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Smart Specialisation: what gets lost in translation from concept to practice?

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ABSTRACT

This paper investigates how and to what extent the Smart Specialisation approach to innovation policy is currently being translated into strategic decisions and policy interventions in Europe. It defines three complementary conditions that operationalize the intervention logic of Smart Specialisation and tests them empirically. The results reveal that Smart Specialisation is being partially implemented. There are in fact significant indications that regions and countries have put in place mechanisms that may circumvent the logic of selective intervention. Implications for policy evaluation are discussed.

KEYWORDS

regional innovation policy; Smart Specialisation; selective intervention logic; strategic priorities

JEL O25, O30, R12, R58

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INTRODUCTION

This paper investigates how and to what extent the Smart Specialisation approach to regional innovation policy is currently being translated into strategic decisions and policy interventions. We identify three complementary conditions that translate the intervention logic of Smart Specialisation and characterize them in ways that can be investigated empirically. We analyse the nature of the priority areas for policy intervention, the formal mechanisms for project selection, and the type of policy measures already adopted by regional and national authorities. We use original data on the policy priorities identified in Smart Specialisation strategies and the conditions stipulated in the calls for proposals co-funded by the European Regional Development Fund (ERDF) under the chapter on research and innovation policy.

The contribution of this paper is twofold. First, we propose measurable criteria to assess the consistency of policy interventions with the Smart Specialisation approach. The paper helps to fill a gap in the emerging literature on Smart Specialisation regarding which policy initiatives should or should not be considered part of this approach; thus, it provides useful analytical elements to orient impact evaluation exercises. Second, we provide policy implementation evidence based on 39 regional and national Smart Specialisation strategies in Italy and Poland, and 285 calls for proposals published in the period 2014–16 in Poland, Italy, Portugal, Czechia, Hungary, Lithuania and Slovenia. These calls comprise almost all policy measures co-financed by the research and innovation policy chapter of the ERDF in the examined countries.

To the best of our knowledge, this is the first study to examine systematically actual policy measures under the current European Cohesion Policy and their adherence to the Smart Specialisation conceptual framework. Our analysis is also significant in quantitative terms; taken together, the seven countries we study are the recipients of nearly half the ERDF available for research and innovation policy in the European Union, and the resources allocated during the period under scrutiny amount to 41.4% of the budget available to those countries for the whole financial period 2014–20 of the Cohesion Policy.

The paper is organized as follows. The next section introduces the Smart Specialisation approach and discusses its origins in the economic development and regional innovation system literature and its incorporation in European policy. The third section presents the three complementary

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conditions that operationalize the intervention logic of Smart Specialisation and the criteria to test them empirically. The fourth and fifth sections present the data and the results, respectively. The sixth section concludes with a discussion of some possible implications of the results.

THEORETICAL BACKGROUND

The expression 'Smart Specialisation' denotes the European Union's current approach to regional innovation policy. It was first introduced formally in the context of the European Cohesion Policy as part of a broader reform aimed to strengthen the place-based nature of the policy, and to support decision-making with a focus on stakeholder involvement, experimentalism and results (Barca, 2009).

More specifically, Smart Specialisation offered a new, integrated set of principles guiding investment in innovation through prioritization and concentration of public resources, and the mobilization of local assets and entrepreneurial capacity; Cohesion Policy made the largest, pan-European industrial policy funding programme available to apply those principles (Ahner & Landabaso, 2011).

The Smart Specialisation approach was further characterized in order to embrace a broad view of innovation, not confined to research-intensive or technology-based activities, and to stress the inclusive nature of the search and discovery process at the basis of the identification of strategic priorities. The formal adoption of a Smart Specialisation Strategy (RIS3) was then established by the European legislation as a precondition to access the ERDF, which is the main source of funding of the European Cohesion Policy for the period 2014–20 (European Union, 2013).[1]

Noticeably, Smart Specialisation was mainstreamed into Cohesion Policy with no trial period or specific piloting phase (Foray, 2015); no direct evidence was available at the time of launch about its suitability in the different areas and territorial contexts of the European Union. Smart Specialisation was and still is to a great extent an 'ambitious experiment' (Kuznetsov & Sabel, 2017, p. 52), the achievements and effectiveness of which are an important matter of empirical investigation.

Even though Cohesion Policy addresses all countries and regions across the European Union, its main target is represented by less developed regions which receive the largest share of funding. Notably, the literature points to the existence of an 'innovation paradox' in those regions. There is a contradiction between the comparatively higher need to promote innovation in backward regions and their lower capacity to absorb available funds and effectively invest in innovation activities compared with more advanced regions. This paradox is explained by the weaknesses of the regional innovation system and institutional characteristics of these regions. Accordingly, the solution to this contradiction requires institutional change and the strengthening of the regional relational infrastructure (Marques & Morgan, 2018; Oughton, Landabaso, & Morgan, 2002). More in general, the literature on regional and local economic development stresses the importance of the presence of effective institutions, dynamic social contexts, characterized by trust, reciprocity, and strategic cooperation among public and private actors in nurturing development processes (Amin & Thrift, 1995; Martin & Sunley, 1996; Rodríguez-Pose, 2013; Rodríguez-Pose & Storper, 2006).

Government quality has been proven a relevant factor influencing innovation capacity, and effective and transparent public institutions represent a necessary complement to direct innovation support measures (Rodríguez-Pose & Di Cataldo, 2015). Empirical evidence also shows that regional development depends to a large extent on the presence of public goods which can be produced exclusively through the collective action of local 'intermediate institutions' (Arrighetti & Seravalli, 1999). The emergence of cooperative behaviours between local actors and the provision of 'collective production inputs' (Streeck, 1991) are facilitated in an environment characterized by 'institutional thickness' (Amin & Thrift, 1995).

