European Commission

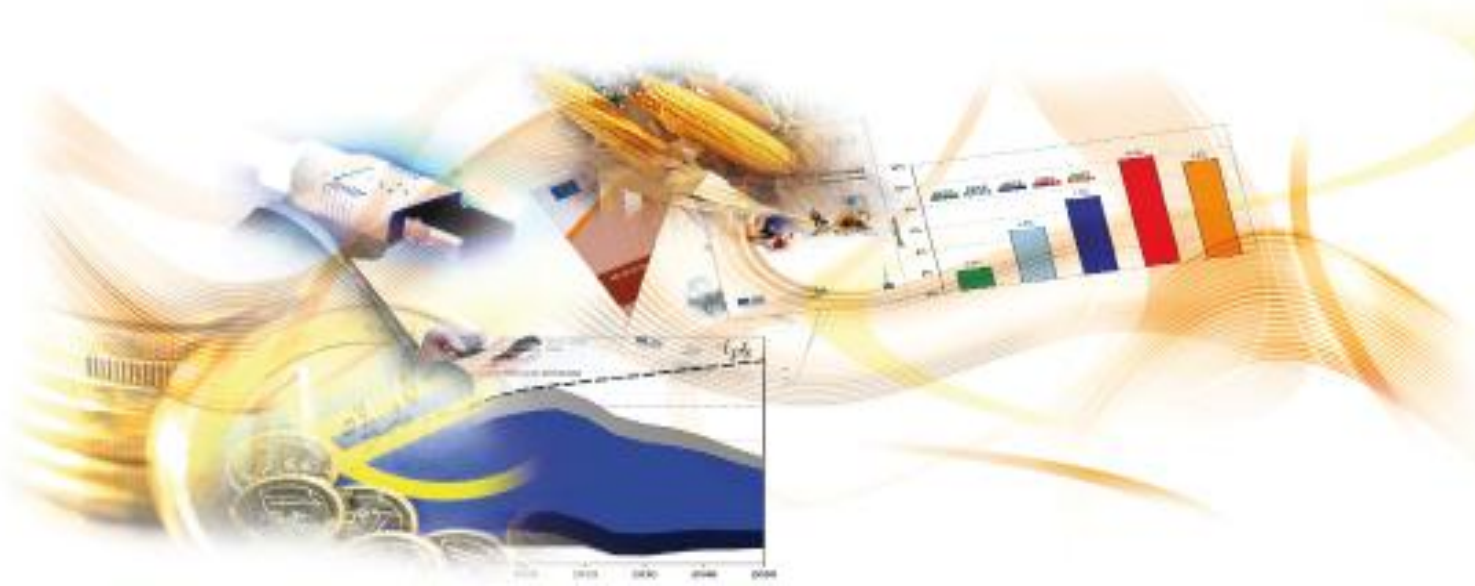
JRC SCIENTIFIC AND POLICY REPORTS

Smart Specialisation programmes and implementation

S3 Policy Brief Series
No. 02/2013

Dominique Foray and Alessandro Rainoldi

2013



Report EUR 26002 EN

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JRC82224

EUR 26002 EN

ISBN 978-92-79-30541-2 (pdf)

ISSN 1831-9424 (online)

doi:10.2791/19106

Luxembourg: Publications Office of the European Union, 2013

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Printed in Spain

Smart specialisation programmes and implementation

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S3 Policy Brief Series n° 02/2013 – May 2013

S3 Platform, JRC-IPTS

Abstract

In the design and implementation of policy, Paul Romer (2000) proposed a useful distinction between goals and programmes.

Goals should be rather conservative (i.e. easy to accept). They should be objectives that are neither risky nor radical and for which there is a broad base of intellectual and political support. Goals should remain relatively constant over time. They should also involve metrics for measuring success.

In contrast to a goal, a programme is a specific policy proposal that seeks to move the system toward a specific goal. It should be possible to judge the success of a programme against the metrics implied by the goal that it serves. All programmes should be designed so that they can be evaluated on a policy-relevant time horizon. If they are, they can also be less conservative and more experimental than the underlying goals. A variety of programmes could be tried, including ones where there is some uncertainty about whether they will succeed. If the evidence shows that they do not work, they can be modified or stopped.

This policy brief aims at giving an operational content to the concept of smart specialisation. Starting with the identification of the sequence of programmes that need to be designed and implemented as key components of the policy process, we will proceed further to address very practical issues of implementation.

