



Multilevel governance and Smart Specialization in EU regions: an evidence-based critical review

Eristian Wibisono^{a, b, *}

^a Doctoral School of Regional Policy and Economics, University of Pecs, Hungary.

^b Member of POLISS: <https://poliss.eu>. This project has received funding from the European's Union H2020 Research and Innovation Programme under Grant Agreement No 860887

* Corresponding author at: wibisono.tian@gmail.com

Abstract. This paper critically reviews the literature on multilevel governance issues in support of implementing Smart Specialization policies in EU regions. Using an evidence-based critical review approach, key literature that draws on three critical concepts is explored: multilevel governance, regional innovation policy, and Smart Specialization in various governance conditions and diverse regional resources. The evidence reviewed points to the critical role of multilevel governance in implementing Smart Specialization. Effective coordination mechanisms are essential building blocks to encounter the challenges of multilevel governance for Smart Specialization. More consequential, however, are substantial synergies that are solid, harmonious, and balanced among multi-stakeholders within institutions and across levels of government. This paper contributes to the limited literature on multilevel governance in support of the Smart Specialization policy. Further studies considering different types of regions are recommended to enrich future literature.

Keywords. multilevel governance, regional innovation policy, Smart Specialization, European Union.

JEL Codes. O25, O38, R58.

DOI. <https://doi.org/10.17979/ejge.2022.11.2.9004>

1. Introduction

The lack of linkages between local institutions and weak governance in implementing regional innovation policies emerged long before the new concept of place-based policies, Smart Specialization, was introduced while on the other hand, institutional and governance characteristics are vital characteristics that can distinguish one region from another (Isaksen and Trippi 2017; Camagni and Capello 2017). Local government structures are complex with various fragmentation of authority, dense development activities, and limited inter-institutional communication and coordination (Lawson 2003; Henning Kroll 2015). Smart Specialization policy comes with a regional approach or regional diversity (Morgan 2013), which is closely related to the capacity and capability of the region in realizing innovation policies that follow regional uniqueness and regional economic transformation goals.

Innovation policies are implemented at various levels of government. Therefore, it is crucial to consider the enabling factors of multilevel governance, especially if the innovation policy involves links between levels of government. As stated by González-López (2019), multilevel interactions



in regional innovation policies should be considered to gain policy lessons that can be useful for creating better policies in the future. The most prominent challenge in multilevel governance is the interactions between different levels to develop effective innovation policy outcomes (Guimón 2018). However, the question then arises whether the policy mix resulting from interactions between levels of government or the relationship of local policy instruments with other policy instruments can affect the eventual efficiency of innovation policy. In the Smart Specialization policy, there is a lot of skepticism and questioning about whether the new concept of Smart Specialization also considers administrative, institutional, and political characteristics in different types of regions. In other words, does every region with diverse characteristics have the same or different governance problems in implementing the Smart Specialization policy?

This paper addresses multilevel governance issues and challenges in the context of Smart Specialization policies and critically reviews evidence and lessons learned in implementing innovation policy strategies in several EU regions. Using a literature review approach, this paper is intended to enrich the study of Smart Specialization place-based innovation policy from the perspective of place-based multilevel governance. By critically reviewing some evidence in several EU regions regarding their Smart Specialization Strategy (S3) development experiences, it is indicated that the role of government in Smart Specialization governance at the local/regional level is closely related to the role and participation of higher levels of government, following the multilevel governance approach. While these related studies are still evolving, the key points presented at the end of this paper are expected to motivate future studies.

This paper applies a critical literature review using literature sources published in reputable journals. The research protocol began with the primary literature search using the keywords "multi-level, multilevel, governance, innovation, smart specialization, Europe, and region" in the journal indexing databases Web of Science and Scopus, limiting the scope to the years of the research (2000-2021). A comprehensive background of the literature is presented in two subsections in the second part of the paper, which discusses governance challenges in implementation and how the concept of multilevel governance is appropriate and can support the implementation of Smart Specialization. In the third section, a review of evidence from previous research is presented to demonstrate the success of good governance close to the concept of multilevel governance in supporting the successful implementation of Smart Specialization (S3) strategies in several EU regions. The fourth section presents the paper's conclusions.

2. Multilevel governance in Smart Specialization policy: theoretical background

Governance challenges in Smart Specialization implementation

The concept of Smart Specialization is driven by the productivity and economic transformation problems of EU member states, which are lagging behind the United States. According to scholars of this concept, such as Foray et al. (2011) and McCann & Ortega-Argilés (2014), the problems

are more due to internal operational issues of the industrial sector at various technological levels rather than the lack of high-tech industrial sectors in European regions. Developers of the concept of Smart Specialization emphasize the importance of new domain inventions and dynamic entrepreneurship in many future fields that new and more appropriate industrial policies must support. As a result, the involvement of the state or government in this "discovery" process is crucial. This concept upholds the principle that industrial policy should be born from academic recommendations that are then translated into practical policy recommendations (Henning Kroll 2017). Since the Smart Specialization policy is practically reserved for European regions, and therefore guided by the European Regional Policy, the involvement of national public actors in this is very limited (Dominique Foray, David, and HALL 2011; Henning Kroll 2015). It is a "place-based policy" (Barca 2009). Hence, the old productivity-oriented industrial policy at the national level has become more oriented toward regional socio-economic issues, which are still being studied (D Foray et al. 2012; H Kroll 2016; Boschma 2014; Capello and Kroll 2016).

