



# Guest editorial on research and innovation strategies for smart specialisation in Europe

## Theory and practice of new innovation policy approaches

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### Abstract

**Purpose** – This Special Issue of the *European Journal of Innovation Management* sheds new light on the burning issue of Research and Innovation Strategies for Smart Specialisation (RIS<sup>3</sup>), both in terms of their policy formulation and their practical implementation in the field. This new policy approach refers to the process of priority setting in national and regional research and innovation strategies in order to build “place-based” competitive advantages and help regions and countries develop an innovation-driven economic transformation agenda. The paper aims to discuss these issues.

**Design/methodology/approach** – This is an important topic both in the current debate about a new industrial policy for Europe and as a policy option for a successful crisis exit strategy led by public investments in the real economy. Moreover, smart specialisation is promoted by the European Commission as an ex ante conditionality for all regions in Europe to receive European Structural and Investment Funds in the field of innovation. Thus, it has become a pre-requisite for accessing fresh funds for investing in badly needed innovation-driven productivity growth throughout the European Union (EU).

**Findings** – The six papers in this Special Issue are the fruit of ground-breaking research and policy testing by nearly 20 leading academics and policy makers throughout the EU. They explore the early smart specialisation concept and its further developments, examine the methodological tools at its disposal and advance specific policy proposals and governance considerations based on actual experimentation in the field.

**Originality/value** – All these make the present Special Issue of the *European Journal of Innovation Management* an important research milestone. This Special Issue is the fruit of a call towards the European academic and research community to help shaping and advancing the smart specialisation concept and thus contribute to better position regions and countries in the global economy through innovation-driven policies.

**Keywords** Smart specialisation, Industrial policy, Practice, Research, Innovation, Competition

**Paper type** Editorial

### 1. Introduction

#### 1.1 *Why smart specialisation now?*

The topic of this Special Issue of the *European Journal of Innovation Management* is Research and Innovation Strategies for Smart Specialisation (RIS<sup>3</sup>), both in terms of their policy formulation and practical implementation in the field. Smart specialisation, initially developed by Foray *et al.* (2009) and subsequently elaborated by Paul David, Bronwyn Hall, Phil McCann and others, is a process of priority-setting in national and regional research and innovation strategies in order to build “place-based” competitive advantages and help regions and countries develop an innovation-driven economic transformation agenda.



This is a very important topic in the current debate about the new industrial policy for Europe and also as a successful crisis exit strategy led by public investments in the real economy. In fact, the only positive aspect of the current crisis is that it has offered the opportunity, out of necessity, to rethink the role of the public sector in the economy beyond standard recipes calling for austerity, sound macro-economic policies and accelerating structural reform (Landabaso, 2014). Professional economists working in the field of development are confronted with the need to engage with the real economy through smart and efficient public investments, particularly in innovation promotion, in order to tackle the challenge of globalisation and the creation of sustainable jobs.

It is only by increasing the long-term productivity of our economies through the enhancement or creation of innovation-friendly business environments that we can succeed in this effort. This, in turn, means better understanding two critically important issues. On the one hand, we need to recognise the collective nature of individual productivity and not just individual talents and efforts (Chang, 2010). Thus, efficient innovation systems are more the result of collective endeavours (Morgan, 2013) and complex systemic interactions, rather than simply heroic individual adventures which follow a linear R&D process (e.g. from the lab to the market starting in American garages and sunny places) (Mazzucato, 2013). On the other hand, we need to understand that innovation-friendly business environments are place-based or territorial in nature, which also means that they are carried out by states and regions, where many of the key drivers of competitiveness reside (Porter and Rivkin, 2012).

Thus, new place-based industrial policies are called for in order to modernise, diversify and explore new areas of economic activity through research and innovation, from advanced manufacturing, within the renewed understanding that there is little economic future without industry, to knowledge intensive business services or promising business opportunities in the “green and silver economy” (e.g. eco-innovation and healthy ageing).

