

MAY 2023

Benchmarking study of national and international best practices on regional innovation systems and governance models of regional smart specialisation strategies



**Comissão de Coordenação e
Desenvolvimento Regional do Norte**

Executive Summary

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1 Introduction

The regional innovation system is a concept created as a consequence of the concept of national innovation systems developed several years earlier. Both approaches consider the systemic character of the innovation process. An innovation system comprises all the determinants of the innovation process, i.e., all the important economic, social, political, organisational, institutional, and other factors that influence the development, diffusion, and use of innovations. The elements of innovation systems are components (organisations and institutions) and relationships between them.

The introduction of Smart Specialisation (S3) as a key pillar of the 2014 reform of the European Union (EU) Cohesion Policy represented a significant strategic shift in European development intervention. S3 strategies aimed at mobilising the economic potential of each EU country and region, enabling a place-based and development-based approach, where regional innovation systems take a central role in the strategic definition of public policies.

This study aims to identify national and international good practices on the institutionalisation of regional innovation systems and governance models of regional smart specialisation strategies that can serve as a benchmark to support the process of formalisation and consolidation of the Norte regional innovation system. The study has as specific objectives:

- promote an analysis on the organisation and functioning of the Norte innovation system and of the governance model of the regional smart specialisation strategy;
- ensure a comparative analysis with other national and European regions, identifying good practices in the implementation of regional innovation systems and governance models of regional smart specialisation strategies;
- propose an institutionalisation model of the Norte regional innovation system;
- propose an institutional model for the structure responsible for public innovation policies at the regional level.

2 Characterisation of the Norte innovation system

2.1 Norte's innovation performance

In the Regional Innovation Scoreboard 2021, Norte is classified as a "Moderate Innovator" region, ranking 151st out of 240 regions. Norte's performance on the innovation index is below the EU average, with a relative performance of 80.3.

The trajectory of the Norte region innovation performance is, overall, one of progress. Among the Portuguese regions, Norte has the second-best performance in the 2021 index, only behind the Lisbon region, and in line with the performance of the Centro

region, both also classified as "Moderate Innovators". Compared to 2014, Norte recorded an improvement in its innovation performance, quantified at 11.8 points compared to EU 2014, being the largest growth among Portuguese regions.

In terms of strengths measured by innovation indicators, Norte outperforms the EU average in some areas, particularly highlighting intellectual property indicators associated with trademark and design registration; authorship of international scientific co-publications; and sales of innovative products.

The main weaknesses in the Norte's performance are found in the indicators of lifelong learning, innovation performance of small and medium-sized enterprises (SMEs with product, process, marketing, and organisational innovations, as well as innovative SMEs that collaborate with others), employment in innovative firms and knowledge-intensive activities.

2.2 Organisation of the Norte innovation system

The organisation of the Norte innovation system and its network of actors from different fields and domains of specialisation was analysed. A survey carried out by CCDR-N (2022) identified 281 non-business entities of the scientific and technological system, including higher education institutions, R&D institutions and infrastructures, technological institutions and infrastructures, innovation clusters and infrastructures for hosting and enhancing S&T activities.

Regarding the business sector, in 2020 there were about 446,000 companies based in the Norte region, employing a total of 1.44 million workers in the region. In line with the national reality, microenterprises predominate in the region, representing 95.6% of the business sector. Micro and SMEs employ about 80% of the total number of people employed by companies. Norte continues to be the most industrialised region in the country and one of the most industrialised in the EU-27. The manufacturing industries, in 2019, accounted for 28% of the employed personnel in companies and 33% of the GVA, with the textile and clothing sector, manufacturing of metal products, footwear industry and food industry being particularly important. In recent decades, however, the region has experienced an overall trend towards the tertiary sector, with particularly high growth in the service sectors.

2.3 Norte's Smart Specialisation Strategy 2014-2020

The Norte Regional Smart Specialisation Strategy 2014-2020 (RIS3 Norte) development process was considered as forerunner in Portugal and is commonly held up as an example of a European good practice.

