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Monitoring mechanisms and institutional arrangements for the implementation of place-based innovation strategies through the smart specialisation concept

Evidence from empirical analysis

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Acknowledgements

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Introduction

Addressing macroeconomic imbalances has always been at the heart of public policy. Neoclassical economists acknowledge that public authorities should intervene only when the market is not producing an efficient level of allocation, creating a market or system failure characterised by socio-economic imbalances. The gradual integration of new Member States into the European Union (EU) has resulted in regional disparities. This situation has worsened in recent decades with globalization and the progressive deindustrialization of the continent (European Commission, 2017a).

The growing disparities between regions have motivated a new wave of modern political thought with two approaches confronting and sometimes complementing each other: the space-neutral and place-based approaches. The first approach recommends public interventions via predominantly space-neutral instruments with the aim of maximising overall growth through increased efficiency (World Bank, 2008). The second approach, which is based on distinct ideas, implies that the potential for growth exists everywhere. The role of primarily place-based policies is to assist underdeveloped regions in realizing their potential (Barca, 2009; OECD, 2009).

The intensity of innovation varies between regions with different levels of development due to the economic, socio-cultural and institutional aspects of the territory (Rodríguez-Pose and Crescenzi, 2008; Fernández-Serrano et al., 2019). In this context, the idea of an "innovation system" is a useful conceptual tool for the spatial analysis of innovation (Lundvall, 1992; Nelson, 1993; Edquist, 2001). This evolutionary approach was quickly adapted from its original national level to the study of innovation at a regional level, allowing researchers to examine the interactive and cumulative process of knowledge creation in a more homogeneous and specific setting (Braczyk et al., 1996; Cooke et al., 1997). The studies on Regional Innovation Systems (RIS) has contributed to a better understanding of regional innovation's complexity (Asheim et al., 2011; Doloreux and Porto Gómez, 2017). However, there still are major barriers, challenges and information shortages pointed out by the academic literature (Doloreux, 2002; Tödtling and Trippl, 2005; Porto Gómez et al., 2016).

The EU cohesion policy, which was introduced in the 1980s to address regional inequities, is one of the most symbolic policies conducted by the European Union, accounting for one third of the Union's budget (€392 billion for the years 2021-2027). Following Barca's recommendations (2009), the notion of smart specialization, first proposed by Foray and

Van Ark (2007), was adopted for the first time at a significant scale for the EU 2014-2020 cohesion policy. The concept arose out of concern that prior investments in Research and Innovation (R&I) had failed to provide commercial advantages, as well as a transatlantic productivity divide between the US and the EU (OECD, 2009). The 2008 financial crisis and a lack of public money reinforced the necessity for a new approach centred on concentrating public funds on a small number of carefully chosen topics. The smart specialisation approach is perhaps the most important recent example of a modern form of policy produced within the scope of EU cohesion policy (Ahner and Landabaso, 2011; Foray et al., 2012). To help implement such an ambitious and innovative policy concept, in 2011, the European Commission launched the "smart specialisation platform"[1] to help Member States and regional authorities to define their own smart specialisation strategies better. The facility, hosted and implemented by the Joint Research Centre (JRC)[2], is based in Seville (Spain) and assists public authorities in the strategy's design and implementation process. The platform brings together expertise from universities, research centres, regional authorities and businesses.[3]

The EU policy agenda for the 2021-27 financing period introduced a more pronounced directionality in European policy with the European Green Deal, which is also part of the EU's innovation and growth agenda. This directionality is reflected in the EU industrial strategy, which aims to create new industries and jobs resulting from a more strategic approach to environmental and digital transitions (European Commission, 2020). The importance of using public funds for large-scale projects that impact competitiveness and strategic autonomy demands further institutional capacity-building that is critical in the context of the new EU policy, which requires 'systemic innovation'. In times of global transition, this new directionality in EU policy emphasises more results-oriented smart specialisation strategies with improved evidence-gathering and awareness of local strengths and weaknesses, opportunities and threats (McCann and Soete, 2020; Doussineau et al., 2020). In addition, the mission-oriented approach (Mazzucato, 2018) is an element to consider for the next generation of S3 strategies, as is the Horizon-Europe programme.

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[1] https://s3platform.jrc.ec.europa.eu/

[2] The Joint Research Centre (JRC) is the European Commission's science and knowledge service which employs scientists to carry out research in order to provide independent scientific advice and support to EU policy.

[3] From 2012 to 2021, I was a policy analyst at the JRC in Seville providing support and assistance to national and regional authorities with the design and the implementation of their respective S3 strategies (organisation of seminars and workshops, publication of methodological guidelines, good practices and peer-reviewed articles).

The smart specialisation concept is a place-based innovation policy framework that aims at "finding ways to enhance the scale and effectiveness of entrepreneurial processes trying to develop regions' indigenous potential" (Foray et al., 2011). Nevertheless, some questions were raised about the concept's suitability for all types of EU regions, particularly regions lagging behind in terms of economic development, despite being the main target of EU cohesion policy (McCann and Ortega-Argiles, 2015). S3 strategies are designed following a generic six-step methodology (Foray et al., 2012), including developing a suitable monitoring system but leading to different interpretations by policymakers. The heterogeneity of EU regions can lead to a gap between what should be done in theory and what is implemented in practice. As a form of place-sensitive policy, smart specialisation strategies need to be tailored according to the reality on the ground as there is no one-size-fits-all place-based policy (Tödtling and Trippl, 2005; Jackson et al., 2019). The fundamental variable that emerges from consideration of what makes a results-oriented place-based policy is the ability of a local government to steer such a process. The need for "good governance" for place-based innovation policy has been engrained in EU cohesion policy regulation when the EU defined enabling criteria for the governance of the new generation of smart specialisation strategies, stressing the importance of an appropriate institutional setting (European Union, 2021).

One may argue that mainstream neoclassical economic theory overlooked the role of institutions in regional development patterns, as it assumed that maximisation of individual utilities would result in an efficient and socially optimal outcome. The regional innovation system (RIS) approach emphasizes the ability of regional governments to intervene in the event of "system failures" by limiting dysfunctional interactions and promoting collective learning, as collaboration and learning from one another are critical components of the innovation process (Smith, 2000; Laranja et al., 2008). According to Evolutionary Economic Geography (EEG), regional innovation policies should support mechanisms that promote variation and avoid partial or complete "system failures" (Lambooy and Boschma, 2001). However, this approach centred on firms does not sufficiently consider the role of institutional bodies and the resulting institutional arrangements in supporting regional path development.

As there is no one-size-fits-all governance model for regions, policy instruments and organizations that support policy implementation can help address socio-economic and environmental objectives, bridging the divide between the generic concept of place-based innovation policy (i.e. the theory) and its implementation in diverse territorial contexts (i.e. the practice) (Tödtling and Trippl, 2005; Kroll, 2015; Capello and Kroll, 2016).

In this respect, the central research question guiding this PhD thesis is:

RQ: *How can a place-based innovation policy concept such as smart specialisation better fit the reality of the diversity of governance capacities of EU regions?*

This research question is addressed from two distinct perspectives. On the one hand, this thesis explores the institutional arrangements underpinning place-based innovation policies and smart specialisation design and implementation with the creation of regional innovation agencies. On the other hand, by focusing on the monitoring of smart specialisation strategies, this doctoral thesis explores the monitoring activities from the perception of policymakers in charge of the design and the implementation of the strategies.

In the relation with the first perspective, regional innovation agencies (RIAs) are intermediary organisations that can be an effective tool for implementing innovation policies due to their proximity to local and private actors involved in innovation promotion, as well as their facilitators' central position in enhancing regional partnership and social capital (Fiore et al., 2011). The importance of a regional focus has grown as a result of various forms of decentralisation of innovation policy to the regional level, as well as the development, or strengthening, of the institutions needed to manage policy and tailor the measures implemented to local needs. In some cases, regional governments have taken full responsibility for interventions and strategy development. In others, intermediary organizations have been established, along with the necessary institutional arrangements, to carry out regional innovation policies in general and smart specialisation strategies in particular. Place-based policies and, specifically, smart specialisation strategies imply a high-level of governance complexity, whereas an important disparity can be observed in the capacity of regional governments to deal with it. The first analysis of the thesis posits that RIAs are policy instruments that improve the implementation of place-based policy, allowing a better connection between policymakers and stakeholders. Through empirical analysis, the thesis investigates the role played by RIAs within institutional arrangements in different regional contexts. The objective is to define the advantages, weaknesses and limitations of the RIA as a policy instrument and to assess whether it can address, at least partially, the challenge of bridging the gap between the theory and the concrete implementation of a place-based innovation policy comprising all regional specificities.

The research question related to the first analysis is then the following:

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RQ1: How are policymakers using regional innovation agencies as a policy instrument to improve the implementation of regional innovation strategies in diverse institutional settings?

In the relation with the second perspective, the set-up of a suitable monitoring system should reflect the strategy itself and its complexity. The smart specialisation concept has brought a new way to envisage place-based innovation policy with the continuous involvement of stakeholders through the entrepreneurial discovery process (EDP) that should be embedded in a monitoring mechanism (Foray et al., 2012; European Commission, 2012). The monitoring function is a cross-cutting component of the policy cycle and is considered a twin sister of the evaluation. However, monitoring as a discipline is sometimes overlooked by the academic community and policymakers, who mistakenly view it as a stand-alone activity necessary mainly for completing financial audit requirements. Monitoring is now viewed as a management tool that assists public authorities in building stronger relationships with stakeholders and putting the strategy in motion. Like the introduction of RIAs into the institutional setting, the monitoring, as a management tool, supports a better implementation of place-based innovation policies in general and the S3 strategy in particular. The second research question is then the following:

RQ2: How do regional and national policymakers in Europe conceive monitoring mechanisms for strategic interventions related to territorial innovation and development policies for smart specialisation?

This doctoral thesis jointly addresses the research questions through the five following chapters:

The first chapter (Chapter 1) defines the main concepts underlying the governance of place-based innovation policies within the European Union (e.g. regional innovation systems, the EU cohesion policy and the smart specialisation concept).

The second chapter (Chapter 2) explores the challenges related to the design and the implementation of a place-based innovation policy. This chapter is divided into two parts: the first part highlights the main characteristics that make each region unique and which can act as a facilitating or a hampering factor for implementing place-based innovation policies (e.g. economic development, research and innovation capacities, political autonomy and quality of government). The second part of this chapter discusses the specific challenges related to governance and monitoring of smart specialisation strategies.

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While the two first chapters set this thesis's conceptual and theoretical foundations, the third chapter (Chapter 3) presents the methodological approaches adopted for the two analyses that constitute it. Both studies follow empirical methods to address their respective research questions:

a) A case study approach was used to analyse the institutional arrangements underpinning place-based innovation policies and smart specialisation design and implementation through the activity of regional innovation agencies (RIAs). To get a clear picture of the role of these agencies, four RIAs established in three different regional innovation systems were selected in regions that the EU and the OECD have acknowledged as exemplary in terms of innovation governance mechanisms (OECD, 2011; Huang, 2015; Maclean, 2015). The four case studies are the following:

(1) the Brainport Development agency established in the Brainport region of the Netherlands;
(2) the Innobasque and (3) SPRI (Sociedad para la Promoción y Reconversión Industrial) located in the Basque Country (Spain); and
(4) Ruta N based in the city of Medellín, Colombia.

The research for this analysis was based on three types of information, i.e. semi-structured interviews, documents and non-participant observations. Preliminary desk research was conducted to understand the regional environment better and prepare face-to-face interviews with key stakeholders who have direct experience with the agencies under investigation.

b) A survey approach was used to investigate how policymakers in the EU perceive the smart specialisation strategy's intervention logic and how they translate it in the monitoring system they are setting up. The survey was conducted in the context of the JRC's S3 platform activities with the aim of capturing various elements of monitoring activities and examining the gap between the theoretical conceptualization of the monitoring activity (described in Chapter 2) and the understanding of policymakers in charge of the implementation of S3 in their respective regions or countries. The survey consisted of 13 questions organized into six dimensions, namely:

(1) the level of development of the monitoring system;
(2) the main functions fulfilled by monitoring;
(3) the channels for disseminating monitoring results;
(4) the presence of and relationships among the S3 conceptual building blocks;

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(5) the sources of information and methodologies employed to monitor the strategies; and (6) the degree of stakeholder involvement.

The fourth chapter (Chapter 4) presents the results of the two analyses and draws some preliminary conclusions. The results of the four case studies on RIAs and institutional arrangements, followed by the results of the survey of European policymakers on monitoring smart specialisation strategy, are then presented. A final discussion section makes some cross-cutting conclusions, emphasizing the importance of adapting the governance of place-based innovation policies, such as smart specialisation strategies, and their monitoring systems to bridge the gap between a promising theoretical framework and the real, and at times complex, implementation. The analyses reveal the difficulty of applying a theoretical framework in various contexts and suggest that more targeted public intervention is better for strategy governance and monitoring with stakeholders' continuous and real involvement in governance and monitoring mechanisms. This chapter concludes by emphasizing the importance of government autonomy and the quality of the institutional framework, which are the preliminary conditions for the good implementation of place-based innovation policies.

The fifth and final chapter (Chapter 5) presents the main findings of this thesis and opens the discussion on the future perspectives and policy implications for the new generation of smart specialisation strategies. The degree to which policymakers can influence the future development of regions is particularly critical, given that the bulk of external and internal variables affecting strategy implementation are beyond their control (Lambooy and Boschma, 2001).

One of the main findings of this thesis stresses the important role of RIAs as a component of a tailored governance framework that designs and supports the implementation of place-based policies. The introduction of RIAs can contribute to address the necessity for strong institutions, dynamic social contexts and strategic collaboration between public and private actors advocated by the academic community (Amin and Thrift, 1995; Martin and Sunley, 1996; Rodriguez-Pose and Storper, 2006; Rodriguez-Pose, 2013).

The other finding presented in this thesis relates to the perception of a new type of monitoring mechanism ushered in by the introduction of the smart specialisation concept. Monitoring is a vital part of an innovation strategy and should reflect the novelty and complexity of the S3 concept. The analysis of the survey results shows three ambiguities in the behaviour of policymakers in charge of S3 monitoring. The first is related to the trust between policymakers and stakeholders. In theory, keeping stakeholders informed about

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plan implementation builds trust. However, policymakers generally tend not to consider stakeholders as important actors in the monitoring of S3 strategies and, in reality, often only offer them a passive role. Stakeholders must feel more ownership since they know what results can be achieved with a given set of outputs. A second ambiguity is an apparent reluctance to take priority areas into account even though the concept of smart specialisation is based on prioritizing and concentrating investments in particular activity areas and industries. A third ambiguity raised by the analysis is that outputs appear to be unrelated to desired outcomes. While policymakers seem to understand and apply the intervention logic of S3 strategies, only a small minority of policymakers (national and regional) established a clear link between output and result indicators and, more specifically, the socio-economic impact.

Figure 1 below outlines the elements contributing to a place-based innovation policy concept such as smart specialisation and positions the two analyses undertaken for this thesis showing the path, from theory to practice, between the strategy design from a generic methodology to the implementation of innovation policies in a real context.
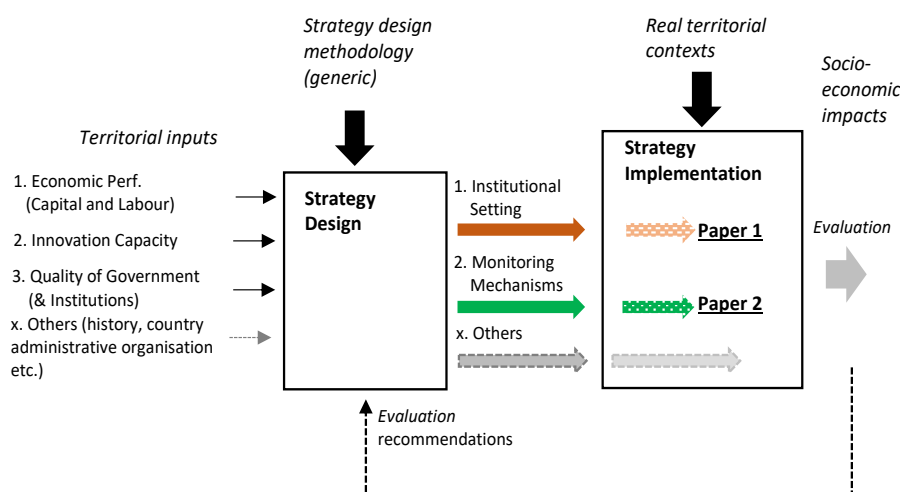
Figure 1 Institutional setting and strategy monitoring mechanisms: from theory to reality. Source: own elaboration.

1 Place-based innovation policy and smart specialisation strategies

This first chapter aims to explain the main concepts underlying the governance of place-based innovation policies within the European Union.

1.1 Regional innovation systems in place-based policy

Place-based innovation policies are grounded in regional innovation systems (RIS). This section introduces the concept of place-based policy and defines the main components of a RIS.

1.1.1 Space-neutral or place-based policy?

Two modern policy approaches, space-neutral and place-based, have evolved and competed against one another. The space-neutral approach favours public intervention with homogeneous coverage in every territory, while the place-based approach supports region-specific interventions (World Bank, 2008). Both approaches aim at strengthening aggregate economic growth, and the most striking distinction between the two approaches is the critical role of geography. Structural policies largely depend on the geographical characteristics of policy instruments deployed (Varga, 2017). Geography is important in defining the nature and direction of the economic system's evolution. Evolutionary economic geography (EEG) stresses the importance of factors that initiate, inhibit or consolidate the contextual settings that change over time, particularly the relationships between regions and their respective actors that shape socio-economic activities (Boschma and Martin, 2010).

From a historical perspective, the concept of place-based policy, as implemented nowadays, is relatively recent. Its origin may be traced to the 1990s with the idea of "agglomeration economies" (or economies of agglomeration). Renowned economists such as Krugman (1989) showed how cities and regions link trade activity to economic growth. Porter (1990) demonstrated how the geographical concentration of industries was an important structuring factor in national economies (e.g. Silicon Valley in the US with the IT sector or Baden Württemberg in Germany with the automotive industry). One can define agglomeration economies reap the benefits resulting from the geographical proximity of firms and people in cities and industrial clusters. Benefits come from transport cost savings and also from knowledge spillovers created by people sharing information, or from better matches between workers and firms (Glaeser, 2010; Capello, 2014; McCann and van Oort, 2019). However, the consequences of agglomeration economies can also be seen negatively. Firms and workers relocating from one area to another contribute to agglomeration

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economies in some more attractive regions and, by a transfer phenomenon, contribute to broadening the territorial divide.

After a period of economic deregulation advocated by neoclassical economists in the 1980s based on self-regulated and efficient markets in the context of globalisation of the economy, the 2008 financial crisis has affected not only individuals but also places. The drastic increase in geographical divides and social inequalities has led to a push for more policy intervention in the economy through place-based policies. At the European level, place-based policy may be the most effective way to accomplish the EU's economic and social objectives as suggested by the report "An agenda for a reformed cohesion policy" (Barca, 2009). According to Fabrizio Barca, a "place-based policy is defined as a long-term strategy to tackle persistent underutilisation of potential and reduce persistent social exclusion in specific places through external interventions and multi-level governance".

As a cornerstone of the EU cohesion policy, place-based policies first target underperforming regions in European Union countries. However, the place-based approach can improve regions that are already performing well by encouraging, for instance, further development of existing clusters of businesses concentrated in a particular industry (Neumark and Simpson, 2015). Regarding public intervention, regional differences in innovation capacities suggest that a tailored mix of policy instruments is the most appropriate approach (e.g. infrastructure investments, tax credit towards enterprises, and grants to support innovation projects to create or maintain jobs). The context of place-based policy implementation shapes public intervention and can be formalised in a system that gathers different stakeholders with their own interests and interactions.

The following section defines innovation as a system on a given territory based on academic literature.

1.1.2 The emergence of the concept of the regional innovation system (RIS)

Lundvall (1992) defined the national innovation system (NIS) as the flow of technologies and information among people, enterprises and organizations that is critical to the national innovative process. Thanks to the concept of NIS providing an analytical framework, comparisons between countries are possible and reveal differences in such attributes as economic structure, research and development (R&D) base, innovation performance and institutional set-up (Edquist, 2001). Later, the same approach was applied at the regional level (Cooke, 1994; Doloreux and Parto, 2005; Doloreux and Porto Gomez, 2017).

The place-based policy concept is, de facto, associated with the regional innovation system (RIS). The key strengths of place-based approaches to regional innovation policy are that they take place within their own institutional context and provide tailor-made policy solutions (OECD, 2009; Barca et al., 2012). However, in the context of the difference between national space-blind policy versus regional place-based policy, Ohmae (1992) advocated in his seminal publication "The rise of the region state" that in an increasingly borderless world, the nation state becomes dysfunctional. As regions become more specialized and draw the institutional support structure along, Cooke and Morgan (1993) described "region states" as communities of economic interests that must seek a competitive advantage by mobilizing their assets, including institutional and governmental assets.

What defines a region? The academic literature provides many elements to describe what makes a region in the context of EU place-based policy. From a solely economic angle, the industrial cluster concept can be used as an initial approximation (Porter, 1990). Clusters are defined as a group of economic actors who collaborate closely. All economic entities that directly contribute to the dominating production process, such as manufacturing and supply and marketing firms, financial institutions, research institutes and technology transfer agencies, regional governments, and even informal groupings, are partners in this network. It is important to note that the cluster concept differs from traditional, industry-specific analysis in that it focuses on cross-industry collaboration with the governance structure.

Of course, regions frequently have multiple economic clusters. A "region", according to Cooke et al. (1996), is an intellectual concept defined by four criteria: (1) a region may not have a fixed size; (2) a region is homogeneous in terms of specific criteria; (3) a region can be distinguished from neighbouring areas by a specific type of association of related features; and (4) a region processes some internal cohesion. Regional innovation systems are thus viewed as a type of self-help and learning tool that is supposed to generate local dynamics, particularly in peripheral areas. In theory, this would aid these underserved areas in catching up with core areas (De Bruijn and Lagendijk, 2005; Fernández-Serrano et al., 2019).

Once the concept of region is defined, what defines an innovation system? Innovation systems can also be defined as "…all important economic, social, political, institutional, and other factors that influence the development, diffusion, and use of innovation" (Edquist, 2010). First, the concept of innovation is used in the study of technological change processes. The process of technological change often consists of three different stages: the

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invention stage associated with more fundamental research, the innovation related to applied research, and the diffusion stage associated with activities related to access to the market. In the case of social innovation, the path may be different as the links between the upstream (knowledge production) and downstream (the market) sides may be weaker or absent. The Technological Readiness Level scale[4] is often used (Figure 2) to help position innovation activities in the product or service creation process.
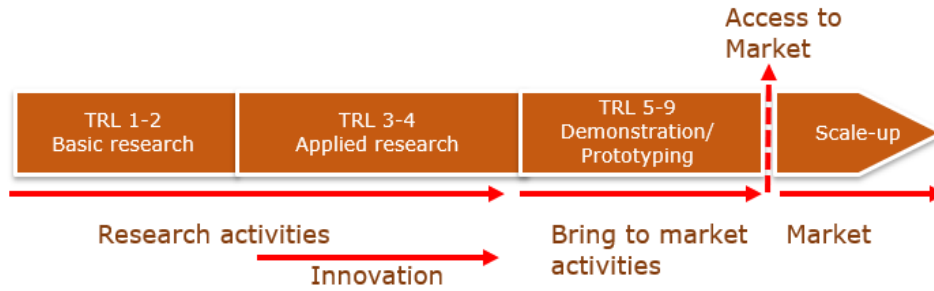
Figure 2. Innovation activities in the technological readiness level scale.
Source: own elaboration.

In many cases, innovations result from the interaction between actors through technology, knowledge transfer or research collaboration. The production of new knowledge and new technologies influences the environment and the external conditions of its own functioning. Innovation actors also interact with all regional stakeholders (e.g. intermediaries, public authorities), with feedback mechanisms allowing a learning process. All these components are the "ingredients" of a RIS (Cook et al., 1996). Their diversity makes each RIS unique as their innovation capabilities, industrial base and institutional contexts can differ widely. Figure 3, adapted from Guerreiro (2005), shows the different components contributing to a RIS.

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[4] The Technology Readiness Level (TRL) was originally developed by the National Aeronautics and Space Administration (NASA) in the 1970s as a management tool for systems and technology managers to assess the maturity of new technology. This scale is made up of nine levels: TRL 1: Basic principles observed; TRL 2: Technology concept formulated; TRL 3: Experimental proof of concept; TRL 4: Technology validated in lab; TRL 5: Technology validated in relevant environment; TRL 6: Technology demonstrated in relevant environment; TRL 7: System prototype demonstration in operational environment; TRL 8: System complete and qualified; TRL 9: Actual system proven in operational environment.
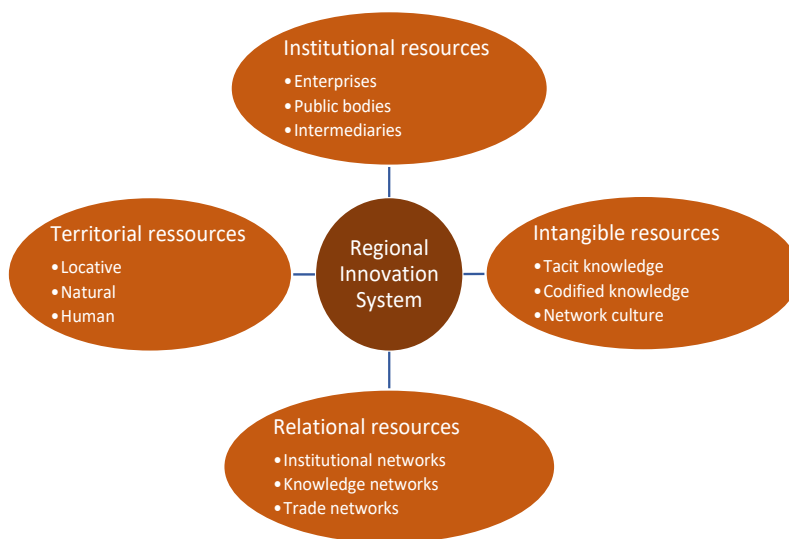
Figure 3. A conceptual representation of a Regional Innovation System.
Source: adapted from Guerreiro (2005).

In evolutionary economic geography, firms and entrepreneurs are developing new industrial path development without any public intervention as regional policies only support path development into more complex activities (Asheim et al., 2011; Neffke et al., 2011). However, institutional organisations supporting regional path development are not really considered in this approach, as it is only centred on firms. The academic literature that has emerged around the concept of regional innovation systems contributes to addressing this weakness of EEG in showing that there is no one-size-fits-all policy strategy to encourage paths of development because various RISs have distinct characteristics and consequently varied policy responses (Tödtling and Trippl, 2005; Isaksen et al., 2018).

1.1.3 The role of institutions in the regional innovation system

The impact of institutions on regional development patterns was largely ignored by mainstream economic theory, which thought that maximising individual utilities would lead to an efficient and socially desirable conclusion. The new growth theory (Lucas, 1988; Romer, 1990; Aghion and Howitt, 1992) has made important progress in endogenizing technological developments, demonstrating that capital, labour inputs and knowledge accumulation all have direct effects on innovation. However, the role of institutions in innovation is not considered as institutions are seen as a given (Symeonidis, 1996). New Institutional Economics (NIE) is an economic approach that focuses on institutions in order to expand economics. It underlines the importance of institutions in economic growth.

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Therefore, the emphasis has shifted towards recognising the institutions' role, as many studies have focused on mechanisms relating to innovative activity within a system embedded in the institutional framework.

How to define institutions in the regional policy context? Institutions can be defined by the social and legal norms and rules that underlie economic activity. However, the definition can be more complex than that. Traditional institutions (also known as "hard" institutions or "society"), according to some academics, can be considered as universal and transferable rules that generally include constitutions, laws, charters, bylaws, and regulations (North, 1990; Fukuyama, 2000). Meanwhile, informal institutions can be defined as tacit institutions gathering individual habits, group routines and social norms and values. In this respect, the dominant view of institutions is closer to an "enduring system of socially ingrained rules" (Hodgson, 2007), which implies that "institutions cannot be reduced to specific organisations" (Storper, 1997).

Academics such as Barro (1997) and Rodriguez-Pose (2020) claimed that economic and political institutions are the most important elements in explaining disparities in growth between economies because they are at the foundation of any economic policies or strategies. Huang and Xu (1999) also showed that financial institutions significantly impact growth and argued that the institutional level contributes considerably to innovative performance. The NIE previously defined proposes the concept of "adaptive efficiency" (North, 1990: 80), which is the ability of a society to acquire knowledge and learn from itself to induce innovation to solve socio-economic problems. The ability of local institutional settings to be adapted over time, affecting local technical and economic progress, is critical in this sense.

In the context of the design and implementation of place-based innovation policies and particularly smart specialisation strategies, the type of institution considered in this thesis is the formal institution represented by an organisation as it contributes to frame and analyse institutional arrangements.

1.2 The European Union framework: the EU cohesion policy and smart specialisation strategy

Adam Smith first described the theory of economic specialisation in his book "An inquiry into the nature of the wealth of nations", published in 1776. The concept of smart specialisation emerged in the academic literature as of 2007 before being implemented in the context of European regional policy during the period 2014-2020. This section starts

with a description of the EU cohesion policy and explains the origins of smart specialisation in the European policy arena.

1.2.1 Place-based policy for the EU cohesion policy

The EU cohesion policy represents a concrete implementation of place-based policy at the European level. This section describes the origins and the main features of the most important policy of the EU in terms of budget allocated.

1.2.1.1 The EU cohesion policy: overcoming the EU geographical divide

An essential role of the European Union is to preserve the social and economic stability of the European Union territories. One critical mission is to overcome the regional divide stemming from the consequences of globalisation and the accession of new Member States with socio-economic weaknesses. EU cohesion policy targets regions and cities to foster business competitiveness, job creation through sustainable development and to improve the quality of life of European citizens. EU cohesion policy was founded in the second half of the 1980s and, since then, its aims and resources have periodically changed. Nowadays, almost a third of the total EU budget is set aside for this policy.