In the political agenda of Smart Specialization, the ex-ante requirements of the European Commission require regions to set regional investment priorities obtained through identifying new domains in the entrepreneurial discovery process (EDP). The implementation of Smart Specialization in the regions has become an essential political agenda because the European Structural and Investment Funds (ESIF) have to be accountable to regional political authorities with different capacities among the Member States. There are several essential factors that, according to (Henning Kroll 2017), can cause Smart Specialization policies to be absorbed differently by each region, including variations in regional economic potential, multilevel governance of local governments, and the political culture of local governments.

The multilevel governance context of Smart Specialization is essential to a region for administrative reasons. Multilevel governance implies that policy actors who play a role in a particular policy process can play a role again in another policy process (Hooghe, Marks, and Marks 2001; Kuhlmann 2001; Flanagan, Uyarra, and Laranja 2011), for example in the case of Smart Specialization policies. Many regions in Europe (such as some federal government regions in Germany) have decided not to have their regional industrial policies and continue or implement strategic national industrial policies (Henning Kroll 2017).

The discovery of new domains and complex EDP processes undertaken at the national level and then adapted at the regional level has raised major questions about what the mix of national and regional policies looks like and how best practices for the financial management of European Funding are implemented at the regional level. A further issue is the structural complexity of local government. Local governments have complex structures with fragmented authorities, dense development activities, and limited inter-agency communication (Lawson 2003). It can be concluded that, in addition to being fragmented, the government has limited internal and external coordination capacity (Henning Kroll 2015).

Regional innovation policies long before Smart Specialization was often associated with a lack of linkages between local institutions and weak governance of socio-economic systems (Isaksen and Trippel 2017). Regional innovation policies should consider regional specificities, including the

governance and institutional character of the region (Camagni and Capello 2017). As a new place-based innovation policy, Smart Specialization puts forward a territorial approach to what is referred to as territorial diversity (Morgan 2013). This territorial diversity is, of course, closely related to the region's capacity and ability to identify the region's economic potential that can truly describe the future development trajectory and structural changes of the region in line with the specificities of its geography. The place-based policy instruments promoted by Smart Specialization have opened flexible access to structural funds according to the context of regional specificities to support the economic transformation goals of the region.

González-López (2019) argues for the importance of considering the influence of multilevel governance on innovation policy in the context of regional innovation policy. His concept is based on the two main analytical tools for assessing learning in regional innovation policies that have been raised in the studies of Lundvall & Borrás (1998) and Nauwelaers & Wintjes (2008). Innovation policies are often implemented at different levels of government. Regarding discussing innovation policy in a regional context, it is crucial to consider the multilevel governance structures of different levels of government (regional, national, and sub-national) and their interactions. The key to this concept is, of course, strong coordination to achieve policy coherence. It also means that other levels of government (e.g., EU national or sub-national governments) are external knowledge channels or sources that strongly influence policy learning at the regional government level.

Previous scholars have expressed some skepticism about Smart Specialization in the context of regional and local governance, arguing that the policy concept of Smart Specialization is insufficient and incomplete to address administrative, institutional, and political constraints in specific regions. It also means many regional operational capacity issues in implementing Smart Specialization (Capello and Kroll 2016; Iacobucci 2014; Pugh 2014). Concretely, the implementation of S3 in more developed or urban areas has received more attention than, for instance, in less developed regions or sparsely populated areas (SPAs). McCann, P., Ortega-Agiles, R. & Foray, D. (2015, p. 68) mention that the main challenge for the last instance regions in implementing S3 is the limited critical mass of economic actors in these regions. Boschma (2015) argues that regions with weak innovation capacity have less potential to diversify. On the other side, Tödtling & Trippl (2005) argue that due to regional diversity reasons, more underdeveloped regions tend to favor the easy way of copying innovation policy best practices in more prosperous regions. The study by Sörvik et al. (2019) may provide further insights into regional innovation policy issues for Smart Specialization in SPAs with limited local actors and various regional governance, political and administrative matters.

The different policy levels at the regional and national levels should not be understood as interchangeable but rather as interdependent and complementary (Guimón 2018). Multilevel governance refers to the proportional and tiered division of responsibilities in the process of policy planning and implementation across different administrative and territorial levels (Benz and Eberlein 1999; Koschatzky and Kroll 2009). The most prominent challenge in multilevel governance is the effectiveness of interactions between different levels to create efficient

innovation policy outcomes. A further challenge relates to the policy mix resulting from interactions and interdependent relationships with other policy instruments that can affect the efficiency of innovation policies (Flanagan, Uyarra, and Laranja 2011; Martins 2016). Some studies show that the combination of policy mix and multilevel governance is believed to create a more effective innovation process locally than at other levels (Karo 2012; Howlett and Rayner 2007). However, it is crucial to bear in mind that while this combination has the potential to increase the effectiveness and efficiency of regional innovation policies, coordination failures can vandalize the expected success. Possible administrative governance problems include policy duplication and overlapping, poorly agreed prioritization, and policies that are not coherent and consistent with other policies (Magro, Navarro, and Zabala-Iturriagoitia 2014).

In the Smart Specialization policy context, regions are encouraged to actively participate in determining priority domains according to their regional characteristics either as participatory partners in bridging national policies or independently developing policies and strategies independent of national authorities and implementing projects according to their resources (Cohen, 2019; Laranja et al., 2020). Smart Specialization is an evolving regional policy concept that draws on established concepts of governance and regional innovation systems (del Carmen Sánchez-Carreira, González-López, and Varela-Vázquez 2021; Hassink and Kiese 2021; Gancarczyk, Ujwary-Gil, and González-López 2021). This policy places great emphasis on mechanisms for sharing responsibility and proper coordination between various local actors and at various levels of government (Moodie et al. 2021; Larrea, Estensoro, and Pertoldi 2019; Guzzo and Perianez-Forte 2019; Marinelli, Fernández Sirera, and Pontikakis 2021; Serbanica 2021; Magro and Wilson 2019).