Smart Specialisation acknowledges the above-mentioned factors and encourages institutional change, capacity-building and collective action, while making the policy process more inclusive. In doing so, the policy embraces a 'constructability perspective' according to which even when the socio-institutional context is highly fragmented and is not particularly effective in favouring the process of development, public policy may influence this context, modifying the mentality and behaviour of local actors, facilitating the achievement of development objectives (Evans, 1996). Public policies, characterized by clear incentive structures and rules, can promote institutional change and collective action for innovation and development purposes. However, it is necessary to bear in mind that public intervention is not always successful in doing that. Initial conditions and the deployment of policy measures on the ground determine the final outcome. The socio-institutional context cannot be totally ignored; at the same time, the success of the policy depends on the quality of the policy design and implementation processes.

Compared with traditional industrial policy, Smart Specialisation exhibits two distinctive, complementary characteristics (Foray, 2015; Radosevic, 2017). First, public intervention must be selective, that is, focused on particular economic activities. Horizontal or sectoral policies aimed, for example, at improving the framework conditions for economic exchange and entrepreneurship, could complement, but do not represent, a direct means to implement the Smart Specialisation policy.[2] Second, selection of the intervention areas would be based neither on the knowledge and will of the policy-maker only nor on a purely analytical knowledge base, but rather would result from an interactive process between policy-makers and the private sector, the so-called *entrepreneurial discovery process*, which allows exploration and evaluation of emerging opportunities in terms of potential benefits, risks and policy needs (Foray, 2015; Foray & Goenaga, 2013).

To adopt a selective intervention logic implies discriminating across economic activities and granting support only to those new to the local economy, and with the potential

for scale and agglomeration economies. During the last decade, this argument has been mainstreamed in development economics, especially in the so called New Industrial Policy approach (Hausmann & Rodrik, 2003, 2006; Rodrik, 2007), which was the basis for the later elaboration of the Smart Specialisation concept (Foray & van Ark, 2007; Foray, David, & Hall, 2009; Radosevic, 2017). In particular, Rodrik (2007) notes that, in the absence of government intervention, private incentives for diversification are weakened and could be neutralized by the presence of information and coordination externalities that prevent pursuit of growth opportunities (Hausmann, Rodrik, Benavente, & Rodríguez, 2005; Rodrik, 2007).[3] The role of industrial policy is therefore to elicit information from entrepreneurs on these externalities and devise possible ways of correcting them according to a highly targeted and selective intervention logic.

Information externalities originate from the fact that investment in cost discovery – that is, discovery, through experimentation, of which products or services can be produced competitively (Hausmann & Rodrik, 2003) – can generate social gains (through imitative entry in the new activity), but the associated risks might discourage the individual entrepreneur from engaging in it. Coordination externalities arise because establishing new activities often requires simultaneous up- and downstream investments, with uncertain returns and perhaps high fixed costs which discourage private investment.

Importantly, the level at which information and coordination externalities typically materialize, and hence should be tackled, is not the whole sector or industry, but rather a specific economic activity such as a good or service, or a technology application (Rodrik, 2007). In the documents outlining the Smart Specialisation approach, the economic activities that are the target of policy intervention are usually referred to as *priorities* or *priority areas*. According to Foray (2015, p. 6), Smart Specialisation policy requires 'setting priorities – not horizontal priorities such as improving human capital, developing good universities or building an effective intellectual property rights system – but vertical ones regarding particular fields and technologies as well as particular sets or networks of actors'.

The externalities that motivate policy intervention according to the Smart Specialisation logic can differ substantially depending on the industries and technologies involved and the underlying societal challenges; thus, the types of intervention will vary across priorities. For instance, subsidies for public–private research collaborations in an emerging biomedical cluster, envisaged to develop prosthetic solutions for people with limited mobility are, of course, different from the managerial advice and seed capital needed to support start-ups aimed at valorizing cultural heritage for tourist activities through the use of digital applications.

In order to highlight the *necessarily* activity-specific nature of policy intervention, Hausmann and Rodrik (2006) insightfully overturned the conventional view of horizontal policies as the rule and specific interventions as the exception, by stressing that truly horizontal policies are not really possible. They argue that a particular economic activity requires specific inputs, including public intervention: 'These inputs or requirements are developed to solve the more or less particular needs of existing activities, but they may or may not be supportive of some other, potentially not yet existing activities' (p. 9).[4]

The inherent aim of an industrial policy is therefore to put in place the specific support each activity would require in order to enable agglomeration forces to set in and drive diversification in the local economy (Hausmann & Rodrik, 2006). This implies that policy measures must be designed with the specific characteristics and needs of individual priorities as the starting point (Mieszkowski, Gómez Prieto, & Nauwelaers, 2016).

This argument is also present in the 'innovation system' approach, one of the main implications of which is that policy interventions need to be tailored according to the specific strengths and weaknesses of the regional innovation system (Asheim & Gertler, 2005; Cooke, 1998; Tödtling & Trippl, 2005). This approach notably emphasises that innovation is generally not the result of the activity of isolated firms or entrepreneurs, but rather the outcome of evolutionary processes characterized by actors and organizations interacting in networks embedded in wider socioeconomic systems (Edquist, 1997; Lundvall, 1992).