The accession of Spain and Portugal in 1986 led to a push for a drastic reform of EU regional policy. The year 1988 marked the beginning of the EU cohesion policy. This reform improved regional policy efficiency and significantly increased regional funding by doubling the structural funds' commitments (representing 30% of the EU commitment). The Council adopted a first regulation integrating the structural funds around four fundamental principles (European Economic Community, 1988):

> *1. Concentration: the EU assistance shall be focused on a limited number of objectives in the least-developed regions.*
>
> *2. Programming: the EU assistance supports multi-annual programmes based on analysis, strategic planning and evaluation.*
>
> *3. Additionality: the EU funds shall be added (and not substituted) to Member States' expenditure.*
>
> *4. Partnership: to formally require the involvement of relevant regional and local authorities in programme formulation and implementation.*

European structural and investment funds are allocated to the regions through EU Member States, and the management of funding is shared between the European Commission and national or regional authorities. Historically, the European Commission introduced a more strategic approach to regional innovation within the cohesion policy in 1990-1993 with pilot projects. This first experience was followed in 1994-1999 by the launch of the first

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Regional Innovation Strategies Initiative and the Regional Information Society Initiatives[5] programmes. The Regional Programmes of Innovative Actions[6] (RPIA) were further implemented in 2000-2006 to incorporate the key lessons learned from previous experiences into their mainstream European Regional Development Fund (ERDF) operational programmes by allocating a part of the cohesion policy budget to stimulate innovation.

1.2.1.2 *The 2014-2020 programming period: a concentration of EU resources for greater impacts*

The 2014-2020 programming marked a turning point for the EU cohesion policy. Starting from the consensus in 2009 that the European Union should modernise its budget to address new challenges and break away from bureaucratic inertia, the EU Commissioner for Regional Policy requested an assessment of the effectiveness of cohesion policy and proposals on how to reform cohesion policy for the period post-2013. Fabrizio Barca[7] proposed the groundwork for a new place-based policy strategy that uses external interventions and multilevel governance to address underutilization of local potential and chronic social exclusion in specific regions (Barca, 2009: vii).

The EU cohesion policy for the period 2014-2020 was organized around 11 thematic objectives. These 11 objectives were designed to focus resources on areas that provide the most benefits to citizens while building synergies between funded projects and preventing excessive fragmentation of support.

The 11 thematic objectives of the 2014-2020 programming period were as follows (European Union, 2013):

1. Strengthening research, technological development and innovation. *

2. Enhancing access to, and use and quality of information and communication technologies (ICT).*

3. Enhancing the competitiveness of small and medium-sized enterprises (SMEs). *

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[5] On 30 January 1997, 24 European regions, meeting in Brussels, agreed to create a European Association of Regional Information Society Initiatives (RISI). The principal objectives of the Association were to shape ways to promote sustainable economic, social and cultural development of member regions in the forthcoming information society.

[6] The Regional Programmes of Innovative Actions (RPIA) were the Commission's first coordinated attempt to approach all European regions (EU-15) at NUTS 2 or NUTS 1 level. The idea was to provide additional ERDF funding for the 2000-2006 financing to support regions in using "a trial-and-error method and developing new, innovative policy approaches" (Article 4, Regulation (EC) No 1783/1999).

[7] Fabrizio Barca was Director General at the Italian Ministry of Economy and Finance from 2006 to 2010 and, from 2010, special advisor to Johannes Hahn, the EU Commissioner in charge of regional policy.

4. Supporting the shift towards a low-carbon economy in all sectors. *

5. Promoting climate change adaptation, risk prevention and management.

6. Preserving and protecting the environment and promoting resource efficiency.

7. Promoting sustainable transport and removing bottlenecks in key network infrastructures.

8. Promoting sustainable and quality employment and supporting labour mobility.

9. Promoting social inclusion, combating poverty and any discrimination.

10. Investing in education, training and vocational training for skills and lifelong learning.

11. Enhancing institutional capacity of public authorities and stakeholders and efficient public administration.

*: Thematic objectives related to innovation and regional competitiveness.

Each thematic objective was funded by European Structural and Investment Funds (ESIF), namely the European Regional Development Fund (ERDF)[8], the European Social Fund (ESF)[9] and the Cohesion Fund (CF)[10], the European Agricultural Fund for Rural Development (EAFRD)[11] and the European Maritime and Fisheries Fund (EMFF)[12]. The first four thematic objectives cover innovation and regional competitiveness, mainly supported by the ERDF.

Regarding the budget, it represented around €160 billion out of the €450 billion dedicated to EU cohesion policy for the period 2014-2020 to be distributed across the EU regions to tackle the geographical divide among them through investments in innovation.

The intensity of EU support is place-based and calculated according to the level of GDP per inhabitant compared to the EU-27 average with a level of EU funding intervention ranging from 50% to 80% of the total cost of projects, depending on the region's level of development. As Figure 4 shows, the EU cohesion policy, between 2014 and 2020, targeted first the eastern and southern European peripheral regions (non-capital regions).

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[8] ERDF : https://ec.europa.eu/regional_policy/en/funding/erdf/

[9] ESF : https://ec.europa.eu/esf/

[10] CF : https://ec.europa.eu/regional_policy/en/funding/cohesion-fund/

[11] EAFRD : https://ec.europa.eu/sfc/en/2014/fund/eafrd

[12] EMFF : https://ec.europa.eu/sfc/en/2014/fund/emff

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(% of EU-27 average)

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 04/2017

- 🟧 Less developed regions (GDP per inhabitant, < 75)
- 🟦 Transition regions (GDP per inhabitant, ≥ 75 – < 90)
- 🟦 More developed regions (GDP per inhabitant, ≥ 90)

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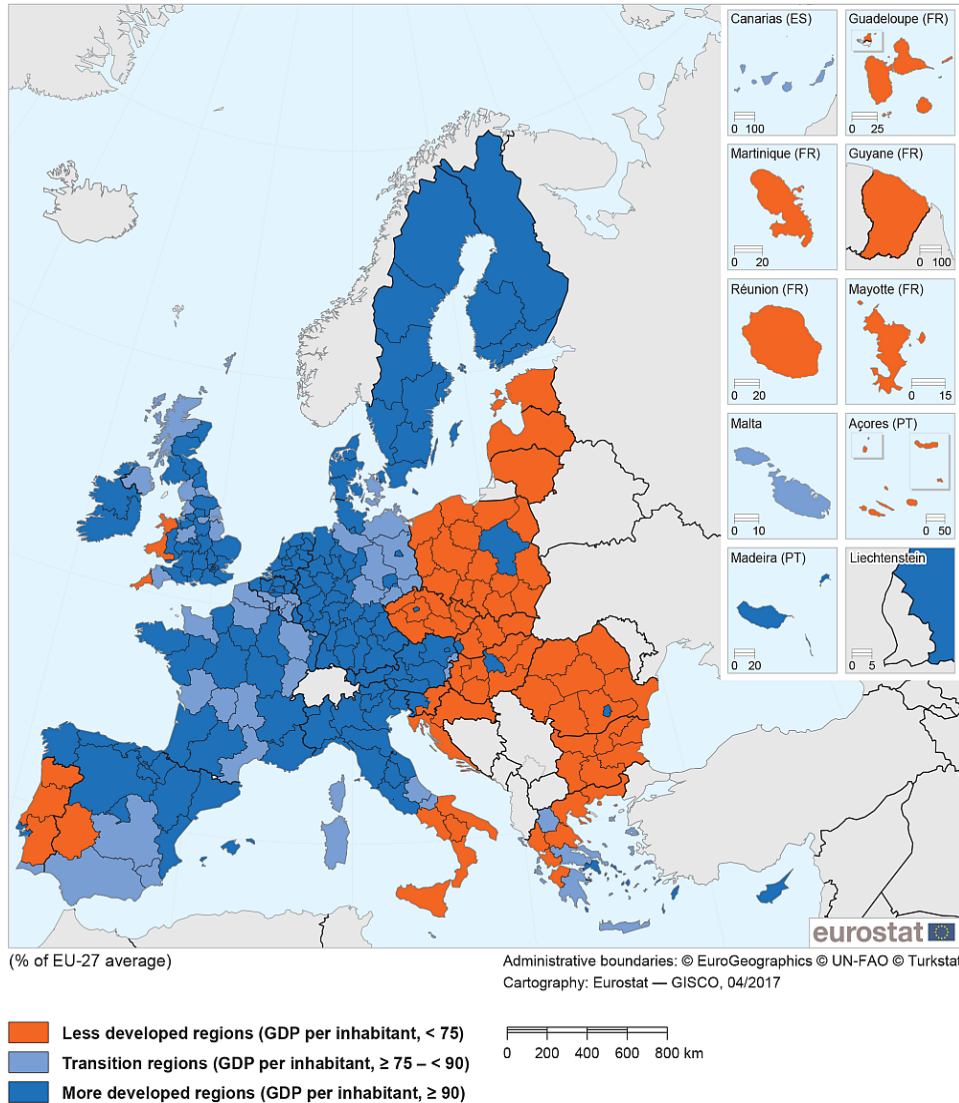
Note: GDP per inhabitant (in PPS) over the period 2007–09 was used as the basis for the allocation of structural funds for 2014–20; as such, calculations relating to regional eligibility were based on the NUTS 2006 classification and with reference to the EU-27 average. The EU-28 regions in this publication are delineated on the basis of the NUTS 2013 classification and as a result there are regions where regional eligibility does not follow the new NUTS boundaries: Chemnitz (DED4) and Merseyside (UKD7) are partly eligible as transition regions and partly as more developed regions; Vzhodna Slovenija (SI03) is mostly eligible as a less developed region and partly as a more developed region.

Figure 4. Eligibility of regions for cohesion funds based on the GDP per inhabitant (in PPS), by NUTS 2 region, for the programming period 2014-2020 (% of EU-27 average).
Source: European Commission, Directorate-General for Regional and Urban Policy.

1.2.2 The smart specialisation concept: breaking with traditional policy design

Smart specialisation, as a new policy approach to regional development, was conceptualised in the 2000s (Foray et al., 2009, 2011) after its introduction in Barca's report (Barca, 2009) based on a seminal work published by Foray and Van Ark (2007). Since then, it has found wide-ranging practical applications, mainly in European regional policy-making. Regional

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cluster plans do not address the problem of highly mimetic national programmes that result in "uniformization" of the knowledge base, needless duplication of R&D activities, and the evaporation of potential agglomeration economies. Smart specialisation, on the other hand, entails identifying what makes a local knowledge base distinctive and relatively unique. As a result, smart specialisation increases the variety of knowledge expertise at the system level, making the entire system more capable of benefiting from agglomeration economies resulting from the creation of different and unique sets of capabilities in each geographical area (Foray et al., 2012).

Perhaps the most important recent example of a modern form of policy produced within the ambit of EU cohesion policy is the smart specialisation approach (Ahner and Landabaso, 2011). The concept was implemented for the first time on a large scale for the EU 2014-2020 programming period following the recommendations made by Barca (2009). However, some questions were raised about the concept's suitability for all types of EU regions, particularly regions lagging behind in terms of economic development, despite being the main target of EU cohesion policy (McCann and Ortega-Argilès, 2015).

A broad transformational agenda for how territorial innovation policies are created and executed underpins smart specialisation as a policy idea. It is based on identifying a limited number of priority areas for regional growth policies within a generic six-step methodology (Figure 5). In a nutshell, smart specialisation seeks to identify opportunities for regions to gain competitive advantages in high-value-added activities. The approach is based on the idea that each region has unique economic and institutional structures that determine its future development potential, providing an alternative to the EU's previous neutral, mimetic policies, which were primarily country-oriented. Smart specialisation is a dynamic and evolutionary (continuous) approach through the entrepreneurial discovery process described earlier. S3 marks a break with past European regional development policy approaches by introducing four novelties (Foray et al., 2012):

(i)   renouncing conventional industrial policy's sectoral focus in favour of recognizing more precisely defined and emergent activities both within and beyond industries;

(ii)   prioritizing a small number of activities;

(iii)   requiring policymakers to identify areas or types of intervention eligible to become specialisation areas based on strong evidence and significant participation of stakeholders such as businesses, research institutions, universities, and civil society;

(iv)   including built-in monitoring systems to effectively enable participatory and inclusive policy learning and make the policy cycle self-correcting and sustainable.

The emergence of S3 has required a new approach in envisaging monitoring and evaluation, resulting in a six-step design process as defined in the guidelines provided by the European Commission to regional authorities in charge of managing ERDF funding (step 6 in Figure 5).

A smart specialisation strategy (S3) should be based on existing regional competencies, resources and knowledge strengths, as well as regional stakeholders participating in the "entrepreneurial discovery process" (EDP), in which governments facilitate and orchestrate discussions with partners across a "quadruple helix". The quadruple helix is an evolution of the triple helix concept that emphasises trilateral networks of university-industry-government relations to provide the necessary conditions for innovation and economic development (Etzkowitz and Leydesdorf, 1995, 2000), adding, as the fourth helix, the civil society (Carayannis et al., 2012). The concept of the EDP is based on the observation that "the knowledge about what to do is not obvious... It is hidden and needs to be discovered" (Foray, 2016: 1433).
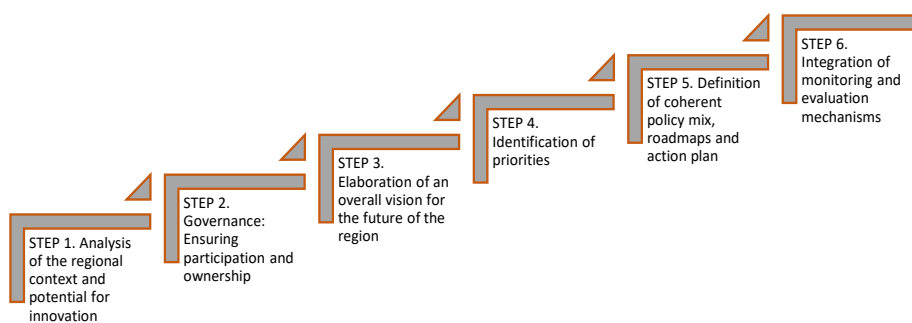
Figure 5. The six steps to designing S3.
Source: adapted from European Commission (2012).

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2 Challenges related to the governance and the monitoring of place-based innovation policies

This chapter explores the challenges related to the design and implementation of smart specialisation strategies, particularly those related to governance and monitoring. It suggests that differences can emerge when comparing the theoretical framework with the implementation in a real and a changing context. Indeed, the European Union offers a broad panorama of regions in terms of economic development, territorial assets, institutional capabilities, historical heritage and quality of government. All those features result in a comprehensive typology of areas, making it very difficult to apply the same generic "recipe" to such a diversity of contexts. However, characteristics making each EU region unique can act as a facilitating or a hampering factor for implementing smart specialisation strategies.

The first section of this chapter describes the challenges for the innovation and regional policies associated with the diversity of regions in the EU. The second section focuses on the specific governance and monitoring challenges regarding the design and implementation of smart specialisation strategies.

2.1 Challenges related to the differences in regional contexts

The regional context in which an innovation policy is implemented is a variable of crucial importance. Facilitating or hindering factors coming from the regional context directly impact the way any policy is implemented. This section aims to show the diversity of regional contexts in Europe, first considering economic performance and second the quality of government and institutions.

2.1.1 Differences in regional economic performance

The level of economic performance provides a good picture of the diversity of European regions. This subsection shows how economic disparities between regions are persisting in terms of wealth and economic activities. According to the local socio-economic context, different typologies have been designed by academics to better adapt place-based policies.

2.1.1.1 Convergence at national level but growing disparities between regions

Before considering the regional level, differences can also be observed at the country level. The evolution of the EU-28 Member States' GDP between 2000 and 2016 shows a relatively stable picture (Table 1). Indeed, the average EU-28 GDP per capita increased by 20% but with an almost identical standard deviation (reference taken from the EU average). We could conclude that disparities between EU countries did not increase between 2000 and

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2016 despite the accession of 13 new EU Member States in 2004 (10 countries), 2007 (2), and 2013 (1). However, such general figures hide some changing contexts behind them. For instance, the 2008 financial crisis impacted the EU Member States differently. Southern European countries such as Greece and Spain have faced a tough time breaking the positive trend that started in early 2000s. National figures can also blur a growing regional divide between central and peripheral regions.

	2000 (EU-15)	2000 (EU-15+EU-13 countries)	2016 (EU-28)
Average GDP per capita (in current prices)	24,350	19,850	29,330
Standard deviation	9,668	12,864	18,803
Standard deviation (average GDP per capita=100)	39.70	63.80	64.11

Table 1. Comparison of the GDP per capita in EU Member States in 2000 and 2016.
Source: Eurostat, own calculation.

The last decades have seen considerable changes in the wealth distribution among territories. Inequality across cities and regions in Europe and the developed world has risen dramatically since the beginning of 2000, after declining in the 1990s from high levels in 1980 (Rosés and Wolf, 2018). Differences between EU regions arise from the different levels of economic performance, revealing the strengths or weaknesses of a territorial ecosystem. When focusing on the European Union, as stated before, the geographical divide between the "old" (EU-15) and the "new" (EU-13) Member States still exists, and the same divide can also be observed between northern and southern regions in some European countries (e.g. in Greece, Spain, Italy). Nevertheless, the regional level gives a much clearer and more reliable picture of the socio-economic reality. According to Iammarino et al. (2019), "regional economic divergence is becoming a threat to economic progress, social cohesion and political stability". The authors showed that the geographical divide has increased at the regional level within countries between the capital regions (core or central regions) and the other regions (peripheral regions) over the last two decades. The fragmentation between regions in the northern and southern parts of Spain and Italy is not new and persists over time. However, the socio-economic gap between capital and peripheral regions is relatively recent and more visible in the new Member States, revealing the unbalanced economic growth since their accession to the EU. This phenomenon is particularly significant in countries such as Czechia, Poland, Hungary, Slovakia and Romania.

The GDP per capita is a proxy indicator giving information about the region's income. It provides a reliable, although incomplete, idea of the socio-economic context of the region.

Many fundamental characteristics, such as education, science and technology, infrastructure, and institutional framework, are generally shared between economies with comparable income levels. Using this indicator, the EU report on Economic, Social and Territorial Cohesion (European Union, 2017b) confirmed the growing regional fragmentation. The report stated that more than a quarter of EU citizens (27%) lived in a region with a per-capita income[13] of less than 75% of the EU average (base 100). The regional income disparities in the EU range from about 1:7 to 1:8. Bulgaria's most impoverished region has an index value of 30, the wealthiest regions in Belgium and Germany of just under 210.

The combination of external economic forces and regional characteristics creates a geography of countries and regions with different structural positions in the European (and global) economy (Scott and Storper, 2003). Research by academics focusing on place-based innovation policies has proposed various classifications or typologies to support tailored place-sensitive policies by generating insights into economic performance and a distinctive perspective on policy. In Europe, several types of regional economic development coexist, reacting to various development challenges and opportunities. Consequently, it is possible to group regions according to their levels of development. Iammarino et al. (2019) use the GDP per capita as a discriminating variable to classify regions. Depending on their degree of development, European regions can be divided into several economic categories: prosperous regions with a very high GDP per capita (of 150% of the EU average or greater); rich regions with a high GDP per capita (of 120–149% of the EU average); average regions with a medium GDP per capita (of 75–119%); and poor regions with a low GDP per capita (of less than 75% of the EU average). Figure 6 shows these four economic development groups.

The very rich regions group includes a number of large cities—many of them national capitals—at the core of Europe. Meanwhile, the rich regions" group covers the Alpine area and involves many big cities and national capitals elsewhere in Europe. The middle-income group of regions embraces the majority of the western side of the EU. In contrast, the low-income group of regions comprises regions in the south and east of the European Union.

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[13] Measured in purchasing power standards.

(per capita personal income Index)

Administrative boundaries: © EuroGeographics © UN–FAO © Turkstat
Cartography: Eurostat – IMAGE, 10/2021

Legend:
- ■ Low per capita personal income
- ■ Medium per capita personal income
- ■ High per capita personal income
- ■ Very high per capita personal income
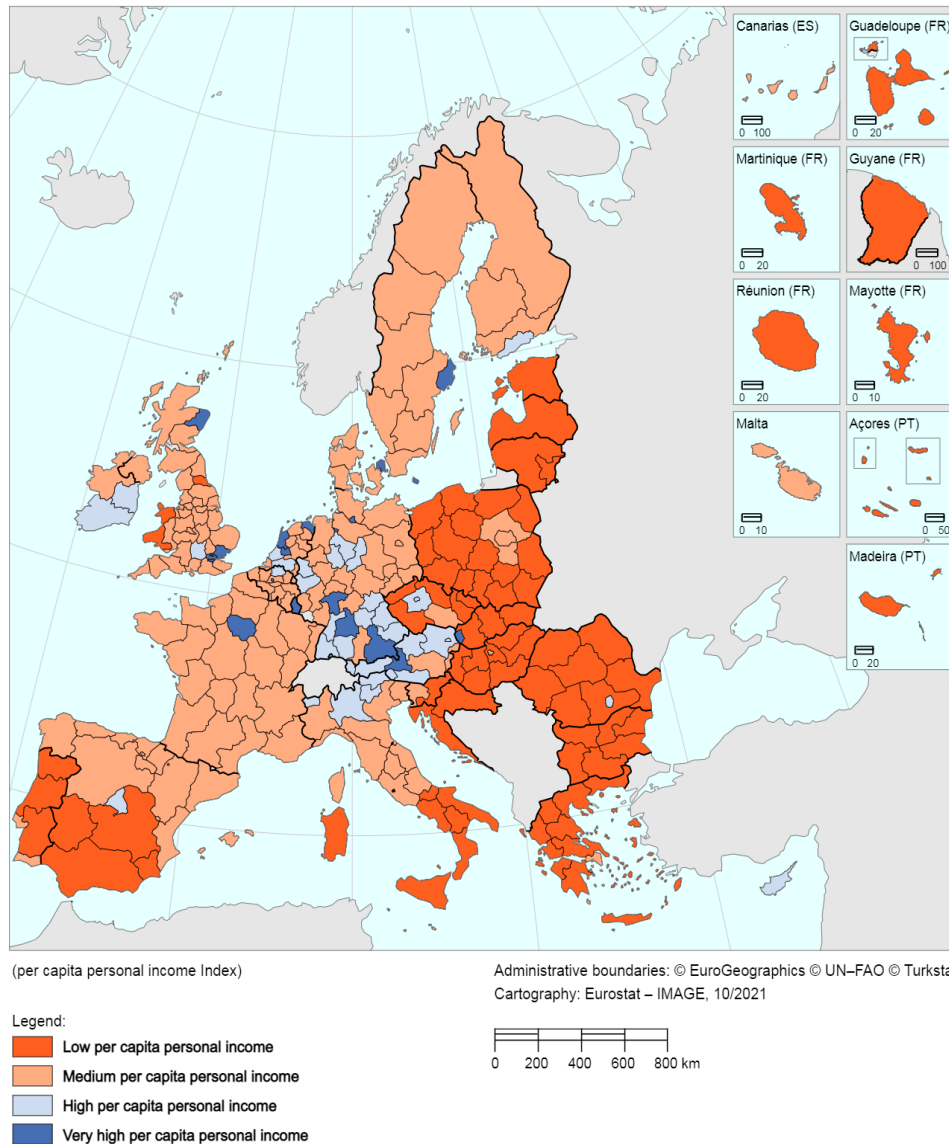
Figure 6. The economic performance categories of European regions (2018).
Source: adapted from Iammarino et al. (2019).

2.1.1.2 Capital versus peripheral regions at the heart of regional disparities

A more accurate way to analyse the geographical divide is to do it within countries. The lack of territorial cohesion at the EU level starts at the country level between capital regions attracting people and industry and other regions on the periphery. The analysis of these two types of regions shows a significant difference between countries (Table 2). In the table, EU countries are ranked according to the standard deviation of the GDP per capita of regions of a given country compared to the GDP per capita of the country. The most interesting group of countries to analyse is the new Member States (EU-13), which have a relatively low average income but show significant differences between regions. In these countries, capital

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regions have fully benefited from the accession to the EU. They concentrate economic capacity and innovation potential to the detriment of peripheral regions. The next part of the ranking shows that highly political decentralised countries such as Germany, Spain and France, to a lesser extent, show a better homogeneity between regions. Despite concentrating their population and economic assets in capital regions, Scandinavian countries (Denmark, Finland, Sweden) do not show substantial differences between regions in terms of GDP per capita.

	Country group	GDP per capita (2015)	Level of income (in comparison to EU average GDP per capita[14])	Average spread between regions (in % of the national GDP/inhab)[15]	Geographical divide
Slovakia	**EU-13**	14,550	Low	72	Very high
Romania	**EU-13**	7,670	Very low	51	High
Czechia	**EU-13**	16,670	Low	47	High
Hungary	**EU-13**	11,480	Low	43	High
Bulgaria	**EU-13**	6,050	Very low	34	Medium-high
Poland	**EU-13**	11,240	Low	34	Medium-high
Belgium	EU-15	34,620	High	32	Medium
Ireland	EU-15	49,930	Very high	32	Medium
Italy	EU-15	26,240	Medium-high	28	Medium
France*	EU-15	31,770	High	22	Medium
Germany	EU-15	34,610	High	21	Medium
Denmark	EU-15	46,720	Very high	20	Medium
Finland	EU-15	35,330	High	19,6	Low
Spain	EU-15	23,760	Medium-high	19	Low
The Netherlands	EU-15	39,810	High	19	Low
Slovenia	**EU-13**	18,550	Low	18	Low
Sweden	EU-15	42,920	Very high	18	Low
Greece	EU-15	16,850	Low	18	Low
Austria	EU-15	36,390	High	17	Low
Portugal	EU-15	17,010	Low	15	Low
Croatia	**EU-13**	11,100	Low	2	Low
Cyprus	*EU-13*	*22,270*	*Medium*	*Not relevant*	*Not relevant*
Estonia	*EU-13*	*13,720*	*Low*	*Not relevant*	*Not relevant*
Lithuania	*EU-13*	*12,070*	*Low*	*Not relevant*	*Not relevant*
Luxembourg	*EU-15*	*82,880*	*Very high*	*Not relevant*	*Not relevant*
Latvia	*EU-13*	*11,150*	*Low*	*Not relevant*	*Not relevant*
Malta	*EU-13*	*20,210*	*Medium*	*Not relevant*	*Not relevant*

Table 2. Regional divide between capital and peripheral regions in the EU by country.
Source: own elaboration, data: Eurostat (2015).

2.1.1.3   The regional convergence or divergence dynamics

The analysis of the GDP per capita for a given year gives only a snapshot of the European regional divide. The dynamic is often as relevant (sometimes more) as the actual figure in policy-making. Figure 7 shows the regional convergence (or divergence) trend in the 2016 regional GDP per capita and the trend over the period 2008-2016 for 278 regions (NUTS 2

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[14] EU-27 GDP per capita (2015): €19 600.
[15] Average spread between region in a given country = Standard Deviation of GDPpc (i,n)/GDPpc (national) where GDPpc is the Gross Domestic Product per capita and i represents a region in a country with n regions.

level). The 278 regions are distributed in four groups (two extreme and two intermediate groups):

- The "rich" regions getting richer (Group 1): Group of regions with a GDP per capita above the EU average and a positive 2008-2016 trend.
- The "poor" regions getting richer (Group 2): Group of regions with a GDP per capita below the EU average and a positive 2008-2016 trend.
- The "rich" regions getting poorer (Group 3): Group of regions with a GDP per capita above the EU average and a negative 2008-2016 trend.
- The "poor" regions getting poorer (Group 4): Group of regions with a GDP per capita below the EU average and a negative 2008-2016 trend.

Results show that a large group of regions is getting (relatively) poorer (152 regions), with their average GDP per capita decreasing. Moreover, among this group of declining regions, 105 already have a GDP per capita lower than the EU average (Group 4), showing that the existing regional gap is becoming more prominent. On the other hand, 60 regions (Group 1) show a GDP per capita higher than the EU average and a positive trend between 2008 and 2016.
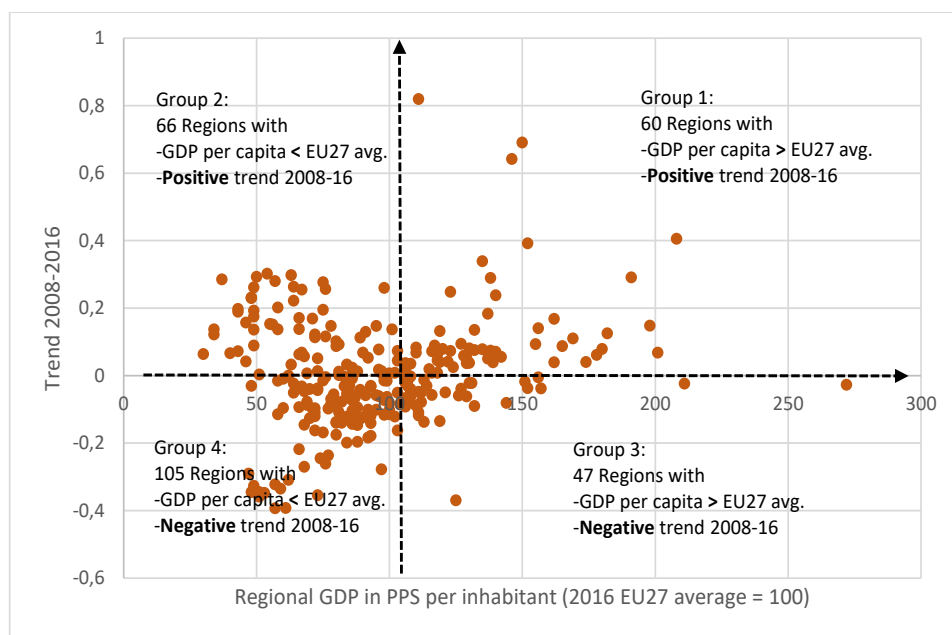
Figure 7. NUTS 2 regions grouping according to the trend and the level of economic development.
Source: own elaboration, data: Eurostat (2008 and 2016).