Under RIS3 Norte eight priority domains were identified, categorised into core domains (Culture, Creation and Fashion; Advanced Production Systems; Agri-Environmental Systems and Food; and Mobility and Environmental Industries); emerging domains (Symbolic Capital, Tourism Technologies and Services; and Life Sciences and Health); and wild-card or riskier domains worth investing domains (Marine Resources and Economy; and Human Capital and Specialised Services).

The governance model of RIS3 Norte includes a Regional Innovation Council, composed of business associations, technology developers and advanced users, entities of the scientific and technological system, universities, technological poles and clusters, and national planning and management entities of R&I policies and inter-municipal entities. The Council meets in plenary or is thematically subdivided into Regional Smart Specialisation Platforms that have been launched to facilitate entrepreneurial discovery processes. The platforms are legitimised by the Regional Innovation Council and should make recommendations and proposals for action lines for each S3 priority.

A preliminary analysis of the available information and monitoring reports of RIS3 Norte, allows to infer some limitations that should guide some adjustments in the future:

- RIS3 Norte, as a regional innovation policy, does not have institutional competences for innovation, nor does it have autonomy in defining public policy instruments, so its operationalisation had as a corollary a reactive logic, consisting mainly in the evaluation of projects in the operational programmes regarding their alignment with the specialisation strategy;
- the governance model revealed a less dynamic than desirable, both in the mobilisation of the Regional Innovation Council and the thematic platforms, creating discontinuity in the entrepreneurial discovery process and limiting the ability to take greater advantage of the involvement of regional actors. Also to be underlined was the difficult articulation between the implementation of the strategy and the governance model of Portugal 2020, leading to major limitations in the modelling of specific calls;
- the Regional Innovation Council shows a possible fragility in its composition due to the absence of companies, being this representation in charge of business associations and clusters.

On the other hand, the implementation of NORTE 2020 operational programme shows a high alignment of the supported projects with RIS3 Norte, registering an alignment rate of 91% of the number of approved projects where the RIS3 Norte constituted preferential or admissibility criteria, and 94% of the total eligible investment. The distribution of the number of approved projects and eligible investment over the priority areas of RIS3 Norte shows a concentration on the strategy's core domains, which accounted for 69% of the projects and 74% of the investment. The emerging domains accounted for 22% of the number of projects and 17% of the eligible investment. Wild-card domains accounted for 8% of the number of projects and 6% of the eligible investment.

The territorial distribution of approved projects framed within RIS3 Norte reveals very significant differences in terms of the access and participation of the NUTS III regions. There is a strong concentration of investment in the Metropolitan Area of Porto (44%), followed by Ave and Cávado subregions, which concentrated 12.7% and 10% of the investment, respectively, with the remaining NUTS III presenting much lower levels of eligible investment. These differences are in line with the imbalances in the distribution of the main regional innovation system actors across the region's territory.

2.4 Knowledge transfer networks and dynamics

The study sought to characterise the networks and dynamics of knowledge transfer in the region, by developing a network analysis on the “co-promotion” funding typologies supported by NORTE2020 and COMPETE2020. This exercise aimed at mapping the network of relationships between the actors involved, identify core actors in relation to their positions in the network (e.g. companies, universities and research centres) and detect network clusters and analyse their composition and interactions, assessing the potential for collaboration and knowledge sharing in the clusters found.

The network analysis revealed several strengths, weaknesses, and opportunities. The strengths of the network include a high clustering coefficient, indicating the presence of many closely connected groups of nodes. The modular structure of the network also indicates the presence of several distinct communities of nodes, which may have unique properties and functions. Furthermore, the network has a relatively high degree and weighted degree, indicating that most nodes have a significant number of connections and are therefore potentially influential.

One of the weaknesses of the network is its sparse structure, which indicates that the network has many isolated nodes and is not as connected as it could be. In addition, the network has several poorly connected components, which can limit the flow of information and influence through the network. However, the opportunities provided by the network are significant. The analysis indicates the potential the network has to be used as a platform for communication, collaboration and knowledge sharing across a wide range of sectors.