The Smart Specialization Strategy (S3) faces many challenges in its implementation. Developing and underdeveloped countries or regions, in particular, with decentralized innovation policy structures, face more acute challenges due to the diversity of their innovation systems (Trippi, Zukauskaitė, and Healy 2019; Papamichail, Rosiello, and Wield 2019; McCann and Soete 2020; Dominique Foray 2019). This phenomenon is exacerbated by the problem of institutional instability and income inequality which are still the leading cases even in developed countries such as the US, UK, and several member countries of the European Union (Atkinson, Casarico, and Voitchovsky 2018; Cassiolato and Lastres 2000).

Guimón (2018) explores several issues related to the decentralization of science and innovation policies in several developing countries. Two interesting things discussed in his study are the importance of competency sharing and proper coordination mechanisms at various levels of government. The division of local government competencies in developing Smart Specialization policies in the regions must be adequately distinguished from the central or national government. In addition, the proper coordination mechanism between levels of government must also be regulated to address various governance issues in the implementation of S3 (Valdmaa, Pugh, and Müür 2021; Ruhrmann, Fritsch, and Leydesdorff 2021; Ghinoi et al. 2021; Dominique Foray, Eichler, and Keller 2021).

How does multilevel governance support the implementation of Smart Specialization?

Multilevel governance (MLG) can be understood as the active involvement of local innovation actors in developing or implementing policies through formal and informal mechanisms (Tödtling-Schönhofer et al. 2013; Caponio 2021; Ongaro et al. 2019; Moodie et al. 2021). The definition of MLG put forward by Schmitter (2004) is: "arrangements for making binding decisions that involve multiple politically independent but interdependent actors - private and public - at different levels of territorial aggregation in more or less continuous negotiation/ deliberation /implementation, and that do not assign exclusive policy competence or assert a stable hierarchy of political authority to any of these levels". Barca (2009) defines MLG as a system where policies are designed, implemented, and distributed across different levels of government and local authorities or institutions according to their respective objectives. Furthermore, Serbanica & Constantin (2017) underline the role of MLG in integrating various policies and activities at different levels of government, emphasizing the importance of synergy between all actors. In the context of EU policy, the concept of MLG has been used explicitly with the concept of a network approach or interrelated relationships without paying attention to hierarchical relationships. In this approach, MLG is described as "a collective decision-making process by multi-stakeholder authorities at different levels of governance and across different policy sectors" ("Spatial Foresight Local and Regional Partners Contributing to Europe 2020" 2015).

Hooghe et al. (2001) classify MLG into two types: Type 1, which promotes the concept of vertical governance relationships where decisions in a process are taken based on hierarchical relationships and geography, and Type 2, which promotes more fluid horizontal relationships, which seems more appropriate in the context of Smart Specialization innovation policy. Smart Specialization foregrounds the relationships of the four elements of the Quadruple Helix and places importance on the horizontal interactions of various regional innovation actors in generating new domains in formulating the Smart Specialization Strategy (S3). Interactions between national and local/regional governments in the S3 development process may be limited to optimizing the role of local entrepreneurial actors who best understand local conditions. Therefore, considering multilevel governance (MLG) in the implementation of Smart Specialization that involves the role of government at several levels (national, regional, and sub-regional) will potentially improve the effectiveness and efficiency of collaboration between them.

On the one hand, national governments may have better competencies than regional governments, or regional governments may have better competencies than sub-regional governments. But on the other hand, it is not necessarily that the government at a higher level can always be present to handle many things at once when in a region, new domain opportunities arise in various fields or sectors. It then raises the question of the optimal governance mechanism in managing S3 at various levels and interconnecting horizontally and complementing each other (Larrea, Estensoro, and Pertoldi 2019).

The rationale behind Smart Specialization is a place-based approach that has the potential to be implemented in any region through at least two things: collaboration between different levels

of government with similar or different levels of knowledge for learning; and capitalizing on the local government's strong understanding and knowledge of its potential. Thus, quoting from Larrea et al. (2019), the main concept of MLG for Smart Specialization can be said to be a complex collaboration process between different government authorities to make S3 open and accessible to other actors. The MLG concept can help improve the implementation of S3 in accordance with the fundamental principles of Smart Specialization (Cohen, 2021; Joint Research Centre, Institute for Prospective Technological Studies, Goenaga Beldarrain, & Foray, 2013). First, linking S3 priority programs with local investments enhances innovation capacity and local knowledge (level of granularity principle). Second, it positions the government as a platform that guides the entrepreneurial discovery process (EDP) in identifying and integrating local assets and knowledge. Thirdly, S3 emphasizes the importance of monitoring and evaluation involving all stakeholders through relevant communication mechanisms and for learning purposes.

The description above confirms that governance challenges emerge as an essential issue in the implementation of S3; thus, MLG also emerges convincingly. While multilevel coordination in implementing S3 is crucial, it is also essential to understand that MLG, in this case, is more of a "joint strategy creation process" where significant central government control over cohesion projects for local interests must also be balanced (Marques & Morgan, 2018). Based on these arguments, it can be convinced that the Smart Specialization framework requires a significant role of local governments and actors, which the MLG concept could potentially support. In this regard, this paper will afterward focus on how the role of government at various territorial levels with a multilevel governance approach can support the implementation of Smart Specialization.

