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The Challenge of Smart Specialisation in
less favoured Regions

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1 Introduction

Inherent in its conception, the smart specialisation approach carries an intrinsic tension between its alleged place-based nature at the meso-level of regions and the fact that it was derived from theoretical premises that derive from the analysis of competition between nations (Foray et al. 2009; 2011). Implicitly, therefore, it presupposes a certain degree of completeness and variety in economic and innovation systems as is commonly assumed in international comparative analysis between nations – debatable as this suggestion may in itself be. Obviously, the actual innovation systems of European regions are often much more fragmented (Capello and Kroll 2016; Isaksen 2014; Kroll 2015; Technopolis et al. 2012; Tödtling and Trippl 2005).

At the same time, it borrows concept of exploration and discovery from the analysis of the world of business (Hausman and Rodrik 2003) which cannot easily be transferred to the world of governance, leave alone government. While, possibly, it can most easily be read as promoting the public triggering of such processes where their absence constitutes an obstacle to economic development and their better guidance in others (Lan-dabaso 2012; 2014), this ambition is neither an easy task in practice nor theoretically very well understood to start with. Overall, there has been limited differentiation between processes that are merely discursive and those that amount to actual co-creation and joint discovery.

Nonetheless, the proposition the concept makes is undisputedly geographic and refers back to earlier work of Asheim et al. (2006) and others. Moreover, it is a basic insight of political science that without at least temporary co-location of relevant actors that enables the exchange of tacit knowledge (Nonaka and Takeuchi 1995), the creation of new, lasting policy arenas (Kuhlmann 2001) or genuine interactive processes of entrepreneurial discovery can hardly be achieved without a 'shared space for emerging relationships' (Nonaka et al. 2005). Moreover, without the conscious framing networking and interaction in a defined regional framework, the resulting processes of technological and economic cross-fertilisation would only accidentally follow a place-based logic (Barca 2009; Maskell et al. 2006), as most economic players do not strategically plan based on or limited by these inherently political, categories of constituency and spatial delineation.

Politically, this conscious, discursive anchoring of economic actors that would otherwise not (sufficiently) consider their geographic environment (Bathelt et al. 2004; Barthelt 2008) and to use discursive formats to shape joint expectations and strategies that allow business ambitions and political objectives to be met at the same time might thus well be read as a, if not the key potential of the smart specialisation approach. If

processes of entrepreneurial discovery (or debates about such) can serve to harness business interests for local development and create better interfaces between local challenges and interregional, market-driven momentum much would have been achieved (Foray et al. 2009; 2011).

In the first years of the smart specialisation agenda, however, this potential has been underutilised and – if at all – insufficiently discussed. In the light of legal, ex-ante obligations, many regional actors have considered mostly that and on what – but not comprehensively why they should specialise (Capello and Kroll, 2006; Kroll 2015). At the same time, the potential of bottom-up, discursive approaches has not always been appreciated by all responsible governments and for many was inherently new and problematic (Iacobucci 2014; Kroll 2015). In many regions, therefore a transformation of mere talks on strategy into actual processes of new path development has arguably not been achieved.

At the same time, the European Commission's discourse has drifted towards a conception of smart specialisation as a 'new industrial policy' based on networks of leading regions along value chains. Seeing the difficulties in many other places and lacking ideas how a less than effective cohesion policy can be pursued on a broader basis (Mohl and Hagen 2010; Kroll, 2015), joint discovery and economically relevant collaborative actions gravitate towards those regions in which there is a sufficiently diversified economic basis and sufficient prior momentum – both intra-regionally and between regions (Vanguard Initiative 2016).

In light of these developments, this paper will maintain that a smart specialisation-based industrial policy of creating a framework architecture among the best is a necessary, yet can by no means be a sufficient condition to leverage all place-based potentials for a process of industrial transformation across the European Union. Too many jobs and sites of production lie elsewhere. At the same time, most firms include less developed regions in their considerations as markets and application environments and so should policy.

2 Conceptual Approach

Observations on current Smart Specialisation Activities

From a conceptual angle, this paper draws on two main observations on the smart specialisation approach as it has been outlined in the initial as well as the recent debate.

First, Foray's theory of identifying domains at the interfaces of sectors and technologies, driven by emerging constellations of actors following promising business opportunities cannot apply directly in regions that lack diversity with respect to technological activities and critical mass (Capello and Kroll 2016) with respect to actors who could embark jointly on the exploration of new domains out of technological niches (Markard and Truffer 2008) or even efforts of targeted path transplantation or diversification (Lester 2005; Isaksen and Trippel 2014). As is known, however, communities of practice extend beyond regional borders (Wenger 1998; Bathelt et al. 2004) and for the core of Foray's proposition to materialise, it is by no means required that processes of discovery remain localised in a parochial sense.

Quite to the contrary, those regions (and, for that matter, smaller, less developed member states) which cannot sensibly expect to generate emerging technological niches based on their existing technological landscape have greater opportunities to play a role in actually *entrepreneurial* processes of discovery if they engage with partners from other regions (Foray et al. 2012; Foray 2014). In the author's reading of the existing literature in regional science and general innovation theory, two main options exist to do so. On the one hand, all innovators need to interact with future users even during the process of development and to pilot relevant solutions before their full scale market launch (Kroll et al. 2016). In recent years, these trends towards open, user centred innovation are increasing and peripheral or lagging regions can be important application environments for a variety of solutions. On the other hand, disruptive technologies can emerge from smaller countries even where there is no well-developed technological system (cf. Skype) (Kroll et al. 2016). Typically, these are at eye-level with other technological paths from more developed regions and can interact with them in the way suggested by Foray (Foray et al. 2009).

So far, the first element is indeed mentioned in the smart specialisation literature quite frequently, albeit conceptually reduced to the decision of the peripheral or lagging region to support application of new general purpose technologies, leaving open the framework for their provision. With respect to the second point, limited considerations have been illustrated at all, despite the fact that multiple H2020 oriented innovation strategies do in practice point in that direction.