Building on this notion and the related concept of the 'learning region' (Asheim, 1996; Morgan, 1997), Smart Specialisation recognizes innovation as a collective social endeavour, where the mobilization of localized, often tacit knowledge and iterative learning across a network of public and private actors play a fundamental role in disclosing new development paths. This is central to understanding how to elicit and collect information on the activities that produce relevant externalities which may need policy intervention. The regional innovation system literature and Rodrik point out how such information can only arise through a learning process and collaboration between the public authorities and the private sector (Asheim, Lawton Smith, & Oughton, 2011; Rodrik, 2007).

By definition, new activities are not yet present in the local economy, and their feasibility and profitability in a given context is not known before the actors actually experiment with them. As effectively explained by Sabel (2012), this perspective builds on the notion that economic decisions, especially entrepreneurial decisions, are based not only on general information conveyed by the price system but also on knowledge that is local, that is, it is possessed by individual actors and is not freely available, and often tacit, that is, it is not articulated or codified, and thus cannot be immediately accessed by others (Hayek, 1945). Knowledge about new activities can only be produced by local actors engaged in a (costly) process of discovery, provided that a suitable incentive scheme (e.g., competition) is in place (Hayek, 2002).

The identification of new opportunities for economic diversification is thus fundamentally uncertain both on the side of the policy-maker, and on the side of the entrepreneurs; the search process in these conditions can only be

conceived as a joint learning process through trial and error; in the context of Smart Specialisation it is referred to as the entrepreneurial discovery process (Foray et al., 2009). According to Foray (2015, p. 24) this process

> is the essential phase, the decisive link that allows the system to reorient and renew itself. Indeed, the entrepreneurial discovery that drives the process of smart specialisation is not simply the advent of an innovation but the 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 view of evaluating the effects of the policy measures implemented in the Smart Specialisation framework of the European Cohesion Policy, we first need to understand how and to what extent the principles of Smart Specialisation are translated in the indeterminate zone of policy implementation and practice. This paper focuses on assessing three complementary aspects: (1) how priorities are defined; (2) how public support measures are circumscribed to those priorities; and (3) how policy measures are differentiated according to the type of priorities. It is worth stressing that the paper does not explore the process that led to priority selection, but it will shed some light on important aspects of it; neither does the paper address how appropriate the priority choices are with respect to, for example, the assets/potential of the territory.

As for point (1), to the best of our knowledge, very few studies analyse the priorities identified by regions and countries in their RIS3. No existing works provide assessment criteria that are consistent with the theoretical foundations of Smart Specialisation, the official regulations of Cohesion Policy and the European Commission guidance all together. Iacobucci and Guzzini (2016) analyse the RIS3 priorities indicated by Italian regions and find that they correspond in general to rather broad domains, identified as either sectors or technologies, and often split into several specific sub-domains. Also, they argue that regions, apparently, have not adopted a common classification or labelling criterion for defining Smart Specialisation priorities. They focus on the empirical methods used to define priorities, and they do not provide explicit criteria to assess the consistency of priorities with the Smart Specialisation conceptual framework. Sörvik and Kleibrink (2015) and McCann and Ortega-Argilés (2016) compare priority patterns across European countries based on information obtained from the European Commission open data repository, Eye@RIS3. This information provides only a reclassification of priorities according to NACE codes (Statistical Classification of Economic Activities in the European Community), obtained from multiple, sometimes not official sources, and is not suitable for evaluating the actual intervention areas. Kroll (2015) collects information on Smart Specialisation priorities through telephone interviews with policy-makers, but he does not provide a framework for priority analysis.

As for points (2) and (3), we are not aware on any study providing empirical evidence in this respect; the analyses provided in this paper are therefore novel and unique.

RESEARCH OUTLINE

This paper provides a framework through which to assess the consistency of the policy interventions with the Smart Specialisation approach, and conducts an empirical analysis based on a significant sample of actual policy measures in European countries and regions. We proceed in two steps. First, we consider how policy priorities are indicated and described in regional and national Smart Specialisation strategies. Second, we look at the policy measures funded entirely or partially by the research and innovation policy chapter of the ERDF and, therefore, are bound to support the implementation of Smart Specialisation strategies; and we assess whether those measures exclusively or preferentially support the priorities declared in the strategy documents and the extent to which interventions are customized so as to respond to the specific needs of each priority area.

European legislation explicitly mentions the notion of Smart Specialisation priorities. In the act laying down the European Union's Common Provision Regulation 1303/2013 for Cohesion Policy in the period 2014–20, Smart Specialisation strategies are meant to 'concentrate resources on a limited set of research and innovation priorities' (European Union, 2013, p. 438). However, the regulations do not provide indications about the expected nature of such priorities.

A more precise indication of how priorities should be defined can be found in the European Commission's guidance on Smart Specialisation strategies. In particular,

> priorities could be framed in terms of knowledge fields or activities (not only science-based, but also social, cultural and creative ones), sub-systems within a sector or cutting across sectors and corresponding to specific market niches, clusters, technologies, or ranges of application of technologies to specific societal and environmental challenges or health and security of citizens (e.g. ICT [information and communication technology] for active ageing, mobility solutions to reduce traffic congestion, innovative material solutions for eco-construction, etc.).
>
> (European Commission, 2012a)

Notably, in the literature on Smart Specialisation, priorities are not defined according to a unique dimension (e.g., industry or technology). As Iacobucci and Guzzini (2016) note, it is difficult to assess and compare the scope and granularity of the priority areas in the absence of a single reference taxonomy (e.g., NACE codes for industries, International Patent Classification (IPC) codes for patented technologies). Rather, the approach followed by the European Commission, building on recent advances in development economics and the existing, although limited, Smart Specialisation literature, identifies candidate activities for policy interventions at the intersection of different dimensions (and classifications). In particular, priorities can result from the application of technologies or innovative processes to certain industries characterized, possibly, by the use of specific natural or cultural assets, with the aim of pursuing specific societal goals.