3. Multilevel governance and Smart Specialization in EU regions: an evidence-based critical review

This section aims to present evidence and a critical review of the various governance-related challenges in the implementation of S3 in EU regions and how the Multilevel Governance (MLG) approach could then potentially help improve the implementation of S3 in different regions in the EU. This section also intends to show that according to the experience and evidence from several EU regions, the Smart Specialization framework essentially has features that are mutually supportive with the MLG concept as discussed in the previous section.

In the *first* critical review, I observe what has been discussed by Kroll (2017), who takes a case study of the multilevel governance of regional innovation policy in two regions in Germany, North Rhine-Westphalia (NRW) and Saxony. As in Germany's federal system, all Länder have a very complex set of federal-regional duties per the country's constitution. The federal government handles innovation and technology policy in Germany, and meaningful projects resulting from the entrepreneurial discovery process are also financed nationally without much regional involvement, especially in terms of budget. In short, the German federal government plays the most crucial role in innovation policy at the regional level. Furthermore, within a complex

governmental structure, innovation and technology policy in Germany involves three prominent authorities that deal with economics, science, and the chancellery. Each of these entities has diverse resources and elements of interest within its organizational structure. Effective coordination is the most substantive challenge in this regard.

In the first case study of North Rhine-Westphalia (NRW), Kroll (2017) emphasizes governance aspects. Critical actors in the region play a significant role in regional innovation policy even though it is integrated into the national innovation policy. As the region is autonomously well-equipped with strategic facilities and resources, its regional innovation success is less dependent on the national investment (H Kroll and Meyborg 2013). North Rhine-Westphalia (NRW) has developed specialized policies in the long term as national policies cannot always facilitate the regional transformation challenges NRW. In addition, due to the region's large geographic and economic size, another challenge is the complexity of its administration. The NRW region may have managed to overcome budgetary issues and its administration. However, there is complex coordination and communication within the internal agendas of ministries and agencies. Due to the challenges of the region's transformation, NRW was fully supported by European Structural Funding over a long period which causes NRW's regional administrative capacity has emerged as an essential factor in supporting regional innovation policy.

The following case study from Kroll (2017) study is the region of Saxony, which represents the eastern part of Germany. Saxony joined the Federal Republic of Germany in 1990, and since then, its focused economic policies have transformed its economy and made it the strongest in East Germany. Due to the remarkable legacy of the previous government system, the region has many qualified human resources. Information Technology (IT) is emerging as the region's new leading industry, while the machinery industry inherited from the past is still a strength that continues to be promoted (Zenker and Kroll 2014). The entrepreneurial discovery process in many fields has been successful, but these new domains generally differ from the previously existing and thriving leading fields.

In the process of successful economic transformation, Saxony has greatly benefited from national investments that was supported by three critical success factors: public research institutes, leading universities, and clusters of regional (Zenker and Kroll 2014). Local governments focus European Structural Fund for Saxony on supporting the growth of mid-cap companies. Although the geographic and economic size of the Saxony region is much smaller than NRW, Saxony is administratively challenged in its regional organization efficiency. The organization created after the reunification process is still relatively new, replacing the previous organization. In taking responsibility for making an excellent regional innovation climate, Saxony only relies on two departments in a single ministry that coordinates relatively well with other ministries and agencies (Henning Kroll et al. 2016). Saxony's government administratively is among Germany's most professional and efficient.

On the other hand, Saxony has succeeded in developing the best strategy document that links its public investments directly into innovation and technology and the possible socio-economic impacts. In the process, the determination of this strategy should be based on scientific evidence

and regional economies' elements. With an already efficient organizational structure, substantive improvements are not so visible. In the RIS3 process, Saxony may differ slightly from NRW in that it cooperates with the European Commission in accessing additional funds, which they can allocate to several administrative units in its region to develop better regional innovation strategies.

The two case studies discussed by Kroll (2017) show the uniqueness and significant progress of regions in Germany in supporting innovation and technology through public funding. Public investment can be accessed after going through a substantial long process, starting with forming a strategic policy derived from the entrepreneurial discovery process and finding new domains for public investment purposes, matching the character of the Smart Specialization place-based innovation policy. This success also seems to reflect the effectiveness and efficiency of aspects of good governance. There are similarities in the relevance of the national budget for these two case studies, namely, both accessing federal funding. But organizationally, the complexity of the two is very different. NRW is much more complex than Saxony. It is mainly due to the very diverse size of the region's geography, economy, and population. It also causes the role of EU funding in the two regions to differ. There is EU funding involvement in NRW with substantial efforts from the region. But for Saxony, EU funding plays a significant leading role in regional innovation policy.

Second, a recent study by González-López (2019) explored the regional innovation system's evolution, policy learning, and influencing factors over two decades in Galicia (Spain). Using a case study approach, he interviewed seven key actor's instrumentals in the policy-making innovation process in the mandate period 1989-2017. The integrated innovation policy that is considered the primary milestone of innovation policy in Galicia is estimated to have started in 1999, while the Galician RIS3 of 2014 was the primary innovation policy reference used at the time of the study.

In terms of creating good governance and low-cost, flexible, and efficient bureaucracy, Galicia created the Galician Innovation Agency, the most significant institutional evolution in the region's innovation policy-making process. It was demonstrated by a smaller number of policy instruments but a larger budget in the hope that it would reduce bureaucratic costs and increase the impact of innovation policy. Other innovations include implementing reforms in public procurement programs that require intensive interaction with the government's internal audit and financial management agencies.