It is important to note that these new and improved ways of public intervention are not based on short-term stimulus packages (Sachs, 2013), but on “a healthy and productive balance of competition and cooperation in an interconnected society where complex challenges of science and technology, higher education, modernisation of infrastructure, climate change litigation and the restoration of budget balance cannot be addressed without a careful multi-year planning process within government – embracing complexity being the key to effective planning” (Sachs, 2012).

In short, we are in urgent need for new forms of public entrepreneurship and in particular we have to quickly develop effective innovation policies that target the real economy and focus on sustainable jobs in a global world with climate and resource constraints. RIS<sup>3</sup> are a practical response to these challenges and needs. This Special Issue is an attempt at providing new insights and methodological improvements to the current RIS<sup>3</sup> initiatives.

Several international organisations, such as the OECD (2012), the World Bank in a number of Eastern European countries and regions, as well as a large number of experts and academics have engaged with the European Commission in the process of deepening our knowledge in this development policy area. They have done so by further exploring the early smart specialisation concept, refining the methodological tools at its disposal, addressing measurement methodologies and the development of indicators, and in particular advancing in its practical implementation in the field

through specific policy tools. Most importantly, over 150 regions and 14 countries have already joined the RIS<sup>3</sup> platform set up by the European Union (EU) Commission's Joint Research Centre and DG Regio in Seville and are in the process of designing such strategies. These conditions make the present Special Issue of the *European Journal of Innovation Management* so important. It has been produced out of a call towards the European academic and research community to help shaping and advancing developing the smart specialisation concept and thus contribute to the design of research and innovation strategies that can help regions and countries to better position themselves in the global economy through policies for sustainable growth and employment creation.

The six papers that follow are the fruit of ground-breaking research and policy testing by nearly 20 leading academics and policy makers throughout the EU.

## 2. Good governance and RIS<sup>3</sup>

### 2.1 RIS<sup>3</sup> and institutional karma

Navarro, Valdaliso, Magro, Aranguren and Wilson make an attempt at explaining institutional factors, beyond generalisations such as "history matters", shaping the evolution of innovation policy, which is seen as a path-dependent process. They do so by referring to the Basque Country where this type of policies started to develop in the mid-1980s fuelled by the pressure of industrial reconversion.

The authors identify a very important issue for RIS<sup>3</sup> design by focusing the analysis on the mechanisms of continuity, change and path dependence of policy making. They argue that initial choices of (high cost) R&I infrastructures will weigh heavily in policy options for the future, since these fixed capital investments, "due to their quasi-irreversibility, network externalities and self-reinforcement effects", have long lead times and require continuous commitment and maintenance to ensure sustainability. They are, together with the complex institutional set-up which develops in parallel, key determinant factors in the path dependence of science and technology policy of a given region.

The Basque Country RIS<sup>3</sup>, in the form of the Science technology and innovation (STI) Plan called PCTI-2015 is an example of the above. The choice of eight broad fields stemming from the RIS<sup>3</sup> prioritisation process is largely the result of "a layering process" where the new fields coming out of entrepreneurial discovery are added and shadowed by those which were already there as a legacy from the past, tied to the region's institutional path dependence process. The latter effectively establishes a limit to the entrepreneurial discovery process in breaking away from the past. It also possibly undermines the capacity of the RIS<sup>3</sup> in narrowing the policy focus in the absence of strong public entrepreneurship capable of resisting pressure from ingrained interests in a complex institutional system with a strong legacy from the past. Thus, one could conclude that "overinstitutionalisation", on the opposite side of "underinstitutionalisation" which is found in many less favoured regions, is also a limiting factor in the design and implementation of RIS<sup>3</sup> as an economic transformation policy tool. In the case of the Basque Country, its historical bias towards technology and applied research, and the institutions that accompany them, act a barrier to a reformed STI system which possibly requires a more disruptive impulse from science and new basic research inputs, on the one hand, and more open and non-R&D-based innovation on the other. Overinstitutionalisation may also give rise to unhealthy competition amongst the existing STI organisations, 158 in the case of the Basque Country Science, Technology and Innovation network, which may

lead to fragmented efforts, lack of coordination and critical mass for the regional innovation system as a whole.