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

1 – Typology of programmes

The companion policy brief on "The goals of smart specialisation" (Foray and Goenaga, 2013) emphasizes five principles for designing a policy process as well as the general objectives of smart specialisation. From these initial insights, a few key specific policy proposals can be derived that will contribute to moving the system towards smart specialisation. These policy proposals, or programmes, would involve three main operational objectives:

i) maximising “public-private entrepreneurial discoveries”;

ii) providing operational facilities for continuous observation, detection and evaluation;

iii) supporting early growth of the prioritised activities.

The details of all these programmes as well as their relative importance would have to be adjusted based on a more thorough prior analysis of the local context, circumstances and connectedness of the region considered. In other words, in the framework of what the European Commission denotes as “RIS3” (European Commission, 2012), the process of incorporating smart specialisation into a regional/national innovation strategy would move from the analysis of the local context to the identification of priorities and then to the choice of the most appropriate policy-mix i.e. the set of programmes.

In comparison with the more general exercise of setting appropriate public policies to foster regional development, the three operational objectives outlined above are expressly focused on the more genuine conceptual features of smart specialisation (Foray *et al.,* 2009). This is intended to highlight the comprehensive role that smart specialisation can play in inspiring and steering the process of establishing regional/national innovation strategies. However, it cannot incorporate all the complexity of regional development issues nor become an illusory all-in-one solution to fostering regional growth.

The following description of each programme remains at quite a generic level in line with the purpose and ambition of this document.

1.1 Tools and mechanisms to support entrepreneurial discovery

Information externalities

In the recent literature addressing the problems of entrepreneurial discovery, the simple and only rationale for policy is given by the case of informational externalities (Haussman and Rodrik, 2003; Rodrik, 2004): “good” discoveries are expected to result in a proliferation of “entries” into the new activity. This is a positive step for regional evolution towards smart specialisation, but raises an appropriation issue. The entrepreneur who has made a discovery will not be able (and actually should not be able) to capture a significant fraction of the social value of the initial investment. Consequently, there is a risk that an insufficient number of agents and organisations will invest in this particular type of discovery. So – according to these authors - the correction of imperfect appropriation is the main policy problem. While correction mechanisms (such as patents with a broad scope) address the appropriation problem, they block imitative entry, which, to a certain extent, is desirable, because entries will translate a single discovery into a collective phenomenon so that agglomeration externalities can be realised. There is therefore a problem of incentive alignment.

Aligning incentives through intelligent policy design

Intelligent policy design essentially involves solving the potential conflict between two kinds of incentives that are needed throughout the process: i) incentives to reward those who discover new domains and activities; and ii) incentives to attract other agents and firms and facilitate entries, enabling agglomeration and scale effects to materialise at the next stage. As well demonstrated in Rodrik (2004), these two sets of incentives are not perfectly aligned. To solve this problem, the reward to the entrepreneur who has made a discovery needs to be structured in such a way that maximises the spillovers to subsequent entrants and rivals.

Capabilities

The information externality raises an important issue and requires the design of some mechanisms to subsidise the costs of discoveries. However, the objective of building an economy with an intensive level of entrepreneurial experimentation and discovery requires actions other than "simply" correcting this market failure. This is particularly true for regions that are relatively poor in entrepreneurial capabilities. This goal also requires the creation of appropriate conditions for the emergence of multiple micro-systems of experiments and discoveries. The performance of entrepreneurs and firms in experimenting with and discovering potential domains for future specialisation may depend upon the way in which they build an external network of connections with universities, laboratories, suppliers and users. The main policy challenge therefore appears to be to facilitate the design of such inter-organisational connections and coordination of efforts in the sphere of experimentation and discovery.[1]

In regions that are poor in entrepreneurial capabilities, the main issue is, therefore, not insufficient incentives (informational externalities) impeding the private effort of the existing entrepreneurs but the lack of local entrepreneurial knowledge. Policy makers concerned with this kind of region will face different options for launching a smart specialisation strategy, including the mobilisation of extra-regional resources.[2]

Guiding discoveries?

An important research question is the role of policy not only in supporting entrepreneurial discovery but also in influencing the "direction" in which experiments and discoveries should be oriented. Under what conditions can such policy action be undertaken without causing the usual failures of wrong choices and market distortions? The companion policy brief on the goals of smart specialisation (Foray and Goenaga, 2013) sets out a typology of structural changes (modernisation, diversification, transition, radical foundation). This typology outlines central elements in the policy process. It provides policy makers with the possibility to think ahead and identify the most desirable structural evolution of the regional economy, given its strengths and weaknesses. The policy maker can search for the entrepreneurial knowledge and discoveries necessary to realise and validate the policy vision. There is therefore a feedback mechanism from a policy vision – as determined by the identification of structural change that is particularly desirable for the regional economy – to the search for entrepreneurial knowledge in the sectors and institutions corresponding to such a vision. However subsequent decisions and choices – whether to help and support a particular trend as a potential domain for future specialisation - are conditioned by the quality of entrepreneurial discoveries that will (or not) be made.