Second, we know from political science and sociological theory that the constitution of sustainable, rather than ephemeral, opportunity oriented political arenas takes time (Kuhlmann 2001). Much more so, the ambition to restructure the process of regional negotiation and arbitration of support mechanisms, leave alone the establishment of a business culture needed for actual processes of joint discovery is no easy undertaking

(Kroll, 2015; Kroll, 2016). Referring back to notions of structuration and related theoretical strands (Giddens 1984), it is more than obvious that it will take time before repeated action changes accepted practice and, ultimately turns into commonly expected standards and norms. What this implies in practice is that on the one hand, the proposed notion of entrepreneurial discovery processes is versatile and offers diverse opportunities to improve different ends of the required support architecture in a place-based manner (Foray et al. 2012; Foray 2014). At the same time, theory suggests that these will have to be gradually established and institutionalised before they can fulfil the function that Foray's original concept assigns to them (Foray et al. 2009). Also – with a view to their ultimate ambition of generating economic impact – they will eventually have to involve real entrepreneurs and business actors which can only partially be substituted by others (Landabaso 2014).

Conceptually, it is clear that the large majority of processes of stakeholder consultation initiated and documented under the ex-ante conditionality were temporary arenas of consultation legitimising action in a window of political opportunity (Kroll 2015; Kroll et al. 2014). In a first step, these would have to be rendered sustainable and institutionalised to make joint discovery a common practice and solid foundation on which future policy making can be build. Even this, however, can conceptually not be expected to per se make a difference with respect to growth and jobs. If that is to happen, the culture of joint discovery has to be transferred from the sphere of governance to the sphere of business and economic value creation or, more precisely, an existing culture of business sector entrepreneurial discovery that can be found in most places has to be interfaced with that of the newly established governance processes to leverage it for regional economic development.

So far, this differentiation, albeit obvious, has not been very clearly addressed. With the ex-ante conditionality now past, however, it is conceptually inevitable that the extent to which this transfer from policy to practice and the interfacing of both sides can be made a success will determine whether the smart specialisation agenda will in hindsight be considered a success or not. Specific varieties of how that could happen and be politically supported under different framework conditions have not yet been broadly discussed.

Observations on a desirable Architecture for Industrial Modernisation

When it comes to connecting de-facto activities with the ambitions that the smart specialisation agenda set out to achieve, several general, long established insights from regional science and innovation theory should be revisited.

First, while research and pre-competitive development are foundations of economic success (Mazzucato 2013) they are necessary, not sufficient criteria for innovative dynamism and transformation (Kroll and Meyer 2016; Lundvall 1992; Freeman 1987). In any case, basic findings take time to translate into economically relevant applications – if they ever do so – and require strong partners with competences in the field of application. Moreover, the eventual valorisation of research results occurs to a strong extent in the proximity of these application partners, rather than that of the initial research providers.

Second, decades of regional science research unambiguously found that, with respect to leveraging an economy's full economic potential, both the hope for simple trickle down effects from the centres and the mere alimentation of less developed regions cannot be successful, largely for three reasons (Lundvall 1992; Freeman 1987): the lack of suitable channels of economic collaboration between them, the lack of institutional density and dynamism in peripheral and/or lagging regions and counteracting forces such as the migration of qualified people from the periphery to the centres.

Third, modern innovation theory increasingly suggests that specific markets and user preferences matter (Kroll et al. 2016). At a time when mass customisation becomes more prevalent, the involvement of current or future customers in the process of knowledge generation and exploitation will become more commonplace. Moreover, certain specifically local and general societal challenges such as the demographic transformation or urban planning in the age of an increasingly networked society require locally fitted solutions for idiosyncratic configurations of infrastructures and actors.

Finally, countries with large domestic economies, like the United States or China are in a better position when it comes to the piloting and eventual launch and rollout of novel solutions. With a view to the supply side, larger economies also encompass larger and more complete parts of existing value chains– leading to more opportunities for cross-fertilisation and the emergence of new niches (Markard and Truffer 2008; Foray 2014). With a view to the demand side, first movers can test and adapt their propositions in a lead market they know with respect to culture and business practice – before having to export.

Evidently, all four aspects are implicitly touched by the smart specialisations original proposition to improve the overall performance of the European economy by a better division of tasks that is at the same time critical mass conscious and place based (Foray et al. 2009). Without giving conceptual attention to all of them it will be difficult to conceive a conceptually clearer proposition of RIS3 with a view to implementation. In practice, in particular the market perspective has so far only been rather partially dis-

cussed (with a view to markets resulting from new technological domains) and possible ways to move towards that end have not yet been reflected on from different angles.

Conceptual Conclusions

In summary, these considerations illustrate why the smart specialisation agenda may currently be at a crossroads and a better conceptual framing is needed for the coming process that may eventually transfer political negotiation into economic practice.

One possible and increasingly prevalent version to read the approach at this stage it is that it constitutes a fruitful basis for the further development of support policies in well-developed regions, with a particular emphasis on reducing fragmentation through inter-regional collaboration by picking up on Foray's notion of interregional sharing of tasks. This, however, seems a conservative reading that would in hindsight prove those right which saw little more in it than old wine in new bottles. By definition, the strategies of leading regions will be rather technology driven. While they may constitute the continent's motor of development there – in light of the above said – little conceptual reason why their collaboration alone should be able to spur European economic transformation on a larger scale. Another reading, however, would be to take seriously the conceptual notions of application and challenge orientation seriously, develop Foray's nascent definition of market orientation further and think about what precise role new processes of consultation could play in restructuring actual entrepreneurial processes of discovery in different regions. Arguably, a combination of a dynamic core architecture of exchange between the stronger regions, increased interregional collaboration and improved local anchoring could provide at least part of the answer to the long known conundrum that neither trickle-down based approaches nor equalisation-oriented subsidies have improved Europe's economic performance on a broader basis.