The authors refer to the recent efforts of the government, in particular through “path broadening” to avoid lock-in, in the form of new policy mandates to its key innovation agencies, as a way to avoid lock-in. The question remains on how to use RIS<sup>3</sup> to tackle institutional reform by countering existing dispersion of policy efforts and inefficient institutional complexity. This latter process is likely to inform most of the RIS<sup>3</sup> efforts in the future. It is precisely the reason why RIS<sup>3</sup>, as an external conditionality imposed from the outside by the EU Commission, can be used as a disruptive process to re-align policies and institutions towards more efficient innovation systems by overcoming some of the institutional barriers and path dependency referred above.

The paper offers new analytical perspectives on how to shape STI policies in view of path dependence, underlining the difficulty for new policy approaches – such as RIS<sup>3</sup> – in overcoming the “enormous inertia and resistance to new approaches, both in existing ideas or mental frameworks, and in incumbent actors and constituencies of these policies with vested interests”. These vested interests are key to understand how RIS<sup>3</sup> should take up the challenge of path dependency by identifying “triggering events and self-reinforcing mechanisms” which shape and condition STI policies in regions.

### *2.2 RIS<sup>3</sup> as a “place-based” approach in different institutional contexts*

McCann and Ortega-Argilés examine issues of strategy and implementation regarding the centrality of entrepreneurship in policy design and the importance of regional context and institutions in shaping policy priorities and objectives.

Their paper rightly emphasises the need for regional policies “to focus on fostering local entrepreneurship and innovation, built on strategies which are realistic and appropriate to the regional context”. Thus, explaining how “one-size fit all” and/or top-down national sectorial approach would not work for smart specialisation. In doing so, they rise two critically important issues in the design of RIS<sup>3</sup>. First, the need for a place-based approach in RIS<sup>3</sup> implicitly recognises the importance of entrepreneurship and innovation as key drivers for regional development and, furthermore, explains how and why the local and regional levels influence and shape the national innovation performance. Second, efficient national innovation systems require sound regional innovation policies developed in a bottom-up way through RIS<sup>3</sup>. One can conclude that smart specialisation is critically important for the overall research and innovation performance of the nation and the institutions which facilitate this processes at sub-national levels. It also means that RIS<sup>3</sup> should sensibly combine bottom-up (regional) and top-down (national) processes, where “results-oriented” discussions amongst policy partners – through an entrepreneurial process of discovery – is key for determining the effectiveness of innovation policies.

The authors rightly stress that research and innovation policy, rather than being exclusive or prescriptive, should be “towards the prioritisation of activities and initiatives which are likely to build on, enhance and diversify the capabilities of the region by partnering the different entrepreneurial capacities in place from all the relevant RIS<sup>3</sup> stakeholders”. Moreover, they underline that “the fostering of policy experiments is also an important feature of the approach, because many aspects of (regional) self-discovery are risky and require trial and error”.

All the above important features of the RIS<sup>3</sup> elaboration process, although essential in the smart specialisation policy are still quite foreign to most regional institutions responsible for drafting innovation policy, in particular, in less favourable regions. One may conclude from this that new forms of public entrepreneurship are a pre-condition for RIS<sup>3</sup> to succeed, including more transparency, accountability and inclusiveness in order to maximise the mobilisation and engagement of local RIS<sup>3</sup> stakeholders.

The authors refer to three country examples to substantiate their arguments. In the case of the UK they claim that the lack of “an appropriate and regional differentiated governance structure, militates against the capacity to conduct efficient smart specialisation strategies”. In this sense, they argue that the capacity and ability of local enterprise partnerships to design and implement RIS<sup>3</sup> appears to be highly questionable and has to do with the limited empowerment given to the sub-national government levels in the country, including institutional capacity for funding. Most interestingly, smart specialisation may be acting as a catalyst for fostering new domestic institutional reforms which are more appropriate for responding to specific challenges in the UK’s regional context.