[1] David and Metcalfe (2007) and Aghion *et al*. (2009) for a more general treatment of the importance of such "linkages" in growth policy design at the national level.

[2] Think of the role of the diaspora as emphasized in Rodrik (2004).

Funding experiments and discoveries

Determining the most appropriate method to finance experiments and discoveries as well as the initial development of a new activity is no trivial matter. The uncertainty associated with starting a new activity is coupled here with the uncertainty and risks related to the fact that, very often, this activity will be carried out in a region that is little developed. The uncertainty, informational asymmetries and moral hazard[3] are considerable and are likely to permit opportunistic behaviour on the part of entrepreneurs. It will therefore be difficult to attract private investors or even win a share of development funds established by banks as part of their corporate responsibility.

The combination of high uncertainty, asymmetric information and moral hazard, and the fact that R&D typically does not yield results instantaneously, imply a particular funding mechanism: venture capital organisations (VCs). While R&D carried out by small entities and entrepreneurs is often characterised by considerable uncertainty and informational asymmetries, permitting opportunistic behaviour by entrepreneurs, VC organisations employ a variety of mechanisms to address these information problems. In short, the environment in which VCs operate is extremely difficult. It is the mechanisms associated with the VC funds that are critical in ensuring that they receive a satisfactory return. These circumstances have led to VCs emerging as the dominant form of equity financing for privately held technology-intensive businesses. At the same time, there are reasons to believe that despite the presence of private VC funds, there still might be a role for public VC programmes in the kind of difficult contexts described above.

There are several arguments for public investments:

- the structure of venture investments may make them inappropriate for many projects (venture funds tend to make quite substantial investments, even in young firms, and so VC organisations are unwilling to invest in projects that require only small capital infusions);
- the VC industry is limited: VCs back only a tiny fraction of technology-oriented businesses and VC funds are highly geographically concentrated;
- if public VC awards could certify that projects are of high quality, some of the information problems could be overcome and investors could confidently invest in these firms;
- finally, public finance theory emphasises that subsidies are an appropriate response in the case of activities that generate positive externalities.

These are all valid reasons for public VC to be a complement and extension to private VC in the case of projects aimed at discovering new areas for future specialisation. Such efforts often have financial requirements that are too small in relation to the average financing scale. The fact that projects may be located in less advanced regions increases the informational problems to such an extent that the usual types of monitoring mechanisms set up by the VCs may seem insufficient or increase the costs too sharply compared to the anticipated profitability. Finally, **the essence of entrepreneurial discoveries is the generation of informational spillovers (effects of demonstration and emulation) that in themselves represent a rationale for public financing.**

An important policy tool to examine and develop is therefore a public VC fund; that is to say, a public financing mechanism addressing the problems of entrepreneurship and entrepreneurial projects, given the challenging circumstances of many regional economies. In more general terms, one could

[3] Moral hazard refers to inefficient behavior by one actor in a transaction brought on by differences in information available to parties in the transaction – on application about finance and innovation, see Hall and Lerner (2010).

build on the experience gained from the use of publicly supported financial tools in the framework of the EU regional policy.

1.2 Observation, detection and evaluation

Fine-grained observation and detection capabilities on the part of policy makers are becoming critical conditions for success in a smart specialisation strategy. Fine-grained observation of emerging activities is tremendously important. This is the right level to observe 'what are the pieces of the knowledge economy' that a region can take as a basis for smart specialisation. Policy makers need to differentiate between "simple" innovation and discoveries that have the potential to spawn new areas of specialisation and might constitute the cornerstone of a smart specialisation strategy.

Given the immensity of the observation tasks, new models of incentives for encouraging firms to elicit information and bring their own knowledge to the regional policy maker need to be designed and tested. Such models involve transforming the approach to detect entrepreneurial discoveries from one of 'what does the policy maker know and how can they find out what they do not know' to one of 'how those who know, the entrepreneurs, can be induced to come forward with that knowledge'.