3 Structuring Propositions

In light of the conceptual considerations and anecdotal observations outlined above, the following propositions can be put forward for corroboration on a more robust empirical basis

1. Regional economic ecosystems are incomplete, a localised approach cannot work
2. The exchange between regions is still too limited
3. Regional processes of consultation are in fact not processes of entrepreneurial discovery

4. The composition of actors makes it difficult to believe that they could become such
5. The transfer of RIS3 to levels where actual entrepreneurial discovery happens is limited
6. There is increasing awareness that a challenge oriented approach has to be put in place
7. There is potential in putting the different parts together, S2E is a good sign

4 Data and Method

Like earlier papers by the same author, this article will draw on the annual Fraunhofer ISI survey of managing authorities and other policy makers in charge of smart specialisation strategy development. The first round of this survey was conducted in 2013, ahead of the completion of many region's formal strategies (Kroll et al. 2014). While in the first round, a focus was placed on the region's general assessment of the European Commission's policy agenda, later rounds focused more specifically on issues of policy implementation, monitoring and interregional collaboration. The most recent round, launched in May 2016 and completed in early August the same year focused on the continuation and substance of entrepreneurial discovery after the formal completion of the formal strategies and, combined with insights from earlier rounds, thus provides suitable evidence to address the abovementioned research questions.

As described in detail in Kroll (2015), the survey seeks to address responsible policy makers rather than external observers. For that purpose, a databased of addressees was built from information available on European Commission as well as many region's own website. Every year, this list is updated and cleaned before the survey is conducted again and tests during the survey reflect that the aim of reaching policy makers rather than external parties is indeed reached to a large extent. While it will often be the case that several people within one region are contacted based on their past and present involvement in the process – the exact nature and status of which is in many cases unknown, the approach relies on the assumption that answers to such survey tend to be coordinated within administrations, usually resulting in no more than one answer per region. During the first three rounds the pattern of response from single regions corroborated this assumption.

Technically, the survey is conducted as an anonymised online survey, using Quest-Back's EFS survey tool which, despite anonymization, allows to track detailed re-

sponse patterns by hiding the link between questionnaire and respondent information from the user.

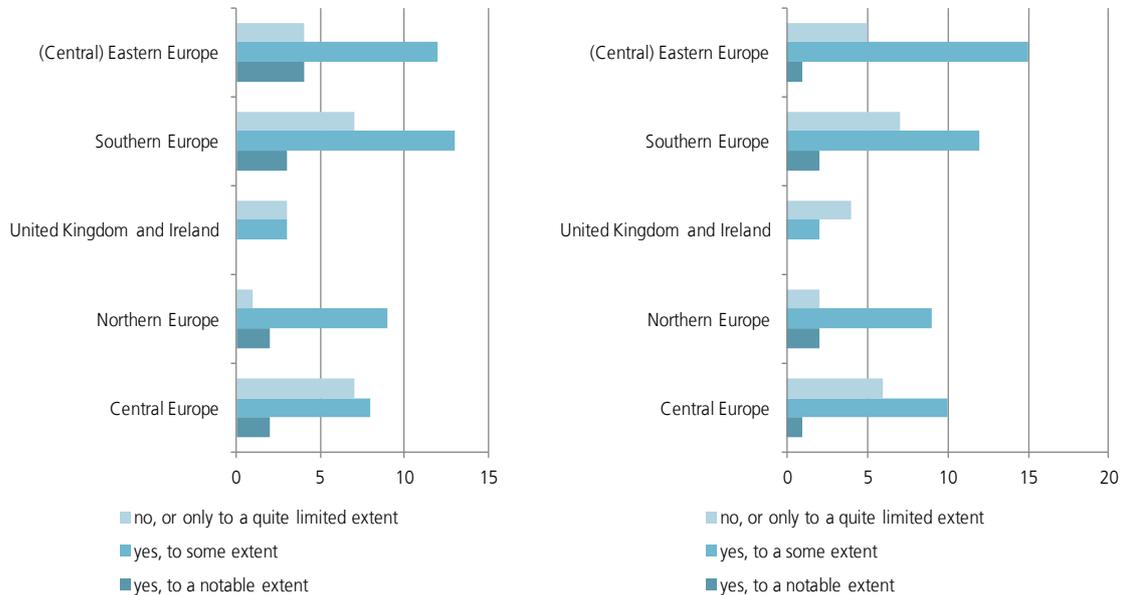
In 2016, the survey link was sent out to more than 1,200 potential contacts of which 179 decided to open the questionnaire. 113 of these questionnaires were answered completely, 66 partially – a slight increase compared to earlier rounds. As illustrated by Figure A1, the survey achieves a fairly good coverage of regions and Member States in a geographical sense, receiving input from more than 50% of all managing authorities across Europe. While a certain bias may thus still be likely, it can by no means be considered a distorted opinion of ‘a happy few’. As in most prior rounds, somewhat more than 50% of the respondents had filled out one of Fraunhofer ISI’s earlier questionnaires, while due to changes in responsibility, shifting remits, etc. more than 40% answered the survey for the first time. The survey is therefore not in a strict sense a panel, but has a substantial core that is – even more so if that characteristic is defined at the level of administrations rather than individual persons answering.

In 2016, the questionnaire comprised some 35 questions, slightly more than in the second and third round, as the survey was during this round supported by the European Commission and diverse areas of interest had to be covered. Not all of these questions are therefore of interest for this paper while, at the same time, some findings from earlier rounds may be. Consequently, no full account of the questionnaire needs to be given at this point.

5 Results

With a view to the first proposition it seems worthwhile to draw on the survey’s 2015 questionnaire in which exactly this question was included: Do you think that your companies need external markets and networks (rather than interacting locally) and do you think that your research organisations need international partners (rather than interacting with local firms and organisations). As Figure 1 illustrates, the predominant assessment of policy makers in more peripheral and less developed Member States, was that, yes, such external links were indeed needed.