The case of the Netherlands is used to illustrate a country which, unlike the UK, has strong sub-national governments, but in which the national government responsible for innovation policy has largely taken “a space-blind logic, sectorial in concept and top-down in governance instructions”. The latter may explain the difficulty to engage SMEs in the national top sector framework, which emphasises industries and sectors rather than tasks or activities, in compliance with the smart specialisation approach. In this sense, smart specialisation might allow for local differentiation, facilitating private engagement in innovation, which is a main structural challenge of the Dutch national innovation system. Instead, the authors alert that smart specialisation strategies in the Netherlands are becoming “simply a lower institutional level of top-down sectoral policy instead of a genuinely place-based approach focused on entrepreneurship and innovation”.

Finally the authors refer to Spanish regional examples and illustrate how the sub-national government, financial constraints and low-level trust of the population in government and the public sector may undermine the smart specialisation process in the country. They also use the Spanish example to argue against focusing innovation policy exclusively on activities and technologies of high technology leaders in core locations, instead of having a much “broader, specific and targeted approach to the enhancement of the types of activities in which the different regions have a greater potential”. In particular they refer to the need of building stronger links between entrepreneurship and the regional innovation system, including by helping close the labour market mismatches in terms of skills for innovation.

### 3. RIS<sup>3</sup> in practice: country examples

*3.1 The risk of “overspecialisation” in small peripheral economies: the case of Malta*  
Georghiou, Uyarra, Saliba Scerri, Castillo and Cassingena explore the adaptation of the smart specialisation planning process to small island economies, where the absence of critical mass in research and innovation and the risk of lock-in due to overspecialisation set number of challenging restrictions to this new policy concept.

Malta is a good test bed to assess the extent to which the economic transformation potential of smart specialisation strategies can make a small island internal market

more resilient against external shocks, and more competitive to non-conventional island activities such as health, aviation, and high-added value manufacturing.

The authors rightly point out the challenge of specialised diversification in a context where branching-out to related local industries is often the only realistic possibility. In a small island, high value niche markets are populated by a few firms only and critical mass of research and technological activities are generally absent. The authors explore how these processes of branching-out can and achieving greater economies of scale and scope, and positive knowledge spillovers, be achieved by walking a thin line between competition and collaboration amongst market players, some of which have consolidated a long standing power position in the local economy.

Moreover, the authors underline the risks associated with overspecialisation stemming from the very few options available for radical foundation or specialised diversification in a peripheral economy, characterised by a small manufacturing base and little foreign investment in activities incorporating research and innovation. On the other hand, they stress the opposite danger, linked to a lack of specialization which may mean that “all sectors are subcritical in terms of capability and have a lack of local competition which reduces the incentive to innovate”, including the associated brain-drain challenges of small markets where it is hard to develop lead innovative markets.

In this difficult context, this paper describes and explores the processes and opportunities for smart specialization to drive innovation-led economic development. In Malta, entrepreneurial discovery was implemented building on key priority thematic areas already identified in past research and innovation planning documents, while still identifying new promising departures from previous strategies.

It is clear that the entrepreneurial process of discovery had to combine two seemingly contradictory objectives. On the one hand, to allow for undiscovered new investment opportunities, while on the other to prioritise, R&I opportunities that maximise scarce investment, market resources and assets to make a real economic impact. The description of the prioritisation process that ensues could be a good reference for other island economies in the southern periphery of the Union. The paper very much stresses the joint need to provide a broad supportive ecosystem, well beyond the manufacturing sector, focusing on open innovation over and above narrowly defined research efforts, and to promote proactively cross-sectoral integration, exploiting related varieties through synergies among existing research and innovation capacities.