We follow this line of thinking and propose the definition of the archetypal Smart Specialisation priority as a distinctive combination of four dimensions: (A) the sectors or value chains of primary interest for the intervention; (B) the transformative processes to be activated (technology applications); (C) the societal challenges to be addressed; and (D) the natural and/or cultural resources to be used (e.g., maritime ecosystem, alpine ecosystem, cultural heritage). The intersection of these dimensions determines the (set of) activities to be targeted by the policy intervention. In practical terms, since the interaction among all four dimensions may represent a too-binding constraint on innovation support measures, which inherently require some scope for experimentation, we consider suitable Smart Specialisation priorities those areas defined as a combination of at least two of the four dimensions.

However, whether priorities identified according to this criterion represent a real effort to discriminate among several possible activities and grant preferential support to only some (selectivity principle) remains difficult to tell. The scope of innovation activities in a 'broad' industrial sector could still be embraced, provided that a large enough number of 'narrow' or highly specific priorities are defined. The European regulations state that the number of priorities should be limited, but give no further indication on how to evaluate their number, which presents the real risk of circumventing the selectivity principle by establishing many narrow priorities that, jointly, cover a wide spectrum of activities.

In the European Union's policy funding schemes, most resources are allocated competitively through project-selection procedures or contests based on written solicitations of proposals (usually referred to as calls for proposals), which specify a formal process to select and award funds to successful applicants. According to the intervention logic of Smart Specialisation, we expect the policy measures devised to realize the strategies will *exclusively* or *preferentially* support projects contributing explicitly to the Smart Specialisation priorities or the actors operating in the prioritized areas.

In the case of measures implemented through public calls for proposals, alignment with the declared Smart Specialisation priorities can be evaluated based on the presence in the call of specific eligibility or selection criteria for proposals. The present study focuses on regional and national calls for proposals financed through the ERDF under the research and innovation policy chapter, that is, under the Thematic Objective 1 (TO1) 'strengthening research, technological development and innovation' (European Union, 2013); in what follows, we denote these calls ERDF-TO1.

We consider that a call implements the Smart Specialisation strategy if the alignment of project proposals with declared Smart Specialisation priorities represents either an *eligibility condition* for funding or a *preferential evaluation criterion* applied to the selection of proposals. In general, an eligibility condition can be of two types: *formal*, if the applicant can be classified as belonging, or not, to Smart Specialisation priority areas based on its main activity, according to an explicit taxonomy, which must be included in the strategy documents; or *substantial*, if the specific content of a project proposed by the applicant (s) for evaluation by a committee belongs to, or is aligned with, a Smart Specialisation priority area. The preferential selection criterion is an incentive to submit projects in the priority areas, but does not guarantee ex-ante alignment of funded projects to those areas; this type of alignment mechanism is clearly less stringent than the eligibility condition in which any proposal not explicitly related to a priority is not further considered.

In the case of Smart Specialisation, the formal eligibility condition is of little help because, in general, only the sectoral dimension of the applicant's activity can be easily characterized through the administrative records, while the other important dimensions that need to be appreciated in order to evaluate alignment with Smart Specialisation priorities (technology employed, societal challenge tackled and natural/cultural resources used) cannot be assessed in this way. Therefore, we will consider only eligibility of a substantial type, which will need to be evaluated by a selection committee.

We finally consider how the measures implementing the Smart Specialisation strategies are tailored based on the specific characteristics and needs of each priority area. Within a single strategy, we expect to observe an appreciable degree of variation across priorities with respect to the definition of policy instruments, categories of beneficiaries, funding rules, and timing and duration of the intervention. To verify this, we check whether the measures implemented through ERDF-TO1 calls are designed to address single priorities, a subset of priorities or all priorities in the same way. Table 1 presents the conditions for selective policy interventions and the respective criteria for empirical analysis.

DATA

The analysis is based on two sources of information: the RIS3 documents adopted by European regions and countries; and calls for proposals issued under the TO1 budget lines of regional and national ERDF Operative Programmes for the period 2014–20.

We analyse 39 Smart Specialisation strategies, corresponding to the total number of strategies currently being implemented in Italy and Poland (21 regional strategies and one national strategy in Italy; 16 regional strategies and one national strategy in Poland). The two countries represent 28.8% of the ERDF-TO1 budget available for the entire European Union – with Poland accounting for 20.3% and Italy for 8.5% – and have decentralized administrative structures that allow regional authorities to design and implement regional RIS3s with a dedicated budget.

Information on actual implementation of the Smart Specialisation policy derives from the analysis of 285 calls for proposals employing ERDF-TO1 resources, launched under 46 ERDF Operational Programmes in Italy, Poland, Portugal, Czechia, Hungary, Lithuania and Slovenia between 1 January 2014 and 31 December 2016. To our

Table 1. Selective intervention logic of Smart Specialisation: conditions and criteria for empirical analysis.