On the other hand, an apparent weakness in the innovation policy evolution over two decades in Galicia has been the evaluation and monitoring of policies, which, although formally on the agenda of R&D planning documents, have not been earnestly implemented. In addition, the technology assessment and forecasting process, which has often involved universities and independent consultants, has not been optimally utilized. External study reports that are useful for policymaking are taken for granted as a document or work output but are not used sustainably in the policy planning process.

In the last two decades, only the most recent period involved social and political participation in the region's design and implementation of innovation policy. It was due to a requirement from

the EU Commission in the entrepreneurial discovery process that required the involvement of experts and various stakeholders in supporting the creation of the region's innovation policy. In this process, the Galician government also interacts with the two levels of government above it, namely Spain and Europe. Galicia has policies and government structures that the Spanish government heavily influences. Arguably many things are copied for normative or political reasons, making specific changes challenging to identify and tend to bring uncertainty. It has been a constant trend in Spanish governance. Multilevel governance channels are needed to adapt continuously to the country's changing political and legal situation.

In addition to being strongly influenced by the central government, Galicia's innovation policy learning is also affected by innovation policy at the EU level. Innovation policy strategies that follow the European Commission's guidelines are highly relevant to the Galician innovation policy system. Other essential lessons also come from other EU regions or member states. Simple imitation may still produce positive results if policymakers always consider the peculiarities of the region. The design and implementation of RIS3 in the last period of Galician governance demonstrated the efforts of many stakeholders in the innovation policy formulation process, which should be maintained in the future. This is the first time that Galicia's innovation policy process has involved systematic socio-political participation. The concept of Smart Specialization innovation policy proved to be very advantageous in the evolution of innovation policy in Galicia.

Third, I discuss the study by Sörvik et al. (2019), which explored the application of S3 in sparsely populated areas in five regions across five European countries using a comparative case study approach. The study addresses critical issues related to S3 in SPA regions in Europe based on five key dimensions of the Smart Specialization concept. The first evidence shows that SPA regions have undergone a meaningful transition in the regional innovation policy-making process since the advent of the S3 framework. This transition is embedded in the SPA regions in the form of a change in the region's paradigm towards innovation, making them more supportive of the region's potential and more future-oriented. They also quickly accepted the entrepreneurial discovery process (EDP) paradigm as the primary basis for Smart Specialization policy.

The emergence of S3 as an innovation policy strategy reconstructed the mindset of local governments in SPA in managing their region's resources. The S3 also increased the participation of various stakeholders in the policy-making process. For example, as happened in Nordland (Norway), which runs a green industry project in producing renewable energy by synergizing with various sectors or as happened in Lapland (Finland), where the government involves multi-partners in building innovation policy strategies that focus on the birth of strategic SMEs as a new growth element of the region by improving ICT access which they have been facing due to their geographical position.

The implementation of S3 in the SPA region was carried out by prioritizing innovation in the traditional primary resources of the region. However, the challenges become substantive in several respects, including multilevel governance, quality of human resources, new sources of knowledge, and expansion of channels. This issue is essential in multilevel governance, given that SPA areas generally have limited administrative resources and institutional thinness.

Program synergies and strategies become more efficient due to good coordination between institutions. In addition, the government is also faced with the problem of conflict of interest in multilevel governance. At the SPA region level, it is pretty challenging to mobilize stakeholders at the national level to engage in their regional activities. One of the best suggestions by Moodysson et al. (2015) is aligning SPA region policies with other higher-level policies where there are many sectoral regulations that may be relevant for different levels of government. For example, national regulations on environmental sustainability or programs related to renewable energy are the kind of sectoral regulations that can be implemented even at the lowest level of government. This kind of integration is also critical to create synergies within the SPA region and between levels of government. As Sörvik et al. (2019) suggested, the European Social Fund could be considered to improve the competencies of SPA regions in addition to aligning and enhancing synergies between rural policies and Smart Specialization policies.

4. Conclusion

Governance in innovation policy is widely recognized knowledge. However, there needs to be more literature on how implementing the new place-based innovation policy, Smart Specialization, can be improved through multilevel governance (MLG) efforts. This paper critically examines the governance challenges in implementing Smart Specialization in the EU region using an evidence-based review approach. These fundamental issues are firstly raised and then followed by presenting supporting literature on how multilevel governance (MLG) is considered can support the implementation of Smart Specialization at the local/regional level.

Some of the evidence reviewed shows that, *firstly*, regions with a strong historical background that have managed to transform significantly show a vital role of national authorities (such as the cases of NRW and Saxony in Germany). In creating regional innovation strategies in line with Smart Specialization principles, regions with sufficient resources to discover new domains through the Entrepreneurial Discovery Process (EDP) are controlled by the national (federal) government with a balanced presence of local government authorities. In this case, mechanisms for effective coordination and communication between levels of authority are crucial. *Secondly*, regional authorities' most frequent difficulties are related to monitoring and evaluating policy implementation in regions where innovation policies are well-established and integrated nationally (such as the case of Galicia in Spain). Involving multi-stakeholders from the EDP process to the monitoring and evaluation stage of the Smart Specialization Strategy (S3) can advance its effectiveness. Intensive interaction between institutions and levels of government can serve as a learning channel to absorb external knowledge and experience so that governance at the local/regional level can continuously adapt to changes at the country or EU level. *Thirdly*, regions with significant limitations in governance and institutions for geographic and demographic reasons (such as Sparsely Populated Areas (SPAs) in Nordland-Norway and Lapland-Finland) can still develop their innovation strategies based on their regional uniqueness through harmonized

innovation projects. Effective coordination between local institutions is undoubtedly an important asset, and at the same time, substantial synergies between levels of government can optimize the impact of these projects.