This interesting piece of research offers a set of critically important considerations and open questions which are relevant for many peripheral areas, and also can help further adapting and refining the concept of smart specialisation as a place-based policy approach. For example, in a narrow social context where “everybody knows each other” and in an economy where power positions are well established with little room for new entrants, including through foreign direct investments, how can new clustering, networks and regional branching through related diversification be effectively pursued? Furthermore, what are the policy instruments in the hands of the public sector to promote innovation system linkages beyond well-established boundaries and consolidated market positions of the few incumbents in place?

Another interesting question we may ask ourselves is about the level of “granularity” in the choice of specialisation domains: are the eight thematic areas, identified in Malta, too many for a population of 400,000 people in a relatively remote and isolated island with substantial environmental and energy constraints? Linked to the above,

there is the issue of how to mobilise and involve in the specialisation process those traditional micro-firms which are not part of the few promising market niches identified through the RIS<sup>3</sup> entrepreneurial discovery process. Is there a way to facilitate innovation through the internationalisation of larger parts of the local economy and how can this be achieved? Finally, what is the competitive advantage of small-scale state markets, such as small-scale energy generation and water desalinisation, mentioned in the paper, that they can be used as living-labs or test-beds for lead markets.

### *3.2 RIS<sup>3</sup> and the economic crisis in southern Europe*

Komminos, Reid and Musyck explore how the European southern periphery have designed and started implementing smart specialisation strategies during a period of deep financial crisis. They use the examples of Greece, Slovenia and Cyprus to illustrate how the new RIS<sup>3</sup> approach can help in small countries with underdeveloped and fragmented innovation systems to regain competitiveness and growth. Moreover, they investigate how the process of entrepreneurial discovery can best work in a context with weak institutional capacities and public sector credibility is low.

In their reflection on the meaning of specialisation in the context of the southern European periphery they underline that “it is not industry specialisation, but should be conceived as a combination of production and R&D and innovation specialisation” enabling less favoured regions to catch-up. This catching-up can only take place if the process of intra-industry specialisation within the single market leads them to higher quality, technology and value added in international market segments and not based on a Ricardian world of comparative advantage based on marginal or opportunity costs, which in these cases means mainly low labour costs.

In the case of Greece, the authors explain the difficulty of designing RIS<sup>3</sup> in a country placed on “no-man’s land” which is “not competitive in products coming from low wage countries, but also not competitive in higher quality products, thus running a constant deterioration of the trade balance for over a decade”. Designing a RIS<sup>3</sup> in this context is really challenging. On the one hand, while statistical evidence from existing research clearly points at a limited number of economic activities worth specialising, the authors propose a two-stage methodology to complement this statistical analysis with a true entrepreneurial discovery process which allows to “specify, as precisely as possible, market niches as well as define technologies across sectors and those niches previously identified”. In this sense, the identification of technologies faces a double challenge, to define R&I infrastructures, and key-enabling technologies, including ICT as drivers of industry diversification and to make these technologies diffuse widely throughout the economic tissue. In terms of governance, the authors alert against central government doing “more of the same with a set of horizontal policy measures without sufficient focus which would prolong the inertia of the innovation system, including the disconnect between universities and research centres and business needs”. They advocate for a new governance of the innovation system focusing on two particular features for “radical re-engineering”: the high concentration of R&I in universities and the underperformance of R&I investments by the private sector. In order to tackle this challenge, they point in four directions: increasing funds for innovation in businesses, attracting innovation-intensive foreign direct investment, opening academic research to better link it to economic needs, and above all, the massive involvement of companies into innovation activities, including non-R&D innovation in marketing, quality and organisation.

Slovenia, hard hit by the crisis, is suffering from very low manufacturing productivity levels and poor export performance, which in the opinion of the authors required decisive action on the side of innovation policy by increasing focus and developing critical mass through specialisation on well-defined areas “preferably related to existing on emerging technological business strands”. The authors underline that the RIS<sup>3</sup> approach in Slovenia does take into account related variety in priority setting by focusing on expertise and technology know-how rather than sectors or clusters in order to irrigate with knowledge spillovers large sections of the manufacturing sector. Moreover they strongly recommend establishing policy incentives to facilitate connections of small companies to centres of R&I excellence and existing networks.