Principle n° 5 described in the companion policy brief on the goals of smart specialisation (Foray and Goenaga, 2013) emphasised the experimental nature of the policy process and concluded that rigorous benchmarking and assessment were central elements. The point is not to reduce the risk of mistakes, which would result in no discovery at all, but to minimise the costs of mistakes when they do occur by conducting strict assessment procedures both ex ante to evaluate potentials and select priorities and ex post to identify success and failures. The use of appropriate indicators in both ex ante and ex post assessment (using for instance profiling indicators on one side and result indicators on the other side) represents a key issue, which might influence the ability of the policy maker to detect and correct mistakes sufficiently early.

It is essential to put the process of assessing potentials into operation to reduce risks in policy implementation and the practice of smart specialisation. The precise *ex ante* estimation of the future value of an R&D specialisation that would be required for a cost-benefit analysis is a nearly impossible task and one better left to investment markets. As explained in the companion policy brief on the goals of smart specialisation (policy dilemma) (Foray and Goenaga, 2013), the "blind giant" metaphor suggests that it is always very difficult to assess the stability and sustainability of a specialisation at an early stage. This is why the smart specialisation approach is positioned at a particular point in the development cycle, one at which a degree of local commitment and development has already occurred and has achieved a measure of stability.

The *ex ante* assessment of discoveries and potentials involves questions such as whether the considered activity is new; whether it aims at experimenting and discovering opportunities and has the potential to generate valuable information and learning spillovers; whether the discovery is likely to initiate a desirable structural change (modernisation, diversification) for the region; what are the funding requirements; are the key supply factors (including human capital) available or accessible; is there a global demand and who and where are the main competitors.

Box 1. Eight ex-ante criteria to assess projects or domains and to select S3 priorities.

1. Proximity to market: the centre of gravity of S3 is business and the development of commercial applications; so this first criterion is proposed to avoid projects that would only emphasize fundamental research and/or research infrastructure.

2. Does the activity open a new domain potentially rich in innovation and spillovers? This is the essence of discoveries (versus innovation): opening a new domain in which several innovations will occur.

3. What is the degree of collaboration, the number of partners involved? The project needs to involve a sufficiently large number of actors. Each new activity set as a priority is a collective experiment.

4. Is public funding needed? Projects that are so promising (in terms of expected private profitability) that they will be undertaken in any case should be rejected.

5. What is the significance of the activity for the regional economy? Some excellent projects might be too narrow in terms of their significance for the regional economy (in terms of job, number of firms, etc.). To misquote Nobel Prize winner Robert Solow: we want to see the effect of S3 in the statistics!

6. What is the capacity of the region to keep the successful activity on its space, so as to avoid the innovation here benefits elsewhere syndrome? In general new successful activities which are related to (and built on) the local innovation ecosystem are easier to keep in the region.

7. Can this activity realistically drive the region towards a leadership position in the selected niche?

8. What is the degree of connectedness of the activity vis-à-vis the rest of the regional economy? R&D domains with a greater degree of connectedness create more opportunities for structural transformations and evolution than a more isolated domain.

1.3 Support of early stage and growth of new activities

Even once priorities have been set, well-known market and coordination failures may prevent the emerging activities from growing. Most projects with the potential to spawn new activities require simultaneous large-scale investments to be made in order to become profitable. All the necessary services and complementary activities have fixed costs and can only start if the potential provider has sufficient positive expectations regarding the future of the smart specialisation strategy. Profitable new activities can fail to develop unless upstream and downstream investments are made simultaneously. There are various solutions to such coordination problems, which are not necessarily based on subsidisation (see Rodrik, 2004). Resolving coordination failures also involves responding to the new "knowledge needs" of traditional industries that are starting to adapt and apply general purpose technology. This entails the provision of adequate supply-responses (in human capital formation), by subsidising the follower region's access to problem-solving expertise from researchers in the leader region, and by ensuring the development of local expertise to sustain the incremental improvement, as well as the maintenance of specialised application technologies in the region.

We will turn now to more concrete recommendations about implementation in the next section.

2 – How to start? Towards practical implementation

Section 1 describes programmes at a certain level of abstraction. This means that the definition of sequences of programmes (maximising entrepreneurial discoveries, observation, detection and evaluation, support of early growth, intelligently designed policy), while useful for giving a general sense of what a smart specialisation policy needs to involve, does not really engage with the big problems of practical implementation. How to start the process; what are the milestones and the deliverables at each stage?