2.5 Participation in international S&T networks and consortia

An in-depth analysis was carried out on H2020 funded projects involving actors from the region. The data extracted from CORDIS revealed participation in 809 projects by entities from the region. Of these projects, 235 were led by Portuguese entities, which highlights the active participation of Norte in European projects. The total investment in these projects represented 6.052.423.749 euros, with the eligible investment from Portuguese entities amounting to 485.882.229 euros. However, it is important to note that only 8% of the eligible investment was allocated to Portuguese entities in relation to the total project funding, which may suggest that more efforts are needed to increase the participation of Portuguese entities in project leadership and funding.

A network analysis was also developed on H2020 projects in Coordination and Support Actions with at least one entity from the Norte region. The highly modular nature of the network, with many distinct communities and groups of densely connected entities, highlights the presence of a cohesive and collaborative research and innovation community.

3 Benchmarking of organisational models of regional innovation systems and governance models of regional smart specialisation strategies

A benchmarking exercise was developed to identify good practices in the implementation of regional innovation systems and in the governance of smart specialisation strategies. Considering as main criteria the innovation performance in recent years, similarities in terms of structural conditions, geographical proximity to Norte and (in the case of Portuguese regions) a greater degree of political autonomy within the national territory, ten regions were selected for this comparative analysis: Azores, Bretagne, Castile and Leon, Emilia-Romagna, Galicia, Madeira, Northern Netherlands, Basque Country, Pays-de-la-Loire and Puglia.

Two main dimensions were considered within this analysis: the regional context (level of autonomy, policies, mechanisms, formal structures, and multi-level approach) and S3 governance models (governance structure and management bodies, vertical and horizontal coordination, and competences and resources).

Although the way in which the studied regions organise their innovation and governance systems is very diverse, just as their regional contexts are very different, it was possible to observe the importance of the structures responsible for coordinating STI policies and S3 strategies, generally demonstrating an effective capacity for an integrated intervention in the respective innovation systems, through responses that are close and adjusted to local needs. In most of the territories studied these structures take the form of regional innovation agencies, with their own legal personality and administrative and financial autonomy.

4 Institutionalisation of the Norte innovation system

In the framework of this study, a model for the institutionalisation of the regional innovation system and corresponding main formal structures is proposed.

A set of principles were taken into account in the design of the proposed model: **1)** maintaining coherence with the structures created in the recent past, such as the Regional Innovation Council and the Smart Specialisation Platforms; **2)** facilitation of bottom-up participative and decision-making processes; **3)** existence of a dedicated central structure, with extended competences and endowed with the necessary financial and human resources; and **4)** contributing to a greater territorial balance of the regional innovation system through the action of local working groups capable of responding to the major sub-regional challenges.

The model that was put forward advocates the implementation of four main structures in the Norte innovation system:

- Regional Innovation Council. Continuing its mission along the lines defined when it was created in 2017, it is encouraged to also integrate companies, and

be composed by a representative of the dedicated executive structure and by representatives of the working groups for local missions (GTML).

- Regional Thematic Platforms. Pursuing their mission as thematic forums that put into action the smart specialisation strategy and act as entrepreneurial discovery spaces, it is proposed that the platforms are empowered to become intelligence/foresight units, monitor scientific and technological developments in the RIS3 Norte priority areas, and propose actions to boost the entrepreneurial discovery process (e.g., peer learning, brokerage, project co-creation workshops, etc.). In the proposed model, it is also suggested that platforms integrate, apart from the representatives of the regional quadruple helix, a thematic coordinator (external expert), an executive coordinator (representative of the executive structure) and companies based in the region.
- Local Mission Working Groups (GTML). Inspired by the local innovation missions promoted by the European Union, it is proposed that these working groups are created with the mission to address Norte's sub-regional main challenges, promoting innovation based on territorial assets. Focused on the NUTS 3 and coordinated by the respective Intermunicipal Communities (CIMs), they would be composed by actors of the quadruple helix of the respective NUTS 3 and would focus on critical challenges for their territories, with the support of policy instruments specifically created for this purpose. The GTML groups could also have a multi-NUTS 3 deployment.
- Dedicated executive structure. Critical node of the regional innovation system, it is proposed that this structure takes responsibility for implementing, boosting, and monitoring regional innovation policies and strategies, particularly focused on smart specialisation strategies. In a chapter specifically dedicated to this structure, the study presents alternative scenarios with a view to its operation and institutional model.