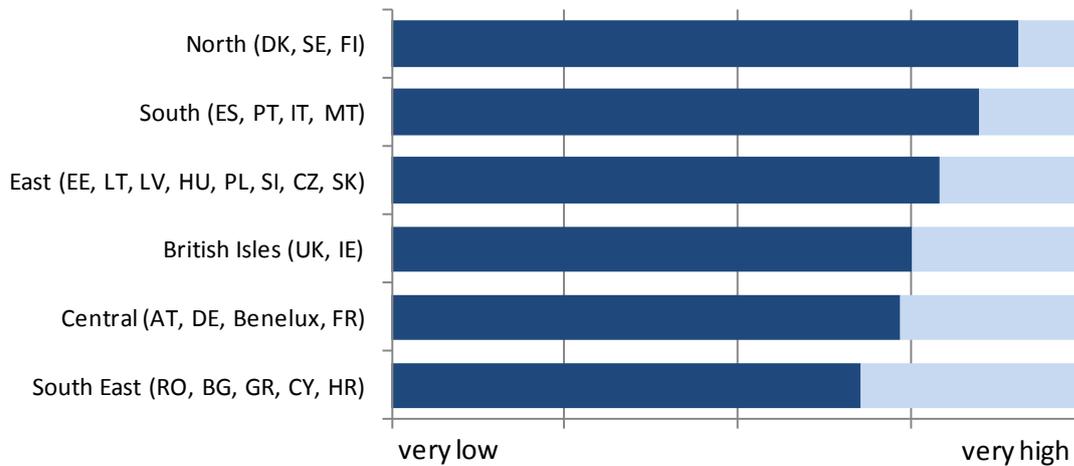
Figure 1: Need for Extra-regional R&D Supply, Prospective R&D Markets outside Region



Source: Own data and analysis, 2015 survey

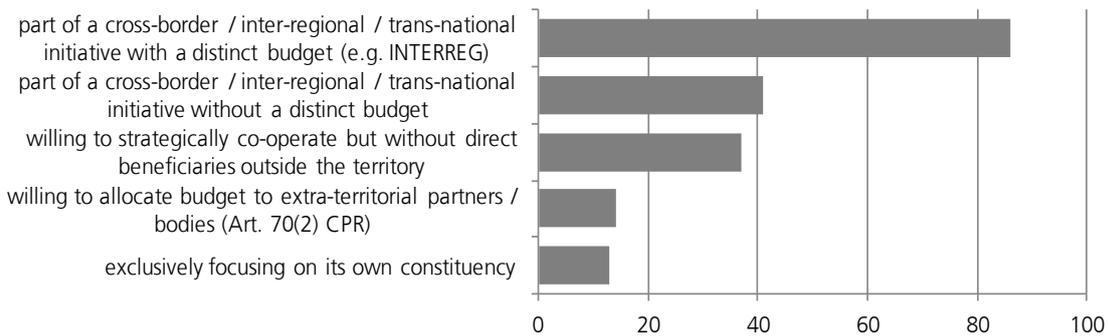
With a view to the second proposition it seems relevant to draw on a question during the 2016 round: Which benefit do you see in the combination of different funding sources (to join and participate international research networks) as well as in interregional collaboration proper. Moreover, the respondents were asked to what extent they saw actual activities to that end within their administrations. Quite remarkably, some of the least developed Member States saw the potential promise of such efforts more critically than others (Figure 2). Whether this resulted from a sober assessment of what can be achieved or a genuine believe that collaboration would not benefit their regions cannot be known. In any case, even respondents from those countries in which it was more common to see promise in principle reported – like all others – that actual political collaboration to integrate support efforts along actual or yet to emerge economic linkages, less with a view to shared societal and social challenges. Where those collaborations were supported at all, this typically happened either without any specific budgetary commitment or based on dedicated, separate ones e.g. in the framework of INTERREG (Figure 3). Typically, moreover, any collaboration that was pursued was motivated by support for building interregional value chains.

Figure 2: Potential seen in interregional collaboration efforts



Source: Own data and analysis, 2016 survey

Figure 3: Type of interregional collaboration actually reported by respondents

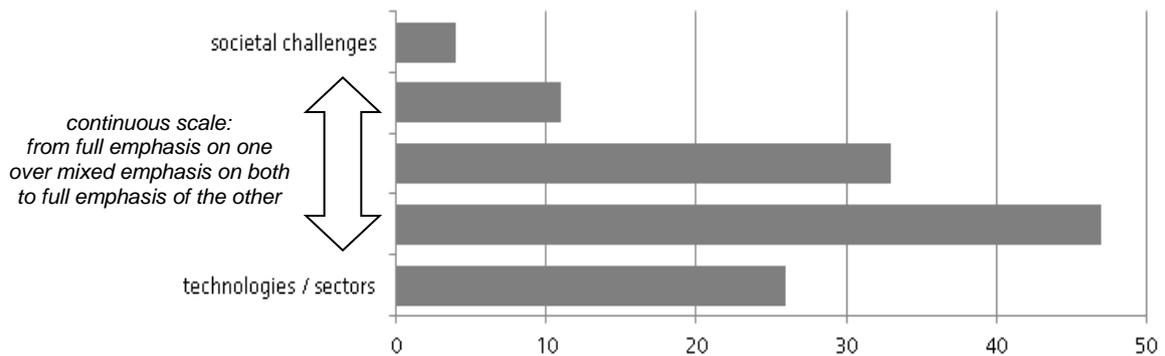


Source: Own data and analysis, 2016 survey

With a view to the third proposition, the survey suggests that the processes of entrepreneurial discovery that have been set up in the context of the European Commission's RIS3 agenda are still relatively focused on classic technology prioritisation rather than a broader, challenge and local capability oriented approach (Figure 4) and by many not expected to yield large benefit in areas outside R&D investment and science-industry collaboration proper (Figure 5). Quite openly, for example, a substantial share of respondents has rather limited expectations with respect to their potential to generate additional momentum in the fields of industrial modernisation and skills (Figure 5). Moreover, they clearly indicate that the entrepreneurial discovery processes potential to improve policy makers' ability to leverage private funding – i.e. engage private enterprise – or be taken into account in political decision making at all is less than overwhelming (Figure 6, Figure 7). Further questions resulted in the finding that the most