In the case of Cyprus, where GDP lost nearly 15 per cent in two years, there has been a gradual erosion of its real economy towards financial speculation and real estate, fuelled by external cheap credit. This “industry asphyxia needs to be reversed with the help of RIS<sup>3</sup>”. It is interesting to note how RIS<sup>3</sup> sparked an inclusive and participatory planning process for the first time which involved surveys, interviews and workshops with nearly 1,000 businessmen. Despite these efforts, “the participation of private sector entrepreneurs was rather poor” showing how hard it is to change institutional inertia and gain new credibility amongst the relevant stakeholders for their involvement in entrepreneurial discovery. Issues like more R&I friendly banking, the under-utilisation of existing public R&I infrastructure or the engagement of academic R&I institutions with business, bad governance, including corruption and black economy, and the need to improve sectoral cooperation, came at the centre of discussion. It is interesting to note that authors identify as the main threat to RIS<sup>3</sup> in Cyprus, the abandonment of the bottom-up approach at a stage when crucial choices need to be made and project selection criteria are to be defined. So the question remains if “policy makers which had not been able to implement choices, choosing instead to over extend in a quest to satisfy all stakeholders at the same time, often into brick and mortar prestige projects”, will be able and willing to do so within the RIS<sup>3</sup>. Paradoxically, the crisis may work as a catalyst to open new opportunities for innovation-led growth tackling their structural weaknesses related to productivity, internationalisation and re-industrialisation through a bottom-up, inclusive planning process.

In conclusion, the success of RIS<sup>3</sup> in the European southern periphery seems to hinge on a good governance system which allows for a true entrepreneurial process of discovery. It follows that RIS<sup>3</sup> stakeholders need to understand the concept of specialisation in terms of linkages between specialisation, innovation and competitiveness and examine together with entrepreneurs activities “where innovation is more likely to appear; where higher growth of productivity should be expected; where critical mass and higher innovation gains, would increase more added-value and market share, in particular through related variety and access to key-enabling technologies”.

From the above country examples, it appears that the key obstacle to innovation promotion in less favoured regions is good governance, in the form of strong connections between innovation actors, including local, regional and national institutions, working towards common and not competing aims. Thus, one might conclude from these examples that unless RIS<sup>3</sup> drives institutional change, beyond formal conditionality to access European funds, it will not fulfil expectations.



### 3.3 Smart specialisation and regional connectivity: the case of Andalucía

Gianelle, Goenaga, Gonzalez Vazquez and Thissen introduce a new methodology to assess interregional trade flows in order to draw lessons for the design of RIS<sup>3</sup> and use the example of Andalucía to test their assumptions empirically. In actual fact, their findings give us not only a good sense of the degree and depth of regional integration in the European single market, but also identify trade flows as a reference for selecting the most suitable RIS<sup>3</sup> domains for a given region in the global economy. The latter is an expression of the external connectivity of regional economies which was generally missing in previous generations of regional innovation strategies, thus filling an important methodological gap for better strategic planning in this field.

The authors use network methodologies to assess trade involvement of regional economies within the single market which facilitate the identification of international competitive activities that are subject to prioritisation within RIS<sup>3</sup>. They develop a tool to rank and position regions within wider trade networks. This regional positioning offers a new perspective on the rich variety of competitive edges available. It offers new insights on the multiple opportunities for innovation existing in the rich European regional diversity well beyond what standard national trade statistics and analysis shows. It offers planners a level of “granularity” which is adequate for RIS<sup>3</sup> identification of comparative economic strength, in particular when referring to regional positioning in global value chains.

