaboration in innovation. A new administrative reality to adapt to Access to EC programmes and funding structures	Realise joint opportunities Concrete, ad hoc, projects, limited in time. Jointly funded programmes or actions addressing common problems	National and regional agencies from other Member states and regions	Research infrastructure and innovation support. Cluster policy Living labs Pilot projects Public procurement Open platforms for collaboration. Joint funding models for innovation projects	Step 5 - Policy mix
Develop intervention logic that better reflect joint activities and allow bench learning	Develop common indicators	Managing authorities	Joint design projects Inter Reg	Step 6 - Monitoring & Evaluation

6. Concluding remarks and reflections on further work on collaboration within RIS3

Innovation networks increasingly extend well beyond regional boundaries, and there is thus a need for regional strategies to go beyond the restrictive space of administrative boundaries. Smart Specialisation stresses the need for a regionally embedded policy design that leverages regions' unique strengths and assets but also the need to adopt an 'outward looking' perspective. The outward looking orientation involves being aware of, coordinating and exploiting synergies with policy initiatives, instruments and infrastructure in other regions and at multiple levels of governance. Inter-regional collaboration is a core concern and a challenge for smart specialisation.

In this working paper, we have sought to conceptualise this 'outward looking' perspective. More particularly we have looked at the rationale for inter-regional collaboration within the framework of RIS3 in order to better understand its multiple dimensions, namely the why, what, where, who and how of collaboration and its connection with the RIS3 steps. In each of these steps, the dimensions of collaboration might have different characteristics at different stages in time and level of development.

Addressing regional research and innovation policies in a collaborative way can, inter alia, be justified in the context of S3 by a need to increase economies of scale and scope, maximize spill over effects, favour access to specialist services and enhance policy coordination and policy learning. In the case of lagging regions, collaboration can overcome fragmentation and lack of critical mass and facilitate access to specialized services. Access to extra regional resources and a broader ecology of innovation services can expand the capacity of small firms in these regions.

Inter-regional collaboration for research and innovation can pursue multiple goals, take multiple forms, involve a variety of actors, and utilise a range of instruments that range from short term projects to long term strategic partnerships. Each option has different risks and preconditions, including different forms of proximity, differences in national regulations and institutional systems, trust and political commitment, and regional actors need to consider the trade-offs of each option to their needs.

The experiences of the Baltic Sea region through EUSBSR and a RIS3 workshop in Malmö in November 2013 have been seen within this framework as a first step to understand its usefulness in exploring collaboration further. By exploring the Baltic Sea Collaboration within the framework of the multiple dimensions of collaboration and the six steps of the RIS3 process, we have seen that there are motives and possibilities for RIS3 collaboration in the BSR and that there are valuable experiences for other regions to be inspired from.

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Abstract

The objective of this Smart Specialisation (S3) Platform Working Paper is to examine the role of inter-regional collaboration in national or regional Research and Innovation Strategies for Smart Specialisation (RIS3). It provides a conceptualisation of inter-regional collaboration within the framework of RIS3. It draws from the literature on innovation policy to develop an analytical framework to better understand the multiple dimensions of inter-regional collaboration, namely the why, what, where, who and how of collaboration; and explores how inter-regional collaboration varies according to the six steps of the RIS3 process. Finally, it looks at experiences of inter-regional collaboration for innovation in the Baltic Sea region within this framework.

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