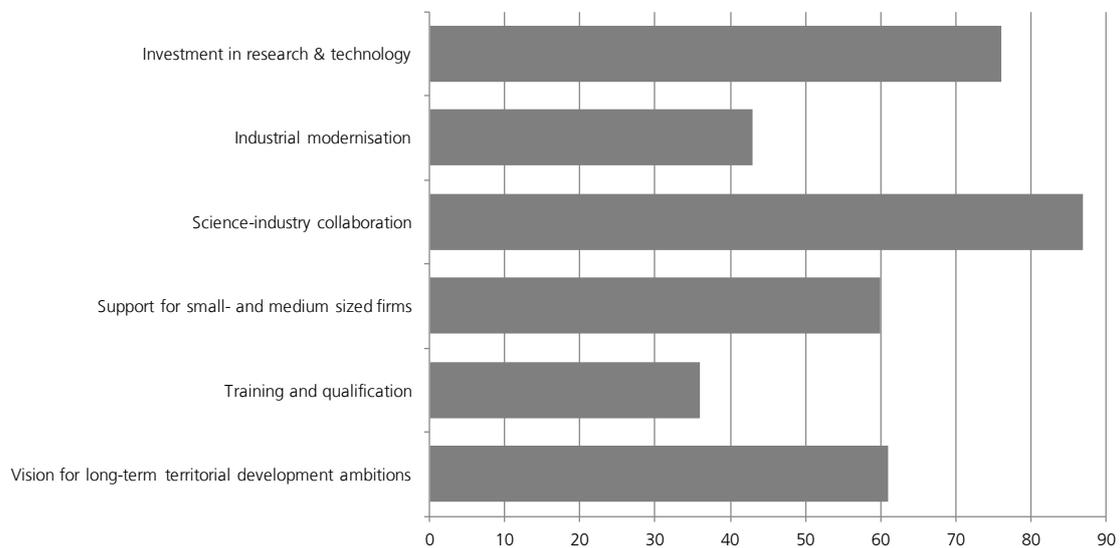
commonly expected benefit of the so-called entrepreneurial discovery processes was to "consolidate processes of consultation". Quite evidently, therefore, what has developed are new arenas of political negotiation, bartering and the promotion of individual interests – not new practically minded communities of practice in direct pursuit of business opportunities or the development of future-oriented domains.

Figure 4: Focus of entrepreneurial discovery processes, as reported by respondents



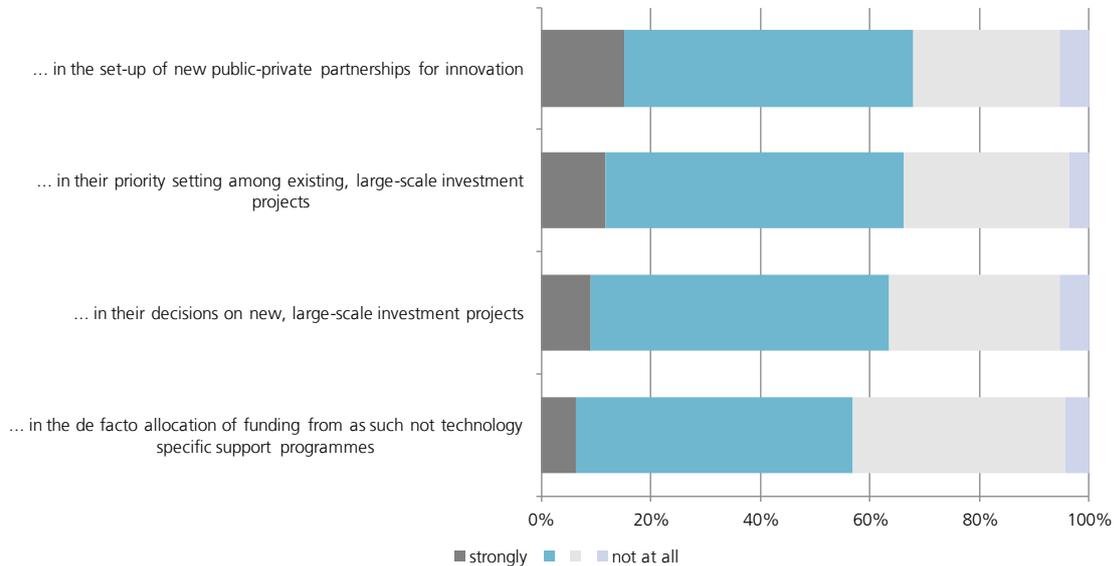
Source: Own data and analysis, 2016 survey

Figure 5: Policy fields in which respondents foresee a potential impact of RIS3 policies



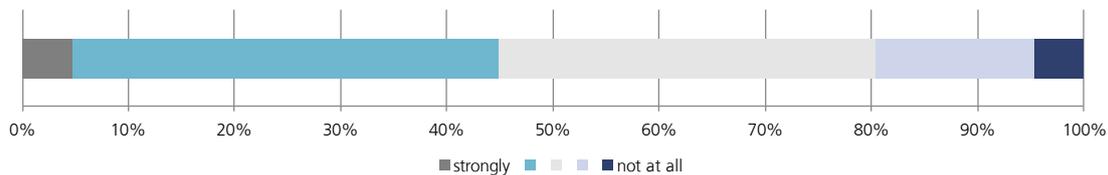
Source: Own data and analysis, 2016 survey

Figure 6: Policy fields in which respondents perceive a actual consideration of EDP outcomes



Source: Own data and analysis, 2016 survey

Figure 7: Extent to which respondents believe that EDP will help to better leverage private funding