This methodology also offers new insights on opportunities for complementarities and cooperation among the wide array of international players, be it clusters, sectors or R&I capacities, pointing at new possibilities for cross-sectorial and inter-cluster innovation opportunities. In fact, as the authors rightly point out, the “identification of complementarities with other regions in order to establish interregional cooperation frameworks that will enhance these regions’ ability to compete in the global economy is a key element of the smart specialization”. The latter is particularly true in the case of macro-regional strategies in the making, such as the Baltic area, the Danube area, the Adriatic, etc. In short, this outward looking approach to innovation policy offers useful insights for the comparative assessment of regional economies and their embeddedness in interregional and international economic networks. This mapping of interregional trade flows is critically important as a source of differentiation for future specialisation within RIS<sup>3</sup>.

The authors provide a pioneering methodology to identify measures of the “centrality and connectivity of regions” using the only presently available comprehensive data set that describes trade between European regions according to 58 product categories. They test their model on tradable agricultural goods as well as the processed food networks. Through this mapping they try to understand how well and how widely interconnected central and peripheral regions are in view of identifying potential priorities for investment and R&I efforts. With this in mind, they focus on the case of Andalucía to distil policy recommendations in terms of their RIS<sup>3</sup>. In this sense, they show how while Andalucía leads all rankings for the agricultural products network, revealing an outstanding performance in exports of non-processed primary agricultural goods, it only ranks eighth in the processed food products network, where much of the value added through research and innovation is to be created. This leads the authors to identify agriculture as an obvious choice for the Andalusian RIS<sup>3</sup>. They also signal that the current regional strategic framework for regional R&I does not put agriculture as a key priority, thus potentially missing an opportunity for smart specialisation that can spillover into related sectors and exploit

the untapped competitiveness potential in the food industry. In short, the methodology proposed shows that it is capable of contributing to the RIS<sup>3</sup> process with powerful policy insights. In the case of Andalucía, it shows that the agricultural sector potential could be further exploited “by extending the regional value chain by integrating higher value-added activities in the food processing industry, but this requires not only complementary R&I efforts, but also new entrepreneurial capacities including better understanding of foreign markets and the adaptability of products to higher value-added market niches”.

In short, this paper provides a practical tool to develop badly needed policy intelligence for the identification of untapped economic and R&I activities for regional competitiveness. In fact, it provides a primary basis for prioritizing economic activities for RIS<sup>3</sup> by illustrating the competitive positioning of regions within the single market in the framework of interregional trade.

#### **4. Progress in theory building through policy experimentation: entrepreneurial discovery as RIS<sup>3</sup> DNA**

Dominique Foray clearly establishes the centrality of the concept of entrepreneurial discovery in defining RIS<sup>3</sup> as a virtuous process of structural transformation via the discovery and exploration of new domains, both in terms of technological (R&I) and market opportunities. This virtuous process involves both the integration of complementary knowledge as well as the exploitation of spillovers effects irrigating large parts of the regional economy, which may result into modernisation, diversification, transition or radical foundation.

The author uses a number of “stories” to illustrate the dynamics and stylised facts that characterise the RIS<sup>3</sup> process. In these examples the notion of “discovery” involves the demonstration that new knowledge combinations can be exploited in the market place. Thus, in his view, entrepreneurial discovery is the essential phase of RIS<sup>3</sup> that drives the process of “deployment and variation of innovative ideas in a specialised area that generate knowledge about the future economic value of a possible direction of change” in the economic transformation in a regional economy. The author goes at great length in distinguishing “discovery” from innovation in a narrow sense. The former covers the application of existing (generic) technologies as well as the diversification based on economies of scope, internal spillovers or the transition from low productivity to higher value-added market niches. In this sense it is important to note that exploration and discovery, beyond innovation, are key elements of the RIS<sup>3</sup> process and critically hinge on the capacity to combine science, technology and engineering technical knowledge with market potential and broad economic knowledge, defined as “the knowledge of what works (and does not work)”.

With experimentation being a defining feature of entrepreneurial discovery, one may ask if regional and national governments responsible for RIS<sup>3</sup> are capable of shifting their traditional planning culture in this radically new direction. Moreover, one may wonder if they are in a position to facilitate the combination of technical and economic knowledge by integrating “divided and dispersed” knowledge from different regional stakeholders and willing to manage the risks of entrepreneurial discovery. Are these governments capable of identifying in which sectors are structural changes most desirable and can they provide through public goods an appropriate system of incentives, including rewards for entrepreneurial discoveries which maximise spillovers and agglomeration externalities in a region? In short, is public entrepreneurship up to the task?