Regarding geographical location (Figure 8), the group of "rich regions becoming richer" (with the best economic performance) comprises regions from western Germany, Austria,

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northern Italy, Flanders, Denmark and almost all capital regions. On the other side, the "poor regions becoming poorer" (Group 4) are the most numerous and comprise regions from France, Spain, Italy, Greece and the UK. The reason for their economic situation may vary, but a slow industrial decline may often explain the performance of some regions. It is worth noting that most of the peripheral regions of new Member States have a growing GDP per capita, even if below the EU average.
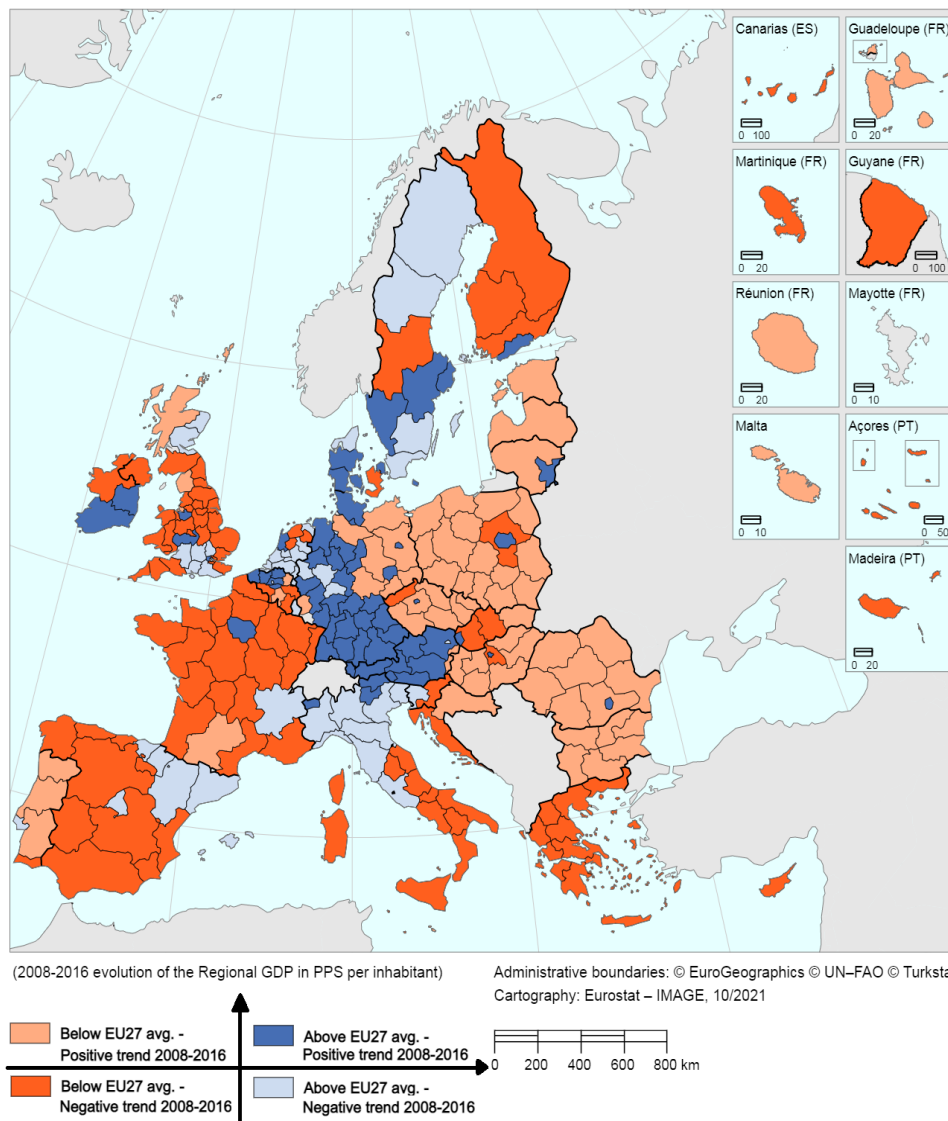
Figure 8. Evolution of the GDP per capita at NUTS 2 level (EU-27: 100) between 2008 and 2016.
Source: own elaboration, data: Eurostat.

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The academic community still questions the impact of the EU cohesion policy. Some researchers do not entirely agree on whether regional development intervention across EU regions delivers the promised impact, i.e. reducing the socio-economic gap between regions in the European Union significantly. Independent studies recently conducted on this topic have come up with disparate results. Some analysts suggest that the European Union's structural financing efforts have had little or no influence (for example, Boldrin and Canova, 2001; Dall'Erba and Le Gallo, 2008), while others think that they have been a success (e.g. Cappelen et al., 2003). In between these two extreme conclusions, some researchers point out that the impact of the structural funds has been limited (e.g. Puigcerver-Peñalver, 2007). A last group of researchers argues that the impact can change depending on the focus placed on different development axes (Rodriguez-Pose and Fratesi, 2004) or from one geographical region to another (Percoco, 2005; Mohl and Hagen, 2010).

2.1.1.4   Regional disparities in innovation potential

It seems logical to assume that the capacity of a region to innovate is highly correlated to its GDP per capita and competitiveness. According to the European Commission's annual Regional Innovation Scoreboard[16], there is a clear and positive correlation between regional innovation performance and regional competitiveness. The report, which is updated annually, compares the performance of innovation systems in 220 regions across 22 EU Member States (European Commission, 2017b). The scoreboard combines a set of indicators to measure the ability of a region to innovate (e.g. patents, publications, start-up creation, number of researchers).[17]

As with the diversity in terms of GDP per capita, an East-West and North-South regional divide can be seen. As shown in Figure 9, northern and western European regions have greater innovation capacities than southern and eastern European regions.   Europe's regions have been classified as follows:

- Regional innovation leaders (53 regions): Scandinavian countries, southern England, south-west Germany and the Paris region are among the most innovative regions. Innovation excellence is concentrated in a few areas in Europe.

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[16] European Commission's Regional Competitiveness Index:
https://ec.europa.eu/regional_policy/en/information/maps/regional_competitiveness/
[17] Due to a lack of information at regional level, the Regional Innovation Scoreboard is limited to using regional data for 12 of the 25 indicators used in the European Innovation Survey (EIS) (at country level). Because regional data would not be available if the definitions were the same as in the EIS, slightly   alternative   definitions   were   utilized   for   several   indicators.   (See https://data.europa.eu/data/datasets/regional-innovation-scoreboard?locale=en).

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- Strong regional innovators (60 regions): Other regions in the UK, Germany, France, Ireland and Austria are the very innovative regions.
- Moderate regional innovators (85 regions): The most numerous group of regions concerns most of Spain, Italy, Greece, Portugal, Czechia, Slovakia and the Baltic countries.
- Modest regional innovators (22 regions): Lagging regions are part of Poland, Spain (Extremadura), Romania and Bulgaria.

Regional innovation leaders are located in only six current EU Member States: Denmark, Finland, Germany, France, the Netherlands and Sweden and in the United Kingdom. The majority of countries have little variation in regional performance groups. This suggests that national and regional innovation performance are correlated. Regional specificities and the existence of regional "pockets of excellence" can, however, be seen in the form of a stronger variation in some countries (mainly the larger ones). All regions of Austria, Bulgaria, Slovakia, Hungary and Romania are in the same performance group, while there are two separate regional performance groups in 12 countries and three distinct regional performance groups in the four larger EU Member States (France, Germany, Italy and Spain).

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(Summary Innovation Index)

Administrative boundaries: © EuroGeographics © UN–FAO © Turkstat
Cartography: Eurostat – IMAGE, 10/2021

Legend:
- Emerging innovator
- Moderate innovator
- Strong innovator
- Innovation leader

Figure 9. Regional innovation performance groups (Regional Innovation Scoreboard 2019).
Source: own elaboration, data: European and Regional Innovation Scoreboards 2019.

Another way to illustrate the diversity of European regions is provided by Koschatzky et al. (2019). They discriminate regions based on different dimensions such as dominant economic sector, location (peripheral/central), appropriation of technology, and production efficiency. To illustrate the diversity of regional structural change in Europe, the authors have drawn on the typology of Tödtling and Trippl (2005) and developed it further based on recent findings in innovation system research (Warnke et al., 2016). The outcome is the typology of the following seven types of regions characterised by three main dimensions: the R&D intensity compared to the national average, the maturity of the

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technological base, and the density of the economic actors making up the ecosystems (Table 3). The two additional dimensions, namely the dominant economic sector and the geographical location, are also important elements to consider when designing and implementing a place-based innovation policy such as smart specialisation strategies.

	R&D intensity (below or above national average)	Technological base	Actor density	Dominant economic sector	Location*	Examples
1. Agricultural regions with technological "islands"	Above	Modern	Low	Agriculture	Peripheral	Algarve (PT), Sicilia (IT), Brandenburg (DE)
2. Metropolitan regions with systemic weaknesses	Above	Modern	Fragmented ecosystems & systems gaps	Services	Central	Catalonia (ES), Berlin (DE), Vienna (AT)
3. Partially industrialised regions with inefficient production facilities	Below	Mature/low level	Low	Production facilities controlled from outside the region	Peripheral	Andalusia (ES), Galicia (ES), Centro (PT), Norte (PT), Centru (RO)
4. Regions with fragmented, small-scale industrial structures	Below	Fragmented	Fragmented ecosystems & systems gaps	Various (niche industry)	Peripheral	Lombardia (IT), Emilia-Romania (IT), South Moravia (CZ), Thuringen (DE)
5. Peripheral-fragmented, mono-structured regions with adopted technologies	Below	Mature	Fragmented ecosystems & systems gaps	Often mono-structured in mining, raw materials or early-stage processing	Peripheral	Northern Sweden, North-East Finland, Scotland
6. Mono-structured old industrial regions	Below	Mature	High (complete ecosystems)	Coal and steel-based	Peripheral	Hauts de France (FR), Upper Silesia (PL), Wallonia (BE)
7. International leading high-tech regions	Above	Modern	High (complete ecosystems)	Automotive, mechanical engineering, aeronautics	Central	Baden-Wurtemberg (DE), Stockholm (SE), South-East of England (UK)

A region is considered as "central" when it hosts economic centres of decisions (companies' headquarters) and/or political power.

Table 3. Typology of European regions in structural change.
Source: adapted from Warnke et al. (2016) and Tödtling and Trippl (2005).

In conclusion, this section (2.1.1) has shown that the differences in terms of regional economic performance can be manifold. They can be characterised by various indicators from GDP per capita and innovation capacity to pre-existing industrial assets and geographical location of the region within its own country. These factors strongly influence the regional innovation systems and the place-based strategies to be designed and implemented through appropriate institutional arrangements and a sound monitoring system.

2.1.2 Regional differences in the quality of government and institutions

The quality of the institutional framework is a key factor for an exemplary implementation of place-based innovation policies, particularly for smart specialisation strategies that require the active participation of all regional stakeholders. This section defines the concept of quality of government and links it with the European place-based innovation policy. Later in this section, the concept of "quality of institutions" is also introduced as a crucial component of any good governance framework.

2.1.2.1 Origin and overview of the quality of government at the regional level

The intended nature of the exercise of public authority is described by terms like "quality of government" and "good governance".[18] The interest in such concepts has increased considerably over the years. Governance is one of the fundamental challenges behind implementing smart specialisation strategies. The challenge is first in the design because one particularity of the smart specialisation approach lies in its bottom-up, inclusive and democratic approach embedding all actors of the regional ecosystems in a co-construction process. Then, at the implementation phase, the approach requires the full and continuous participation of all the actors of the ecosystem more than any other innovation policy approach.

Following the World Bank definition (Kaufman et al., 2009, 2011), *"Governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies, and the respect of citizens and the state for the institutions that govern economic and social interactions among them."*

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[18] Both terms "government" and "governance" can be found in the academic literature. As governance is what governments deliver, it seems that the term 'governance' corresponds better to the topic approached in this section, even if the political layer (the people elected) also plays an essential role as a decision-maker.

From a development perspective, the World Bank and the United Nations have increasingly emphasized the importance of good governance and impartial institutions (Holmberg et al., 2009). In 2008 through a research project, the World Bank designed the first global indicator to measure and compare the quality of governance at the world level: the WGI[19] (for World Bank's World Governance Indicator). The WGI is a composite indicator[20] that covers over 200 countries and territories measuring the quality of government at the national level according to four main and interrelated "pillars" defined by Kaufmann et al. (2009): (1) the control of corruption, (2) the rule of law, (3) the government effectiveness and (4) the voice and accountability.[21]

The Quality of Government Institute from the University of Gothenburg (Sweden)[22] developed this concept further to be applied in a European policy context. Based on analyses of political theory, Rothstein and Teorell (2008) proposed a more coherent and specific definition of the quality of government (QoG): the impartiality of institutions that exercise government authority. While certainly relevant, the analysis of the quality of government at the national level does not tell the whole story, particularly regarding regional innovation policies.

To add specificity to the national level, Charron et al. (2011) launched a survey to complete and give a regional dimension to the World Bank's World Governance Indicator (WGI). The survey targeted 34,000 European citizens from the 18 largest EU countries to collect ascertain their perception of regional public authorities, as citizens' perception is considered a good proxy to assess the quality of government (Charron et al., 2014). The WGI external assessment was considered and combined with the regional-level survey data to create a comprehensive European Quality of Government Index (EQI) for the nine other smaller EU countries. Respondents were asked to rate their own experiences and perceptions of education, healthcare and law enforcement in their region concerning three related concepts of QoG: (1) quality, (2) impartiality and (3) level of corruption. In the end, the EQI focuses on both perceptions and experiences with public sector corruption and the

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[19] https://info.worldbank.org/governance/wgi/

[20] The Worldwide Governance Indicators (WGI) are gathered in a research dataset that summarizes the opinions on governance quality expressed by a large number of businesses, citizens, and experts in both developed and developing countries. These figures come from a variety of sources, including survey institutes, think tanks, non-governmental organizations, international organizations, and private sector businesses. The Natural Resource Governance Institute, the Brookings Institution, the World Bank, its Executive Directors, or the countries they represent do not endorse the WGI.

[21] The ability of citizens to choose their government, as well as freedom of expression, association, and a free press, are all part of the voice and accountability pillar.

[22] Professor Bo Rothstein and Professor Sören Holmberg founded the Quality of Government (QoG) Institute in 2004. It is an independent research institute within the University of Gothenburg's Department of Political Science. (https://www.gu.se/en/quality-government)

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extent to which citizens believe various public sector services are impartially allocated and of good quality in the EU.

The EQI shows a clear gap between the old EU Member States (the EU-15 group) and the new Member States (the EU-13 group) (Figure 10). This gap suggests that countries, where citizens have a better opinion of the regional government are countries with a longer democratic tradition. However, variation within the country can be observed. This is particularly the case for countries like Spain and Portugal, with groups of regions ranking amongst the best European regions (e.g. the Basque Country particularly) while others sit below the European Union EQI average

(European QoG Index 2017)

Administrative boundaries: © EuroGeographics © UN–FAO © Turkstat
Cartography: Eurostat – IMAGE, 10/2021

Legend :

- 🟧 Bad perception of QoG (EQI< -0.9)
- 🟧 Rather bad perception of QoG (-0.9<EQI<0)
- 🟦 Rather good perception of QoG (0=<EQI<0.879)
- 🟦 Good perception of QoG (EQI>=0.879)
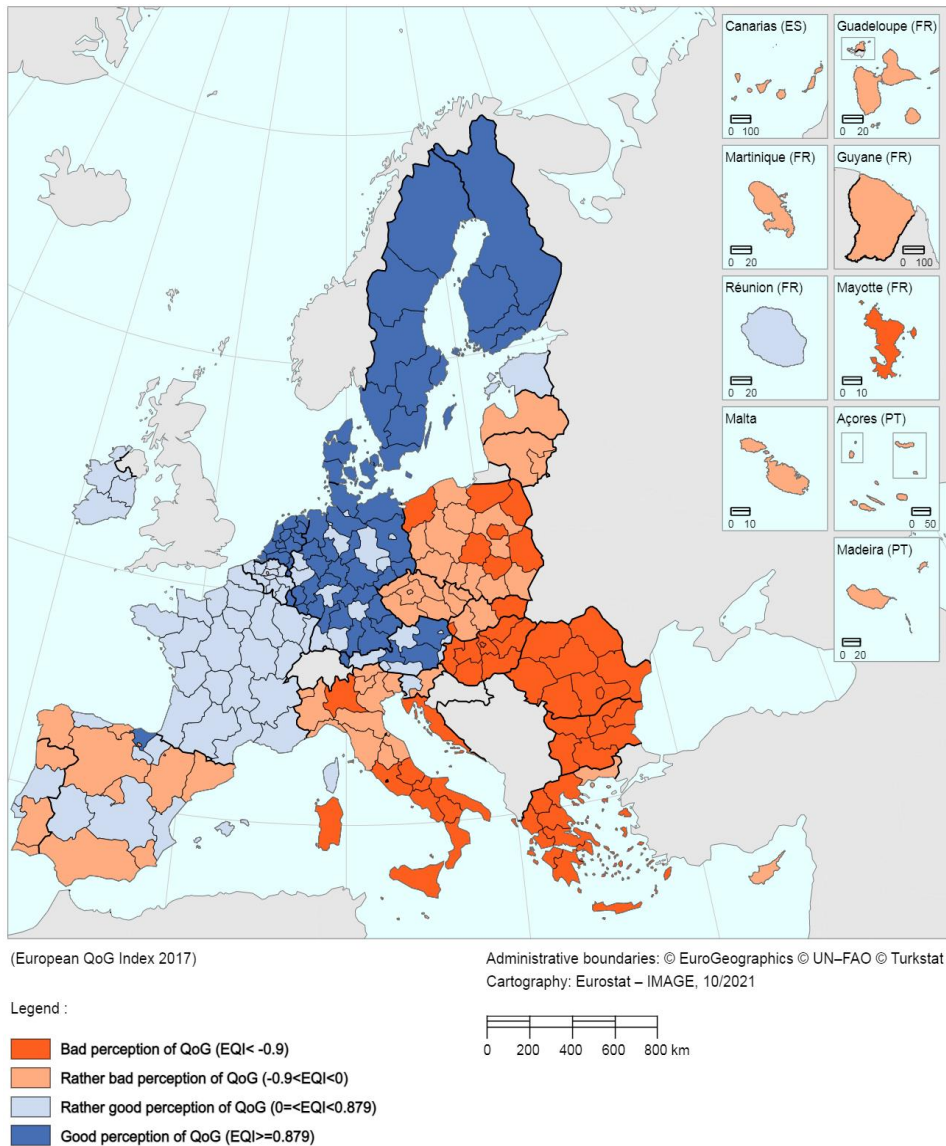
Figure 10. Quality of Government in European regions in 2017.
Source: own elaboration, data from Charron et al. (2019).

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2.1.2.2 Quality of the institutional framework and regional innovation performance

The local public institutions are an essential driver for implementing any place-based policy. In the academic literature, institutions are defined by the social and legal norms and rules that underline the socio-economic environment (North, 1990). In the context of regional innovation policies and for this analysis, the term institutions is understood to mean the bodies in charge of implementing the government's decision. Institutions have a critical responsibility in delivering policy, and the policy impact is highly correlated with the quality of the institutional framework and the whole quality of government per se. The quality of institutions impacts the innovative potential of a region, but the link between institutions and innovation is still a "black box". A lack of effective institutions is likely to jeopardize regional development policy (Rodriguez-Pose, 2013). Institutions are placed at the centre of the policy design and implementation process, with regional public authorities (regional councils or local governments) acting as coordinators of the innovation policy. The logic of intervention of place-based innovation policy (e.g. smart specialisation strategies) is more complex than most national-level interventions. As it is specific to the local context, place-based policy should be "tailor-made", and the institutional framework specific to any public intervention (Farole et al., 2011). Institutions are the "key enablers of innovation, mutual learning and productivity growth" (Putnam, 2000) and thus pave the way for efficient innovation strategies across territories.

The quality of institutions also has a direct impact on innovation. Using patent applications as a proxy for innovation and the Quality of Government Index, Rodriguez-Pose and Di Cataldo (2015) found that quality of government[23] has a clear and positive impact on regional innovation changes. The authors demonstrate that the quality of the institutional framework has a significant effect on local knowledge production processes. To reach this conclusion, they divided the sample of 225 EU regions into two categories: "periphery" ("lagging" regions eligible for Objective 1 or "convergence" support in the European Regional Policy during the period 2000-2006) and "core" (all remaining regions). Figure 11 is based on the authors' contributions. It reveals (1) a strong correlation between innovation (patent applications) and the quality of government index, and (2) a significant difference in the average level of both quality of government and patenting capacity between Europe's core and peripheral regions. These findings support the hypothesis that better institutional conditions are linked to more robust regional innovative performance.

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[23] Authors used the subnational EU Quality of Government (QoG) index created by Charron et al. (2013) as a proxy for regional government institutions.

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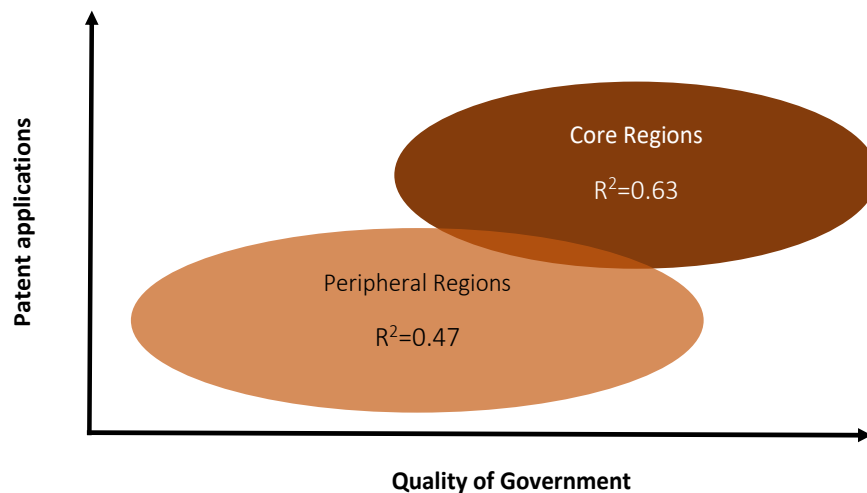
Figure 11. Innovation and quality of government in peripheral and core regions (1997-2009)[24].
Source: adapted from Rodriguez-Pose and Di Cataldo (2015).

In conclusion, it is worth pointing out that the diversity of institutional settings also has an influence on the heterogeneity of regional contexts. Regional innovation dynamics in Europe are influenced by region-specific institutional conditions, which are by definition difficult to transfer from one location to another. Different types of knowledge-generating interventions are required in different parts of Europe, and regions should establish specific institutions to support their innovation strategies.

The smart specialisation concept, which was introduced for the 2014-2020 programming period, marked a significant policy shift in European development intervention. The S3 concept aims to improve the effectiveness of EU intervention in addressing governance issues (e.g. priorities-setting, monitoring mechanisms) with a step-by-step methodology and ex-ante conditionalities to fulfil (see Chapter 1). Even before the full implementation of the S3 concept, some academics questioned the ability of the concept itself to fit a particular type of region (Charles et al., 2012). After some years of implementation, Capello and Kroll (2016) argued that the "European Union has finally matured to abandon the conviction that it might be possible to find a one-size-fits-all policy serving the very different regions of Europe". Sotarauta (2018) pointed out discrepancies between the theory and reality by identifying five issues arising from implementing S3 strategies in regions. The five practical

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[24] The model was estimated for the 1997-2009 period. According to the authors, serious data constraints led to the exclusion of Bulgarian, Cypriot, Danish, Greek, Maltese and Slovenian regions. National data were used for EU countries with only one NUTS 2 region (Estonia, Latvia, Lithuania, Luxembourg).

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issues would be (1) the centralist versus localist governance mechanisms, (2) the conflict between institutions, (3) the lack of capability to manage new processes, (4) the insufficient stakeholders' mobilisation and (5) the lack of shared vision provided by managing authorities towards regional stakeholders. Even if these five issues could be discussed, these design and implementation failures would be evident in the case of evaluation.

There are a number of other flaws that can be identified. When S3 strategies are implemented, they result in a proliferation of objectives, which is a problem that primarily affects areas with a weak quality of government (Di Cataldo et al., 2020). Furthermore, strategies are usually only loosely related to each region's inherent characteristics, and they mostly imitate what neighbouring regions are doing. For instance, Caramis and Fay Lucianet (2016) pointed out that five out of eight southern Italian regions chose high-tech specialisation areas when those regions are facing a lack of capacity in R&D. The propensity for areas with a weak quality of government to generally copy what their neighbours are doing is likely to result in ineffective strategies that fail to deliver on their promise of mobilising local economic potential and raising development levels. Only territories with stronger governance structures and a good quality of government have clearer and more focused strategies, which means they are following a simpler and more transparent strategy implementation, with a more realistic and achievable number of priorities (Marques and Morgan, 2018; Di Cataldo et al., 2020).

2.2 Challenges related to the setting of governance and monitoring mechanisms

This section focuses more specifically on the challenges related to the two papers around which this doctoral thesis is structured. First, this section tackles the challenges associated with the governance of place-based innovation policies through implementing smart specialisation strategies across EU regions. Second, it looks at the challenges related to the design and implementation of monitoring mechanisms in different regional contexts.

2.2.1 Regional differences and governance of innovation policies

How a region is organised administratively, and its autonomy towards the national level can hamper or facilitate the design and the implementation of place-based innovation policies. It also strongly influences the institutional arrangements necessary for the good implementation of regional innovation strategies.

2.2.1.1 *The administrative level of implementation and management of European regional funding*

Commonly, regions are defined as an administrative, functional or homogenous spatial entity (Schätzl, 2001) or an authentic community of interest (Ohmae, 1992). In European regional policy and for analytical and statistical purposes, regions are defined either by the NUTS level 1 or 2 classifications[25]. Regions may not have identical functional or political-administrative spatial units within the same NUTS classification. Regions can vary in terms of institutional settings and governance mandates that can directly influence the governance of innovation policy. The level of political devolution and the national political regime, whether centralistic or federal, influence the degree of political autonomy. For the last two decades, more and more countries have given more and more autonomy to regions in terms of research and innovation policy, political powers, and budgetary responsibilities (Koschatzky and Kroll, 2009).

As a result, different regions are distinguished by region-specific governance systems that arose from the economic, political, and social environments and histories of each. The four different governance types of Wiehler and Stumm (1995: 244-245) are still valid as of today:

- regions with broad powers (for example, German Länder);
- regions with advanced powers (for example, Spanish autonomous communities);
- regions with restricted powers (for example, Dutch provinces, French and Italian regions); and
- regions with no authority (e.g. Portuguese planning regions).

Over 180 smart specialisation strategies (S3) were designed at the regional or national level during the previous programme period of 2014-2020. Although one of the characteristics of the S3 concept is to be place-based, Member States can choose to design strategies either at the regional level, the national level, or at both levels. One crucial factor behind this choice is the administrative level of the public authority managing the ERDF funding dedicated to research and innovation (thematic objective 1). Another factor is the presence of autonomous local authorities with a political mandate of managing economic performance and innovation.

EU countries implementing S3 strategies can be broken down into three categories:

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[25] 'Nomenclature des unités territoriales statistiques' (NUTS) is a geographical nomenclature subdividing the economic territory of the European Union (EU) into regions at three different levels (NUTS 1, 2 and 3). The classification is based on Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 and is regularly updated.

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- Countries implementing the S3 concept at the national level only: this category comprises mainly small countries where a place-based approach makes sense at this level (Baltic countries, Cyprus, Malta, Luxembourg, Slovenia, Czech Republic, Slovakia, Hungary, Bulgaria). Apart from Luxembourg, countries on this list entered the EU after 2004 (EU-13).

- Countries implementing the S3 concept at the regional level only: this category comprises the EU's largest country and (or) old Member States (EU-15) with a federal political system (Germany, Belgium) or with a highly decentralised system (France, the Netherlands, the UK). The management of ERDF funding dedicated to research and innovation must be entirely at the regional level (NUTS level 2 or 1).

- Countries implementing the S3 concept at the national and regional levels embeds a mix of countries mainly from the EU-15 group (Italy, Spain, Portugal). In this case, the place-based approach (the regional level) is combined with the national research and innovation strategy.

	Country group*	Degree of power according to the Wiehler and Stumm classification (1995)	S3 implementation level	S3 funding management level (ERDF R&I management authority)
Austria	EU-15	None	National	National
Belgium	EU-15	Wide-ranging	Regional (NUTS 1)	Regional (NUTS 1)
Bulgaria	EU-13	None	National (NUTS 0)	National
Cyprus	EU-13	Not relevant	National (NUTS 0)	National
Czechia	EU-13	None	National (NUTS 0)	National
Germany	EU-15	Wide-ranging	Regional (NUTS 1)	Regional (NUTS 1)
Denmark	EU-15	None	National (NUTS 0)	Regional (NUTS 2)
Estonia	EU-13	None	National (NUTS 0)	National
Greece	EU-15	None	Regional (NUTS 2)	Regional (NUTS 2)
Spain	EU-15	Advanced/Limited	National & Regional (NUTS 2)	Regional (NUTS 2)
Finland	EU-15	Limited	Regional (NUTS 3)	Regional (NUTS 2)
France	EU-15	Limited	Regional (NUTS 2)	Regional (NUTS 2)
Croatia	EU-13	None	National (NUTS 0)	National
Hungary	EU-13	None	National (NUTS 0)	National
Ireland	EU-15	None	National (NUTS 0)	National
Italy	EU-15	Limited	National & Regional (NUTS 2)	National & Regional (NUTS 2)
Lithuania	EU-13	None	National (NUTS 0)	National
Luxembourg	EU-15	Not relevant	National (NUTS 0)	National
Latvia	EU-13	None	National (NUTS 0)	National
Malta	EU-13	Not relevant	National (NUTS 0)	National
Netherlands	EU-15	Limited	Regional (NUTS 2)	Regional (NUTS 2)
Poland	EU-13	Limited	National & Regional (NUTS 2)	National & Regional (NUTS 2)
Portugal	EU-15	None	National & Regional (NUTS 2)	National & Regional (NUTS 2)
Romania	EU-13	None	National (NUTS 0)	National
Sweden	EU-15	Limited	Regional (NUTS 3)	Regional
Slovenia	EU-13	None	National (NUTS 0)	National
Slovakia	EU-13	None	National (NUTS 0)	National
United Kingdom**	EU-15	Limited	Regional (NUTS 1)	Regional (NUTS 1)

* EU-15 and EU-13; EU-13 countries are countries that acceded to the EU after 2004.
** The UK is considered a member of the EU for the analysis as Brexit happened during the programming period.

Table 4. S3 strategies according to their territorial level of implementation.
Source: own elaboration.

Tödtling and Trippl (2005) argue that not every regional government is in a position to establish a scientific and research infrastructure that can compete internationally. As explained before, the degree of regional autonomy varies considerably between European countries and sometimes also between regions of the same country (such as Spain and Italy). It depends on the respective national constitution's role in regions and differences in the sense of regional consciousness. Regional autonomy has a natural influence on regional innovation governance. When there is a high degree of regional autonomy, it is essential that policymakers customize policies precisely to the regional context for innovation systems (Baier et al., 2013). Baier et al. (2013) designed a composite indicator applied to regions made of three distinct variables.