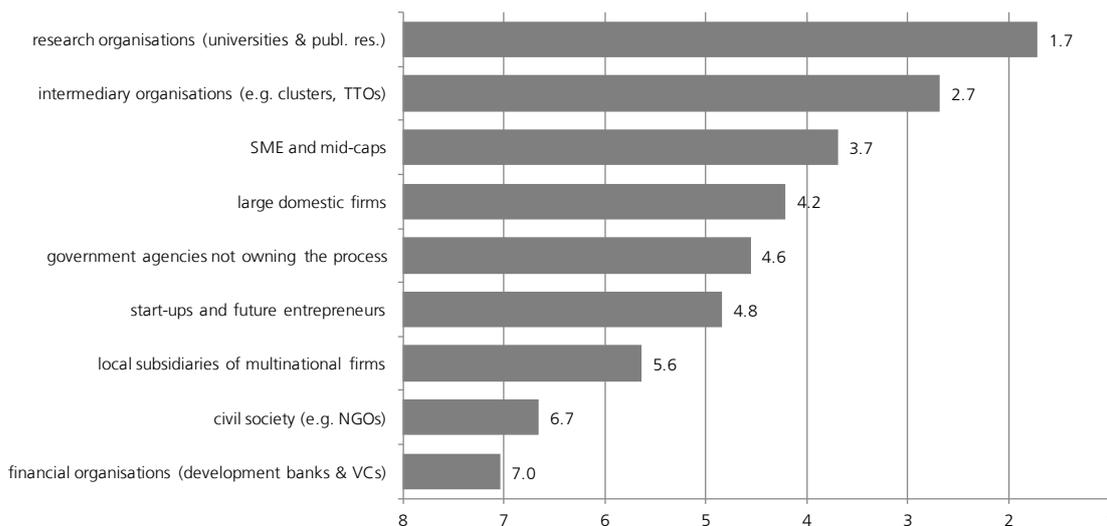
Source: Own data and analysis, 2016 survey

With a view to the forth proposition, Figure 8 illustrates that the lead participants in most cases are universities and intermediaries which corresponds to their earlier identified focus on science and technology policy. While SME's still play a notable role, larger firms or – important for peripheral regions – multinational subsidiaries is in fact rather low. Remarkably, this situation is only partially different in less developed areas where a less technology focused approach would be more central. Instead, the role of universities is even higher in these environments, possibly for a lack of other actors – but arguably also to a lack of political capacity to connect to relevant entrepreneurial actors other than through intermediaries. Importantly, moreover, answers to further questions suggest that in these regions, universities do by now means act as productive entrepreneurial actors *in the place* of firms. Rather they pursue their own interests in the

process of political negotiation even stronger than elsewhere which, with a certain likelihood, will not result in a shift away from traditional science and technology oriented.

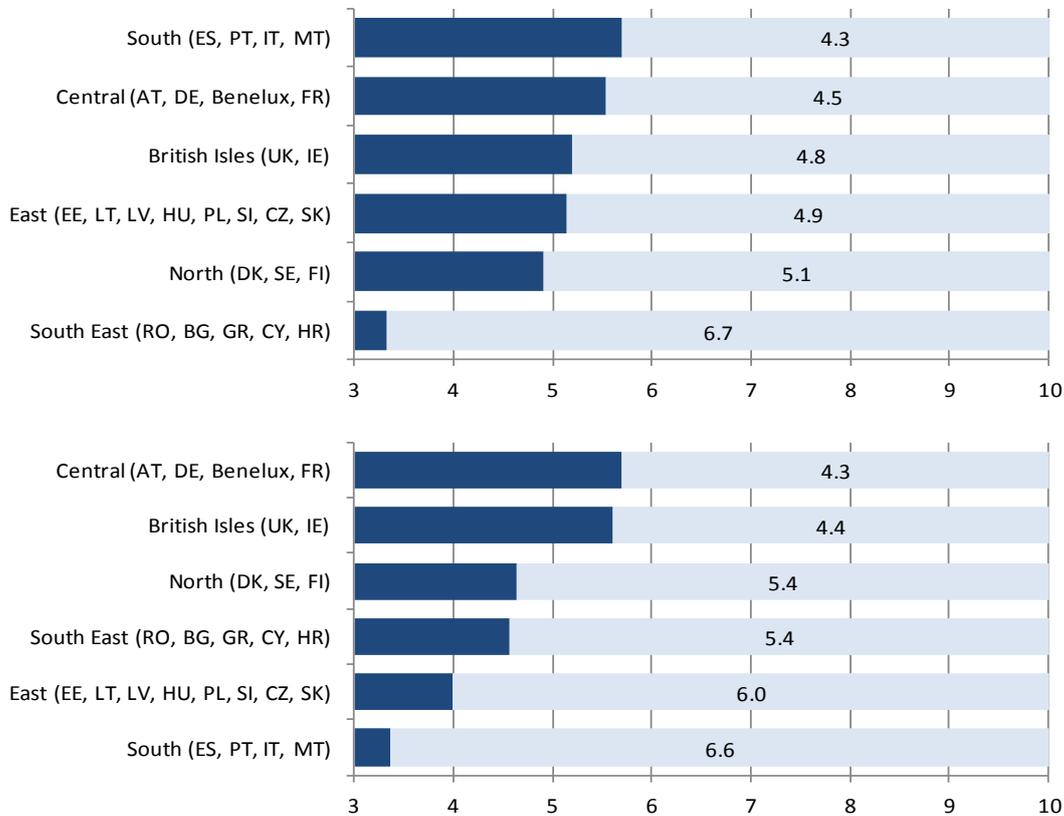
With a view to the fifth proposition, it seems relevant to point out that start-ups and entrepreneurs are often absent from what, nominally, is an entrepreneurial process of discovery (Figure 8). Also, those firms that are of strongest economic relevance for peripheral regions – multinational subsidiaries typically do not engage much and less so where they would be needed most. Only Southern Europe displays a positive exception with respect to the higher presence of start-ups and future entrepreneurs (Figure 9). Even less common, for that matter, is the participation and involvement of civil society (Figure 8) which would across the board be crucial to understand regions' potential not only as producers of knowledge but as users with place-based specificities and localised test environments for products and product-service solutions.