2.1 Starting (as usual) with macro-analysis (structures and trends)

It is very helpful to **start at the highest level of aggregation** to produce a sound analysis of the structures of the economy, its clusters and related trends, involving a SWOT-based approach. Such a preliminary approach needs to involve both government and industry, as well as the other relevant stakeholders, such as knowledge institutions and the demand side. Ideally, and in order to seek the maximum synergic potential, the smart specialisation process should mobilise all the actors of the "quadruple helix" right from the very beginning. It is recommended to conclude such an analysis with the generation of some kind of preliminary **"allocation rule," determined in accordance with the broad strategic vision that such a macro-analysis will produce; a strategic vision about the future of the regional economy**[4].

2.2 Thought experiment

Let us assume that the regional economy includes a huge agro-food sector characterised by rather weak to moderate innovation capacities, a high tech cluster and a population of low tech SMEs operating as subcontractors for the automotive sector which is based in other regions. This structure could be described as involving **a sleeping giant, some excited goblins and a few hungry dwarfs**. The establishment of a preliminary "allocation rule" is needed so that the excited goblins do not corner all the funding because they have the capacities to present so many good projects! As argued in the companion policy brief on the goals of smart specialisation (Foray and Goenaga, 2013), the smart specialisation strategy needs to be inclusive in order to be efficient: the sleeping giant, as well as the dwarfs, badly need structural changes – modernisation or diversification. While this will happen through a smart specialisation strategy involving them, good projects are likely to be more difficult to identify than in the high tech cluster context. The preliminary allocation rule is therefore useful to devote some funding to help capability formation and support entrepreneurial discoveries and emerging activities in sectors where these new activities are desperately needed but difficult to develop spontaneously.

2.3 From the macro-analysis to the selection of priorities at the micro-level

The smart specialisation strategy is not, however, determined by the macro-approach ALONE. While the macro approach determines, so to speak, the shape of the smart specialisation budget, **the identification of priorities will be based on the macro-analysis (preliminary allocation rules) AND**

[4] See principle nr. 4 in section 2 in Foray and Goenaga (2013).

the best knowledge of the local policy-making communities about entrepreneurial discoveries and emerging activities in each of the sectors or between sectors.

On the basis of the allocation rule, it is necessary to observe and detect (and in some cases create the conditions for) the emergence of activities at a fine-grained level of aggregation. At this level, as already stated, the real challenge for the policy makers is about observation, detection and monitoring.

By combining the macro-level analysis and the observation of micro-dynamics (emerging activities), the strategy will highlight a small number of priorities, distributed across the whole regional economy according to the allocation rule.