- The first variable is the 'general regional autonomy' based on a review of all 28 European Member States' constitutions, explicitly focusing on the degree of power regions have in their national contexts.

- The second variable is the 'regional competencies concerning innovation policy' derived from a focused review of EU Member States' constitutions.

- The third and last variable is 'regional influence on structural fund allocations. The management of EU structural funding for research and innovation by regional authorities is crucial to regional autonomy.

The authors assigned scores through a Likert scale for each of these variables. The combination of the three variables can be seen in Figure 12. Regions are broken down from low policy autonomy to high autonomy (degree of power vis à vis central government, competence regarding regional innovation policy, and EU structural funds).
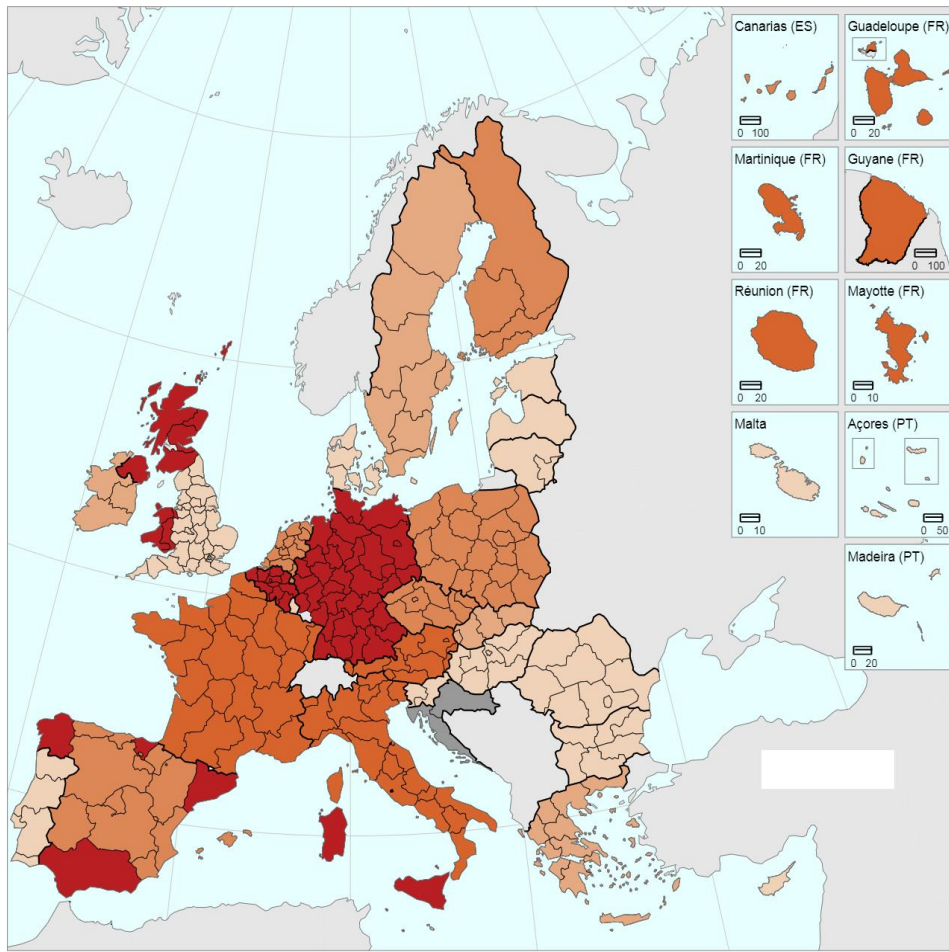
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Administrative boundaries: © EuroGeographics © UN–FAO © Turkstat
Cartography: Eurostat – IMAGE, 10/2021

Legend : Degree of Autonomy in Regional Innovation Policy

- Low Autonomy
- Limited Autonomy
- Medium level Autonomy
- Substantial Autonomy
- High Autonomy
- Data not available
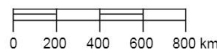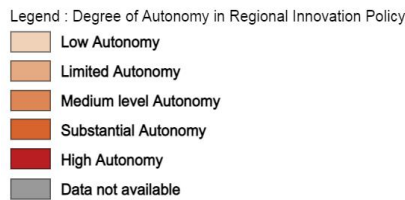
Figure 12. Composite index of regional autonomy.
Source: adapted from Baier et al. (2013).

2.2.1.2 Multilevel governance and the specific role of regional government

The growing importance of subnational governments in the EU's cohesion policy reflects
the notion of multilevel governance (MLG) (Piattoni, 2009, 2010). Multilevel governance is
described by Hooghe (1996) and Hooghe and Marks (1996, 2001, 2002) as the distribution
of authority vertically across numerous levels of government and horizontally among many
quasi-governmental and non-governmental organizations and individuals. This type of
governance implies continuous negotiation between the government and territorial actors

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at different political levels. Multilevel governance refers to a variety of arrangements between officially independent but functionally linked entities that constantly redefine interrelationships via coordination and negotiation (Sabel and Zeitlin, 2007). As a result, governance is multilevel in the sense that it brings together several players on a vertical axis, such as the EU and national, regional and subregional governments, as well as public and private organisations (Bernard, 2002: 229). It follows a vertical scheme with the upper part a supranational level, gathering EU institutions, a national level with Member States' governments and a subnational (regional) level with regional authorities. We can find substate actors such as local governments, interest groups, and intermediary bodies (Nugent, 2003: 473). All these different levels of government are interconnected with the implementation of the policy through stable government frameworks completed by institutional arrangements (Figure 13).
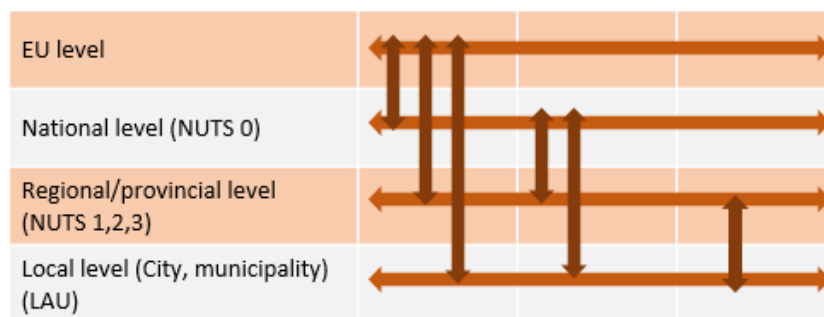
Figure 13. Multilevel governance: possible horizontal and vertical interactions.
Source: own elaboration.

The different rationales for policy interventions to address market or system failures through place-based policies under a multilevel governance setting imply that regional policymakers deal with policy complexity (Flanagan et al., 2011). Indeed, it is useful to mention that policy failure as defined as a policy's inability to fulfill its objectives, can occur as a result of poor policy design, implementation, and governance (Dal Bó, 2006). According to Cooke (2003: 414), the move towards multilevel governance in regional innovation systems implies an animator (facilitator) of a public-private interactive and mainly incremental learning-based innovation process. Doloreux and Parto (2005: 134) define a regional innovation system as" a *set of interacting private and public interests, formal institutions and other organizations that function according to organizational and institutional arrangements and relationships conducive to the generation, use and dissemination of knowledge"*. However, a regional government's involvement should be limited to creating a favourable legislative and institutional framework that encourages vertical collaboration across levels of government and horizontal links between institutions

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and stakeholders. In the specific context of S3, regional governments should, in particular, be responsible for creating favourable conditions for implementing the entrepreneurial discovery process from a bottom-up approach.

However, a multi-level governance system, if too complex, can raise legitimate question of democratic representation (DeBardeleben and Hurrelmann, 2007). According to Charles et al. (2004: 13), regional governments should stimulate but not govern processes. Three key roles are attributed to regional governments:

- setting regional priorities for research based on small units of excellence not necessarily recognised at the national scale;
- negotiating with central actors to shape central policies for the benefits of their regions;
- building linkages from all elements of the regional science system into innovation, commercialisation and technology transfer.

2.2.1.3 *Institutional arrangements and the S3 entrepreneurial discovery process (EDP)*

Regional systems are not national systems in miniature. They react to a variety of rationales and institutional contexts that may or may not be found at the subnational level. The regional level may not have all of the required ingredients and institutions for innovation. It may be necessary to cooperate with other regional or national systems in order to bring together all the resources required in a given territory (Asheim and Gertler, 2005). In other words, the governance of place-based innovation strategy requires institutional arrangements resulting from existing formal institutional settings such as administrative traditions and capacity, history of public-private interactions, and shared norms and values. These elements are always context-specific, so the resulting governance structures and processes vary across regions in the EU (Guzzo et al., 2021).

The practical implementation of the smart specialisation concept represents a showcase of European regional diversity. It appears that the disparities in public institutions, and, more crucially, the specific modalities of governance, have a significant impact on S3 implementation. Not all institutional arrangements and procedures are set in stone, and it may be one of the S3 agenda's most valuable assets not to accept any generic governance model transferred from elsewhere. Because diverse institutional capacities characterise countries and regions, they have to face and handle various challenging situations. However, Capello and Kroll (2016: 1396) argue that smart specialisation could (at least) provide a common policy rationale.

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As introduced in the first chapter, the entrepreneurial discovery process (EDP) is a particularity of the smart specialisation concept. The EDP can be considered to be at the core of S3 governance since the S3 concept is not possible without information provided by stakeholders. The EDP is based on the quadruple helix (Lindgren and Packendorff, 2010), gathering together (1) public administration (and related bodies), (2) research actors (including universities, public and private research organisations, science and technological parks), (3) business actors (including large firms, SMEs, clusters) and (4) civil society (consumer associations, NGOs, and other citizens groups). Stakeholders are, by definition, parties interested in the strategy design and implementation process, and their contribution is not unbiased, nor is the information they provide. SMEs and entrepreneurs are, at the same time, the main recipients of the policy and also active stakeholders in the EDP. Determinants of innovation for such a category of actors can vary significantly according to the region in which they are established (Romero and Martínez-Román, 2012; Fernández-Serrano et al., 2019). With the involvement of a diverse pool of stakeholders, the EDP engages them in a collective iterative process of "entrepreneurial discovery" and knowledge sharing to increase the tacit knowledge base. At the same time, it reduces the likelihood that a single individual interest or perception prevails over the others. The information bias associated with the involvement of interested parties is also reduced by the need to compare and complement it with objective analysis and official statistics. The EDP is commonly regarded as an inclusive and evidence-based approach that generates information about the potential for new activities, allowing for more effective research and innovation policy targeting. Foray (2019) described the entrepreneurial discovery logic as meaning "that the targeted transformation will not follow a path that is decided from the top but will be discovered as the process unfolds". After some years of implementation, it is clear that the main factors influencing the success of the entrepreneurial discovery process are the following (Perianez-Forte and Wilson, 2021):

- the continuity: the difficulty of maintaining interest in the engagement of stakeholders;
- the associated mechanisms and instruments: intermediary institutions (e.g. innovation agency) with appropriate monitoring mechanisms;
- the organisation and coordination: committed regional government with a set of clear rules.
- adequate capabilities: skilled government and intermediary institutions.

Figure 14 provides an overview of the relationship between the governance of the S3 strategy and the collaboration between stakeholders through the EDP. The regional

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innovation agency (RIA) function is seen as an interface between the regional government responsible for the EU funding on one side and the rest of the public administration in contact with the S3 stakeholders on the other side. This new layer of governance is inspired by the New Public Management (NPM) approach explained later in this section. Regional innovation agencies are created as additional governance structures by the regional government to implement place-based policies that boost regional innovation capacity (OECD, 2011).
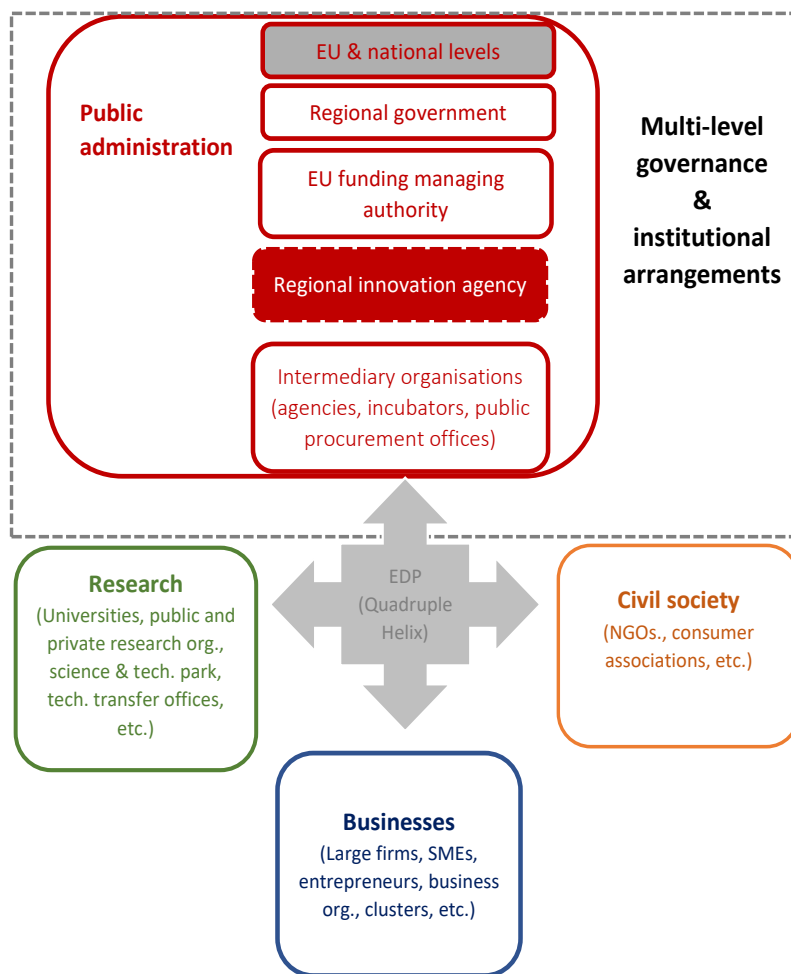
Figure 14. Multilevel governance, institutional arrangements and stakeholder collaboration through the entrepreneurial discovery process (EDP).
Source: own elaboration.

An RIA can be defined as a key intermediary in the multilevel governance entity that acts as "an agent or broker in any aspect of the innovation process between two or more parties" (Howells, 2006: 720). The existence of an RIA is context-dependent and varies according to the institutional structure and level of regional autonomy. Economic variables such as

competitive advantages, sector specialisation, and the presence of major entities (e.g., businesses, universities and research institutions) all influence the size, mission, activities and financing obligations of RIAs. This results in a wide range of RIAs in terms of size, mission, activities and funding responsibilities (OECD, 2011).

Before the formal introduction of the S3 concept in 2014 in the European regional policy arena, the increasing "regionalism" in innovation policy already required a better knowledge of governance. As the European Union expanded and became increasingly interconnected, a multilevel governance system emerged, in which national government power was diluted by supranational and subnational actors' activities. Place-based policy governance has become more complex as the EU intensifies regional innovation policy (European Commission, 2001, 2005) to reach the Lisbon Strategy's and Barcelona Declaration's objectives (i.e. the objective of an R&D expenditure of 3% of GDP). At the same time, political decentralisation tendencies in some European countries (such as France, Italy and Spain) led to regional governments becoming important entities in the political system, thus strengthening the regional policy level (Lyall and Tait, 2004). These developments required the creation of a governance structure to ensure the effective and efficient implementation of regional policy decisions (Nauwelaers and Wintjes, 2003). The introduction of the smart specialisation approach emphasized this need.

As we see it nowadays, regional governance is strongly influenced by the New Public Management (NPM) concept (Hood, 1991). NPM aims to improve the quality of public service, increasing the citizens' (seen as "users") satisfaction, using methods taken from the private sector. Regarding regional governance and the implementation of place-based policy, it is necessary to interact more closely with beneficiaries of the public intervention. As a result, intermediate organizations are major stakeholders because they are vital participants in the governance chain and play an important role in disseminating new information about economic activities, technology and markets. They facilitate the creation and dissemination of new ideas and narratives, as well as the building of personal and organizational networks. Institutional arrangements are not static but dynamic. As a result of the implementation process, governance arrangements have evolved in many territories. Among intermediary organisations, regional innovation agencies aim to support the innovation process and fill the gap between the regional government and stakeholders involved in the innovation strategy.

Place-based policy involves a high-level of governance complexity, and regional governments do not have the same capacity to deal with this complexity. The difference between a theoretical framework and policy implementation requires that regional

governments find solutions to adapt their approach to steer innovation strategies. Regional innovation agencies could provide a solution with institutional arrangement features to address specific needs arising from the design and implementation of place-based policy.

This thesis examines the institutional arrangements that facilitate the formulation and implementation of place-based innovation policies in four regional innovation agencies established within three distinct regional innovation systems.

2.2.2   S3 governance and monitoring mechanisms

Many factors influence the design and the implementation of a monitoring system for a smart specialisation strategy (S3). The complexity comes first from the inside, the originality of the smart specialisation concept itself, and second from external factors facilitating or hindering the monitoring.

2.2.2.1   Monitoring mechanism as a mirror of S3 complexity: originality and challenges

The monitoring of policies and strategies refers to a set of actions that includes the iterative collection of data and the development of indicators that guide policy implementation as well as the direction and evolution of socio-economic phenomena. According to Leeuw and Furubo (2008), monitoring needs to be institutionalized and designed to continuously enable relevant and well-informed decisions to support responsive and efficient policy-making. Its use is crucial in the decision-making process for adjusting the course of policy actions at any time of the implementation. Monitoring can be defined as a "continuing function that uses systematic data collection for specified indicators to provide information on the progress and achievement of objectives of a policy intervention".

The concept of monitoring is easy to understand at first glance; however, it can be much more complicated when considering the link with the logic of intervention of the S3 strategy. The complexity of the S3 strategy is reflected in the monitoring mechanisms. Based on the prototypical structure of an S3 strategy, Gianelle and Kleibrink (2015) have associated an operational description of (the) monitoring (activity) following the logic of the policy intervention, as Figure 15 shows.

To undertake monitoring activities appropriately, policymakers must first verify that the conceptual building blocks of an S3 strategy are accurately defined and understood, as well as the causal and logical relationships between them. Monitoring can be understood exclusively in terms of its intrinsic link to the strategy's structure as a manifestation of the causal sequence of propositions that constitute the principle of smart specialisation. It

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is important to ensure that suggested causal relationships between strategy-building components are based on good practices established in other geographic contexts, lessons learned from previous policy experience or developing analytical data. Because smart specialisation strategies are experimental, the proposed monitoring system should have broad support from stakeholders and experts. Policymakers could set up a mechanism to see if a suspected causal link works in practice in the S3 logic of intervention, as shown in Figure 15.
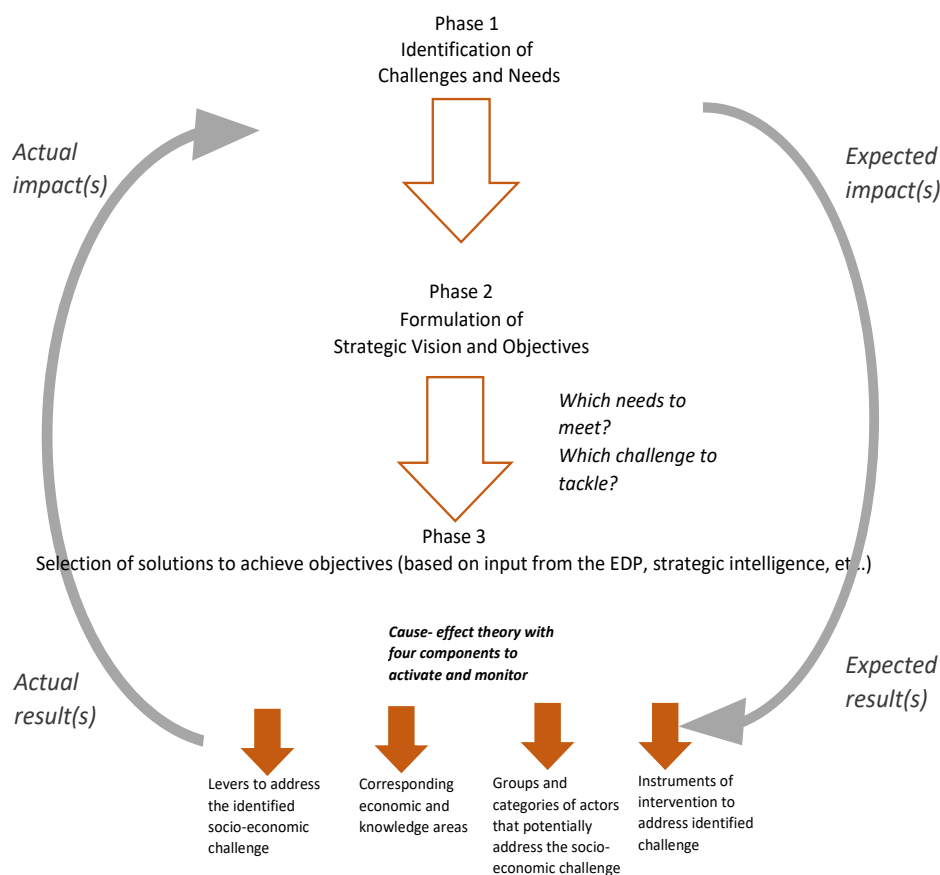
Figure 15. Monitoring within the logic of intervention of smart specialisation strategies. Source: adapted from Gianelle and Kleibrink (2015: 6).

The monitoring system of S3 should reflect the originality and complexity of the strategy or programme it aims to monitor, considering the stakeholders' continuous involvement through the entrepreneurial discovery process (EDP).

As entrepreneurial discovery is the primary process behind the smart specialisation concept, monitoring activities represent a key element. Stakeholder involvement is essential at every stage of the monitoring process, from indicator design through data

collection to data provision. They are the immediate users and beneficiaries of the information generated by the monitoring system. Stakeholders perceive the "ownership of the change processes placed in place through the S3" since they participate in indicator decisions (Gianelle and Kleibrink, 2015). Monitoring is highly dependent on the institutional context, which itself is related to the regions where the strategy is implemented. However, it refers not only to the institutions and arrangements in place in different regions but also to rules, norms and practices that affect what monitoring takes place and how. Stakeholder collaboration, which is an important variable, may be more anchored in some regions compared to others. The new introduction of S3 strategies in 2014 pushed many policymakers to find governance arrangements to adapt the concept to the regional context. Figure 16 shows in a simplified way how monitoring can be embedded in the governance of an S3 strategy considering the governmental and non-governmental stakeholders and the strategic and operational level. The figure can evolve according to the regional or national context; however, the involvement of stakeholders making up the quadruple helix (i.e. academia, business, public administration and civil society) should always be present in any case.

The monitoring system is an essential component of any policy without which governance is blind and unable to steer public intervention. The setting of an appropriate monitoring mechanism is a legal requirement requested by the European Commission for a region to allocate EU funding through the European Regional Development Fund (ERDF) (European Union, 2013). Besides the legal obligations directly deriving from the regulations related to European structural and investment funds (ESIF), the S3 monitoring mechanism should be understood as a fundamental management tool for the smart specialisation approach (European Commission, 2012). A badly developed monitoring system would impede the territory's ability to adequately address its development demands, and could even preclude the strategy's proper execution. To be a suitable and successful policy tool, the S3 monitoring system should reflect the logic of the strategy's intervention (Gianelle et al., 2015).

S3 monitoring activities are fully embedded in the governance system and should reflect each level. They should generate and communicate information about the strategy's aims, achievements and progress to the broader economy and society. They are meant to convey a narrative that engages a more comprehensive set of actors in the strategy's transformational agenda within and outside the territory and facilitates consensus on its rationale and needs. The monitoring system should be used as a management tool for S3 strategies linking monitoring governance, in addition to the legal obligations imposed by

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the ESIF regulations. According to the European Court of Auditors (2007: 7), in the context of European regional development policies, weak monitoring mechanisms have hindered numerous evaluations in the past by failing to provide essential information.

The regional government plays a key role in organizing and monitoring the policy action plan's progress, as well as encouraging all regional innovation agents to work together in a coordinated effort. S3 monitoring through the continuous and shared follow-up of the strategy implementation is a key governance component. It allows the creation of ownership and continuing dialogue between all stakeholders forming the EDP.
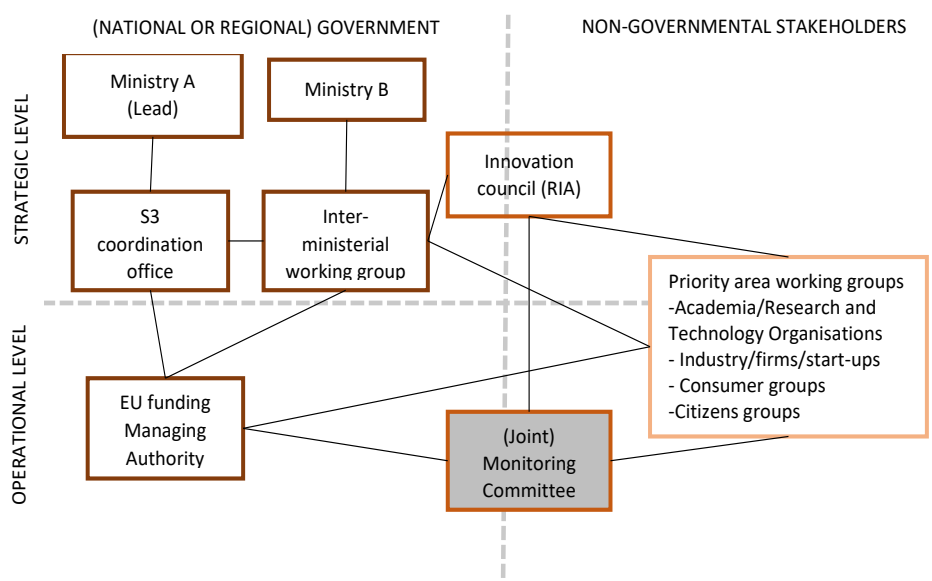
Figure 16. S3 monitoring within the governance system.
Source: adapted from Gianelle and Kleibrink (2015: 17).

2.2.2.2   The main functions of S3 monitoring

Within the context of smart specialisation, monitoring is more complex and has broader functions:

- Firstly, monitoring for S3 is a tool for <u>policy learning</u> for both the public administration and stakeholders about actual transformation processes, collecting information and making it available to decision-makers (Florida, 1995; Floc'hlay and Plottu, 1998).
- Secondly, monitoring for S3 supports policy communication by building and strengthening <u>trust and cooperation</u> with and among stakeholders and civil society (Saltelli, 2007; Gianelle and Kleibrink, 2015). This entails defining the objective and

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operation of innovation initiatives in order to make them more accessible to the general public.

▪ Thirdly, monitoring for S3 should facilitate the public administration's <u>accountability</u> and transparency, ensuring the accountability of policymakers and project managers (Hanberger, 2011; Magro and Wilson, 2015) through the constructive involvement and participation of stakeholders.

▪ In addition, the S3 monitoring system should fulfil the function of <u>control</u> of budget expenditure and strategy achievements. The system should also accomplish the role of provider of management tools and communication support.

Figure 17 summarises the elements described previously. The monitoring system should perform three essential functions:

1. Collecting evidence and making it available to decision-makers for eventual adaptation or reorientation as a feedback control system learning from itself (learning & acting).

2. Clarifying the purpose and functioning of the strategy and making it understandable to the broader public (accountability).

3. Supporting stakeholders' constructive involvement and participation through transparent communication (trust-building) (Gianelle and Kleibrink, 2015).
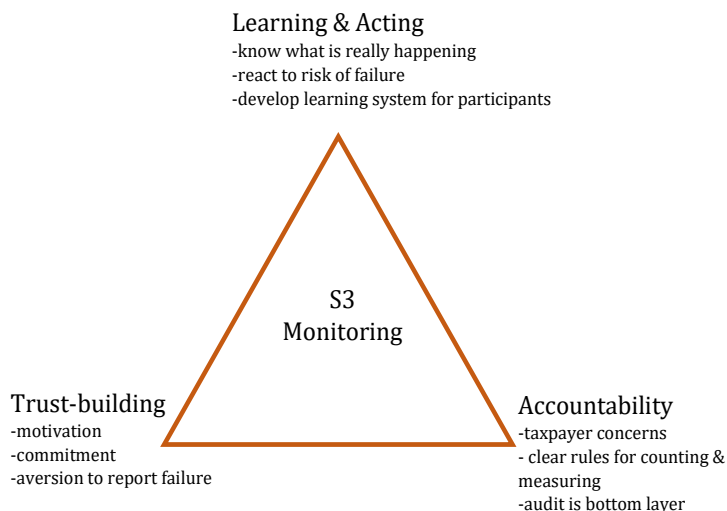
Figure 17. The three main functions of S3 monitoring system.
Source: adapted from Gianelle and Kleibrink (2015).

Table 5 helps to understand further the characteristics necessary for good monitoring of a smart specialisation strategy for the different categories of indicators.

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Standard requirements for S3 monitoring

Types of indicator	Function	Examples
Implementation (Input)	Measurement of the implementation of the policies and actions	Capacity of funding absorption, number of projects, amount of EU/national/regional funds allocated, type of beneficiaries and amount of contributions paid
Output	Measurement of the direct outputs produced by funded projects	Patents and licences filed, publications, number of people trained, new product and process, collaboration networks established
Result/ Outcome	Measurement of the degree of achievement of the socio-economic objectives for each of the S3 priorities	Value-added generation, quality upgrading of products and services, job creation, export performance, start-up creation, private R&D expenditure

Extensions depending on the S3 objectives

Impact (Structural change & specialisation)	Measurement of changes (absolute and relative) in each of the S3 priorities based on the trajectories and transitions predicted in the strategy for each priority, as well as the economy and society as a whole	Technological specialisation of local production systems, structural characteristics of the business sector (firm size, business ownership structure, new markets), distribution of economic activities, demographic dynamics of firms
Broad impact (Context)	The creation of a picture of the area economy's competitiveness, with a focus on issues of research and innovation	Incidence of R&D by economic activity, distribution of value-added and employment by economic activity, distribution of patents by economic activity, general indicators of innovation and R&D activities

Table 5 Monitoring indicators, functions and examples.
Source: adapted from Gianelle and Kleibrink (2015).