This evidence review clarifies that the Smart Specialization principles implemented at the sub-national level are not without challenges. This paper intends to highlight that governance challenges in implementing Smart Specialization at the sub-national level are closely related to the role of government across levels. Evidence also suggests that effective coordination mechanisms can help address governance issues at the sub-national level. However, concerning multilevel governance (MLG), the main emphasis in this concept is not only on the coordination perspective but also on solid, harmonious, and balanced synergies among multi-stakeholders at different levels of government.

Finally, it is premature to claim that the points raised in this paper conclusively show how multilevel governance is worth considering in implementing Smart Specialization policies. Studies on this subject are still to be developed, and the critical review in this paper is expected to be one of the motivating ones. Furthermore, the apparent limitation of this paper is that the selection of region types in presenting the evidence review may not be equivalent. Such a composition may have led to accuracy and precision problems in drawing conclusions. The generalization of the types of regions has been applied in the presentation of the paper. Future research could examine the phenomenon of stratified governance based on different types of regions, for instance, the less developed regions of the European Union.

Acknowledgments

The author gratefully acknowledges the support provided by POLISS (<https://poliss.eu>), the funded project under European Union's H2020 Research and Innovation Programme, Grant Agreement No. 860887. Views and opinions are only those of the author and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.

The author would also like to thank Professor Tamás Sebestyén, Professor Ilona Pálné Kovács, and anonymous reviewers for their constructive criticism and suggestions.



**Funded by
the European Union**

References

- Atkinson, A. B., Casarico, A., & Voitchovsky, S. (2018). Top incomes and the gender divide. *Journal of Economic Inequality*, 16(2), 225-256. <https://doi.org/10.1007/s10888-018-9384-z>
- Barca, F. (2009). Agenda for a reformed cohesion policy. European Communities Brussels.
- Benz, A., & Eberlein, B. (1999). The Europeanization of regional policies: patterns of multilevel governance. *Journal of European Public Policy*, 6(2), 329-348. <https://doi.org/10.1080/135017699343748>
- Boschma, R. (2014). Constructing regional advantage and smart specialisation: Comparison of two European policy concepts. *Constructing Regional Advantage and Smart Specialisation: Comparison of Two European Policy Concepts*, 51-68. <https://doi.org/10.3280/SCRE2014-001004>
- Boschma, R. (2015). Towards an evolutionary perspective on regional resilience. *Regional Studies*, 49(5), 733-751. <https://doi.org/10.1080/00343404.2014.959481>
- Camagni, R., & Capello, R. (2017). Regional innovation patterns and the EU regional policy reform: towards smart innovation policies. In *Seminal studies in regional and urban economics* (pp. 313-343). Springer. https://doi.org/10.1007/978-3-319-57807-1_16
- Capello, R., & Kroll, H. (2016). From theory to practice in smart specialization strategy: emerging limits and possible future trajectories. *European Planning Studies*, 24(8), 1393-1406. <https://doi.org/10.1080/09654313.2016.1156058>
- Caponio, T. (2021). Governing Migration through Multi-Level Governance? City Networks in Europe and the United States. *JCMS: Journal of Common Market Studies*, 59(6), 1590-1606. <https://doi.org/10.1111/jcms.13214>
- Cassiolato, J. E., & Lastres, H. M. M. (2000). Local systems of innovation in Mercosur countries. *Industry and Innovation*, 7(1), 33-53. <https://doi.org/10.1080/713670250>
- Cohen, C. (2019). *Implementing Smart Specialisation: An analysis of practices across Europe*. Publications Office of the European Union, Luxembourg, Doi, 10, 759464.
- Cohen, S. (2021). *Reflections Guiding Smart Specialisation Strategies Impact Assessment*. Joint Research Centre (Seville site).
- del Carmen Sánchez-Carreira, M., González-López, M., & Varela-Vázquez, P. (2021). The implementation of the smart specialization approach in the peripheral region of Galicia. In *Partnerships for Regional Innovation and Development* (pp. 49-75). Routledge. <https://doi.org/10.4324/9780429330261-4>
- Flanagan, K., Uyarra, E., & Laranja, M. (2011). Reconceptualising the 'policy mix' for innovation. *Research Policy*, 40(5), 702-713. <https://doi.org/10.1016/j.respol.2011.02.005>
- Foray, D. (2019). On sector-non-neutral innovation policy: towards new design principles. *Journal of Evolutionary Economics*, 29(5), 1379-1397. <https://doi.org/10.1007/s00191-018-0599-8>
- Foray, D., David, P. A., & HALL, B. H. (2011). Smart specialisation - From academic idea to political instrument, the surprising career of a concept and the difficulties involved in its implementation. In *MTEI-WORKING_PAPER-2011-001*.