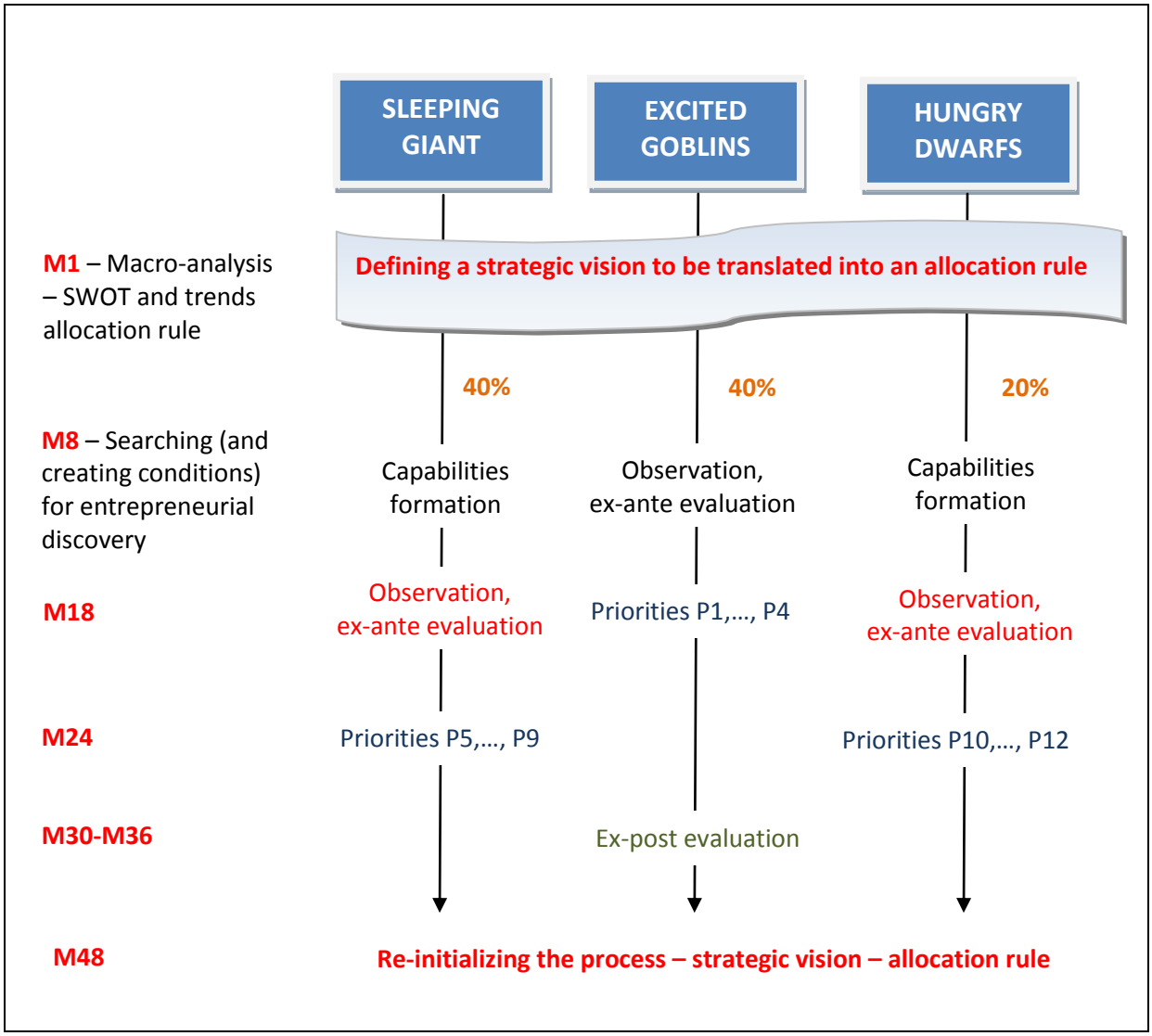
In this framework, as previously stated the observation phase should be as inclusive as possible, i.e. all the regional economy niches and potentials should be scanned, while the priority setting phase should – under those circumstances – be given the best conditions to make the appropriate choices for future specialisation. Moreover, the more inclusive the observatory phase is, ensuring vast involvement of the quadruple helix stakeholders, the less conflictive should be the priority setting activity in terms of reaching consensus amongst the stakeholders on a limited number of priorities to support via public policy mechanisms.

2.4 Pace and tempo

As a smart specialisation strategy aims at covering the whole economy to identify good projects, not only from the excited goblins but also from other less dynamic actors, the **pace and tempo of the policy implementation may differ between sectors**. For example, while policy makers can start quite early to observe, evaluate and set priorities about the excited goblins (emerging projects are already there) according to the macro allocation rule, they need to devote efforts and resources to create the proper conditions for entrepreneurial discoveries in the other sectors. This can be done through a variety of actions (capability formations, calls for pre-investment proposals, building connections with universities, attracting extra-regional resources) before starting to observe, detect, assess and set priorities in these sectors (see Table 1 below).

After a certain period of time (4-5 years), new priorities emerge and the old ones are no longer being supported through the smart specialisation funding. This raises a dilemma as explained in the policy brief on the goals of smart specialisation. However, no longer being a priority of the strategy does not mean that this activity, which is now structured, will not receive some other kind of funding. Financing can continue but, more logically, through standard instruments of the horizontal policy (R&D tax credit, innovation costs subsidies, improving framework conditions, etc..).

Table 1. Pace and tempo of a smart specialisation strategy covering the whole economy.



Conclusions

The concrete process we have described above will be very demanding in terms of policy making capability. Smart specialisation strategies will not succeed in Europe if the policy making capability at regional level does not reach high levels of competence and commitment. This is not a surprise: smart specialisation is part of the family of the so-called 'new industrial policy' that aims at designing and deploying sophisticated instruments to make compatible vertical choices for concentrating resources and market dynamics. The policy challenge is enormous. However, we need to see this challenge as an opportunity for improving human capital and creating pockets of bureaucratic excellence in regional administrations. We have already observed how the goals of smart specialisation can generate great motivation among and engagement of regional policy makers, since the smart specialisation strategy opens new policy opportunities to have a real impact on the future of regions through the deployment of sophisticated programmes.

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European Commission
EUR 26002 – Joint Research Centre – Institute for Prospective Technological Studies

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Luxembourg: Publications Office of the European Union

2013- 10 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424 (online)

ISBN 978-92-79-30541-2 (pdf)

doi:10.2791/19106

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LF-NA-26002-EN-N

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ISBN 978-92-79-30541-2