However, the extent to which monitoring and evaluation mechanisms have been designed and are implemented varies from region to region because, as stated before, both are strongly linked to the local economic and institutional context. Table 5 presents the main factors influencing the design and implementation of S3 strategies and the associated risks. A suitable monitoring mechanism requires appropriate administrative capacity with people with analytical and communication skills to make good use of the data generated by the projects funded. A low quality of government and a lack of trust from stakeholders towards public authorities hamper monitoring activities. In that case, public authorities leading the process would fail to share a long-term strategic vision with the regional stakeholders. Table 6 lists the potential weaknesses that may affect S3 monitoring activities (i.e. administrative capacity, institutional arrangements, political autonomy and quality of government) with the risks associated with each of the three monitoring components (i.e. accountability, learning and trust-building).

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Weaknesses	Risks for the main components of the monitoring system
Lack of administrative capacity of public managing authority (skills etc.)	Accountability (A): difficulty to design reliable financial and achievement indicators Learning (L): weak learning from outcomes coming from monitoring mechanisms and problems to adapt or reorient the strategy Trust-building (T): low trust from outside due to weak communication and lack of reliability
Inappropriate institutional arrangements	A: no impact L: possible adaptation of the institutional setting T: low trust due to difficulties to reach stakeholders with inappropriate institutional settings
Low degree of regional autonomy (with no control of EU funding)	A: no impact (the financial monitoring can be done from national or regional level) L: weak signals are more challenging to capture; the steering of the strategy is less agile due to a longer or more complex decision chain T: weak relation/communication with stakeholders. Organisations/bodies in charge can be distant from beneficiaries or without any power of decision
Low quality of government (corresponding to a lack of trust in public institutions)	A: no significant impact for the monitoring of funding but possible difficulties with the monitoring of achievements due to lack of capabilities/capacities L: low learning capabilities due to a lack of skilled people in charge of the implementation of the strategy T: weak relation/communication with stakeholders due to a lack of trust of the business sector and civil society towards public authorities

Table 6 Factors intervening in the design and implementation of S3 strategies and the associated risks.
Source: own elaboration.

In its empirical part, this analysis seeks to bridge the gap between theory and practice by analysing monitoring systems for territorial innovation strategies. Through a survey addressed to policymakers in charge of the implementation of S3 in EU regions, the proposed theoretical framework is confronted with the practical implementation of monitoring mechanisms in various regional contexts. Therefore, the analysis aims to better interpret how policymakers understand the logic of intervention of smart specialisation strategies and how the logic of intervention is reflected in the monitoring mechanisms.

3 Methodology

While the two first chapters presented the theoretical background of this thesis, this chapter focuses on the methodological approaches adopted for the two analyses that constitute it. Both studies followed empirical methods to address their respective research questions, namely:

(1) A case study approach to analyse institutional arrangements underpinning place-based innovation policies and smart specialisation design and implementation.

(2) A survey approach to investigate how policymakers understand the logic of intervention of smart specialisation strategy and to what extent it is reflected in the design of monitoring mechanisms.

3.1 Case study approach on place-based policy governance

The research question associated with the first analysis relates to the governance framework of place-based innovation policies tackling the institutional arrangements behind the design and implementation of these policies and smart specialisations through the creation of regional innovation agencies. This section defines first the methodological approach employed and then describes in more detail the four case studies that fed into this research.

3.1.1 Methodology and overview of the investigated cases

The methodology employed for the first analysis is based on a case study approach. The data gathered (both primary and secondary) is utilized to develop new hypotheses and insights that can be used to guide changes in practices, programmes and policies. A case study can be defined as "an empirical inquiry that investigates a contemporary phenomenon (the case) in depth and within its real-world context" (Yin, 2014). The case study approach allows in-depth, refined explorations of complex issues in their real contexts.

To obtain a clear picture of the role of the regional innovation agency (RIA), it was deliberately decided to select three very different regional innovation systems with different governance frameworks that are regarded as unique institutional arrangements in their respective countries and that international bodies, such as the EU and the OECD (2011), and academic literature have highlighted as good practices in terms of innovation governance systems (Gomez Uranga and Etxebarria, 2005; Maclean, 2015; Plaza and Haarish, 2015; Huang, 2015; Morgan, 2016).

The four regional innovation agencies selected for the case studies are:

- (1) the Brainport Development agency established in the Brainport region of the Netherlands;

- (2) the Innobasque and (2') SPRI (Sociedad para la Promoción y Reconversión Industrial) established in the Basque Country (Spain); and

- (3) Ruta N based in the city of Medellín, Colombia.

Concerning the Basque case studies, it is worth mentioning that the Basque Business Development Agency (SPRI) is included as this public organization complements the Innobasque in analysing the design and implementation of place-based innovation policies. Ruta N, which is outside the EU, was selected because it is a unique case of a regional innovation agency in Latin America that has received public funding and knowledge from international experts to structure its role in its Regional Innovation System (RIS) (OECD, 2011) and therefore of interest for comparison with European equivalents.

The investigations conducted for this analysis are based on three information sources: semi-structured interviews, documents and non-participant observations. At the first stage, preliminary desk research was carried out to understand the regional context and determine the necessary information to collect on site and prepare face-to-face interviews with key stakeholders who have direct experience with the agencies studied. The documents collected are mainly academic publications, newspaper articles, websites, and management reports for regional innovation agencies.

A total of 31 face-to-face interviews were conducted and were distributed as follows:

- 7 interviews conducted between February and March 2018 at Brainport Development;

- 10 interviews conducted between April and May 2018 at Innobasque and SPRI; and

- 14 interviews conducted in July 2017 at Ruta N Medellín.

The case studies consisted of producing findings based on the analysis of institutional mechanisms supporting the design and the implementation of place-based innovation policies.

A decision was taken to explore only the institutional mechanisms centred on the regional innovation system and voluntarily ignore the multilevel governance perspective at the national level. Significant amount of information and findings were analysed through pattern recognition "to see patterns in seemingly random information" (Boyatzis, 1998:7). The strengths and weaknesses of each RIA were explored and analysed to provide recommendations for policymakers. Case studies are validated with persistent observation

and triangulation to ensure that "the right information and interpretations have been obtained" (Stake, 2013: 36) and using multiple sources of evidence to reach converging lines of research (Eisenhardt, 1989).

Each RIA and RIS is described and analysed in such a way as to let the reader decide on the relevance and feasibility of the transferability of the regional governance structures and their respective institutional arrangements.

Each case study is broken down into three parts comprising:

1. the description of the regional and historical context (summarized in Table 6 in this section);

2. the description of the RIA and its range of action (summarized in Table 7 in Chapter 4); and

3. the analysis and interpretation of the institutional arrangement, namely the role of the RIA in its RIS (presented in Chapter 4).

Regarding the description of the regional context of the RIA analysed, it is worth noting that the three regions are comparable in terms of political and economic position in their respective countries. They are not capital regions, the population is relatively wealthier than the average population, and the three regions have designed place-based innovation strategies and operational regional innovation systems (see Table 7). The following sections present other characteristics linked to the governance of the RISs and RIAs investigated.

RIA	(1) Brainport Development	(2) Innobasque	(2') SPRI	(3) Ruta N
Country	The Netherlands	Spain		Colombia
Region	Noord-Brabant (Eindhoven)	Basque country		Aburrá Valley (Medellín)
Administrative division	21 districts	3 provinces		11 municipalities
Economic Specialisation	Health, food security, energy, green transport, green technologies[26]	Manufacturing, machinery shipbuilding, and iron and steel industry		ICT, food biotech, energy (production and distribution) ad energy efficiency, ICT, agroindustry and advanced materials industry[27]
# Inhab. region	756,615	2,175,819		3,777,009
GDP per capita region	€49,297 (2018)	€32,621 (2018)		US$7,569 (2018)
# Inhab. country	16,979,120	47,350,000		50,880,000
GDP per capita country	€41,258 (2018)	€23,970 (2018)		US$4,201 (2018)
Geographical divide	Low	Low		High
Regional innovation performance	Innovation leader	Strong innovator		Knowledge periphery (innovation follower)
Quality of governance	Good (region)	Good (region)		Average-Low (country)
Level of regional autonomy	Limited autonomy	High autonomy		Substantial autonomy
Typology of regions in structural change	International leading high-tech regions: R&D intensity above the national average, modern technological base, complete ecosystem, core region	Metropolitan regions with systemic weaknesses: R&D intensity above the national average, modern technological base, fragmented ecosystems & systems gaps, core region		Metropolitan regions with systemic weaknesses: R&D intensity above the national average, modern technological base, fragmented ecosystems & systems gaps, core region
Regional innovation system (RIS)	Specialized and organizationally thick	Specialized and organizationally thick		Specialized and organizationally thick
RIS' main weakness	Low diversification	Institutional complexity due to organizational thickness		Remoteness from the knowledge core

Table 7 Overview of the characteristics of the regional innovation systems (RISs). Source: own elaboration.

3.1.2 Presentation of case study one: Brainport Development agency, Brainport Eindhoven region, the Netherlands

The territory of Brainport Eindhoven is part of the South Netherlands, which is made up of three provinces: Limburg, Brabant, and Zeeland. The Brainport Eindhoven region is one of Brabant province's four subregions. Brainport Eindhoven is the result of a collaboration involving 21 municipalities in the Eindhoven metropolitan area, businesses and academic institutions. The Brainport Eindhoven region has a population of 756,615 people and a GDP per capita of €49,297, which is much higher than the national GDP of €41,258. (CBS, 2018).

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[26] RIS3 Zuid - Research and Innovation Strategy for Smart Specialisation for Zuid-Nederland - the region compromising Noord-Brabant, Limburg and Zeeland (the South Netherlands).
[27] Economic specialisation for Antioquia region.

The region is also the Netherlands' principal technology cluster, with one of the strongest growth rates (5.6% in 2017 vs. 2.9% nationally).
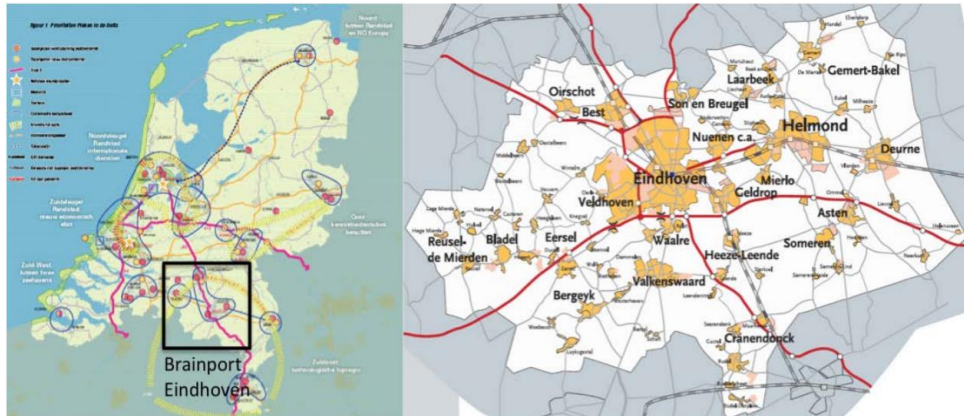
Figure 18. Map of Eindhoven city-region.
Source: based on Dutch Ministry of Economic Affairs 2004; Brainport Foundation NV 2009.

The region is characterized by the high-tech and manufacturing industries. Six companies in the Brainport Eindhoven region are in the Top 30 Business R&D 2019 of the Technische Weekblad[28], a list of the 30 Dutch companies that spend the most on R&D. These are the companies ASML (no. 1), Philips (no. 2), NXP (no. 5), DAF (no. 7), VDL (no. 9), DEMCON (no. 18) and Neways (no. 29). In 2016, the Brainport Eindhoven business community spent more than €1.9 billion on its own R&D. As a result, the business community in Brainport Eindhoven accounts for more than a fifth of total private R&D expenditure in the Netherlands. The economic development has been mainly influenced by Philips, the largest employer in the region, and ASML, a spin-off of Philips (Stam et al., 2016). With €31.9 billion in 2018, it is the third largest export region in the Netherlands, after Rotterdam and Amsterdam. The Brainport area was formally designated a "major port" in November 2016, allowing it to access state financing for infrastructure development alongside Schiphol Airport and the Port of Rotterdam. With 7,222 patents filed between 2011 and 2015, the Brainport Eindhoven region ranked 18th in the world, after Chicago but before Shanghai, with Philips Electronics accounting for 84.9% of patents filed (Bergquist et al., 2017). Brainport Eindhoven experienced an economic crisis in the 1990s as a result of the Philips reorganization and the bankruptcy of the truck manufacturing company DAF (acquired in 1996 by the American company Paccar). During the crisis, the Eindhoven municipality, the University of Technology, a few industrial enterprises, and the Chamber of Commerce began to work together to promote regional economic growth and strengthen the industrial and innovation foundation (Horlings, 2014). This "triple-helix arrangement" allowed for the

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[28] https://www.rankingthebrands.com/The-Brand-Rankings.aspx?rankingID=300&year=1314

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development of technological infrastructures and new institutional arrangements, which culminated in the establishment of a technology park (the Eindhoven High-Tech Campus), an innovation district (the Strijp S), and Brainport Development, a regional innovation and investment promotion agency.

3.1.3 Presentation of case study two: Innobasque and SPRI group, Basque Country, Spain

The Basque Business Development Agency (SPRI group) and Innobasque are the regional innovation governance structures that emerged to transform the Basque Country's economy structurally. When analysing the institutional arrangements of innovation policy in the Basque Country, it is challenging to consider one without the other. The SPRI group was founded in 1979 by the region's first autonomous regional administration in order to preserve the region's industrial legacy. Innobasque, on the other hand, was established later in 2007 as a result of a collaboration between the corporate and public sectors. During a time of globalization and digital revolution, the goal was to strengthen the region's innovation potential. It is important to mention that Innobasque is a private organisation that is funded by the public sector.

The Basque Autonomous Community (Comunidad Autónoma del País Vasco) is located in north-western Spain. The name "Basque Country," on the other hand, has greater historical and cultural importance than the existing administrative limits. The Basque Country shares boundaries with the southwest of France as well as numerous other Spanish areas. The territory, which spans 7,234 km², is divided into three administrative provinces: Alava, Biscay, and Gipuzkoa. Spanish and Basque are the official languages. The Basque Country's population was 2,189,584 in 2018, and its most populous metropolitan area is Bilbao, which has a population of 351,629 inhabitants (Eusta, 2018). The Basque Country has long been one of Spain's most significant industrial centres, with a strong economic focus on the iron and steel sector, shipbuilding and machinery production (Aranguren et al., 2012). General Franco's death in 1975 triggered structural, economic and institutional changes. The 1978 Spanish Constitution resulted in institutional changes that gave the Basque Country autonomy through the 1979 Devolution Act (Moso and Olazaran, 2002). The first regional Basque government was constituted ex nihilo in 1980, mostly with people from the commercial sector (Aranguren et al., 2012). At the same time, the abrupt end of protectionist policies and the opening up of the Spanish economy triggered a serious industrial crisis, resulting in widespread unemployment and social unrest. The terrorist actions of the separatist movement Euskadi Ta Askatasuna (ETA) exacerbated the difficult situation (Gómez Uranga and Etxebarria, 2000).

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The first Basque administration established specific industrial strategies to facilitate the "First Great Transformation" of the Basque economy. The Basque government has been promoting the "Second Great Transformation" of the Basque economy since 2006 in order to improve Basque enterprises' innovation capabilities and competitiveness.

In 2016, the Basque Country was the second most prosperous region in Spain, behind Madrid, with a GDP per capita of €32,620, compared to €23,970 for the rest of the country (INE, 2017; Eusta, 2018). The Basque Country is placed first in Spain and in southern Europe on the European Regional Innovation Scoreboard (see Section 2.1.1.4: 35), which is the most essential indicator for the government to assess the performance of its innovation policies (European Commission, 2017b). Due to its industrial development and urban transition, the area is considered a best-practice model (OECD, 2011; Plaza and Haarich, 2015). However, the region's innovation indices, such as R&D spending as a proportion of GDP and patent applications, had fallen by 2012. (Eusta, 2018; OEPM, 2018).

3.1.4 Presentation of case study three: Ruta N, Medellín, Colombia

The city of Medellín, Colombia's second-largest city, is located in the Aburrá Valley in the Antioquia province. The Aburrá Valley spans 7,234 km² and comprises 11 municipalities. In 2015, the city of Medellín had 2,464,322 inhabitants, while the Aburrá Valley had 3,777,009 (City of Medellín, 2018). Medellín's GDP per capita was much greater than the national average in the same year, at US$7,569 versus $4,201 for Colombia (City of Medellín, 2018; Dane Geih, 2018). The city, which had been Colombia's economic powerhouse and among the Latin America's greatest industrial centres in the 1970s (Argáez, 2016), suffered a significant structural collapse, leading to the city's development as "a cocaine production and distribution hub" (Maclean, 2015). The city embarked on structural reforms in social urbanism, infrastructure development, and programmes to promote innovation, entrepreneurship and education with the election of mayors Sergio Fajardo (2004–2007), Alonso Salazar (2008–2011) and Anibal Correa (2012–2015), all of whom benefited from a broad coalition that included the middle class and the local business elite. As a result of these measures, income disparities and poverty rates decreased significantly (Maclean, 2014). Medellín is in the process of shifting from an industrial city to a knowledge-based and service-oriented economy. Manufacturing employment fell by 29.42% between 2001 and 2017, whereas employment in real estate, construction and commercial activities increased significantly (Dane Geih, 2018). During the same time period, Medellín also outperformed Bogotá and Cali, Colombia's two other main cities, in indicators associated with science and innovation, such as R&D intensity (as a percentage of regional GDP) and the number of

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patents and trademarks registered (OCyT, 2018; SIC, 2018). In 2016, the department of Antioquia registered 124 patents, compared to 6 in 2001 (SIC, 2018).

Figure 19. Colombian map and the location of Medellín.
Source: own elaboration.

3.2 Survey on the perception of the monitoring of the Smart Specialisation Strategies (S3)

The second empirical analysis associated with this thesis relates to monitoring smart specialisation strategies as an expression of a new form of place-based innovation policy. A survey was conducted by the S3 platform of the JRC to capture the diverse aspects of monitoring activities and to assess the gap between theory and practice in distinct regional contexts. The goal of the research was to gather and analyse the opinions of national and regional policymakers in charge of S3 strategies. Gianelle and Kleibrink (2015) argued that monitoring is the twin component of evaluation in a policy cycle. This component is too often neglected and viewed as a mandatory and thankless task in implementing any policy or strategy. This section provides first a description of the survey and an introductory analysis of the information collected.

3.2.1 Objective and main characteristics of the survey

Based on the theoretical conceptualization of the monitoring activity presented in Chapter 2, a survey targeting European regional and national policymakers involved in S3 was designed. The survey comprised the following set of 13 questions broken down into six dimensions[29]:

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[29] see the complete questionnaire with all the proposed statements in Appendix 3: Survey on S3 implementation and monitoring

(i) The level of development of the monitoring system:

- What is the current level of development of the S3 monitoring mechanism in your region? [closed list of possible responses]
- Who has been contributing most to the definition of the regional S3 monitoring? [closed list of possible responses and multiple choices allowed]
- Which body has the main responsibility for the regional S3 monitoring? [closed list of possible responses]

(ii) The main functions fulfilled by monitoring:

- Public authorities were asked to select a limited number of priorities for investment in research and innovation. Which of the following statements best describe the nature of priorities in the regional S3? [closed list of possible responses and multiple choices allowed]
- The S3 typically aims to achieve changes in innovation and socio-economic systems. Which of the following statements best describes how expected changes relate to the different elements of the regional S3? [closed list of possible responses and multiple choices allowed]
- Result indicators are based on variables that quantify specific aspects of desired results. Which of the following statements best describes how result indicators relate to the different elements of the regional S3? [closed list of possible responses and multiple choices allowed]

(iii) The channels for disseminating monitoring results:

- How will the regional S3 monitoring data be disseminated? [closed list of possible responses and multiple choices allowed]
- Who will have the main responsibility for the follow-up of the results of regional S3 monitoring? [closed list of possible responses and multiple choices allowed]

(iv) The presence of and relationships among the S3 conceptual building blocks:

- Which of the following elements are part of the current regional S3 and have NOT been part of previous strategy documents? [open text]
  - *Expected changes in the economic and social environment (increase of GDP, decrease of unemployment in S3 areas, etc.) Please list any newly introduced measures.*

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- *Output indicators directly linked to strategy implementation (number of information events, newsletters, organisations contacted, etc.) Please list any newly introduced indicators.*

- *Result indicators directly linked to strategy implementation. Please list any newly introduced indicators.*

- *Result indicators having a broader scope and NOT directly linked to strategy implementation. Please list any newly introduced indicators.*

   o   Please state how much you think the following monitoring functions are important for the regional S3 [Likert scale].

(v)   The sources of information and methodologies employed to monitor the S3:

   o   Which of the following sources and methodologies will the regional S3 monitoring employ? [closed list of possible responses and multiple choices allowed]

   o   What kind of S3 Platform activities would be most helpful for developing and implementing the regional S3 monitoring? [closed list of possible responses and multiple choices allowed]

(vi)   The degree of stakeholder involvement:

   o   Please state how much you think the following functions of stakeholders are important for the monitoring and development of the regional S3 [Likert scale].

3.2.2   Origin and typology of responses

The survey was conducted via an online questionnaire and was open in May and June 2015. The survey targeted 436 policymakers registered in the online S3 platform hosted and managed by the European Commission's Joint Research Centre[30]. A total of 96 complete responses were finally received, 80 from regional policymakers representing 68 regions, and 16 from national policymakers representing 12 European countries. This corresponds to a total response rate of 22%, which could be considered low but expected for this type of survey. EU Member States are well represented (23 of the 28 EU Member States). Croatia, Cyprus, Latvia, Luxembourg and Ireland are not in the sample. The countries with the most observations are logically the most decentralized, with many regions implementing S3 strategies: 14 responses came from Italy, 10 from Poland and 9 from Spain. The control of

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[30] The S3 Platform provides advice to EU countries and regions for the design and implementation of their Smart Specialisation Strategy (S3). https://s3platform.jrc.ec.europa.eu/home

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the selection bias was done with the comparison of the extent to which the group of respondents differs from the overall population of cases between the categories defined by the European Union cohesion policy[31] (less developed, transition and more developed regions).

As shown in Table 8; the survey distribution of the regional origin of respondents correlates to the distribution of regions in Europe in terms of GDP per capita. More developed regions are somewhat over-represented among respondents, while the opposite can be observed about transition regions. The response bias in favour of more developed areas may be explained by their higher capacity of policymakers from these regions to connect with external institutions, reply to surveys, and offer information, i.e. their greater administrative capacity should make them more likely to react.

	"Less developed regions" (%)	*"Transition regions" (%)*	*"More developed regions" (%)*	*Total (%)*
% of NUTS level 2 regions in sample of survey respondents	*23.4*	*10.9*	*65.6*	*100*
% of all NUTS level 2 regions	*25.9*	*18.4*	*55*	*100*

Table 8 Comparison of respondents' regional origin with all NUTS level 2 regions by GDP level.
Source: adapted from Kleibrink et al. (2016).

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[31] For the financing period 2014-2020, the European Commission divides regions into three categories: more developed regions (GDP per capita >90% of EU average), transition areas (GDP per capita between 75% and 90% of EU average), and less developed regions (GDP per capita less than 75% of EU average).

4 Results and discussion

This chapter is structured into three main sections. The two first sections present, on the one hand, the results of the case studies on RIAs and institutional arrangements, and, on the other, the results of the survey addressed to European policymakers on the monitoring of smart specialisation strategy. A final discussion section proposes some cross-cutting concluding remarks.

4.1 Results of the RIA case studies

This section describes the four regional innovation agencies (RIA) established in three distinct geographical areas presented in the previous chapter (section 3.1) and their range of action. The section proposes an analysis of each RIA based on the institutional arrangements implemented.

4.1.1 Brainport Development, Brainport region, the Netherlands

4.1.1.1 Description of the RIA and its range of action

Brainport Development is a regional development agency that aims to improve the international competitive position of the Brainport region and increase its prosperity and wellbeing. The agency was founded in 2005 as a result of a triple-helix initiative involving the local government, the private sector (e.g. Philips) and academic institutions (e.g. University of Technology of Eindhoven) (Horlings, 2014; Stam et al., 2016). As a regional development agency, Brainport Development's mission is to develop the strategic economic infrastructure of the Eindhoven region. As shown by Figure 20, the agency has two types of "shareholders". One shareholder is the Brainport Foundation, which acts as an executive organization. Brainport Foundation determines the strategy of the RIA, appoints a supervisory committee board through the representatives of the three sectors forming a triple-helix platform (i.e. business sector, knowledge institutes and government). The triple helix includes the executive committee of the regional council (SRE), the mayors of municipal shareholders, the presidents of research institutes, and CEOs of high-tech firms and chairpersons of local business associations, such as East Brabant Chamber of Commerce or employers' associations. The other type of shareholders only comes from regional and local governments. It includes the regional council (SRE), the Eindhoven municipality, the Helmond municipality and the Veldhoven municipality.

Multiple triple-helix arrangements are used to design and implement place-based programmes. The multiple helix arrangement means that, in a first arrangement, the board of businesses and knowledge institutes (involving the deans of universities, CEOs of private

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companies, and the council of local governments) decides which strategic priorities to adopt. A second triple-helix arrangement is made up of upper management, university academics, Brainport Development staff, and government officials. The programmes are evaluated using a third triple-helix configuration. The implementation of place-based programming in the RIS is coordinated with local actors.
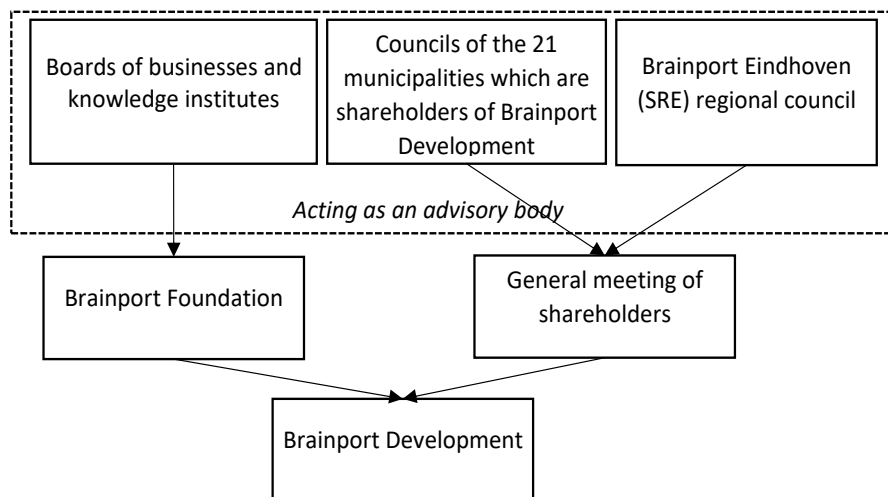
Figure 20. Governance and institutional arrangements of Brainport organisations.
Source: adapted from Huang (2015).

After a period of regional structural crisis, Brainport Development was created by institutional leadership and proximity between the political, economic and academic worlds to generate innovation dynamics and a more aggressive approach to innovation in the region. By attracting international companies and skilled people, as well as supporting the creation of start-ups, the region hoped to diversify its technology base. To achieve this objective, the agency seeks to foster technological innovation to keep the Brainport region one of the world's top technology hubs with the combination of innovation activities and investment promotion. Since its founding in 2005, it has been particularly engaged in assisting start-ups and entrepreneurs, recruiting human capital and foreign direct investment (FDI), and upgrading human capital. Brainport Development can count on around €10 million per year, but it may vary according to stakeholders' decisions. Half of the funding came from the 21 municipalities, with the other half coming from the federal and provincial governments, private enterprises, the European Union, and self-generated money (Brainport, 2018). Brainport Development has five working areas that may be characterized as follows: people, business, international, technology and basics.

- The "People" working area seeks to encourage investment in human capital in order to satisfy the needs of new employers. Brainport Development tackles certain

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labour mismatches induced by fast technological innovation, lowers skill shortages in high-demand occupations, and promotes lifelong learning and science and technology abilities for students.

- The "Business" working area strives to help start-ups and small and medium-sized enterprises (SMEs) develop more quickly than the worldwide and national standards by offering funds, methodology and necessary contacts.
- The "International" working area aims to bring international businesses and workers to the Brainport region.
- The "Technology" working area aims to promote R&D activities and to keep track of emerging technologies and opportunities for businesses in the Brainport region.
- The "Basics" work area supports regional infrastructure and facilities that are sponsored by the national government and the European Union. Additionally, the agency is proactive in addressing critical societal concerns that stakeholders face in certain areas that require collaboration across a range of actors, such as energy, health, transportation and agri-food (Stam et al., 2016; Brainport, 2018).

Working areas	People, business, international, technology and basics
Legal type	Public limited company[32] (NV)
Human Resources (in full-time equivalent)	94
Annual budget	€8.3 million (2018)
RIA's "shareholders"	Triple helix
RIA's institutional arrangement	Multiple triple helix
RIA's main objective	Promote new innovation dynamics
RIA's place-based programmes to promote	Economic diversification

Table 9 Overview of the characteristics of the Brainport Development RIA.
Source: adapted from Morisson and Doussineau (2018).

4.1.1.2   Analysis and interpretation of the institutional arrangements

Although the presence of such an agency in one of the world's most innovative regions may be questioned, it can be explained by a regional economic structure dominated by a few large corporations, mainly Philips and its spin-offs, which may pose certain economic threats to the region. To address some strategic priorities in the RIS and take advantage of new technology trends, Brainport Development has developed place-based programmes. However, an analysis of the Brainport Development agency reveals four flaws that could lead to governance failures:

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[32] A public limited company (NV) generates capital by issuing shares. The shareholders may participate in the decision-making process of the company.

1.   The risk of overlapping with an existing agency at a higher territorial level. The Brabant Development Agency already has the authority to act as the region's regional investment promotion agency. Brainport Development is a non-profit organization that focuses on specific technologies and countries. However, this raises questions about the scope and role of the "international" department, given the existence of similar activities in the region.

2.   Internal evaluations are lacking. The monitoring results are used by Brainport Development to conduct macro-trends evaluations (Brainport, 2018). At the programme and agency levels, more systematic evaluations and set indicators are required.

3.   A civil society component is missing in governance. There are no programmes in place to help municipalities and other public organizations to build institutional capacity. To design and implement place-based policies, Brainport Development should consider becoming more proactive in involving civil society and moving toward quadruple-helix institutional arrangements.