Conditions	Criteria for empirical analysis
Identification of priority areas for policy intervention	Archetypal Smart Specialisation priorities are defined as a distinctive combination of four dimensions: (A) the sectors or value chains of primary interest for the intervention; (B) the transformative processes to be activated (technology applications); (C) the societal challenges to be addressed; and (D) the natural and/or cultural resources to be used The intersection of these four dimensions determines the (set of) activities to be targeted by the policy intervention. In practical terms, since the interaction among all four dimensions may represent a too-binding constraint on innovation support measures, which require some scope for experimentation, we consider suitable Smart Specialisation priorities those target areas defined as a combination of at least two of the four dimensions A text analysis of RIS3 documents is carried out to test this hypothesis
Alignment of funded projects with the priority areas	Calls for project proposals are said to implement Smart Specialisation strategies if project alignment with a selected priority area represents either an eligibility condition or a preferential evaluation criterion applied to the selection of proposals A detailed analysis of national and regional calls for proposals financed through the European Regional Development Fund (ERDF) under the research and innovation chapter (European Union Cohesion Policy 2014–20) is carried out to test this hypothesis
Differentiation of policy measures across priority areas	To assess this hypothesis, we check whether the measures implemented through the abovementioned calls, including the type of instruments and target population of potential beneficiaries, are designed to address individual priorities, a subset of priorities or all priorities simultaneously

knowledge, those calls represent the totality of the calls published in that period by 39 regions and seven national authorities. The seven countries jointly considered account for 48.4% (€19,904 millions) of the ERDF-TO1 resources available for the entire European Union.[5] Table 2 presents detailed information on the distribution of calls and corresponding resources by country.

Poland, Italy, Czechia, Portugal and Hungary are amongst the largest recipients of ERDF assistance for TO1 initiatives. Table 2 shows that the ERDF contribution already allocated through the calls accounts for a little over €8.2 billion, or 41% of the overall ERDF-TO1 resources available for the seven countries during the whole 2014–20 period.

RESULTS

Identification of priority areas for policy intervention

We start by looking at how priorities are defined in the Smart Specialisation strategies. First, we see that in virtually all the RIS3 documents examined, priorities are specified through a nested, multilevel scheme, where the higher levels comprise a number of items each of which is matched with several items defined at a lower level, giving rise to a tree-like structure. Only in the strategy of the Italian region of Umbria are priorities presented in a single-level fashion. In 14 strategies, the priority trees include two levels; in 24 strategies they include three levels.

The 39 strategies examined comprise a total of 198 items in the highest hierarchical level of the priority structure, which we denote level 1, with an average of around five, a maximum of eight and a minimum of three; 92% (183) of level 1 items are matched to one or more level 2 items; 43.2% (86) are further matched to a third level; only 8% (16) of the items listed at level 1 are not matched further. Tables A1 and A2 in Appendix A in the supplemental data online report the number of items at each level of the priority trees for each RIS3.

The items listed for each level in the priority structure can be categorized according to one or more of the four dimensions presented in the third section. The left-hand side of Table 3 reports the type and frequency of the combinations of dimensions we observe at level 1 in the priority tree. We can see that half the items denote sectors or value chains (A), while 70% are categorized as A, B or C. Tables A3 and A4 in Appendix A in the supplemental data online present descriptions of the level 1 priorities for each RIS3.

Level 1 items are important, but are only part of the picture since the precise description of priorities is provided by the complete nested structure of the priority tree. More interesting in the context of this paper is the analysis of the information provided *across* the different levels of the priority tree. On the right-hand side of Table 3, level 1 items are categorized based on the information provided in all related levels of the priority tree, identifying the combinations of dimensions that can be encountered by moving along the tree starting from level 1 'trunk' to the tip of the

Table 2. Number of published calls and funding in the target countries.

Member state	Published calls (by the end of 2016)			Overall ERDF-TO1 funding for 2014–20 (€, millions)	Share of overall ERDF-TO1 funding allocated through calls (%)
	Total number of calls	Total resources, ERDF and national contribution (€, millions)[a]	ERDF contribution (€, millions)		
Italy	70	1322	774	3513	22.0
Poland	109	3860	3860	8351	46.2
Portugal[b]	54	1253	1253	2329	53.8
Czechia	24	873	829	2421	34.2
Hungary	11	1405	1194	2149	55.6
Lithuania	10	245	245	679	36.0
Slovenia	7	94	75	462	16.3
Total	285	9052	8230	19,904	41.4

Notes: [a]When no specific information was provided on the co-financing for the call in the call's documents and institutional websites, the co-financing rate of the ERDF Operational Programme was used to estimate the national contribution and, hence, the total resources available for the call.
[b]For Portugal, the amounts indicated are underestimated since three calls had no information on funding.
TO1, Thematic Objective 1.
Sources: Authors' elaboration based on data reported in European Regional Development Fund (ERDF) operational programmes, institutional websites and European Commission, DG Regional Policy data sets (open data platform).

Table 3. Combinations of dimensions in the definition of Smart Specialisation priorities.

Dimensions[a]	Number of level 1 items: combinations evaluated considering information provided only in level 1 (column %)			Number of level 1 items: combinations evaluated considering information provided in all levels (column %)		
	Italy	Poland	Total	Italy	Poland	Total
A	57 (51.8)	43 (48.9)	100 (50.5)	7 (6.4)	4 (4.5)	11 (5.6)
B	5 (4.5)	9 (10.2)	14 (7.1)	2 (1.8)	3 (3.4)	5 (2.5)
C	16 (14.5)	8 (9.1)	24 (12.1)	1 (0.9)	–	1 (0.5)
D	1 (0.9)	1 (1.1)	2 (1.0)	–	–	–
A + B	10 (9.1)	11 (12.5)	21 (10.6)	58 (52.7)	21 (23.9)	79 (39.9)
A + C	11 (10.0)	11 (12.5)	22 (11.1)	4 (3.6)	2 (2.3)	6 (3.0)
A + D	3 (2.7)	1 (1.1)	4 (2.0)	–	–	–
B + C	1 (0.9)	–	1 (0.5)	11 (10.0)	2 (2.3)	13 (6.6)
B + D	4 (3.6)	–	4 (2.0)	2 (1.8)	–	2 (1.0)
C + D	–	–	–	–	–	–
A + B + C	1 (0.9)	4 (4.5)	5 (2.5)	18 (16.4)	54 (61.4)	72 (36.4)
A + B + D	–	–	–	5 (4.5)	1 (1.1)	6 (3.0)
A + C + D	1 (0.9)	–	1 (0.5)	–	1 (1.1)	1 (0.5)
B + C + D	–	–	–	–	–	–
A + B + C + D	–	–	–	2 (1.8)	–	2 (1.0)
Total	110	88	198	110	88	198