- Foray, D., Eichler, M., & Keller, M. (2021). Smart specialization strategies-insights gained from a unique European policy experiment on innovation and industrial policy design. *Review of Evolutionary Political Economy*, 2(1), 83-103. <https://doi.org/10.1007/s43253-020-00026-z>
- Foray, D., Goddard, J., Goenaga Beldarrain, X., Landabaso, M., McCann, P., Morgan, K., Nauwelaers, C., & Ortega-Argilés, R. (2012). Guide to research and innovation strategies for smart specialisations. apo.org.au. <https://apo.org.au/node/90736>
- Gancarczyk, M., Ujwary-Gil, A., & González-López, M. (2021). The expansion of the smart specialization concept and practice. In *Partnerships for Regional Innovation and Development* (pp. 1-18). Routledge. <https://doi.org/10.4324/9780429330261-1>
- Ghinoi, S., Steiner, B., Makkonen, T., & Hassink, R. (2021). Smart Specialisation strategies on the periphery: a data-triangulation approach to governance issues and practices. *Regional Studies*, 55(3), 402-413. <https://doi.org/10.1080/00343404.2020.1791321>
- Tödtling-Schönhofer, H., Radzyner, A., Frangenheim, A., Bachtler, J., Mendez, C., Charles, D., & Granqvist, K. (2013). *An Assessment of Multilevel Governance in Cohesion Policy, 2007-2013*.
- González-López, M. (2019). Understanding policy learning in regional innovation policies: Lessons from the Galician case. *Innovation: The European Journal of Social Science Research*, 32(1), 104-118. <https://doi.org/10.1080/13511610.2018.1519780>
- Guimón, J. (2018). Decentralisation of science and innovation policies in emerging countries: three key challenges that deserve further attention. *International Journal of Technological Learning, Innovation and Development*, 10(1), 69-87. <https://doi.org/10.1504/IJTLID.2018.091801>
- Guzzo, F., & Perianez-Forte, I. (2019). Smart specialisation at work: evidence from the peer and exchange and learning workshops. Joint Research Centre (Seville site).
- Hassink, R., & Kiese, M. (2021). Solving the restructuring problems of (former) old industrial regions with smart specialization? Conceptual thoughts and evidence from the Ruhr. *Review of Regional Research*, 41(2), 131-155. <https://doi.org/10.1007/s10037-021-00157-8>
- Hooghe, L., Marks, G., & Marks, G. W. (2001). *Multilevel governance and European integration*. Rowman & Littlefield.
- Howlett, M., & Rayner, J. (2007). Design principles for policy mixes: Cohesion and coherence in 'new governance arrangements.' *Policy and Society*, 26(4), 1-18. [https://doi.org/10.1016/S1449-4035\(07\)70118-2](https://doi.org/10.1016/S1449-4035(07)70118-2)
- Iacobucci, D. (2014). Designing and implementing a smart specialisation strategy at regional level: Some open questions. *Scienze Regionali*. <https://doi.org/10.3280/SCRE2014-001006>
- Isaksen, A., & Trippl, M. (2017). Exogenously led and policy-supported new path development in peripheral regions: Analytical and synthetic routes. *Economic Geography*, 93(5), 436-457. <https://doi.org/10.1080/00130095.2016.1154443>
- Joint Research Centre, Institute for Prospective Technological Studies, Goenaga Beldarrain, X., & Foray, D. (2013). *The goals of smart specialisation*, Publications Office. <https://data.europa.eu/doi/10.2791/20158>

- Karo, E. (2012). Modernizing governance of innovation policy through 'decentralization': A new fashion or a threat to state capacities? *Innovation*, 14(4), 495-509. <https://doi.org/10.5172/impp.2012.14.4.495>
- Koschatzky, K., & Kroll, H. (2009). Multilevel governance in regional innovation systems. *EKONOMIAZ. Revista Vasca de Economía*, 70(01), 132-149.
- Kroll, H. (2015). Efforts to implement smart specialization in practice-leading unlike horses to the water. *European Planning Studies*, 23(10), 2079-2098. <https://doi.org/10.1080/09654313.2014.1003036>
- Kroll, H. (2016). Policy brief on smart specialisation. Occasional Report. Karlsruhe: Fraunhofer. https://www.isi.fraunhofer.de/content/dam/isi/dokumente/ccp/2016/Kroll_2016_Policy_Brief_on_Smart_Specialisation.pdf
- Kroll, H. (2017). Smart specialization policy in an economically well-developed, multilevel governance system. In *Advances in the theory and practice of smart specialization* (pp. 99-123). Elsevier. <https://doi.org/10.1016/B978-0-12-804137-6.00005-X>
- Kroll, H., Böke, I., Schiller, D., & Stahlecker, T. (2016). Bringing owls to Athens? The transformative potential of RIS3 for innovation policy in Germany's Federal States. *European Planning Studies*, 24(8), 1459-1477. <https://doi.org/10.1080/09654313.2016.1159666>
- Kroll, H., & Meyborg, M. (2013). Regional innovation monitor plus, regional innovation report North Rhine-Westphalia. Technopolis Group, Brussels.
- Kuhlmann, S. (2001). Future governance of innovation policy in Europe-three scenarios. *Research Policy*, 30(6), 953-976. [https://doi.org/10.1016/S0048-7333\(00\)00167-0](https://doi.org/10.1016/S0048-7333(00)00167-0)
- Laranja, M., Edwards, J., Pinto, H., & Foray, D. (2020). Implementation of smart specialisation strategies in Portugal: An assessment. Luxembourg, Publications Office of the European Union.
- Larrea, M., Estensoro, M., & Pertoldi, M. (2019). Multilevel governance for smart specialisation: basic pillars for its construction. Publications Office of the European Union. DOI, 10, 898433.
- Lawson, T. (2003). Institutionalism: on the need to firm up notions of social structure and the human subject. *Journal of Economic Issues*, 37(1), 175-207. <https://doi.org/10.1080/00213624.2003.11506562>
- Lundvall, B.-Å., & Borrás, S. (1998). The globalising learning economy: Implications for innovation policy.
- Magro, E., Navarro, M., & Zabala-Iturriagoitia, J. M. (2014). Coordination-mix: The hidden face of STI policy. *Review of Policy Research*, 31(5), 367-389. <https://doi.org/10.1111/ropr.12090>
- Magro, E., & Wilson, J. R. (2019). Policy-mix evaluation: Governance challenges from new place-based innovation policies. *Research Policy*, 48(10), 0-1. <https://doi.org/10.1016/j.respol.2018.06.010>
- Marinelli, E., Fernández Sirera, T., & Pontikakis, D. (2021). Towards a transformative smart specialisation strategy: Lessons from Catalonia, Bulgaria and Greece. Publications Office of the European Union, Luxembourg.