5 Proposal for an institutional model for a unity responsible for promoting innovation at the regional level

In the framework of the current study, a proposal is made for the implementation of an institutional model for the regional structure responsible for the design, coordination and implementation of innovation policies. Such a structure would play a key role in promoting a more effective and efficient regional innovation system by addressing the structural weaknesses that currently undermine the region's innovation potential. Such a structure could assume several key functions, including identifying regional priorities, allocating resources to strategic areas, and facilitating collaboration among key stakeholders.

By adopting a governance model tailored to the region's specific needs, the structure would be better placed to use policy instruments designed to the region's unique context and therefore more likely to deliver positive results, notably as a catalyst for

transformative structural change that would enable the region to embark on a new growth path characterised by greater knowledge and innovation intensity.

Fields of action for a regional structure or entity for innovation policy could encompass 1) addressing regional specificities; 2) facilitating the design and implementation of innovation policies; 3) strengthening stakeholder involvement 4) strengthening the cooperation of the quadruple helix; and 5) promoting open discovery processes.

Three alternatives seem possible to give substance to the regional innovation structure, in all cases with the need for proper framing in the new innovation functions assigned to CCDRs:

- Integrated Unit in CCNR-N. This alternative would involve the creation of a unit within CCNR-N responsible for the smart specialisation strategy, without legal autonomy.
- Regional Directorate for Innovation. Intermediate scenario would involve the creation of a specific general directorate within CCNR-N, with a certain degree of independence and a more significant allocation of resources, as well as some influence on the policy instruments of the Regional Operational Programme.
- Regional Innovation Agency. This alternative would involve the creation of an independent innovation entity, with legal autonomy, that would have the authority to design, implement and manage policy instruments.

A thorough analysis on a number of relevant dimensions becomes necessary for effective decision making on the most appropriate model, including institutional autonomy, attributions and resource allocation.

6 Conclusions and recommendations

6.1 Main conclusions

- The Norte regional innovation system encompasses a wide range of actors, competences and resources, including a broad set of relevant S&T organisations which are well interconnected.
- The evolution of the region's RTD performance has shown clear positive signs in terms of input dimensions (e.g., R&D investment, qualified human capital, etc.) but without reflecting with equal intensity innovation performance and economic impact.
- The implementation of the RIS3 Norte policy-mix, through the NORTE2020 Programme and, partially, the COMPETE2020 Programme, encompassed a wide range of types of funding instruments. The implementation of the strategy generally followed a normative transposition of the conditions for alignment with RIS3. This model resulted in the support to domains that at the outset had a greater critical mass (i.e. core domains) and may have limited the ability to

direct public support towards the creation of competences in emerging and wild-card domains.

- The distribution of the main innovation system actors across the Norte territory and the intensity of their connections reveals clear sub-regional imbalances, which are also reflected in the indicators relating to technological effort and economic performance (concentration of resources are observed in the Porto-Minho axis, posing additional challenges to the development of low-density territories).
- The analysis of networks in NORTE 2020 and COMPETE2020 co-promotion funding instruments, highlights the crucial role of strong intermediary institutions in various sectors and the existence of multiple distinct communities. These communities are concentrated in different domains, including materials, forestry, construction, information and communication technologies, agri-food, health and biotechnology, and the sea.
- Entities in the region have actively participated in around 800 H2020 projects, of which 235 were led by Portuguese entities. However, only 8% of the eligible investment was allocated to Portuguese entities in relation to the total funding of the projects, indicating the need to increase the leadership and leverage of funding by Portuguese entities.
- The analysis of the participation of entities from the Norte region in H2020 shows a strong presence in the network, especially in the performance of intermediary roles between different hubs and sectors, particularly in the agri-food, health and biotechnology, and sea industries.
- The governance model of the S3 strategy revealed limited effectiveness in achieving entrepreneurial discovery processes. The fact that its implementation was partly in simultaneous to the Covid-19 pandemic conditioned the mobilisation of the necessary collective processes for the identification of strategic niches of economic specialisation.
- The benchmarking exercise with ten other national and European regions led to the conclusion that there is greater autonomy in the management of STI&I policies in these territories when compared to Norte.
- In the regions analysed there are units specifically dedicated to the management of STI&I policies, with the capacity for an integrated intervention in the innovation system through responses that are close and adjusted to local needs. In most of the territories studied, these specialised units correspond to regional innovation agencies, with their own legal personality and administrative and financial autonomy.
- In the regions studied, it was observed that the governance models of innovation policies and S3 strategies do not follow linear trajectories, differing from country to country and region to region, as well as over time, leading to a wide spectrum of models with different institutional and financial arrangements.