Note: [a]The four dimensions are defined as follows: sectors/value chains of primary interest for the intervention (A); technologies or processes (B); societal challenges (C); and natural or cultural resources (D).
Sources: Authors' elaboration based on information reported by national and regional RIS3 documents.

priority 'branches' at levels 2 and 3. The results are quite different from those on the left-hand side of Table 3.

On average, half of level 1 items (68.2% in Italy, 28.4% in Poland) lead to a combination of two dimensions; 40% (20.9% in Italy, 63.6% in Poland) lead to a combination of three dimensions; while 1% combine all four dimensions. The most frequent combinations are A + B (40% in total, 52.7% in Italy, 23.9% in Poland), and A + B + C (36.4% in total, 16.4% in Italy, 61.4% in Poland), with the former appreciably more frequent in Italy and the latter in Poland.

The above analysis shows that most of the policy intervention areas identified in the 39 strategies examined appear to be suitable Smart Specialisation priorities since they are defined as a combination of at least two of the four basic dimensions identified in the third section. More than 90% of level 1 items lead to suitable Smart Specialisation priorities, yet six regional strategies in Italy and five in Poland contain priorities that do not fully reflect the intervention logic of the Smart Specialisation approach.

The multilevel structure of priorities is an emerging feature of the Smart Specialisation strategies that was not explicitly provided for or discussed in the European regulations (European Union, 2013) and guidance (European Commission, 2012b) and has a fundamental implication. The number of priorities defined by a region or country is not given by the number of items defined at level 1, or at the highest level in the priority tree; instead, it is more correctly represented by the number of items at the lowest hierarchical level, which corresponds with each and all level 1 items.

If we apply this logic, the total number of priorities in Italy and Poland, obtained by considering the items at the lowest possible level of the priority tree, appears to be in the thousands. Notice for instance that the Italian region Campania identifies six items at the first level of the priority tree and 126 items at the third level, while the Polish region Lodzkie identifies six items at level 1 and 459 distinct items at the third level (see Tables A1 and A2 in Appendix A in the supplemental data online). Those numbers may appear excessively high in light of both the need to concentrate public resources on a limited number of priorities, as required by the ERDF regulations, and the administrative and technical capacities needed to effectively follow the development of many distinct areas. However, a proper judgement about the suitability of a given priority tree should be formulated on a case by case basis, taking into account the specific socioeconomic conditions of the country or region, the size of the policy programme and the technological characteristics of each production process. This sort of analysis goes beyond the scope of the present paper.

We argue that the observed branching structure of priorities might counteract and possibly neutralize the selectivity of the policy intervention advocated by the Smart Specialisation approach even in the presence of a formally correct combination of dimensions. This would be the case, for instance, if a certain technology branches into many application fields or sectors, or if a societal challenge is meant to be tackled by applications in multiple sectors. In other words, if the branches are bushy and dense, it is difficult to distinguish whether the interventions depending on such priority structure differ from broad measures that apply across all areas of the economy. For a policy intervention to be selective, the priority tree needs to be sparse.

Alignment of funded projects with the priority areas

We next consider how well the ERDF-TO1 calls for proposals are formally aligned to the Smart Specialisation strategies. In particular, we examine each call for the presence of an explicit eligibility condition or preferential selection criterion for project proposals, as explained in the third section. The results are summarized in Table 4.

Note first that 81% (231) of the calls are only open to project proposals in the priority areas identified in the Smart Specialisation strategies, while 2.5% (7) allow projects in any area, but provide preferential evaluation of those in the Smart Specialisation priority areas, by either awarding additional points or creating a separate ranking. According to the conceptual framework in the third section, 83.5% (238) of the calls appear to implement the Smart Specialisation strategies and we denote them RIS3 calls; 16.5% (47) of the calls do not contain any specific provision to ensure or foster project alignment to declared Smart Specialisation priorities.

The majority of the calls only allow for projects that contribute to the priorities declared in the strategies. However, a considerable number of calls allow for projects outside of those priorities. This applies especially in countries, such as Poland and Czechia, where some one-third of the calls has no priority-alignment mechanism, and Hungary, where close to one-third of the calls contains only a preferential criterion for the evaluation of projects in the priority areas.[6]

Table 4. Alignment of ERDF-TO1 calls with Smart Specialisation priorities.