Figure 8: Main drivers of EDP by organisational type (average rank)



Source: Own data and analysis, 2016 survey

Figure 9: Relevance of participation in EDP: start-ups and future entrepreneurs (upper chart) and multinational subsidiaries (lower chart) (average rank in country group)



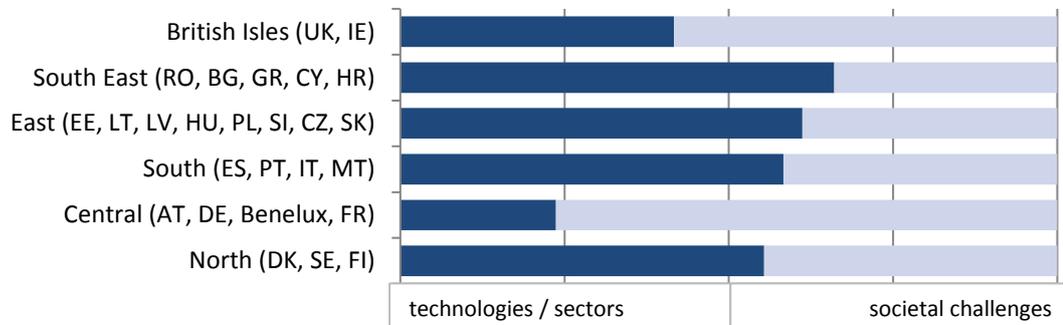
Source: Own data and analysis, 2016 survey

Those areas where theory sees new niches emerge and practice teaches us new entrepreneurial momentum often emerges from are in many cases insufficiently involved in the existing processes. While entrepreneurial discovery occurs on an everyday basis even in less developed and less successful regions, these strands of local dynamic seem so far not to be very integrated in the processes. As their interests and views are often contrary to that of the incumbent actors that are, it seems difficult to imagine that this may change in the nearer future.

With a view to the sixth proposition it seems relevant to mention that at least the pattern of the processes orientation seems to follow a desirable pattern (Figure 10). The most pronounced focus on technologies is indeed found in Central Europe's technological heartland whereas in other areas mixed approaches that involve aspects of both technologies and societal challenges more commonly play a relevant role. If it happens at all, moreover, the inclusion of civil society is more prevalent in those regions where it would indeed seem more pressing, i.e. in South Eastern and Eastern Europe.

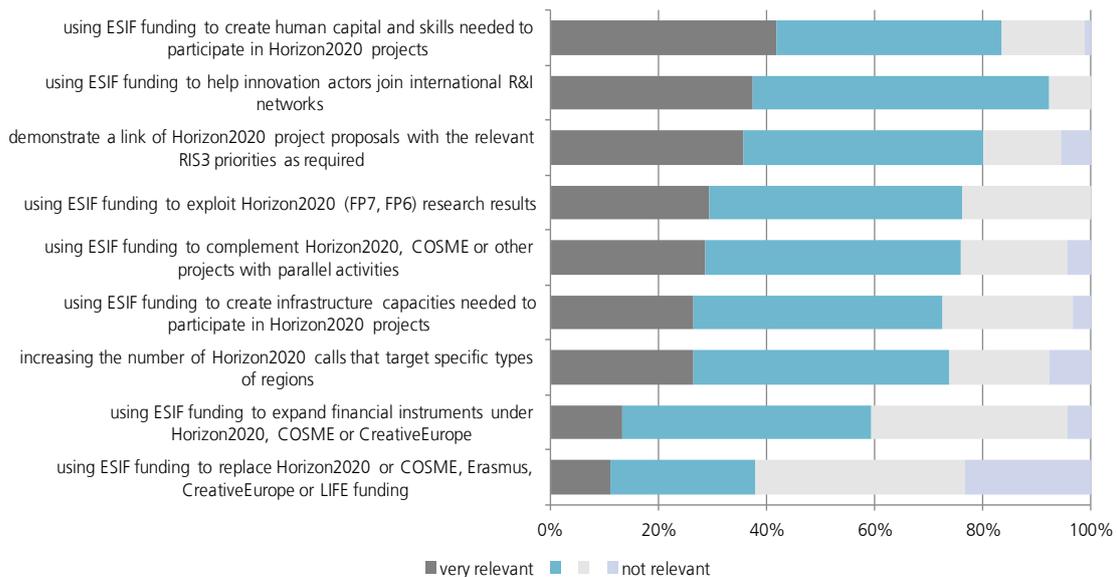
With a view to the seventh proposition, finally, Figure 11 illustrates that the activities in the field of the coordination of funding, even if limited, seem to point towards a growing awareness that the building of qualification and active support for participation in international networks is an important issue to tackle. Yet, these activities remain by definition focused on the science and technology area for which complementary European funding is available through Horizon 2020. Similar collaborations or capacity building exercises in the economic field, in contrast, have yet to be documented although some, like Vanguard Initiative activities, may be hidden in some of the further "collaborations without a budget" mentioned in Figure 3.

Figure 10: Focus of entrepreneurial discovery processes, compared by country group



Source: Own data and analysis, 2016 survey

Figure 11: Purpose of coordination of different funding sources, as currently perceived



Source: Own data and analysis, 2016 survey

6 Summary and Discussion

Overall, the review of the survey data provides a picture of a glass half empty rather than a glass half full when it comes to expectations regarding the RIS3 processes potential effectiveness on a broader basis. Given the daunting challenges that large parts of Europe as well as its industrial sector are facing a partial translation into policy and – even where that is given – a partial translation into economic practice cannot be considered sufficient. While the RIS3 agenda has improved political processes quite a bit it has yet to develop the transformatory power that it set out to achieve.

In the light of the conceptual introduction, the available data suggests that – on a political level – regions are still rather hesitant to promote their capacities as application environment and testbeds for new solutions that could at the same time help to address local societal challenges – or build the skills based needed to do so. Hence, it seems rather conclusive that their potential impact on industrial modernisation and skills development is considered limited.

To reach the initial ambition put forward by Foray et al. (2009; 2011) the current composition of actors involved in processes nominally aimed at entrepreneurial discovery cannot convince. Launching processes dominated by established interest groups may create relevant additional momentum in running systems of Central Europe but achieve little with a view to economic transformation in Eastern and South Eastern Europe.