- Common denominator of the interviews with the regions analysed: the growing need for the reinforcement of CT&I structures with human resources with professional skills and exclusive dedication. It was reported that this process tends to be operationally easier in the context of autonomous entities than within government structures.
- The implementation of entrepreneurial discovery spaces is seen by all the regions analysed as a demanding challenge. More than ensuring the active participation of the quadruple helix stakeholders, it is above all important to mobilise technology takers to respond to the needs and opportunities identified. For this reason, the effective involvement of business actors with knowledge about the evolution of markets proves to be of high importance.

6.2 Main recommendations

- In the framework of the proposal of a model for the institutionalisation of the Norte innovation system, it is recommended that four principles are taken into consideration:
 - maintaining coherence with the structures created in the recent past, such as the Norte Regional Innovation Council and its smart specialisation platforms;
 - having, as a central figure, a structure dedicated to innovation policies, with the necessary political empowerment, adequate financial and human resources, and broader functions;
 - a model that enables participative and bottom-up decision-making processes;
 - a model that contributes to a greater territorial balance through specific structures capable of responding to local challenges and missions.
- It is proposed that the institutionalisation model of the regional innovation system encompasses four main pillars, corresponding to the following formal structures:
 - Norte Regional Innovation Council (CRIN);
 - regional thematic platforms;
 - working groups for local missions;
 - dedicated executive structure.
- It is recommended that a representative of the executive structure responsible for the coordination of innovation policies at regional level and representatives of the working groups for local missions should be part of CRIN, in addition to the entities already participating. CRIN would also gain from having a greater representation of the business community to further stimulate the entrepreneurial discovery processes.
- The smart specialisation platforms could be empowered as intelligence/foresight units, monitor scientific and technological developments

in the priority areas of RIS3 Norte and propose actions to boost the entrepreneurial discovery process (e.g., peer learning, brokerage, project co-creation workshops, etc.). The platforms should also include, apart from the representatives of the regional quadruple helix, a thematic coordinator (external expert), an executive coordinator (representative of the executive structure) and companies based in the region.

- Working groups for local missions could be established to promote a more geographically balanced regional innovation system through innovation grounded in territorial assets. Focused on NUTS 3 (alone or in association) and coordinated by the respective Intermunicipal Communities (CIMs), these working groups would be composed by actors of the quadruple helix of the respective NUTS 3 and would focus on critical societal challenges for their territories, supported by instruments specifically created for this purpose.
- An executive structure responsible for the coordination of regional innovation policies could be set up, particularly focused on smart specialisation strategies. Being in a central position of the regional innovation system, this unit would coordinate the interaction between the system formal structures and promote collaboration between the various agents of the quadruple helix. It could take various forms regarding the institutional model: unit integrated in the CCDR-N (e.g., mission structure); innovation regional directorate; or regional innovation agency.
- A strategic reflection around dimensions of intervention is recommended for effective decision making on the most appropriate institutional model for the executive structure, including: 1) institutional autonomy; 2) legal form; 3) allocation of resources; 4) functions; 5) territorial coverage; 6) complexity; and 7) implementation time.
- Regardless of the formal model the structure may assume, it is recommended that its capacity for intervention is strengthened (compared to the existing situation) in terms of mission, functions, autonomy, and human and financial resources.