	Total number of calls	Calls with a substantial eligibility condition (%)	Calls with a preferential evaluation only (%)	Calls with no priority-alignment mechanism (%)	Resources in calls with no priority-alignment mechanism (€, millions) (%)
Italy	70	62 (88.6)	3 (4.3)	5 (7.1)	32.5 (2.5)
Poland[a]	109	75 (68.8)	1 (0.9)	33 (30.3)	477.0 (12.4)
Portugal	54	54 (100)	–	–	–
Czechia	24	16 (66.7)	–	8 (33.3)	169.6 (19.4)
Hungary	11	7 (63.6)	3 (27.3)	1 (9.1)	112.9 (8.0)
Lithuania	10	10 (100)	–	–	–
Slovenia	7	7 (100)	–	–	–
Total	285	231 (81.0)	7 (2.5)	47 (16.5)	792.0 (8.7)

Note: [a]We found 30 ERDF-TO1 calls in Poland that require the applicant to indicate the Smart Specialisation priority areas to which the project would contribute, and also allow explicitly for the possibility of submitting a project outside the priority areas. We believe that in those cases there is no mechanism in place to guarantee project alignment with Smart Specialisation priorities.
Sources: Authors' elaboration based on data reported in ERDF-TO1 calls, ERDF operational programmes and institutional websites.

Importantly, in the presence of a substantial eligibility condition, the project evaluation team will play a major role in the correct implementation of the strategy. The extent to which the strategy has a real impact on the innovation trajectories in the territory will ultimately depend on the committee's interpretation of the Smart Specialisation strategy. Unfortunately, the rules governing the composition and functioning of the selection committee are not generally specified in the call documents.

Differentiation of policy measures across priority areas

Finally, we look at the specificity of the policy measures contained in the calls with respect to different priority areas. This analysis makes sense only for the 238 RIS3 calls featuring an explicit eligibility condition and/or preferential evaluation criterion linked to Smart Specialisation priorities. In analyzing those calls, we looked specifically at whether policy interventions were designed to respond to individual priorities or address several or all priorities simultaneously. As noted above, multilevel priority structures such as those identified in most of the strategies can generate a degree of ambiguity regarding the correct definition of priorities. Thus, we looked also at the level of the priority structure to which the calls refer. Table 5 reports the results.

Most calls (94.5%) address all the priorities simultaneously; we found that the type of policy instruments implemented, beneficiaries, funding available for individual projects, project timeline, admissible costs, financial rules, etc. were the same across all priority areas identified in the strategies. This pattern applies to all the countries examined; in Czechia, Hungary, Lithuania and Slovenia all the Smart Specialisation calls address all priorities at once.

Italy is the only country with a significant number (11) of calls specifically addressing individual priorities or subsets of priorities. Nevertheless, the priorities referred to in those calls invariably are defined at high hierarchical levels in the priority tree and each embraces a range of different activities. Zooming in on the calls addressing a single priority in Italy, we found reference to the content of level 1 (two calls) or level 2 (two calls) in the corresponding priority structures which comprise several items at levels 2 or 3, respectively; in the case of Portugal, the only call addressing a single priority makes reference to the content of a single-level priority structure identifying broad areas which do not represent suitable Smart Specialisation priorities. All calls addressing a subset of priorities (8) make reference to the content of level 1 in the corresponding priority structures, which contain several items at levels 2 and/or 3.

Overall, there seem to be no truly priority-specific calls in the countries scrutinized in the period considered in this study. Although formally including priority-alignment mechanisms, the examined calls are not significantly customized to the specificities of the priority areas, which we would have expected, according to the logic of a Smart Specialisation approach.

CONCLUSIONS

This study proposed a set of systematic criteria to analyse the coherence of actual strategic decisions and policy interventions with the conceptual framework of Smart Specialisation.

Examining the national and regional Smart Specialisation strategies in Italy and Poland, we found that policy priorities are defined in line with a multilevel, tree-like structure whose higher hierarchical level usually contains a few broad dimensions, and whose branches cover several specific activities. When considered individually, most of those activities represent suitable Smart Specialisation priorities. Yet, in 11 of the 39 RIS3 examined, some of the innovation areas do not fulfil the criteria used in this analysis to define Smart Specialisation priorities.

Several strategies prioritize tens or even hundreds of different activities. It is beyond the scope of the present study to evaluate the appropriateness of the choice of a certain set of priorities; however, the analysis raises an important question about the capacity of the strategy management bodies to support effectively the development of huge sets of activities each of which potentially requires specific competences and dedicated administrative and

Table 5. Policy priorities addressed by RIS3 calls.

	RIS3 calls	Calls addressing all priorities (%)	Calls addressing a single priority (%)	Calls addressing a subset of priorities (%)
Italy	65	54 (83.1)	4 (6.2)	7 (10.7)
Poland	76	75 (98.7)	–	1 (1.3)
Portugal	54	53 (98.1)	1 (1.9)	–
Czechia	16	16 (100)	–	–
Hungary	10	10 (100)	–	–
Lithuania	10	10 (100)	–	–
Slovenia	7	7 (100)	–	–
Total	238	225 (94.5)	5 (2.1)	8 (3.4)

Sources: Authors' elaboration based on data reported in ERDF-TO1 calls, ERDF operational programmes and institutional websites.

technical resources. Also, large sets of priorities, as in the cases in some regions in Italy and Poland, or very dense priority trees may, de facto, circumvent the principle of selective intervention, as the strategies ultimately cover most of the broad economic areas.

The majority of policy interventions in Italy, Poland, Portugal, Czechia, Hungary, Lithuania and Slovenia, co-financed by ERDF-TO1 in the period 2014–16, contain specific priority-alignment mechanisms for project submission and selection, usually in the form of a strict eligibility condition. Nevertheless, 47 of the 285 calls examined do not include effective alignment mechanisms. In countries such as Poland, Czechia and Hungary, a non-negligible amount of funding can be invested outside the declared Smart Specialisation priorities. We highlighted that in the presence of priority-alignment mechanisms, a key role in the realization of the strategy is played by the project selection committee; unfortunately, the call documents mostly do not include detailed information on the composition of the committee and how the results of the evaluations will be used by the strategy management bodies.