4.   The risk of an unbalanced territorial representativity. The municipalities that contribute additional funding can be the shareholders of Brainport Development, so the degree of the Brainport organizations' accountability toward the municipal councils differs from municipality to municipality. This could create an unbalanced situation and create a geographical divide among municipalities.

4.1.2 Innobasque and SPRI group, Basque Country, Spain

4.1.2.1   Description of the RIA and its range of action

A more systematic approach to entrepreneurial discovery, combined with changes in governance and institutions, has been a key novelty for Basque innovation governance (including various mechanisms to strengthen inter-institutional governance across different levels of government administration). One of the Basque Country's unique strengths has been identified as the institutional plurality embedded in a private-public collaboration scheme. (OECD, 2011). The Basque innovation strategy is represented by the "S3 governance house" in Figure 21.

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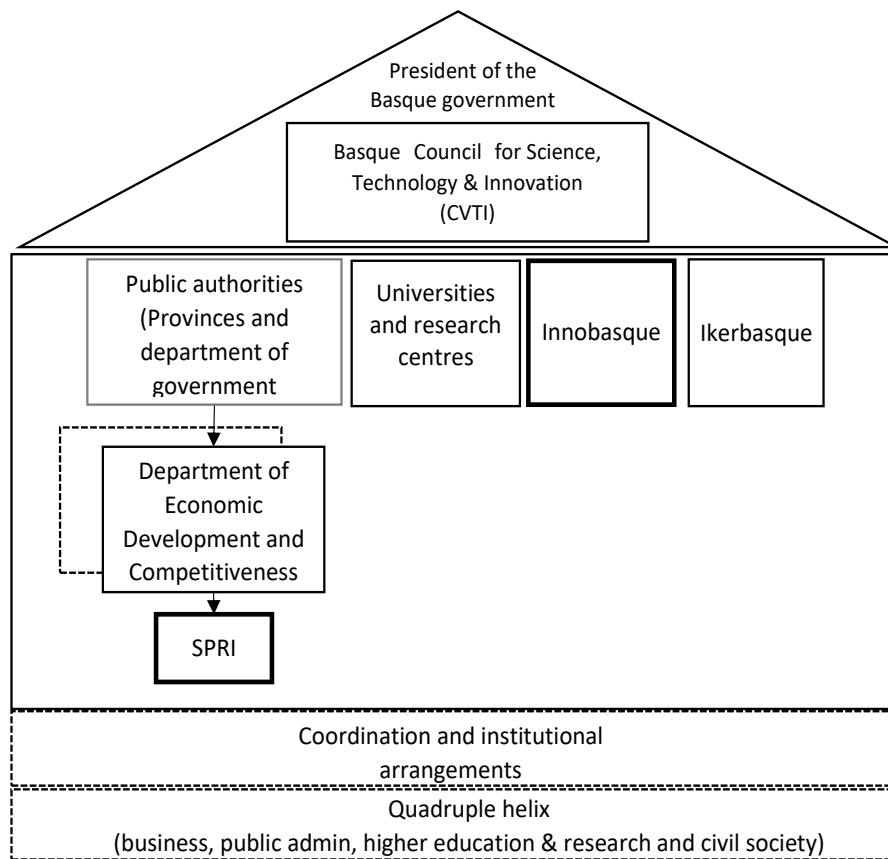
Figure 21. Governance of the Basque innovation system.
Source: adapted from the Basque S3 strategy document.

4.1.2.1.1   The Basque Business Development Agency (SPRI group)

The establishment of new organisations and institutional arrangements is central to the Basque "great transformation". The Basque Business Development Agency (SPRI) was established in 1981 by the Basque Government to aid the region's economic transformation (Gómez Uranga and Etxebarria, 2000). Since its founding, SPRI's role has moved from focusing on industrial restructuring to delivering innovation-related policies and increasing industrial competitiveness. The agency is totally supported by the regional government, with a budget of €30 million and 66 full-time staff (in 2016) (Deloitte, 2017). The President of the government announced the "Second Great Transformation" in 2006 to stimulate innovative dynamics in reaction to new challenges such as globalization and digitalization. In the same year, the Basque Institute for Competitiveness (Okestra) was established to investigate solutions to support regional development and competitiveness. The Basque Foundation for Science (Ikerbasque) was established in 2007 to foster scientific research and recruit foreign researchers. SPRI's current official objective is to help, promote and

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contribute to the competitive improvement of Basque enterprises, thereby contributing to the generation of wealth in the Basque region and enhancing inhabitants' well-being. SPRI thus provides tools for companies to become more international and entrepreneurial, obtain financing, locate industrial land, apply new technologies, innovate, and carry out the processes required for Industry 4.0. Furthermore, this agency of the Basque Government is tasked with attracting and facilitating foreign investment.

Technology and innovation, business promotion, and internationalization are the three main working areas for SPRI:

- The "Technology and Innovation" working area fosters commercial innovation and strengthens the innovative capabilities of research institutions through financial mechanisms and public calls.
- The "Business Promotion" working area operates in the areas of regional strategic initiatives and clusters, entrepreneurship, investment promotion and industrial planning.
- The "Internationalization" working area supports Basque companies to open new markets abroad.

4.1.2.1.2   Innobasque, the Basque Innovation Agency

The Basque Innovation Agency, Innobasque[33], was established in 2007 as a public-private partnership with the purpose of making the Basque Country a "reference" in innovation by 2030 (Innobasque, personal communication, 23 April 2018). In 2016, the agency had 40 full-time employees and a budget of nearly €4 million, which was funded by the Basque government (70%) and European Union programmes (15%), as well as its own members (15%). The agency was established to serve as a catalyst for bringing the entire Basque society together. The group identified and coordinated 1,000 institutions (partners) from the commercial sector (73%), universities and research centres (15%), government (10%), and civil society (3%). These "partners" create working groups to address gaps in the regional innovation system, including those related to technological, social and organizational innovation, internationalization and entrepreneurship (Innobasque, 2018). In 2018, Innobasque revised its strategy to focus more on SMEs, with the goal of maintaining the region's position as an "innovation follower" on the European Regional Innovation Scoreboard (European Commission, 2018). The agency worked in three areas in 2018: prospective, innovation, and networking. These are designed to assist government agencies,

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[33] https://www.innobasque.eus

businesses, universities and civil society organizations in adopting and implementing best practices.

4.1.2.2 *Analysis and interpretation of the institutional arrangements*

The Basque Country is widely recognized as a model for best practices, as the region is top-ranked in Spain and southern Europe on the European Regional Innovation Scoreboard. However, the Basque Country has experienced a decrease in several innovation indices since 2012, raising questions about the Basque model. The administrative systems of the region are among the most densely organized in the EU (Morgan, 2016). Due to path dependence and strong political interests, the organizations have been placed one on top of the other with no significant organizational restructuring, resulting in poor innovation outcomes due to poor coordination. While the multiplicity of institutional arrangements demonstrates the regional elite's commitment to innovation, it has resulted in uncertainty and excessive institutional complexity regarding the duties and boundaries of each entity in the RIS. Combining the responsibilities of Innobasque and Ikerbasque and some of SPRI and provincial government tasks into three RIAs in each of the three Basque provinces could be one way forward.

	Innobasque	SPRI
Working areas	Technology and innovation, business promotion, and internationalization	Prospective innovation policies, public innovation, and alliances and networks
Legal type	Private non-profit[34]	Public organisation
Human Resources (in full time equivalent)	40 (2016)	66 (2017)
Annual budget	€4 million (2016)	€30 million (2017)
RIA's "shareholders"	Public-private partnership	Government
RIA's institutional arrangement	Multi-actor and multilevel	Quadruple helix
RIA's main objective	Promote industrial competitiveness	Identify and address RIS weaknesses
RIA's place-based programmes to promote	Existing industrial sector	Institutional bodies

Table 10 Overview of the characteristics of Innobasque and SPRI RIAs
Source: adapted from Morisson and Doussineau (2018).

4.1.3 Ruta N, Medellín, Colombia

4.1.3.1 *Description of the RIA and its range of action*

Ruta N[35] is a regional innovation governance structure founded in 2009 as a public-private partnership to help Medellín in transitioning from an industrial to a knowledge-based city

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[34] Private non-profit organization created with the aim of being the instrument of coordination and promotion of the Basque science, technology and innovation system.
[35] https://www.rutanmedellin.org/es/

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by implementing a "science, technology, and innovation plan" for the period 2011–21[36] Guimon et al. 2015). The private sector, represented by Proantioquia and the Grupo Empresarial Antioqueno (GEA), and the municipality of Medellín formed Ruta N through institutional proximity. The regional innovation agency has been made financially possible by the support of EPM-UNE (Empresas Públicas de Medellín)[37], a municipally-owned multi-utility company. The agency received approximately US$10 million from the city of Medellín and EPM-UNE in 2015, as well as US$2.12 million from Ruta N's own revenue, which included consulting services, building rents, international agreements, and tuition fees (Ruta N, 2016). In 2015, the agency employed 70 full-time equivalents (Ruta N, 2016) and was operating six working areas as of 2018:

- The "Knowledge Business" working area assists innovative start-ups and SMEs in gaining access to worldwide markets, finance, and skills.
- The "Medellínnovation District" promotes the development of an innovation district near the Ruta N innovation centre.
- The "Organizational Innovation" working area strives to increase innovation capability in private firms, educational institutions, and the government.
- The "Research and Development" working area strives to connect the city's STI system by promoting R&D activities in universities, research institutions, and businesses.
- The "Special Projects" working area aims to reach the widest possible audience with Ruta N's programmes.
- The "Forecasting and Planning" working area supports the development of new Ruta N programmes by incubating disruptive business models.

4.1.3.2   Analysis and interpretation of the institutional arrangements

Medellín could be described as being located on the knowledge periphery, a place that has been cut off from knowledge flows because of its isolated geographical location and history of violence. The RIA has completed the task of "addressing RIS weaknesses" observing well-performing RISs around the world, identified weaknesses and stakeholders and transferred good practices into the regional innovation system. To upgrade its innovation system, the agency has relied heavily on brokering extra-regional knowledge, which is in line with the local business elites and their internationalization strategies. Ruta N was created with the intention of strengthening existing actors in the RIS. It has created place-based programmes

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[36]https://www.rutanmedellin.org/images/programas/plan_cti/Documentos/Plan-de-CTi-de-Medellin.pdf

[37] https://www.epm.com.co/site/

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to improve regional innovation capabilities, as well as to enhance formal and informal institutions and to foster organizational innovation.

Despite the presence of triple-helix actors on its governance board, the agency has relied primarily on internal capacities to identify weaknesses and has underestimated the RIS's existing innovative capabilities because of a lack of internal competencies, poor interactions with other RIS stakeholders, and weak connections with more research-oriented institutions. Instead of focusing on its job of discovering weaknesses, developing solutions, and transferring capabilities, the RIA has seen itself as a start-up, which leads to costly and risky programmes. Ruta N needs to encourage more significant and transparent decision-making and more collaboration with RISs and civil society actors.

Working areas	Business support, organizational Innovation, research and development, "Special projects", forecasting & planning
Legal type	Public joint venture
Human Resources (in full-time equivalent)	70
Annual budget	$12.2 million (2015)
RIA's "shareholders"	Public-private partnership
RIA's institutional arrangement	Triple helix
RIA's main objective	Identify and address RIS weaknesses
RIA's place-based programmes to promote	Regional absorptive capacity

Table 11 Overview of the characteristics of the Ruta N RIA
Source: adapted from Morisson and Doussineau (2018).

4.2 Results of the analysis derived from the survey on S3 monitoring

This section provides an analysis of the results of the survey collecting field information related to the monitoring of S3. The responses are analysed according to the six blocks of questions structuring the survey (from Sections 4.2.1 to 4.2.6).

4.2.1 The state of development of the monitoring system

The survey was conducted in the middle of 2015, while the majority of the monitoring systems were still in the design and development stages. Approximately 85% of respondents answered that the monitoring method had not yet been specified or was not yet functioning (Figure 22). This had the advantage of providing very up-to-date information on current government deliberations. Surveys frequently seek information on past experiences or achievements, which can lead to a variety of biases. One disadvantage of this "snapshot" is that S3 monitoring systems are, in fact, moving targets. Interpretation of the results had to be undertaken with caution since they reflected the agenda-setting phase of what and who was important for monitoring S3 implementation at that time.

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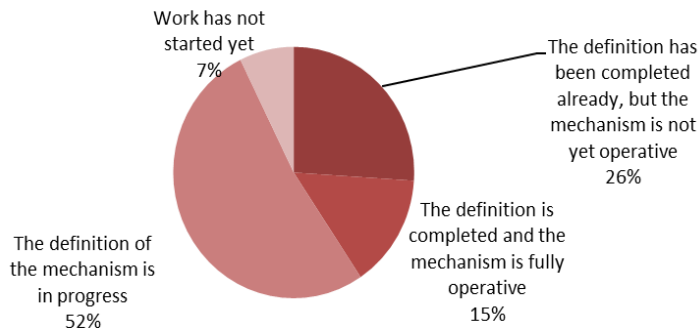
Figure 22. The state of development of the S3 monitoring system.
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

Nearly 20% of respondents at the national level claimed that the organization that principally contributed to the design of the monitoring mechanism is not the same as the organization that led the design of the whole S3 strategy (Figure 23). This observation clearly contrasts with the subnational level as the vast majority (90%) of regional policymakers replied that the same organisation would be responsible for the design of S3 and the monitoring, thus ensuring more substantial alignment and coherence. This difference between the two territorial levels can be interpreted as owing to the need for national authorities who designed the S3 to give the responsibility of monitoring to entities closer to the ecosystem.
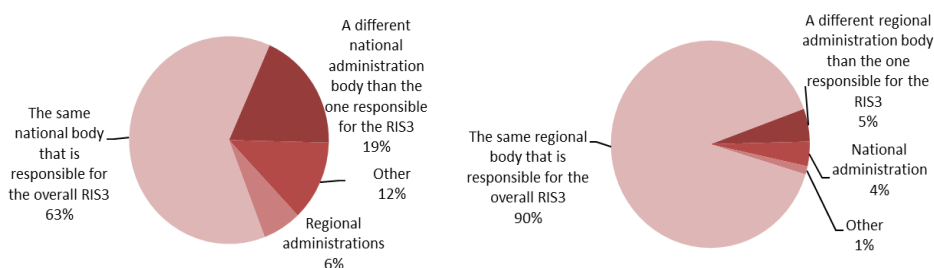
Figure 23 The organisations responsible for the monitoring.
(*Question: "Which body has the main responsibility for the S3 monitoring?" (Left side: National policymakers, Right side: Regional policymakers*)
Source: Survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

In general, regional policymakers have enrolled a broader range of stakeholders, including citizens and user groups, that are not represented at the national level. Broader inclusiveness is likely due to the closer proximity and more limited number of stakeholders in regions known to be relevant, which facilitates gathering a more significant number of organisations. Other organisations like entrepreneurs' associations and research

organisations have not been involved in the design of the mechanism at the national level, while they participated more in this process at the regional level (Figure 24).
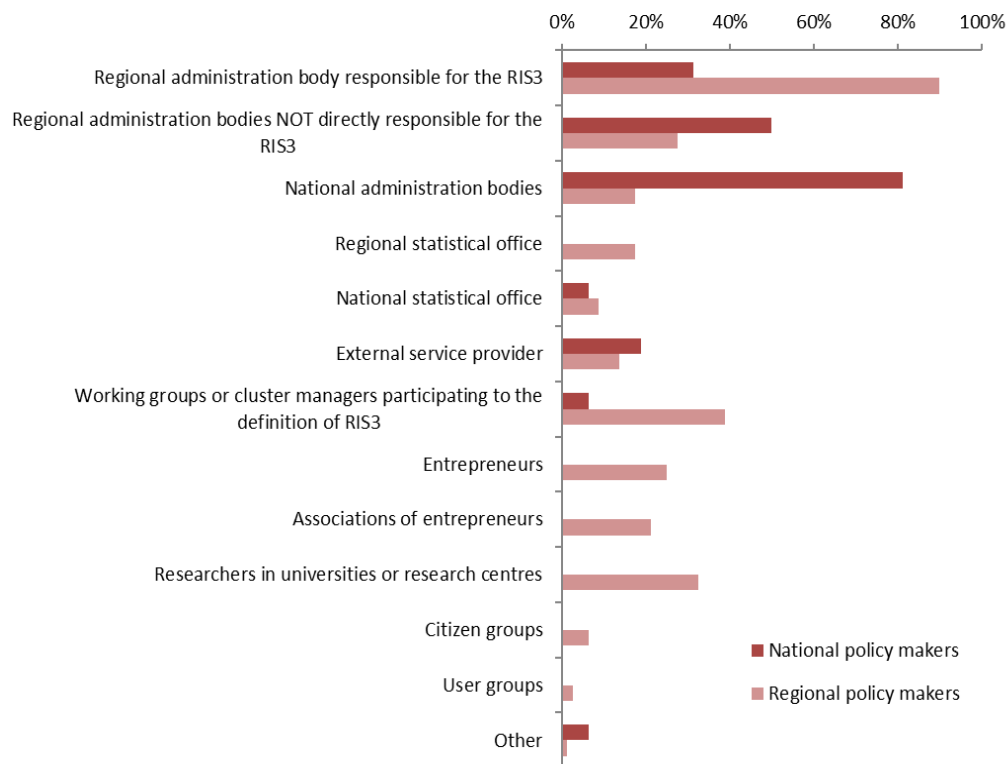
Figure 24. The participants involved in the definition of the monitoring system.
(Question: "Who has been contributing most to the definition of the S3 monitoring?" Multiple choices allowed)
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

4.2.2 The main functions fulfilled by monitoring

The design of a monitoring mechanism is highly dependent on what is to be monitored. The challenge lying behind the S3 monitoring comes from the versatility of the S3 concept and its ambition to address socio-economic problems. In practice, priority (specialisation) areas are not homogeneous. However, they should all address a market niche (technological or not) rather than an economic sector to break with the "old" type of innovation strategies (see S3 definition in Section 1.2.2:19). The survey results show that many policymakers describe the nature of priorities chosen in their respective S3 strategies as "technologies or processes" and linked with economic sectors, activities or domains not defined according to traditional industry classification. Figure 25 shows how policymakers represent their S3 strategies and reveals the difficulty of setting up a monitoring system.
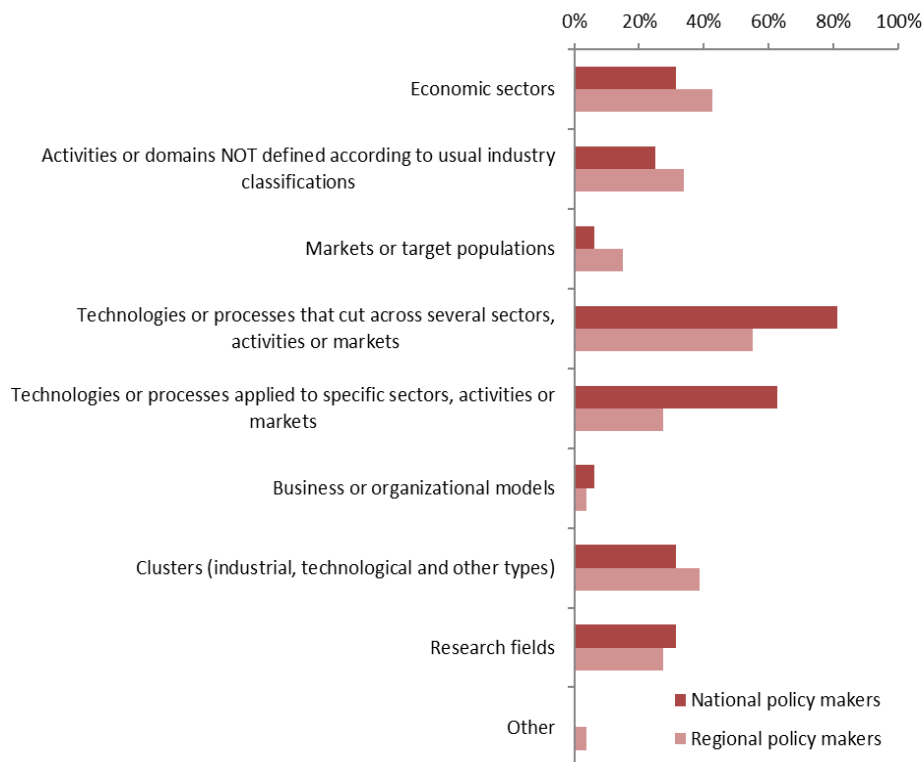
Figure 25. Selected priorities for investment in research and innovation.
(Question: "Which of the following statements best describe the nature of priorities in the S3?" Multiple choices allowed)
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

Policymakers were asked to choose the statement that "best described the relationship between anticipated changes and the S3 elements" (Figure 26). National and regional respondents show a diverging pattern. The majority of regional policymakers (63.8%) say there is a clear relationship between the strategy's expected changes and each of the S3 priorities. This result is in line with a highly priority-specific intervention logic, and also with the smart specialisation approach. National policymakers, on the other hand, only linked expected changes to general S3 goals, indicating that S3 at national level are rarely "priority-specific". Such discrepancies suggest a distinction between the objectives of national and regional S3. Strategies at national level, on the one hand, act as a global strategic framework targeting the achievement of broad socio-economic objectives, and regional strategies, on the other hand, serve as operational tools used to identify and monitor current and future specialisation areas.

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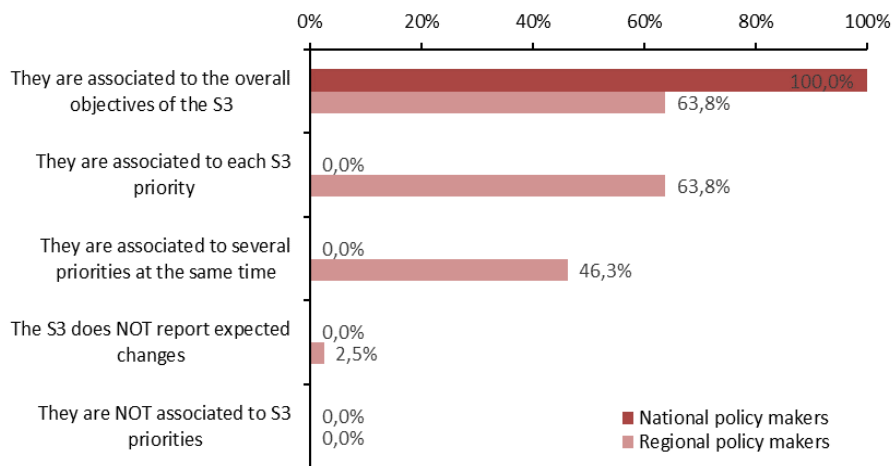
Figure 26. How the S3 typically aims to achieve changes in innovation and socio-economic systems.
(Question: "Which of the following statements best describes how expected changes relate to the different elements of the regional S3?" Multiple choices allowed)
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

When asked to identify the function of result indicators (Figure 27), regional policymakers largely agreed on the S3 intervention logic, with 60% of respondents tying result indicators to expected changes in the strategy. This response is consistent with the S3 structure's conceptualization as described in Section 2. The majority of respondents (75%) also indicated that result indicators are linked to one or a group of S3 priority areas, showing a strong commitment to a priority-specific approach.

Applying and understanding the S3 intervention logic at the national level appears to be more difficult. Only 44% of respondents related the outcome indicators to the expected change outlined in the strategy. A comparable proportion of national policymakers matched result indicators to S3 priorities; these figures were 16 and 6 percentage points higher at the regional level. A similar proportion of national and regional policymakers, around 45%, linked result indicators to expected changes and S3 priorities. Surprisingly, policymakers at the regional level are more likely to identify result indicators that are priority-specific, whereas national policymakers are more likely to define indicators across multiple priorities.

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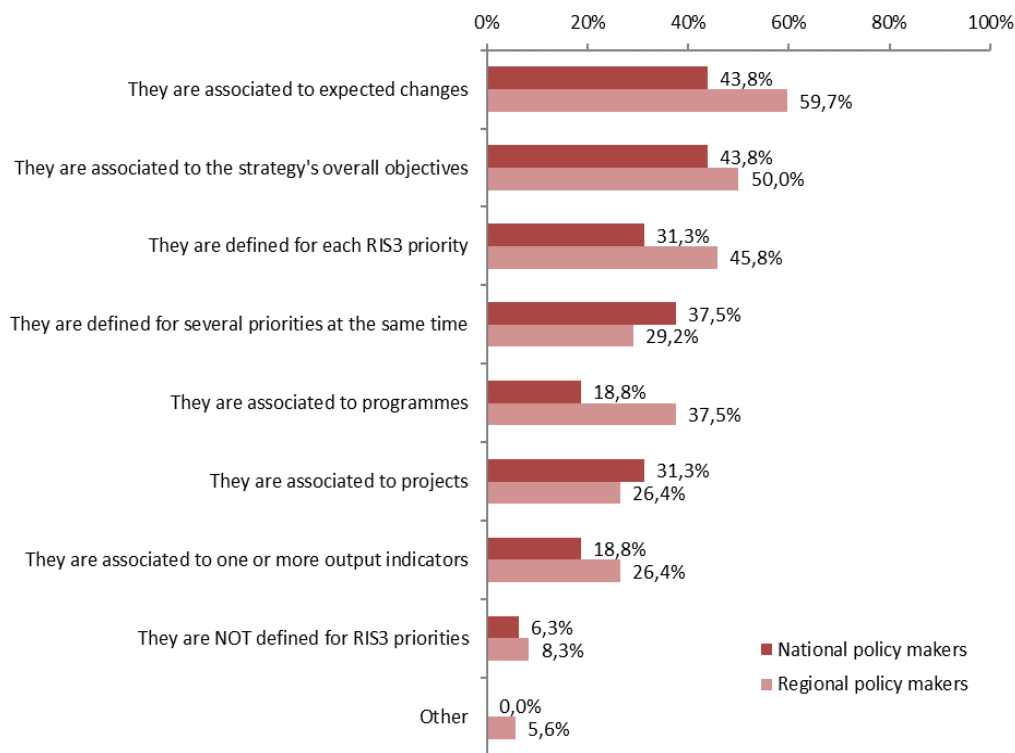
Figure 27. Perception of the S3 logic of intervention through monitoring.
(Question: "Result indicators are based on variables that quantify specific aspects of desired results. Which of the following statements best describes how result indicators relate to the different elements of the national S3?" Multiple choices allowed)
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

4.2.3 Channels for disseminating monitoring results

Information coming from monitoring is communicated through various channels. The survey results suggest that public bodies will drive the follow-up at a strategic level with much less focus on specific priority areas. The most prominent actors in this exercise are public bodies responsible for the overall innovation strategy and innovation councils with stakeholder involvement (Figure 28). Priority-specific working groups are not involved at this stage, which may limit the boundaries of policy learning. It also somewhat contradicts one of the first intentions of smart specialisation: to support specific new domains and activities and monitor their further development.

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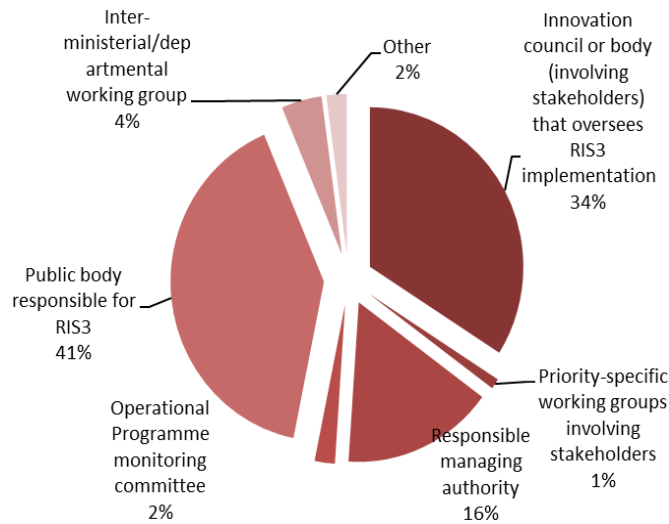
Figure 28. Responsibility for the follow-up of the results of S3 monitoring.
(Question: "Who will have the primary responsibility for the follow-up of the results of S3 monitoring?")
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

Around two third of the respondents (69% of national and 62% of regional policymakers) declared that public reporting on general findings of strategy monitoring are the main dissemination channels. The propensity for expressing broad rather than detailed findings supports policymakers' perceptions of a transversal monitoring approach; related communication does not make any differentiation between S3 priorities and is viewed as a whole (Figure 29). Internal reports, which are likely to follow a financial monitoring logic (of ERDF funding absorption), are significant at the regional level. The third most popular dissemination method is more innovative dissemination channels such as open data websites. The preference for communicating general findings as opposed to specific topics confirms officials' perception of a transversal approach to monitoring. Monitoring activities are considered globally with no distinction between S3 priorities, which may not be the best way to mobilize stakeholders on specific S3 priorities.
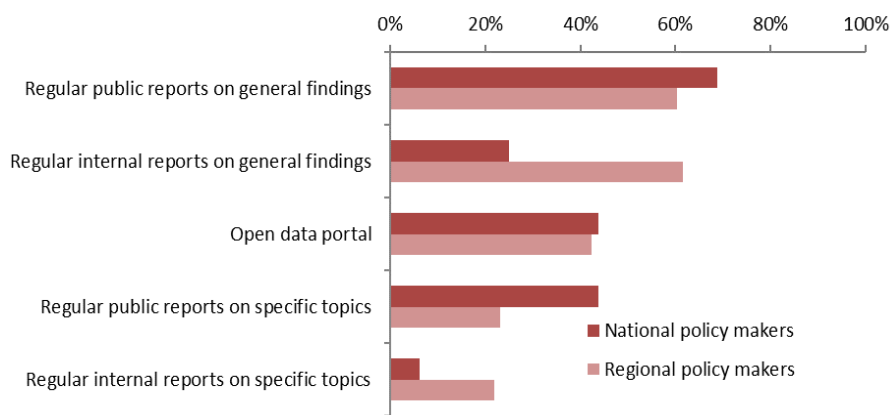
Figure 29. The dissemination of the monitoring information.
(Question: "How will the regional S3 monitoring data be disseminated?" Multiple choices allowed)
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

4.2.4 Relationships between the S3 conceptual building blocks

In the eyes of national and regional policymakers, the most important duty of monitoring is to inform policymakers about progress made. As the literature suggests, a clear change from pure financial monitoring at the programme level to a monitoring system measuring the outcome of an overall territorial innovation policy's impact on the economy and society is required. Traditional ways to monitor innovation policy, which rely mostly on existing statistics sources, may not be able to provide an actual image of the strategy execution. S3 monitoring should be used as both a management tool and a way to communicate with stakeholders. Currently, the monitoring system is viewed as a way of reaching out to stakeholders directly involved in policy execution in order to develop or reinforce confidence with public authorities, rather than as a potential external communication tool for civil society (Figure 30). When looking to the past, officials in charge of structural funds during the previous multi-annual EU financial period (2007-2013) were more concerned with the absorption of as much available funding as possible than measuring the effects on the economy and society. The challenge of an S3 monitoring system is to find a way to move beyond financial monitoring, which is required to manage the use of public funds in connecting building blocks and thus making the S3 approach original. The originality of the S3 concept should be reflected in a new approach to monitoring place-based innovation strategies.