- Marques, P., & Morgan, K. (2018). The Heroic Assumptions of Smart Specialisation: A Sympathetic Critique of Regional Innovation Policy. In: Isaksen, A., Martin, R., Tripl, M. (eds) *New Avenues for Regional Innovation Systems - Theoretical Advances, Empirical Cases and Policy Lessons*. Springer, Cham. https://doi.org/10.1007/978-3-319-71661-9_14
- Martins, J. T. (2016). Relational capabilities to leverage new knowledge. *The Learning Organization*, 23(6), 398-414. <https://doi.org/10.1108/TLO-03-2016-0022>
- McCann, P., & Ortega-Argilés, R. (2014). The role of the smart specialisation agenda in a reformed EU cohesion policy. *The Role of the Smart Specialisation Agenda in a Reformed EU Cohesion Policy*, 15-32. <https://doi.org/10.3280/SCRE2014-001002>
- McCann, P., Ortega-Agiles, R. & Foray, D. (2015). Smart specialization and European regional development policy. In David B. Audretsch, Albert N. Link, and Mary Walshok (eds), *The Oxford Handbook of Local Competitiveness*, Oxford Handbooks. <https://doi.org/10.1093/oxfordhb/9780199993307.013.26>
- McCann, P., & Soete, L. (2020). *Place-based innovation for sustainability*. Publications Office of the European Union: Luxembourg.
- Moodie, J. R., Wøien Meijer, M., Salenius, V., & Kull, M. (2021). Territorial governance and Smart Specialisation: empowering the sub-national level in EU regional policy. *Territory, Politics, Governance*, 1-21. <https://doi.org/10.1080/21622671.2021.1905542>
- Moodysson, J., Tripl, M., & Zukauskaite, E. (2015). Policy learning and smart specialization. Balancing policy change and continuity for new regional industrial paths. <https://doi.org/10.1093/scipol/scw071>
- Morgan, K. (2013). The regional state in the era of Smart Specialisation. *EKONOMIAZ: Revista Vasca de Economía*, 83, 102-125.
- Nauwelaers, C., & Wintjes, R. (2008). Innovation policy, innovation in policy: policy learning within and across systems and clusters. *Innovation Policy in Europe. Measurement and Strategy*, Edward Elgar, Cheltenham, 225-268.
- Ongaro, E., Gong, T., & Jing, Y. (2019). Toward multilevel governance in China? Coping with complex public affairs across jurisdictions and organizations. *Public Policy and Administration*, 34(2), 105-120. <https://doi.org/10.1177/0952076718799397>
- Papamichail, G., Rosiello, A., & Wield, D. (2019). Capacity-building barriers to S3 implementation: an empirical framework for catch-up regions. *Innovation - The European Journal of Social Science Research*, 32(1), 66-84. <https://doi.org/10.1080/13511610.2018.1537844>
- Pugh, R. E. (2014). 'Old wine in new bottles'? Smart Specialisation in Wales. *Regional Studies, Regional Science*, 1(1), 152-157. <https://doi.org/10.1080/21681376.2014.944209>
- Ruhrmann, H., Fritsch, M., & Leydesdorff, L. (2021). Synergy and policy-making in German innovation systems: Smart Specialisation Strategies at national, regional, local levels? *Regional Studies*, 1-12. <https://doi.org/10.1080/00343404.2021.1872780>
- Schmitter, P. C. (2004). Neo-neofunctionalism. na.
- Serbanica, C. (2021). Smart specialisation, peripheries and EU Cohesion Policy. *EU Cohesion Policy and Spatial Governance*. <https://doi.org/10.4337/9781839103582.00023>

- Serbanica, C., & Constantin, D. L. (2017). Sustainable cities in central and eastern European countries. Moving towards smart specialization. *Habitat International*. <https://doi.org/10.1016/j.habitatint.2017.03.005>
- Sörvik, J., Teräs, J., Dubois, A., & Pertoldi, M. (2019). Smart specialisation in sparsely populated areas: Challenges, opportunities and new openings. *Regional Studies*, 53(7), 1070-1080. <https://doi.org/10.1080/00343404.2018.1530752>
- Spatial Foresight Local and Regional Partners Contributing to Europe 2020. (2015).
- Tödting, F., & Tripl, M. (2005). One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy*, 34(8), 1203-1219. <https://doi.org/10.1016/j.respol.2005.01.018>
- Tripl, M., Zukauskaitė, E., & Healy, A. (2019). Shaping smart specialization: the role of place-specific factors in advanced, intermediate and less-developed European regions. *Regional Studies*. <https://doi.org/10.1080/00343404.2019.1582763>
- Valdmaa, K., Pugh, R., & Mür, J. (2021). Challenges with strategic placed-based innovation policy: Implementation of smart specialization in Estonia and Wales. *European Planning Studies*, 29(4), 681-698. <https://doi.org/10.1080/09654313.2020.1767541>
- Zenker, A., & Kroll, H. (2014). Regional innovation monitor plus, regional innovation report Saxony-Anhalt. Brüssel: Technopolis Belgium.