What appears relevant, however, is that some of these issues seem to be tentatively acknowledged by those that in fact pursue some activities in the field of targeted capacity building and interregional collaboration. So far, they are far from sufficient but underline that the actors involved are not blind to the challenges ahead of them even if, in part, these may be difficult to address from within highly path-dependent systems of governance and policy design.

7 Conclusions

In conclusion, the presented broad analysis of the current state of play with respect to processes of entrepreneurial discovery underwrites the intuitive assumptions gained from anecdotal evidence. While the political efforts seems to support processes of entrepreneurial discovery that were already underway in a number of Central European regions which will in the future certainly benefit from increased political support in that respect, the RIS3 policy agenda has yet to be translated from political into entrepreneurial practice in many peripheral regions, particularly in the East.

Currently, there is little evidence that the original smart specialisation concept's arguably most important promise of better connecting regions through the distributed development and application of technologies would stand a great chance of being realised soon. Too dominant is the presence of public research (in traditional roles) in processes of consultation generally and too underrepresented are actors from civil society and relevant firms in the periphery. Too focused are processes on consultation rather than implementation and too limited their perceived ability to change policy substantially and/or leverage private funding.

However, there are some nascent positive developments when considering the data from a relative perspective. Remarkably, lagging regions do indeed place a stronger emphasis on societal challenges than others and a pronounced high-tech myopia can indeed only be identified in Central Europe – where, as a strategic focus, it may to an extent be justified. Also, the involvement of start-ups and future entrepreneurs in Southern Europe as well as the developmental role that universities assume in parts of Scandinavia and the United Kingdom can be considered heartening. As stated initially, it is only natural that the establishment of new forms of political consultation takes time – in particular under somewhat adverse framework conditions.

In consequence, it is clear that, for its initial promise to be realised, future smart specialisation policies have to put a more pronounced emphasis on the business and market orientation of what they nominally call processes of entrepreneurial discovery rather than continue to see them dominated by public research in traditional functions. For actual entrepreneurial discovery to take place, the moderation of the process may have to be handed to actors closer to the business sector. In that sense, the strong participation of intermediaries appears heartening as an interim target.

Moreover, lagging and peripheral region's capacities to reliably identify and commercially exploit specific societal challenges needs to be strengthened. A positive self-awareness of potential commercial test-bed functions and a broader understanding of place-based, socio-economic potentials needs to be nurtured. A practical way to do so may be to promote suitable forms of integration of lagging regions as a specific tier of relevant lead users – as 'networks of laggards' are unlikely to be sufficiently appealing politically.

Finally, all data seems to strongly suggest that administrative learning, professional capacity building and concrete political commitment will be needed to put any of this in place. Keeping administrative capabilities at eye level with the complex needs of an interconnected economy remains a continuous and considerable challenge to meet.

Acknowledgement

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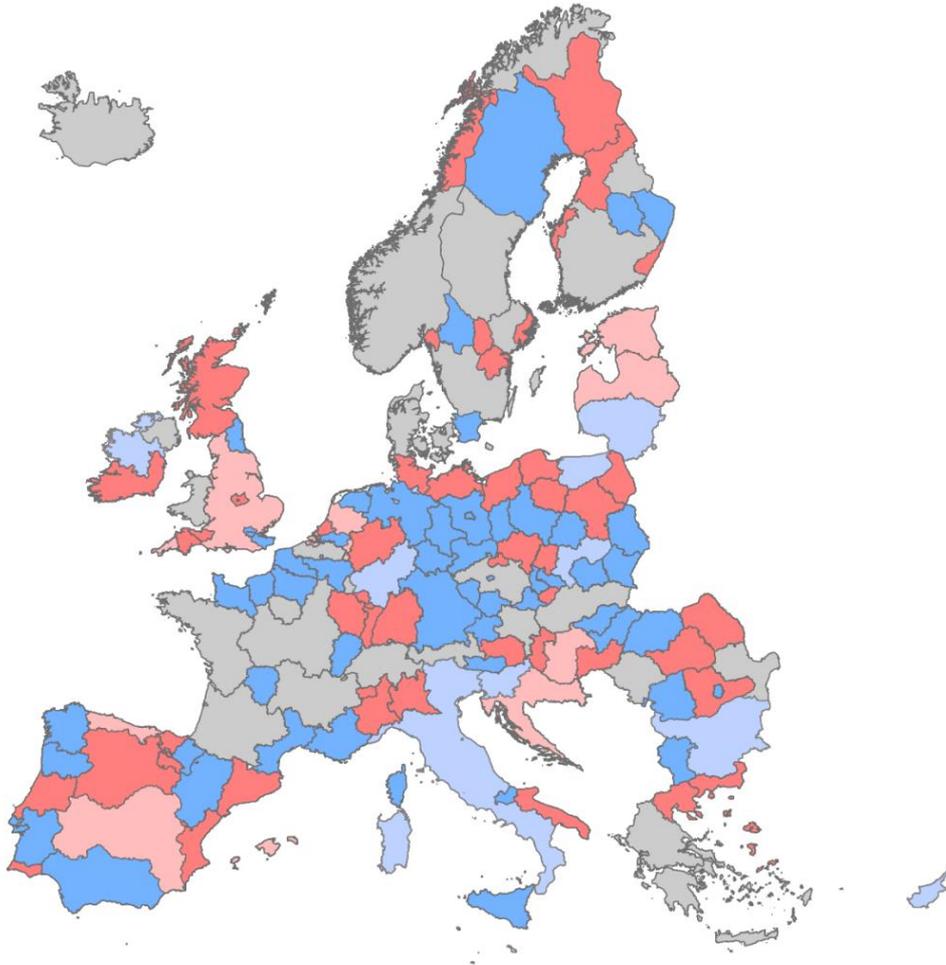
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Annex

Figure A1: Coverage of European Regions by 2016 Fraunhofer Survey



Note: Red: Complete questionnaire, Blue: Partial questionnaire; National level in lighter shades

Source: Own analysis, ESRI ArcGIS

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