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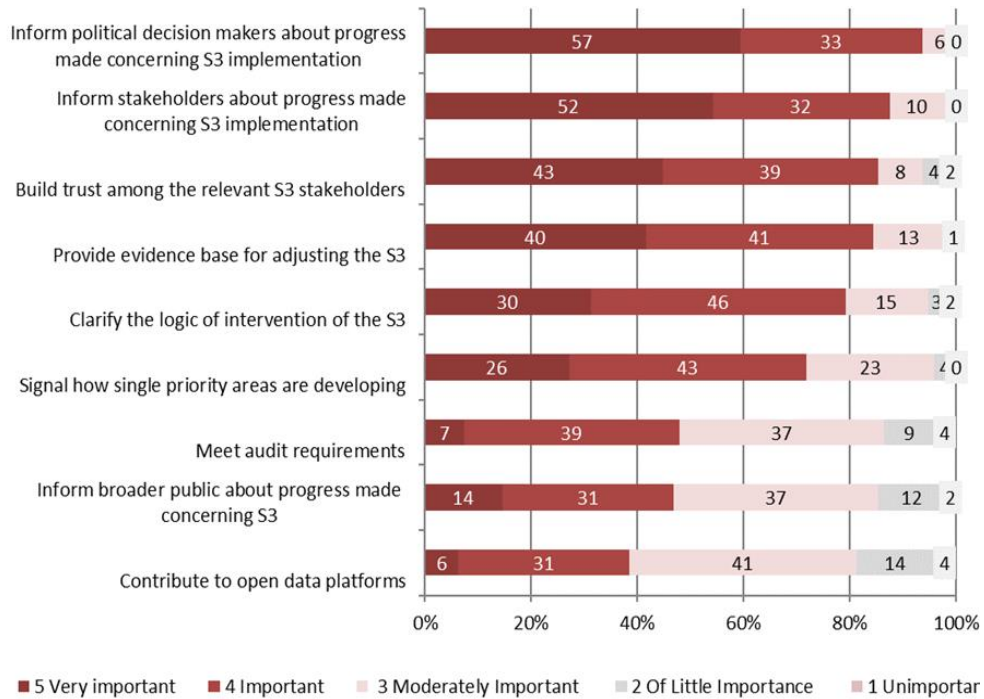
Figure 30. The perception of national and regional policymakers of the main functions fulfilled by monitoring.
(Question: "Please, state how much you think the following monitoring functions are important for the S3")
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

4.2.5 Sources of information and methodologies employed

Because S3 involves a number of programmes and funding sources at the regional, national and European levels, the challenge is to collect quantitative and qualitative data from several different sources (Figure 31). In most cases, management authorities of operational programmes at the regional and national levels are in charge of implementing and monitoring the strategy while monitoring the participation in other programmes (Horizon 2020, COSME, for instance) is done by other public bodies. The challenge for monitoring S3 strategy is then twofold: first, teams in charge of the monitoring have to overcome the "silo thinking and way of doing" in connecting with other bodies monitoring other programmes (e.g. other national and European programmes); second, regarding human resources development, the aim is to design a new monitoring approach that incorporates both quantitative and qualitative components. The management of the monitoring system requires the creation of new capabilities in order to work with a new type of indicator derived from non-traditional sources.

The survey shows that, in practice, the sources of information on which monitoring systems are based mainly come from national and regional statistical offices and Eurostat. These "official" sources have the advantage of being reliable. However, they suffer from a significant drawback: indicators often come late because they are subject to multiple verifications and are usually not regionalised but only collected at the national level. Indicators related to implementation of programmes such as the ERDF operational programme and Horizon 2020 are important as they provide the first signs of whether or not the strategy is being executed and how well it is being implemented. These indicators reflect the capacity of the ecosystem to capture funding from Horizon 2020 and support synergies with structural funds. This information, however, is likely to need to be enriched with thematic and sectoral elements that are not always covered by traditional programme indicators.

The lack of regionalized indicators is another barrier that may hinder regional S3 monitoring. This is particularly the case regarding large integrated programmes such as Horizon 2020, where only limited geographical information is provided about organisations involved in the programme. This situation may be explained by the European Commission providing data relevant to contracts signed by participants to often only a small number of state authorities. Those individuals are bound by a confidentiality agreement that can explain their unwillingness to share information from regional managing authorities with others. This explains the disparity in our survey between national and regional officials. Regionally tailored information like surveys, expert assessments and input from peer reviews are considered but to a lesser extent.

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Official data from statistical offices

Indicators from relevant Operational Programmes

Indicators and data from participation in H2020

European statistics

Survey-based data collection

Input from focus groups

Expert assessments

Data from the SWOT analysis used to select priorities

Benchmarking indicators for comparisons with other regions and countries

Input from peer reviews

Foresight

Delphi method (structured expert meetings seeking consensus)

Other

■ National policy makers
■ Regional makers

0% 20% 40% 60% 80% 100%

Figure 31. The main sources of information and data for monitoring.
(Question: "Which of the following sources and methodologies will the regional S3 monitoring employ?" Multiple choices allowed)
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

4.2.6 The contribution of stakeholders to the definition of monitoring systems

Regarding the multilevel governance and the division of responsibilities, we have evidence suggesting that the broad strategic framework was decided at the national level in many cases (Figure 32). In contrast, implementation issues like monitoring have been delegated to regional public bodies. The bottom-up approach of S3 design considers all stakeholders who may be impacted by the strategy, including public research organisations and universities, the public administration, the business sector, and non-profit entities (forming the quadruple helix). The entrepreneurial discovery process (EDP) focuses on creating economic value while also involving all possible stakeholders in the monitoring system. The type of intervention is still uncertain, but the survey shows that regional and national officials expect stakeholders to contribute to the readjustment of strategies and jointly set targets for predefined indicators.

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Interestingly, stakeholders are not supposed to contribute to the first selection of indicators substantially. This could indicate a conflict between the expectations of stakeholders to contribute significantly at each level of the monitoring process and public entities' perspectives on their involvement, particularly at the conclusion of the process. In the event that stakeholders disagree with the indicators chosen in the first place, they are unlikely to be involved to suggest target values for measuring the progress on what they believe is the incorrect indicator. A possible way out of this dead end could be to ask stakeholders to interpret quantitative information. In any case, their participation in the selection of indicators is a crucial factor in shaping stakeholder feelings of ownership in the continuous monitoring process. Thus, a lack of genuine ownership is a significant risk to the successful implementation of monitoring operations.
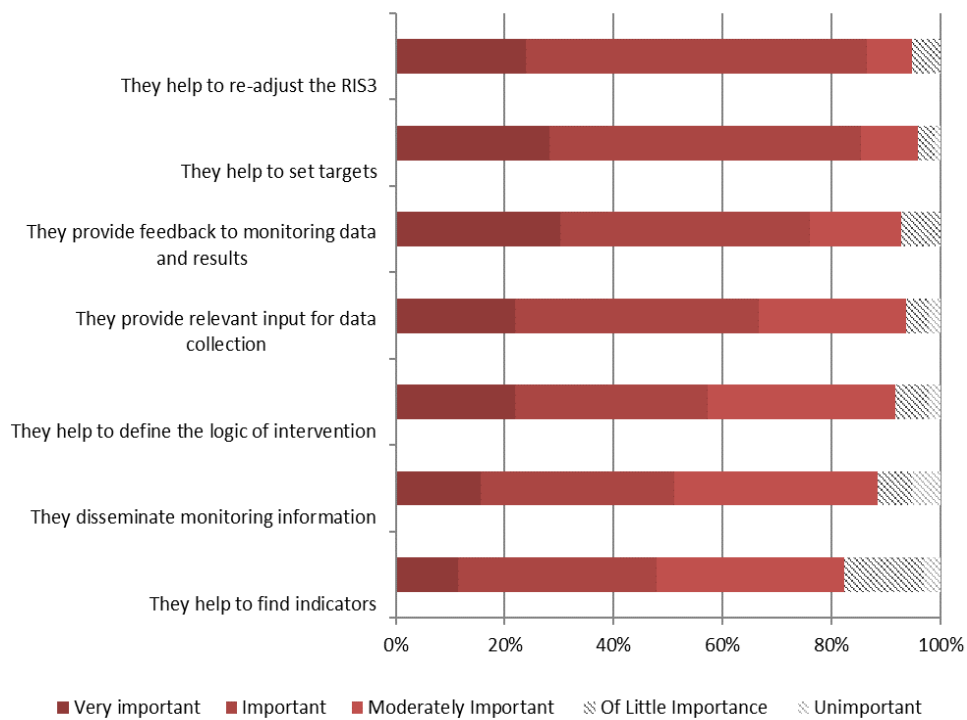
Figure 32. Perception of the role of stakeholders according to national and regional policymakers.
(Question: "Please state how much you think the following functions of stakeholders are important for the monitoring and development of the S3")
Source: survey performed by JRC-IPTS between 10/06/2015 and 30/06/2015 targeting national and regional officials in charge of the implementation of the S3 strategy.

4.3 Discussion

The Lisbon Strategy[38] was launched in March 2000 with the aim to make Europe "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion". The first generation of regional innovation strategies within the EU cohesion policy was an important element, introduced officially for the 2000-2006 programming period, to fuel this ambitious goal (as pointed out in Chapter 1). The concept of smart specialisation in EU regional policy came later, after two generations of regional innovation strategies. After years of implementation across European regions and countries, the concept has managed to win most policymakers round. However, academics and evaluators have identified challenges that stakeholders face when implementing the strategies. The European Court of Auditors and the OECD have pointed out the lack of tangible results of EU cohesion policy due to weak governance and monitoring mechanisms (European Court of Auditors, 2019; OECD, 2020). Lately, the "implementability" of a generic approach such as S3 has drawn the attention of the academic community and public authorities as promised results have not always been delivered.

The central theme of this thesis deals with the challenges related to the implementation of place-based innovation policy such as smart specialisation. The investigation focused on two interrelated topics: the governance of the strategy with the institutional arrangements setting in motion the system and the monitoring mechanisms informing policy decisions.

Typically, as shown in Chapter 1, academics advocate place-based and place-sensitive policies without offering much guidance on how to design or implement them. A reason for this lack of concrete recommendations is that such concepts are relatively recent in the history of socio-economic sciences, particularly when discussing innovation policy. However, the most important reason seems to be the diversity of regional contexts, making a "magic recipe" that works for all types of socio-economic issues impossible to provide (see Chapter 2).

In the smart specialisation framework, each region has to design its own strategy following a six-step methodology provided by the European Commission (Foray et al., 2012). Compliance with this methodology has enabled the regions to validate their strategy with the European Commission. Each strategy has to contain certain precise characteristics (ex-ante conditionalities), particularly a bottom-up approach to the choice of areas of specialisation, the presence of governance, including all stakeholders of the ecosystem, and an inclusive monitoring system. While a guide is available to policymakers to design the

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[38] https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/00100-r1.en0.htm

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strategy, no document supports its implementation. Implementing S3 is therefore a "learning by doing" process. The transfer of good practices, when identified, between regions with similar issues is supported by EU Interreg projects and the S3 platform hosted by the Joint Research Centre of the European Commission. Gianelle et al. (2019) underlined the problem of translating the S3 concept into reality with partial implementation. According to the authors, there is major evidence that regions and countries have put in place systems that may bypass the fundamental principle of the smart specialisation approach.

The analyses carried out for this thesis allow some conclusions to be drawn. Findings from the literature review and empirical research highlight the necessary adaptation of the governance and monitoring system to address the gap between a promising theoretical framework and implementation in a real and sometimes complex context. The three main conclusions are derived from the two empirical analyses presented in this chapter.

- The first conclusion is more generic and highlights the difficulty of implementing a theoretical framework in different contexts with a one-size-fits-all model. It suggests that the more territory-specific the public intervention, the more efficient it is for the strategy governance and monitoring.
- The second conclusion stresses the importance of the involvement of stakeholders in the S3 governance and monitoring mechanisms through the entrepreneurial discovery process.
- The third conclusion points out the importance of the autonomy of the governance and the quality of the institutional framework.

4.3.1 Territorial specificities matter: there is no "one-size-fits-all" approach

Several academic contributions recognise the limitations of horizontal "one-size-fits-all" policy solutions (Cappelo and Kroll, 2016; Hassink and Gong, 2018; Sotarauta, 2018). Tödtling and Trippl (2005) emphasized the importance of adapting place-based strategies to varied geographical settings long before S3 was introduced into EU cohesion policy. There is no "perfect model" for innovation strategy since innovative activities have always varied greatly between core, peripheral and historically industrial regions. Borrás and Edquist (2013) suggested criteria for selecting policy instruments to address specific challenges found in the national or regional innovation system. These contributions, among others, highlight the need for a place-based policy to embed the specificities of the territory to be fully efficient.

The expression "no one size fits all" can also be found in the literature on the implementation of the S3 concept. Any place-based strategy should consider that

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institutional arrangements and governance mechanisms are fitted to their territorial context. Many academics are still seeking a deeper grasp of the difficulties connected with putting the smart specialisation notion into practice in the "real world". The geographical contexts in which smart specialisation is applied are affected by industrial and institutional density and variety, policy capabilities, prior experience with innovative initiatives, and degree of centralization (Trippl et al., 2020). In this aspect, geography matters and place-based policies are crucial. One of smart specialisation's benefits is its capacity to adjust research and innovation policies to national, regional and local settings in a world characterised by significant variety, where one-size-fits-all policies cannot operate well (Demblans et al., 2020).

According to Giodarno and Roller (2003), the level of regional autonomy and awareness of what constitutes a geographical entity in terms of self-governance differ across nations. The authors point out that there is no single best practice in terms of regional governance, technology, or innovation policies. While the political autonomy of a territory is an intangible variable, various other factors need to be considered to shape a governance mechanism appropriate to steer a place-based innovation strategy. When focusing on the governance of place-based innovation policy, it appears that the creation of regional innovation agencies (RIAs) offers an appropriate layer in the strategy governance for facilitating the information flows in the ecosystem. Furthermore, when comparing the three different territorial contexts of the case studies presented in this thesis (one regional and two metropolitan cases), the analysis suggests that the metropolitan region is the best level of governance for the RIA. Multilevel governance in a larger area appears to be the first cause of institutional complexity and coordination failures. The evidence of the relevance of the creation of RIAs at the local level highlights the need for close and continuous interaction with stakeholders to avoid governance lockups that appear more often in overly complex governance mechanisms. However, while the metropolitan level is ideal for obvious operational reasons (geographical proximity between stakeholders), it is not the territorial level considered for the EU cohesion policy. Indeed, it seems unrealistic to design S3 strategy at the metropolitan level as most strategies already exist at NUTS level 2 (e.g. the Spanish regions) or level 1 (e.g. the German Länder) or even at the national level (e.g. most of the new EU Member States). This is why institutional arrangements must be set up vertically, on the one hand, to link with the other governance levels and horizontally, on the other hand, to bridge the different components of the RIS. Therefore, RIAs can be viewed as "one-size-fits-all" institutional arrangements for improving the RIS by establishing and supporting the execution of a tailored policy that only corresponds to their specific context (Morrison and Doussineau, 2019).

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When it comes to territorial differences, survey responses on the design and implementation of an S3 monitoring system reveal distinct territorial patterns, with regional policymakers generally complying with smart specialisation strategy conceptualization more closely. The findings suggest that the more territory-specific a strategy is, the easier it will be to implement. The region or a comparable subnational administrative partition is the most appropriate scale for implementing S3 strategies. More information on the various forms of implementation of national and regional S3 strategies are needed to better understand the distinct roles of different levels of strategic planning (Kleibrink et al., 2016). Whilst it is critical to have institutions that support one another, it is also critical to have institutions that are not in competition with one another (Sotarauta, 2018). Because associated development resources, capacities and policy instruments are spread over different governance levels (e.g. ministries, regional councils, regional innovation agencies and other organizations), governance modalities are crucial for S3 strategies (Capello and Kroll, 2016). Any smart specialisation initiative should be organized and monitored in accordance with the governance system in question. Moreover, if at all possible, the governance system should be updated to better support smart specialisation-related objectives (Sotarauta, 2018).

The S3 policy-making process is complex and iterative. Arrangements that facilitate connections between universities, the business sector and government institutions are crucial for regional development (Rodriguez-Pose, 2013). Since the introduction of the S3 concept, civil society has become more active in policymaking, resulting in the quadruple-helix innovation model that favours the participation of citizens and a more open innovation (Carayannis and Campbell, 2009). The concept of the entrepreneurial discovery process is critical to fully embedding the policy intervention. Regional innovation agencies (RIAs) should bring together the most important players in the regional innovation system, including government, business, universities and also civil society.

In this context, RIAs are regarded as having greater capacity for regional governments in mobilizing other actors, which may be motivated by political considerations. The agency must coordinate various quadruple helices at multiple decision levels, from setting strategic goals and identifying shortcomings to designing, implementing and evaluating place-based policies. The agency's responsibilities also include monitoring successful systems in Europe and elsewhere, finding weaknesses in its own RIS and identifying actors with the capacity to address those weaknesses (Morisson and Doussineau, 2019). Its proximity to stakeholders involved in the S3 strategy also gives the RIA the legitimacy and the ability to monitor the strategy as policymakers perceive the involvement of all stakeholders as an

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important factor for strategy monitoring. Interactions between public authorities, businesses and research institutions require trust. This trust is built by informing stakeholders about the status of strategy implementation through the monitoring system.

According to the policymakers' responses given to the survey presented in this chapter (see Figure 30), it appears that policymakers stress the importance of trust very much. They may be less interested, however, in incorporating stakeholders in the development of a monitoring system and the selection of indicators. Aside from the rhetorical allusion to "collaborative arrangements," the survey findings do not say whether policymakers give stakeholders a passive or active role. This may not be completely satisfactory from the stakeholders' standpoint, who may desire a greater sense of ownership because they have implicit knowledge of the types of results that may really be delivered with a certain set of outputs.

Trust works both ways and, if taken seriously, learning by monitoring would necessitate a cooperative process in which public authorities engage with stakeholders more transparently (Kleibrink et al., 2016). Stakeholders must understand the public intervention and be fully and consistently committed to the governance process. Although policymakers appear to understand and apply the results-oriented logic of intervention in innovation strategies, only a minority of policymakers create a clear relationship between output and outcome indicators (see Section 2.2.2.1). This shows that there is still no comprehensive "implementation theory" in place that identifies inefficient monitoring of policy implementation in the "final straight" which necessitates additional attention from public authorities and organisations in charge of monitoring European territorial policies.

The concept of an integrated regional approach, in which the same organizational unit that developed the innovation plan is also responsible for monitoring, should reassure the European Commission, which promotes and funds smart specialisation strategies. More effort will be needed to actively involve stakeholders throughout the implementation process, demonstrate success in prioritized areas, and ensure that the logic of intervention is respected by proving which objectives were reached with which types of means.

4.3.2 Quality of governance as an essential factor for efficient implementation and good monitoring of S3 strategy

Good governance and key principles such as autonomy and public accountability are required for well-functioning RIAs and monitoring systems. Institutional arrangements imply a set of existing public or semi-public entities addressing socio-economic needs in their respective competency areas. Excessively complex institutional arrangements may

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also hamper the quality of governance. This might be the case for the Basque Country, which has a complex organizational structure and is prone to coordination failure due to the layers of its institutions. The Basque case study presented in this chapter showed that contact with stakeholders might be difficult if the governance is too far from the ecosystems. In that case, the analysis suggests merging some activities carried out by the two agencies (SPRI and Innobasque) and devolving into three innovation agencies, one in each of the three administrative provinces of the Basque Country.

The quality of individual institutions contributes significantly to the quality of the institutional arrangement. Administrative capacity is linked to the question of how qualified staff inside an institution contribute to its importance for the successful implementation of a strategy.

Because S3 encompasses a number of programmes and funding sources from regional to European level, gathering qualitative and quantitative data from different sources is a challenge. More often, the organisation in charge of managing operational programmes is also in charge of ERDF project implementation and monitoring; other public bodies will be in charge of monitoring participation in programmes like Horizon 2020. This highlights two key issues in S3 monitoring: (1) teams in charge of S3 monitoring must renounce a "silo thinking and acting" approach and collaborate with entities monitoring other programmes, and (2) the challenge in terms of human resources is to develop new monitoring approaches that combine qualitative and quantitative aspects. This necessitates the acquisition of new competencies and skills to be able to work with new types of indicators derived from less traditional sources. This conclusion is in line with an OECD report entitled "Strengthening the Governance of EU Funds Under Cohesion Policy" (2020), which emphasizes the importance of human capital in public administrations for more strategic monitoring, including meeting legal auditing obligations, as well as providing strategic input. As a result, the organization recommends bolstering its management and strategic planning capabilities. The ability of a region to continuously monitor and evaluate every aspect of its strategy is critical in informing any policy decisions (Gianelle and Kleibrink, 2015; Kleibrink et al., 2016).

5 Conclusion

5.1 Main findings

This thesis is a piece of policy-oriented research and aims to confront the theoretical framework of the governance of a place-based innovation policy with its implementation in a real context. The recent introduction of the smart specialisation concept in EU cohesion policy has provided a good field of investigation for the academic community working in geography, innovation and socio-economical sciences. The S3 approach arose from realisation that the majority of European regions were applying policies copied from others, not considering their contexts' plurality and RIS diversity, leading to excessive uniformity of regional innovation strategies (Foray et al., 2011). This excessive uniformity was the result of the investment foreseen for minimum efficiency and effectiveness not being sufficient in the regions (Aranguren et al., 2012:66).

The introduction of the S3 concept was intended to guide regional authorities through a six-step methodology (European Commission, 2012) to create tailor-made innovation strategies corresponding to the intrinsic characteristics of the territories. The feasibility of implementing a generic methodological concept for policymaking in the real world had been questioned long before the introduction of S3 (Tödtling and Trippl, 2005). The extent to which policymakers may have an influence in determining the future development of regions is also a central question considering that the majority of external and internal factors involved in strategy implementation are not under their control (Lambooy and Boschma, 2001).

This thesis explores the research gap created by translating a methodological approach that is generic in essence, such as S3, into concrete, fully operational innovation strategies. Two particular research gaps were investigated:

(1) the institutional arrangements through the creation of regional innovation agencies for the governance of S3; and

(2) the setting of monitoring systems necessary for the strategy implementation.

The four chapters of this thesis outline the two research topics that led to the following key conclusions.

5.1.1 The role of institutional arrangements in the governance of place-based innovation policy

The literature on regional and local economic development highlights the necessity for effective institutions, dynamic social environments and strategic cooperation among public and private actors in order to encourage development processes (Amin and Thrift, 1995;

Martin and Sunley, 1996; Rodriguez-Pose and Storper, 2006; Rodriguez-Pose, 2013). Academics, on the other hand, typically argue in favour of place-based and place-sensitive policies without providing any direction on how to create or implement them. This is also true for governmental bodies, such as the European Commission, which included the smart specialisation concept within the EU cohesion strategy throughout the 2014-2020 financing period.

The S3 concept had to be implemented in heterogeneous territorial contexts, from core industrial regions to peripheral rural regions, with a generic six-step methodology. Many areas, however, lack the institutional capacity to design and implement place-based policies, leading to the divide between core and peripheral regions in the EU. Academics have shown that weak institutional capacities affect the quality of government (Farole et al., 2011; Charron et al., 2014) and the capacity of local Regional Innovation Systems (RISs) to absorb public funds (Oughton et al., 2002).

One way to address a regional institutional weakness is through the creation of Regional Innovation Agencies (RIAs). A RIA is a governance framework that designs and supports the implementation of place-based policies under specific regional institutional arrangements. RIAs can be thought of as "one-size-fits-all" institutional arrangements that let organizations enhance their RIS in a systematic way by designing and implementing a place-based policy like S3. In other words, RIAs can be seen as "adjustment variables", allowing a generic place-based policy to fit unique territorial contexts.

This thesis presents four case studies of RIAs: (1) the Brainport Development agency based in Eindhoven in the Netherlands, the (2) Innobasque and (3) SPRI based in Bilbao in the Basque Country (Spain), and (4) Ruta N based in the city of Medellín (Colombia). Although the four RIAs studied have weaknesses (see Chapter 4), they can be considered as good practices for implementing innovation policies, they are emerging in already innovative regions with well-performing economic systems.

The analysis of the four RIAs yields a list of five policy implications relevant for any RIS and regional context. First, the RIA should reflect a common vision between the public and private sectors. Second, the most appropriate and effective level of governance for the RIA seems to be the metropolitan level, as one single RIA in a region would lead to institutional complexity and coordination failures. Third, the RIA should be the most legitimate entity to mobilise the most important actors of the RISs (i.e. private and public sectors, academia and civil society). Fourth, the RIA should be the best-positioned entity to monitor RISs and identify good practices beyond them. Fifth, from defining strategic priorities to designing, implementing, and evaluating place-based policies, at multiple decision levels, a RIA can coordinate multiple quadruple helixes.

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These five implications are inextricably linked to good governance. To achieve the greatest results, best practices must be integrated with contextual aspects, and RIA institutional arrangements can be tailored to particular regional contexts (Dixit, 2009). Policymakers must evaluate whether these five findings can be combined in their regional contexts to improve the impact of the strategy.

5.1.2 Monitoring mechanisms as emerging strategic management: breaking with traditional policy monitoring

Monitoring is an important component of a strategy for innovation and territorial development. The complexity of the S3 monitoring activity goes hand in hand with the complexity of the S3 concept itself. This complexity comes first from the heterogeneity of a place-based innovation policy such as S3 which ties together various public initiatives (EU cohesion policy and other EU framework programmes, among others); second from its inclusive and bottom-up nature with the necessary participation of the main stakeholders of the RIS; and third from the need to design a tailored mechanism corresponding to the uniqueness of the RIS.

According to the survey conducted for the investigation, policymakers view the monitoring of S3 strategy as an exercise that necessitates more than just meeting financial audit requirements. Policymakers view monitoring smart specialisation strategies as a management tool and a means of communicating with stakeholders. However, this perception may have some limitations when implementing the strategy. So far, the survey results indicate that, while the theory of smart specialisation is well known, converting what should be done in theory into practice constitutes a significant challenge in terms of stakeholder engagement in all phases of strategic management.

The observations on the role of stakeholders, monitoring specific priority areas, and linking policy outputs to results revealed three complex ambiguities. First and foremost, trust is critical in interactions between government agencies, private companies and research institutions. In theory, trust is built by using data from monitoring activities to keep stakeholders informed about strategy implementation. Policymakers seem to see trust in only one way, in that they see stakeholders and their participation in the monitoring of S3 strategies as crucial. In practice, however, they only give them a passive or slightly active role. Stakeholders must feel more ownership since they have their own understanding of what kinds of results can actually be delivered with a particular set of outputs. RIAs would, in that case, be a facilitating factor in strengthening continuous cooperation between

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policymakers and actors of the RIS, engaging stakeholders in *a mutual process to better develop a learning by monitoring process*.

Another ambiguity revealed by the analysis carried out is the lack of consideration of priority areas in the monitoring mechanisms. The smart specialisation idea is based on the prioritization and concentration of investments in certain activity areas and industries. The primary data source for strategy monitoring is the data coming from the implementation of the ERDF operational programme and the related funding absorption. Policymakers, however, lack the detail required to show developments in specific regions rather than the entire economy. To break free from this style of thinking, they would need available and accessible data and information sources to truly perform strategy monitoring. The problem could be attributable, in part, to a lack of tailored techniques to explicitly address monitoring needs during implementation, as opposed to providing scenarios of future developments. This ambiguity between "the business as usual" and "breaking with tradition" reflects the ongoing move towards a new way to approach place-based innovation policy. The need to find another approach for monitoring depends on the data and information to consider, their availability, and how to collect them. It also implies enhancing the skills of the public administration. The role of an RIA can again be important in reinforcing a continuous two-way communication flow with stakeholders, helping them to better engage with the strategy implementation and share their data and information for the good of the whole territory.

Finally, the last ambiguity revealed by the analysis is that outputs seem to be disconnected from the desired results. Although policymakers appear to understand and apply the intervention logic of S3 strategies, only a minority of policymakers (national and regional) established a clear link between output and result indicators, and the socio-economic impact per se. In other words, there is not yet a robust "implementation theory" in place (Weiss, 1998), which can be a problem with innovation intended to address the socio-economic problems of the region. The weak monitoring of the "last mile" of policy implementation[39], up to the delivery of expected impacts, deserves more attention from public authorities and bodies responsible for supervising European territorial policies.

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[39] The 'last mile' refers to the final step in the supply chain, when a product transfers from a business (typically a retail store, warehouse or distribution centre) to the customer's business or home, or to a collection point. The concept is used here to define the last step of the implementation of the policy characterised by a socio-economic impact.

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5.2 Policy implications for the new generation of smart specialisation strategies

The 2014-2020 EU cohesion policy has provided an opportunity to experiment with a new type of place-based innovation policy concept based, in theory, on a fully bottom-up approach and continuous dialogue between business, academics, public administration and civil society. However, the 7-year period has also shown the difficulties of implementing such a policy in territories with very different characteristics. In many of the EU's peripheral regions, smart specialisation, which is a place-based approach for developing new transformative enterprises, has faced numerous challenges (Foray, 2018).

Looking backwards and following many evaluations, it is clear that the public funding put on the table to support innovation and cohesion between EU regions is an important element. However, other ingredients are necessary to fully achieve the ambitious initial objectives set by the Europe 2020 strategy (European Commission, 2010). Europe displays numerous paradoxes, meaning that the achievement of objectives depends on a number of factors. The list of economic and innovation paradoxes in Europe is still growing[40], ranging from the Swedish paradox, referring to the fact that higher levels of R&D effort in Sweden are not associated with economic growth (Edquist and McKelvey, 1998; Fagerberg et al., 2002; Bitard et al., 2008), to the more recent innovation-productivity paradox, pointing out the co-existence of exciting new radical ideas with little economic return in terms of new products, competitiveness, growth and employment (Crafts, 2018; Ortega-Argiles and McCann, 2021).