It is also very important to note that Foray clearly recognises related variety as a fundamental logic for translating entrepreneurial discovery into structural change. This has been a matter of contention in the literature, largely because of a misunderstanding of what actually specialisation is meant in the context of RIS<sup>3</sup>.

Foray emphasises the difficulties as well as the need to accompany the sometimes spontaneous process of smart specialisation with adequate policy in order to tackle the main market and coordination failures identified in this process: namely, weak appropriability of entrepreneurial discovery, uncertainty, access to finance, increase in returns in the form of agglomeration economies and coordination failures. He underlines that the identification and selection of new activities form an internal part of the policy process, including not only new activities in a vertical policy logic, but also more horizontal policies which can enhance the effectiveness of the regional innovation system as a whole, by strengthening linkages amongst triple helix stakeholders. In this sense, he acknowledges that entrepreneurial knowledge is not confined to high-tech companies, but also in many other regional stakeholders and activities.

In a nutshell, RIS<sup>3</sup> would be a combination of new activities in a vertical policy logic, as well as horizontal policy action while the former, which is far more difficult, is the preferential intervention logic. In fact, in his view, "the goal is to favour the emergence and development of a few innovation micro systems dealing with particular market niches which are mostly related to existing productive structures and assets in order to transform them through research and innovation". According to Foray, this is the key policy challenge: how to emphasise the vertical logic of prioritisation while avoiding government failures usually associated with top down and centralised bureaucratic processes of technology choices and selection.

This is indeed a test for assessing many RIS<sup>3</sup> that are currently being designed and implemented in the EU. RIS<sup>3</sup> cannot follow a linear planning process from the top, written in stone for seven years, but should attempt an experimental participatory and inclusive process critically anchored on the notion of entrepreneurial discovery, which facilitates the RIS<sup>3</sup> dynamic when it does not emerges spontaneously by the market. In this sense RIS<sup>3</sup> is not a standard recipe but the art of sparking and managing the process of discovery for innovation-led growth.

##### **5. Smart specialization: pending issues and way forward**

The above papers cover a wide range of important issues related to the design and implementation of smart specialisation strategies. However, a number of open questions still remain for further research efforts if we are to improve and develop our understanding of the RIS<sup>3</sup> process and strengthen its policy effectiveness.

First, we need to clarify to what extent RIS<sup>3</sup> is to be developed in a bottom-up fashion vs a top-down one and what are the institutional implications of this. A second unresolved issue relates to the appropriate balance between innovation supply push vs business demand pull. So far, experience shows that in most regions planning processes still follow a linear model of research to the market process. A third related issue refers to the balance between basic research vs broad innovation efforts within RIS<sup>3</sup>. Fourth, in terms of entrepreneurial discovery, the question arises who is in the driving seat and to what extent it is carried out as a policy learning exercise. It is not easy to share power and responsibility through this discovery process for regional and national governments in charge of RIS<sup>3</sup>. In those regions in which RIS<sup>3</sup> works best, it is often the case that the public sector has had the courage and the vision to open up

the planning process to the non-usual suspects in such a way that the word “discovery” is filled with real content, including by placing businesses in the driving seat.

Finally, we need deal upfront with a critical issue: what do we mean by “specialisation” within RIS<sup>3</sup>? Do we actually mean “prioritisation”, or “positioning”? Is it not more about focused diversification than about specialisation as such? And directly linked to this, what is the role of horizontal innovation policies within RIS<sup>3</sup>?

In conclusion, RIS<sup>3</sup> is both a unique economic opportunity and a promising innovation policy process which deserves further research attention as well as bold practical experimentation, not least to help improve badly needed public entrepreneurship in the field of research and innovation.

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