Almost all calls implementing the Smart Specialisation strategies address all priorities jointly; none of the calls examined differentiates among types of policy instruments, categories of beneficiaries, financial conditions or project timelines according to priorities that can span areas as diverse as agro-food technologies, healthcare solutions for an ageing population and green technologies applied in the energy sector. It should be noted that in some countries (e.g., Poland, Portugal and Hungary), already around half the available funds for the period 2014–20 have been allocated through calls addressing all priorities jointly, leaving limited scope for more targeted interventions later on. It also remains to be explained why regions and countries put so much effort into comprehensively defining quite complex priority trees – supposedly based on wide stakeholder involvement in an entrepreneurial discovery process – if much of the information contained in those trees is not used to orient policy implementation. There is anecdotal evidence that the regional authorities managing the ERDF and, hence, responsible also for the Smart Specialisation calls, may simply lack the capacity and resources to manage numerous priority-specific calls. In this case, proper management of the Smart Specialisation strategy would require a more structured executive body, endowed with more resources than currently available to the ERDF managing authority.

The evidence we gathered reveals only a partial transition from the 'old' undifferentiated industrial policy, typical of European regional policy before 2014, to the highly selective Smart Specialisation approach. There are tangible signs that regions and countries have put in place mechanisms that can circumvent the very rationale of Smart Specialisation. This could be the result of lobbying activities, higher political return from widespread public support measures, risk-averse attitude of policy-makers, and lack of adequate institutional and administrative capacity that can be observed at national and regional levels. However, an additional explanation may lie in the incentive structure established at European Union level which did not fully support the intervention logic of Smart Specialisation. Should future research prove this is the case, for the next programming period it would be advisable to revise the incentive structure provided to national and regional authorities in order to reconcile better the experimentalist approach and intervention logic of Smart Specialisation with the requirements established by Cohesion Policy regulations (funding absorption targets, performance framework, etc.).

More research is needed to complete the picture we have sketched and provide a better understanding of the characteristics of one of the most ambitious industrial policy experiments ever attempted. In particular, attention should be devoted to looking at whether and how priority-specific interventions could be implemented, under what conditions, and depending on which enabling factors inside and outside the public administration.

Finally, we believe that the empirically testable criteria we propose for the identification of Smart Specialisation policy interventions will contribute to an understanding of how to perform an impact evaluation of the Smart Specialisation policy once data on project outcomes become available. To assess the effects of Smart Specialisation, we suggest in particular focusing on the interventions that (1) address priorities that are consistent with the policy approach; (2) apply policy measures selectively (exclusively) to those priorities; and (3) apply policy measures shaped around the specificities of each priority area. Comprehensive evaluation of ERDF-TO1 impact cannot in general be assumed as an evaluation of the Smart Specialisation policy.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors. The views expressed are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

NOTES

1. A strategic approach to regional innovation in the context of Cohesion Policy was introduced by the European Commission in 1990–93 with a series of pilot projects. It was scaled up in 1994–99 with the launch of the first regional innovation strategies (RIS) initiative and the Regional Information Society Initiatives (RISI) programmes, which were further implemented in 2000–06 under the Regional Programmes of Innovative Actions (RPIA). In the period 2007–13, RIS were no longer co-financed by European funds through ad-hoc initiatives; instead, regions were encouraged to include the main principles and lessons from past experience in their mainstream European regional policy operational programmes. In parallel with this process, the share of Cohesion Policy resources devoted to supporting innovation increased steadily and represented one-quarter of total funds in 2007–13.
2. Foray's (2015) own words are telling in this respect: 'This is the main idea: having this vertical policy schema in addition to the horizontal programmes in order to enable a region to diversify by the development and consolidation of new specialities or new activities that will facilitate the transformation, revival and renewal of productive structures and generate spillovers towards the rest of the local economy'; and: 'The change of logic – from horizontal to vertical – can be justified almost negatively by the incapacity of recent horizontal policies to shift a large number of regions into the knowledge economy' (p. 35).
3. Rodrik (2007) identifies diversification as a major engine of development; accordingly, innovation is understood as the appearance of new activities in the economic system, and industrial policy or innovation policy is the process that favours and supports diversification.
4. The limits of horizontal, 'one-size-fits-all' policy interventions are acknowledged in several contributions. Tödtling and Trippl (2005) stress the need to adapt policies to different territorial contexts; Borrás and Edquist (2013) propose criteria for the choice of policy instruments based on specific problems detected in the innovation system; Martin (2016) highlights the need to take into account the complex interactions among policy instruments acting on the same pool of actors or sectors; and Taylor (2016) discusses the role of politics in determining the choice and effects of policy measures.
5. The analyses presented in the paper represent a further development and elaboration of two separated studies carried out at different points in time. The differences in the countries' samples between the two analyses depend on the different human/linguistic resources on which the authors could rely when the studies were conducted, given that the RIS3 documents and the ERDF calls are in national languages, and the text analysis performed in this study could not rely on fully automated procedures.
6. In the case of Poland, there are 30 calls in which projects' alignment with the priority areas identified in Smart Specialisation Strategies is an eligibility criterion. Nevertheless, these calls may still finance projects not related to the current priorities if they are explicitly aimed at redefining these areas or exploring potential new innovation domains. In this specific case, was decided to adopt a more prudent approach and not to consider them as RIS3 calls, as the information contained in the text of the calls was not particularly clear on the differential evaluation treatment of RIS3 related proposals with respect to non-related proposals.

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