As a result of the institutional proximity between the private and public sectors, the RIAs studied for this research are established in RISs that are relatively specialized, and institutionally and organizationally dense. They were created to address territorial weaknesses following a period of socio-economic crisis, to face new challenges, or to respond to external shocks (e.g. the Covid pandemic). RIAs have shown their usefulness in strategy governance, being the link between the upper governance level represented by regional authorities and the local stakeholders. However, as the agencies studied are very specific to the places in which they are established, the impact on their respective territories should be thoroughly evaluated before deciding if the policy should be replicated in other peripheral regions of the EU.

In any case, regional governance with appropriate institutional arrangements equipped with an efficient monitoring system that can collect the needs of stakeholders and capture

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[40] For a full review of innovation paradoxes see Fragkandreas (2017).

weak signals coming from outside makes the region more resilient to external shocks (Magro and Valdaliso, 2019; Magro et al., 2022). Kakderi and Tasopoulou (2017) argue that a governance system with polycentric and multi-layered institutions, which promote public participation and collaboration between the different agents, has also been accepted as increasing regional resilience.

The new EU cohesion policy programming period 2021–27 opens up new opportunities for RIAs to contribute to a "smarter Europe" through governance and institutional capacity-building. Building or strengthening institutional capacity can help many regions to meet the challenges in designing and implementing place-based policies considering the parameter of the quality of their governments (Charron et al., 2014), the capacity to absorb funds (Oughton et al., 2002), and the intrinsic institutional capabilities (Farole et al., 2011). Since its inception in 2019, the current European Commission has set ambitious new targets and opted to prioritize sustainable development alongside the digital agenda as part of its overall growth plan for the 2020-30 decade. The European Green Deal (European Commission, 2020) symbolizes the EU's contribution to the UN Sustainable Development Goals (SDGs). Meanwhile, the smart specialisation strategy for sustainable and inclusive growth represents an attempt to develop a leading position in sustainable development at the global level.

The new generation of smart specialisation strategies must be innovation-driven and deliver transformative policy. This "updated" S3 concept should combine local societal visions for sustainability with job creation, inclusiveness, environmental responsibility, and engagement with the overall EU directionality for sustainable development and a green-digital economy that delivers for all (McCann and Soete, 2020). Mazzucato (2018) argues that a mission-oriented policy, like "the mission to the moon" set by the US government in the early 1960s, is the appropriate instrument to reframe the approach to tackle grand societal challenges by creating a new narrative that can better convince policymakers and citizens. The two S3 components examined in this thesis, namely the introduction of RIAs as a new element of multilevel governance and establishing a new type of monitoring system as a management tool, should be more deeply integrated into the EU's new policy directionality. The EU Green Deal and the new EU digital strategy should be embodied, albeit not exclusively, in the content and goal of the S3 strategies. This new top-down policy component should manifest itself in the strategy's implementation and be reflected in the monitoring indicators.

5.3 Limitations and future lines of research

The exercise of writing a doctoral thesis is prone to limitations. The following paragraphs explore the theoretical and methodological issues and future research directions arising from those limitations. The objective of the investigation was to explore, from different perspectives, the way theories and methods behind place-based innovation policy are set in motion in real contexts. To analyse the institutional arrangements, the research was based on case studies, and a survey was used to study the design of monitoring systems. Both approaches are subject to limitations associated with the qualitative nature of the methodologies used. However, this thesis offers a picture of the possible forms of implementation of place-based innovation policy such as S3. In this respect, the analysis presented could be extended in the future using quantitative methodologies.

The four case studies only provide a partial vision of institutional arrangements in place-based policies. Three well-performing regions with a well-established institutional framework but in very different geographical zones were selected to provide enough information to allow comparisons and reach some conclusions. Moreover, the most common argument against using the case study method as a technique for scientific inquiry is the lack of generalizability and transferability of the conclusions arising from the analysis. The case study approach does not definitively determine the causal relationships between place-based policies and improved or reduced regional innovative capacities. As a result, rather than establishing causal relationships and delivering generalizations, the conclusion provides policy implications for different contexts and explores interesting institutional arrangements for dealing with the design and implementation of place-based policies.

The monitoring of strategy implementation is a topic that is not well covered by the academic literature, in contrast to its sibling, the evaluation. Monitoring is very rarely addressed in its own right and is often embedded with other components of the policy cycle. The introduction of the S3 concept has brought a new dimension to monitoring as a new management tool that fulfils three functions for policymakers: learning, trust-building and accountability. The survey results revealed some disparities between what was expected in theory and how a monitoring system for this specific type of policy is perceived by policymakers. This is why the term "ambiguity" has been preferred to "conclusions" because not enough information was provided to reach firm conclusions. For instance, "learning by monitoring" would necessitate a collaborative approach in which public authorities engage with stakeholders more transparently. More research is needed, both conceptually and empirically, to understand how policymakers can incorporate such interaction into the design and daily practice of monitoring (Kleibrink et al., 2016).

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Appendices

Appendix 1: A conceptual map for place-based policy and smart specialization

This section summarises the primary policy (and academic) concepts related to this thesis. They are factors influencing the design and the implementation of place-based policies in general and smart specialisation strategies in particular. Table 12 lists, first, the concepts supported by a short definition, their degree of importance regarding the thesis (core or related), and their respective origin (i.e. author, organisation).

	Concept	Short definition	Core/ Related	Lead Author(s)
1	Agglomeration economies	Benefits that come when firms and people locate near one another together in cities and industrial clusters	Related	Krugman (1989), Porter (1990), Glaeser (2010)
2	Place-based policy	A long-term public intervention that aimed at tackling persistent underutilisation of potential and reducing persistent social exclusion in specific places through external interventions and multi-level governance	Core	Barca (2009) (promoter)
3	Space-neutral policy	A long-term public intervention with homogeneous coverage in every territory centred on people or a specific category of beneficiary	Related	World Bank (promoter)
4	National Innovation System (NIS)	The flow of technologies and information among people, enterprises and institutions that is key to the innovative process on the national level	Related	Lundvall (1992)
5	Regional Innovation System (RIS)	Institutional 'infrastructure' supporting innovation within the production structure of a region	Core	Cooke et al. (1996)
6	EU cohesion policy	EU policy aiming at improving the economic well-being of regions in the EU and avoiding regional disparities	Core	European Commission (1988)
7	Smart Specialisation (S3)	An approach combining industrial, educational and innovation policies to suggest that countries or regions identify and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantages	Core	Foray and Van Ark (2007)
8	Entrepreneurial Discovery Process (EDP)	Bottom-up learning process which frames the interaction and inclusion of varied regional actors (policy, business, academia, social sector) who provide their knowledge and expertise about opportunities in existing or emerging sectors	Core	Foray et al. (2011)
9	Quadruple Helix model	Model of innovation that recognises four prominent actors in the innovation system: science, policy, industry, and society	Related	Carayannis and Campbell (2009)
10	New Public Management (NPM)	Approach to running public service organisations that are used in government and public service institutions and agencies, at both sub-national and national levels	Related	Hood (1991)
11	New Institutional Economics (NIE)	An economic approach that attempts to extend economics by focusing on the institutions	Related	North (1990)
12	Multi-Level Governance (MLG)	The way power is spread vertically between levels of government and horizontally across organisations and actors	Related	Hooghe and Marks (2001)
13	Quality of Government (QoG)	Impartiality of the exercise of public authority	Related	Charron et al. (2011)*
14	Quality of Institutions	Impartiality of institutions that exercise government authority	Related	Rodriguez-Pose (2013)*

* Topics related to government quality and institutions predate EU Regional innovation policies and smart specialisation strategies.

Table 12 Outline of the main concepts included in the manuscript.

Source: own elaboration.

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Figure 33 provides a map of the concepts with their dependencies. The figure allows us to visualize the hierarchy between the various concepts defined in this manuscript and covered by the two related analyses carried out in this thesis, namely (1) the regional innovation agencies within the institutional arrangements for the strategic governance and (2) the strategy monitoring mechanisms. The objective is to show the paths and the association of concepts to help define a hierarchy and identify the importance of each concept regarding the institutional arrangements and the monitoring mechanisms related to place-based policy and smart specialisation strategies.
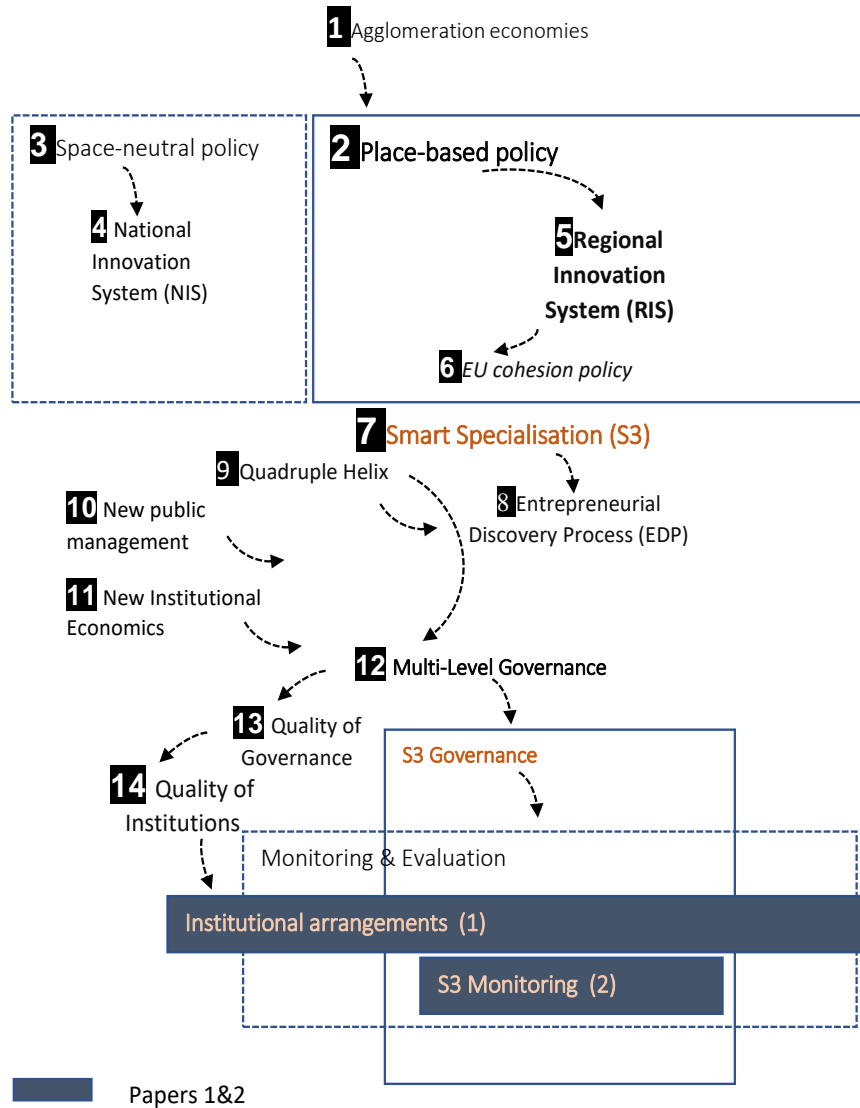
Figure 33. Academic and Policy concepts map.
Source: own elaboration.

Appendix 2: List of case studies interviewees

Name	Position	Organisation
Agustin Arostegi Artetxe	International	SPRI
Aitor Corbanera	Technology and Innovation	SPRI
Gotzon Bernaola	Innobasque Social	Innobasque
Guillermo Dorronsoro	Ex-Director Technology	Innobasque
Iñaki Tellechea	Promotion	SPRI
Joep Brouwers	Director	Brainport
Jose Maria Villate	Director Innobasque	Innobasque
Laura Izaguirre	Promotion	SPRI
Mari José Aranguren	Director	Orkestra
Patty Claassens	Director People	Brainport
Pedro Luis Uriarte	Ex-Director Innobasque	Innobasque
Piet van der Wielen	Director Business	Brainport
Rob Raven	Professor	Utrecht University
Rutger van Poppel	Intern	Brainport
Sander Kern	Director International	Brainport
Sjoerd Romme	Professor	Eindhoven University
Andrés Montoya	Ex-Director Ruta N Medellin	Ruta N Medellin (2009-2011)
Andres Calle	Knowledge Business	Ruta N Medellin
Carlos Franco	Special Projects	Ruta N Medellin
Catalina Gutierrez	Ex-Knowledge Business	Ruta N Medellin (2010-2013)
Catalina Hernandez	R&D	Ruta N Medellin
Jorge Mesa	Professor	EAFIT University
Oscar Eduardo Quintero	Director	Tecnnova
Rafael Aubad	Director	Proantioquia
Samuel Urquijo	Plan CTi	Ruta N Medellin
Susana Ortiz	Knowledge Business	Ruta N Medellin
Adolfo Moreno	Cluster Health City	Chamber of Commerce
Alonso Salazar	Mayor of Medellin (2008-2011)	City of Medellin
Claudia Betancur	Director	Biointropic
Juan José Llisteri	Consultant	IADB

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Appendix 3: Survey on S3 implementation and monitoring

Questionnaire for regional administrations

This survey will help to better target the activities of the S3 Platform to the needs of regional and national authorities implementing innovation strategies for smart specialisation (S3). It covers different aspects of establishing and operating monitoring activities and different possibilities to track the progress of S3 implementation. The survey also includes questions on the kind of assistance you need with regard to S3 monitoring in the coming months.

Please note that your responses will be treated confidentially.

Thank you very much for your engagement.

The S3 Platform Team

1. Does the S3 of your region include a monitoring mechanism or specific monitoring provisions?
   - ☐ Not yet
   - ☐ Completely
   - ☐ Partially

2. Which of the following actors have been participating in the definition of the regional S3 monitoring? (Multiple choices allowed):
   - ☐ Regional administration body responsible for the S3
   - ☐ Regional administration bodies NOT directly responsible for the S3
   - ☐ National administration bodies
   - ☐ Regional statistical office
   - ☐ National statistical office
   - ☐ External service provider
   - ☐ Working groups or cluster managers participating to the definition of S3
   - ☐ Entrepreneurs
   - ☐ Associations of entrepreneurs
   - ☐ Researchers in universities or research centres
   - ☐ Citizen groups
   - ☐ User groups
   - ☐ Other, please specify if possible [free text box]

3. Which body is responsible for the regional S3 monitoring? (Multiple choices allowed):
   - ☐ The same that is responsible for the overall S3
   - ☐ A different regional administration body than the one responsible for the S3
   - ☐ National administration
   - ☐ Regional statistical office
   - ☐ National statistical office
   - ☐ External service providers
   - ☐ Research centre or university
   - ☐ Other, please specify if possible [free text box]

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4. Which of the following elements are included in the S3 of your region?

	Not yet	Completely	Partially
Overall strategic objectives	☐	☐	☐
Priorities	☐	☐	☐
Expected changes	☐	☐	☐
Policy interventions	☐	☐	☐
Result indicators	☐	☐	☐
Output indicators	☐	☐	☐

5. Public authorities were asked to select a limited number of innovation priorities for investment. Which of the following statements best describe the nature of the selected priorities in the S3 of your region? (Multiple choices allowed):
   - ☐ Economic sectors
   - ☐ Activities aimed to transform the existing socio-economic state of affair
   - ☐ Technologies that cut across specific sectors
   - ☐ Technologies that cut across the entire economy
   - ☐ Market segments or niches
   - ☐ Categories of services, processes or organizational practices
   - ☐ Clusters (industrial, technological and other types)
   - ☐ Research fields
   - ☐ Other, please specify [free text box]

6. The S3 typically aims to achieve changes in innovation and socio-economic systems. Which of the following statements best describes how expected changes relate to the different elements of the S3 of your region? (Multiple choices allowed):
   - ☐ The S3 does not currently refer to expected changes
   - ☐ Expected changes are associated to the overall objectives of the S3
   - ☐ Expected changes are associated to each S3 priority
   - ☐ Expected changes are associated to several priorities at the same time
   - ☐ Expected changes are NOT associated to S3 priorities
   - ☐ Other, please specify [free text box]

7. Result indicators are based on variables that quantify specific aspects of desired results. Which of the following statements best describes how result indicators are associated to the different elements of the S3 of your region? (Multiple choices allowed):
   - ☐ They are defined for each S3 priority
   - ☐ They are defined for several priorities at the same time
   - ☐ They are NOT defined for S3 priorities
   - ☐ They are associated to expected changes
   - ☐ They are associated to the strategy's overall objectives
   - ☐ They are associated to projects
   - ☐ They are associated to programmes
   - ☐ They are associated to one or more output indicators
   - ☐ Other, please specify [free text box]

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8. Which of the following elements are part of the current regional S3, which have NOT been part of previous strategy documents?

Expected changes in the economic and social environment (increase of GDP, decrease of unemployment in areas chosen in S3, etc.)

Please list any newly introduced indicators:

Output indicators directly linked to strategy implementation (number of information/brokerage events, number of newsletters, number of organisations contacted, etc.)

Please list any newly introduced indicators:

Result indicators directly linked to strategy implementation

Please list any newly introduced indicators:

Result indicators having a broader scope and NOT directly linked to strategy implementation

Please list any newly introduced indicators:

9. Which of the following methodologies and sources will the regional S3 monitoring employ? (Multiple choices allowed):
   - □ Survey-based data collection
   - □ Quantitative indicators
   - □ Qualitative indicators
   - □ Official statistics from statistical offices
   - □ European statistics
   - □ Data from the SWOT analysis used to select priorities
   - □ Indicators from relevant Operational Programmes
   - □ Input from focus groups
   - □ Indicators and data from participation in H2020
   - □ Delphi method (structured expert meetings seeking consensus)
   - □ Foresight
   - □ Expert assessments
   - □ Benchmarking indicators for comparisons with other regions and countries
   - □ Input from peer reviews
   - □ Other, please specify [free text box]

10. Please state how much you think the following monitoring functions are important for S3. 5=very important, 1=not important

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1...5   Inform stakeholders about progress made concerning S3 implementation

1...5   Inform political decision makers about progress made concerning S3 implementation

1...5   Inform broader public about progress made concerning S3 implementation

1...5   Signal how single priority areas are developing

1...5   Provide evidence base for adjusting the S3

1...5   Build trust among the relevant S3 stakeholders

1...5   Reflect the logic of intervention of the S3

1...5   Meet audit requirements

1...5   Contribute to open data platforms

11. Stakeholders (like for instance, universities and other higher education institutions, research institutes, industry and social partners, etc.) are relevant actors in innovation systems. Please state how much you think the following functions of the stakeholders are important for S3 monitoring. 5=very important, 1=not important

1...5   They help to find indicators

1...5   They help to set targets

1...5   They help to clarify the logic of intervention

1...5   They help to re-adjust the S3

1...5   They provide feedback to monitoring data and results

1...5   They disseminate monitoring information

1...5   They provide relevant input for data collection

12. Who will ensure the follow-up of the regional S3 monitoring?
    □ Innovation council or body (involving stakeholders) that oversees S3 implementation
    □ Priority-specific working groups involving stakeholders
    □ Responsible managing authority
    □ OP monitoring committee
    □ Public body responsible for S3
    □ Inter-ministerial/departmental working group
    □ Other, please specify [free text box]

13. What kind of activities would be most helpful for developing and implementing the regional S3 monitoring?
    [Please add free text]
    What kind of topics?
    [Please add free text]

Questionnaire for national administrations

This survey will help to better target the activities of the S3 Platform to the needs of regional and national authorities implementing innovation strategies for smart specialisation (S3). It covers different aspects of establishing and operating monitoring activities and different possibilities to track the progress of S3 implementation. The survey also includes questions on the kind of assistance needed with regard to S3 monitoring in the coming months.

Please note that your responses will be treated confidentially.

Thank you very much for your cooperation.

The S3 Platform Team

1. Does the S3 of your country include a monitoring mechanism or specific monitoring provisions?
   □ Not yet
   □ Completely
   □ Partially

2. Who has been participating in the definition of the national S3 monitoring? (Multiple choices allowed):
   □ Regional administration bodies responsible for innovation and economic development
   □ National administration bodies
   □ Regional statistical office
   □ National statistical office
   □ External service providers
   □ Working groups or cluster managers participating to the definition of S3
   □ Entrepreneurs
   □ Associations of entrepreneurs
   □ Researchers in universities or research centres
   □ Citizen groups
   □ User groups
   □ Other, please specify if possible [free text box]

3. Which body is responsible for the national S3 monitoring? (Multiple choices allowed):
   □ The same that is responsible for the overall S3
   □ A different national administration body than the one responsible for the S3
   □ Regional administration bodies
   □ Regional statistical offices
   □ National statistical office
   □ External service provider
   □ Research centre or university
   □ Other, please specify if possible [free text box]

4. Which elements are included in the S3 of your country?

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	Not yet	Completely	Partially
Overall strategic objectives	☐	☐	☐
Priorities	☐	☐	☐
Expected changes	☐	☐	☐
Policy interventions	☐	☐	☐
Result indicators	☐	☐	☐
Output indicators	☐	☐	☐

5. Public authorities were asked to select a limited number of innovation priorities for investment. Which of the following statements best describe the nature of the selected priorities in the S3 of your country? (Multiple choices allowed):
   ☐ Economic sectors
   ☐ Activities aimed to transform the existing socio-economic state of affair
   ☐ Technologies that cut across specific sectors
   ☐ Technologies that cut across the entire economy
   ☐ Market segments or niches
   ☐ Categories of services, processes or organizational practices
   ☐ Clusters (industrial, technological and other types)
   ☐ Research fields
   ☐ Other, please specify [free text box]

6. The S3 typically aims to achieve changes in innovation and socio-economic systems. Which of the following statements best describes how expected changes relate to the different elements of the S3 of your country? (Multiple choices allowed):
   ☐ The S3 does not currently refer to expected changes
   ☐ Expected changes are associated to the overall objectives of the S3
   ☐ Expected changes are associated to each S3 priority
   ☐ Expected changes are associated to several priorities at the same time
   ☐ Expected changes are NOT associated to S3 priorities
   ☐ Other, please specify [free text box]

7. Result indicators are based on variables that quantify specific aspects of desired results. Which of the following statements best describes how result indicators are associated to the different elements of the S3 of your country? (Multiple choices allowed):
   ☐ They are defined for each S3 priority
   ☐ They are defined for several priorities at the same time
   ☐ They are NOT defined for S3 priorities
   ☐ They are associated to expected changes
   ☐ They are associated to the strategy's overall objectives
   ☐ They are associated to projects
   ☐ They are associated to programmes
   ☐ They are associated to one or more output indicators
   ☐ Other, please specify [free text box]

124

8. Which of the following elements are part of the current national S3 which have NOT been part of previous strategy documents?

Expected changes in the economic and social environment (increase of GDP, decrease of unemployment in areas chosen in S3, etc.)
Please list any newly introduced indicators:

Output indicators directly linked to strategy implementation (number of information/brokerage events, number of newsletters, number of organisations contacted, etc.)

Please list any newly introduced indicators:

Result indicators directly linked to strategy implementation

Please list any newly introduced indicators:

Result indicators having a broader scope and NOT directly linked to strategy implementation

Please list any newly introduced indicators:

9. Which of the following methodologies and sources will the national S3 monitoring employ? (Multiple choices allowed):
   □ Survey-based data collection
   □ Quantitative indicators
   □ Qualitative indicators
   □ Official statistics from statistical offices
   □ European statistics
   □ Data from the SWOT analysis used to select priorities
   □ Indicators from relevant Operational Programmes
   □ Input from focus groups
   □ Indicators and data from participation in H2020
   □ Delphi method (structured expert meetings seeking consensus)
   □ Foresight
   □ Expert assessments
   □ Benchmarking indicators for comparisons with other regions and countries
   □ Input from peer reviews
   □ Other, please specify [free text box]

10. Please state how much you think the following monitoring functions are important for S3. 5=very important, 1=not important

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1...5   Inform stakeholders about progress made concerning S3 implementation

1...5   Inform political decision makers about progress made concerning S3 implementation

1...5   Inform broader public about progress made concerning S3 implementation

1...5   Signal how single priority areas are developing

1...5   Provide evidence base for adjusting the S3

1...5   Build trust among the relevant S3 stakeholders

1...5   Reflect the logic of intervention of the S3

1...5   Meet audit requirements

1...5   Contribute to open data platforms

11. Stakeholders (like for instance universities and other higher education institutions, research institutes, industry and social partners, etc.) are relevant actors in innovation systems. Please rate the importance of the following functions of the stakeholders. 5=very important, 1=not important

1...5   They help to find indicators

1...5   They help to set targets

1...5   They help to clarify the logic of intervention

1...5   They help to re-adjust the S3

1...5   They provide feedback to monitoring data and results

1...5   They disseminate monitoring information

1...5   They provide relevant input for data collection

12. Who will ensure the follow-up of the national S3 monitoring?
   □ Innovation council or body (involving stakeholders) that oversees S3 implementation
   □ Priority-specific working groups involving stakeholders
   □ Responsible managing authority
   □ OP monitoring committee
   □ Public body responsible for S3
   □ Inter-ministerial/departmental working group
   □ Other, please specify [free text box]

13. What kind of activities would be most helpful for developing and implementing the national S3 monitoring?
   [Please add free text]
   What kind of topics?
   [Please add free text]

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ÁMBITO- PREFIJO	CSV	FECHA Y HORA DEL DOCUMENTO
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Appendix 4: Names and origins of survey respondents

National policymakers

Country	Name
Bulgaria	Leyla Radovanova
Estonia	Mart Laatsit
Estonia	Karin Jaanson
Italy	Giorgio Martini
Italy	Luigi Gallo
Lithuania	Jurgita Petrauskienė
Lithuania	Ramojus Reimeris
Malta	Nadine Castillo
Malta	Alexander Borg
Norway	ag
Poland	Zbigniew Kamieński
Portugal	Miguel Cruz
Romania	Dana Gheorghe
Slovenia	Urban Krajcar
Spain	Ignacio Gomez

Regional policymakers

Country	Region	Name
Austria	Niederösterreich	Irma Priedl
Austria	Oberösterreich	Iris Reingruber
Belgium	Région de Bruxelles-Capitale	Mathilde REUMAUX
Czech republic	Hlavní město Praha	Jakub PECHLÁT
Denmark	Midtjylland	Pia Fabrin
Denmark	Nordjylland	Tommy Hebsgaard Søltoft Henriksen
Finland	Kainuu	Jouni Ponnikas
Finland	Pohjois-Pohjanmaa	Päivi Keisanen
Finland	Pohjois-Pohjanmaa	Mikko Väisänen
Finland	Satakunta	Katja Laitinen
Finland	Lapland	Päivi Ekdahl
Finland	Tampere = Pirkanmaa	Petri Räsänen
Finland	Uusimaa	Kristiina Heiniemi-Pulkkinen
Finland	Lappeenranta-Imatra (Etelä-Suomi)	Markku Mäki-Hokkonen
France	Centre	Jean Louis Garcia
France	Centre	Frédéric Pinna
France	Languedoc - Roussillon	Raphaelle Lamoureux
France	Rhone-Alpes	Hortense Lutz-Hermelin
France	Limousin	Cécile Vernhes-Daubrée
Germany	Freistaat Sachsen	Dr. Marzena Schöne
Germany	Weser-Ems	Dieter Meyer
Germany	Sachsen-Anhalt	Susanne Lueders
Greece	Eastern Macedonia and Thrace	Vasilios Pitsinigkos

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Greece	Eastern Macedonia and Thrace	Panagiotis Koudoumakis
Greece	Eastern Macedonia and Thrace	Ioannis Kessanlis
Greece	Western Greece	Nikos Thomopoulos
Greece	Epirus	Nikos Baltoyiannis
Greece	Ionia Nisia	Thanasis Spiggos
Greece	Ionia Nisia	Lina Roussou
Hungary	Eszak-Alföld	István Kollár
Italy	Emilia-Romagna	Silvano Bertini
Italy	Piemonte	Matteo De Felice
Italy	Lombardia	Armando De Crinito
Italy	Toscana	Albino Caporale
Italy	Toscana	Angelita Luciani
Italy	Sicilia	Dr Emanuele Villa
Italy	Umbria	Claudio Tiriduzzi
Italy	Molise	Massimo Pillarella
Italy	Molise	Renato D'Alessandro
Italy	Friuli - Venezia Giulia	Ketty Segatti
Italy	Friuli - Venezia Giulia	Lydia Alessio Vernì
Italy	Aosta	Marco Riccardi
Netherlands	Noord-Nederland	Eise van der Sluis
Netherlands	West-Netherlands	Jean-Christophe Spapens
Netherlands	West-Netherlands	Ruud van Raak
Norway	Nordland	Terje Stabæk
Norway	Vest-Agder	Manuel Birnbrich
Poland	Województwo Podlaskie	K. Poleszczuk-Wozniewska
Poland	Pomorskie	Joanna Oberbek
Poland	Pomorskie	Karolina Zdrojewska
Poland	Lodzkie	Błaszczyńska Joanna
Poland	Lodzkie	Florczyk Ewa
Poland	Malopolskie	Joanna Domanska
Poland	Zachodniopomerskie	Jacek Baraniecki
Poland	Opolskie	Przemysław Burtny
Poland	Slaskie	Barbara Bujnowska-Sęda
Portugal	Alentejo	Alexandra Rodrigues
Portugal	Norte	Rui Monteiro
Portugal	Algarve	Hugo Barros
Romania	Vest	Raluca Cibu Buzac
Romania	Vest	Cristian Gotia
Romania	Centru	Marius Duca
Serbia	Vojvodina	Mirjana Kranjac
Slovakia	Bratislava	Martin Hakel
Spain	Asturias	Paz Palacio Fernández
Spain	Castilla y León	Javier Álvarez Benedi
Spain	Cataluña	Mariona Sanz
Spain	Illes Baleares	Antonio Viader
Spain	Madrid	Pedro Alonso
Spain	Navarra	Cernin Martinez

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Spain	Valencia	Roberto Parras
Sweden	Örebro	Mikael Jorstig
Sweden	Östergötlands län	Peter Larsson
Sweden	Stockholm	Maria Lindqvist
Sweden	Värmland	Anders Olsson
Turkey	East Marmara	Hüseyin Özgür Ünsal
UK	West Wales and The Valleys	Alastair Davies

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