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CROSS-BORDER, INNOVATION – SUPPORTING NETWORKS WITHIN THE EU STRATEGY FOR THE BALTIC SEA REGION. CONCLUSIONS FOR POLAND

Marta CZARNECKA-GALLAS

University of Gdańsk; marta.czarnecka-gallas@ug.edu.pl, ORCID: 0009-0007-9696-649X

Purpose: Innovation systems research has expanded significantly, yet it often overlooks the social processes and mechanisms that underpin the innovative capacity of specific systems. This paper addresses this gap by analysing the dynamics, key processes, and relationships shaping the cross-border innovation environment in the Baltic Sea Region, enhanced by the EU Strategy for the Baltic Sea Region (EUSBSR).
Design/methodology/approach: The author uses a mixed-method approach, combining quantitative analysis based on Eurostat and the European Innovation Scoreboard with qualitative insights from document and network analysis. The author identifies key innovation networks within the EUSBSR, and analyses Poland's role and benefits within these networks, guided by theoretical frameworks on innovation, regional development, and competitiveness.
Findings: The EUSBSR has significantly advanced regional innovation by promoting knowledge transfer, cross-border collaboration, and technology commercialization through flagship projects and innovation platforms. Poland, as co-coordinator of Policy Area Innovation (PA INNO), has strengthened its innovation capacity, particularly in green technology, digital transformation, and bioeconomy. However, challenges remain, including funding cuts and the need for better alignment between EUSBSR goals and national/regional development strategies.
Research limitations/implications: The study's reliance on publicly available data limits primary data depth. Future research could explore the long-term impact of EUSBSR on national innovation policies and the role of non-EU countries in the region. Further analysis of specific flagship projects' effectiveness could offer more detailed insights.
Practical implications: The study suggests that Baltic Sea Region countries should continue fostering innovation ecosystems through cross-sector collaboration, SME support, and better alignment of national policies with EUSBSR objectives.
Social implications: The paper highlights how transnational innovation cooperation can promote sustainable economic growth, address regional challenges (e.g., climate change), and enhance social resilience through innovation-driven job creation and reduced regional disparities.
Originality/value: This paper offers a case study of the EUSBSR as a transnational innovation ecosystem, providing insights into the interplay between governance structures, innovation networks, and regional competitiveness, particularly for newer EU member states like Poland.
Keywords: Innovation Ecosystem, EU Strategy for the Baltic Sea Region, Transnational Cooperation, Regional Competitiveness, Poland, Innovation Networks.
Category of paper: Research paper.

1. Introduction

The European Union (EU) has long recognized the critical role of innovation in achieving global competitiveness and driving economic development, both at the level of individual member states and the Union as a whole. This recognition culminated in the integration of innovation as a key component of competitiveness in the Lisbon Strategy (Council of the European Union, 2000). In its renewed iteration, innovation was not only maintained as a central element but was complemented by the inclusion of knowledge as a fundamental driver of economic growth. According to the revised strategy, EU member states could only secure a competitive edge in the global arena through the strategic application of knowledge, innovation, and education (European Commission, 2020).

In 2010, the "Innovation Union" initiative was launched as part of the Europe 2020 strategy. Its primary goal was to enhance the competitiveness of EU countries by leveraging their respective strengths and addressing weaknesses in innovation. This initiative aimed to increase innovation output across the European Union, fostering economic development and international competitiveness.

The EU's extensive policy measures to support innovation at both the national and regional levels have led to the establishment and implementation of various strategic undertakings, dedicated policies and funding programs, such as the European Innovation Council, Horizon 2020 (and its successor, Horizon Europe), Digital Single Market as well as initiatives funded by the Structural Funds (Rossi, 2022).These efforts have contributed to the economic growth of individual member states, generating employment opportunities, improving citizens' quality of life, and facilitating the adoption of technologies that reduce material and energy consumption. Consequently, these advancements have supported the transition toward cleaner and more socially responsible production practices (Dziallas, Blind, 2019).

However, despite substantial investments and policy measures aimed at promoting innovation within the EU, significant disparities persist across member states in terms of their innovative capacities (Brodny et al., 2023). This variance underscores the need for more refined assessments of the innovation levels across the EU. To measure national innovation performance, the European Innovation Scoreboard (EIS) is commonly employed. The EIS ranks countries based on the Summary Innovation Index, which is calculated as the arithmetic average of several sub-indices. However, this approach has been critiqued for its lack of a solid theoretical foundation, an overemphasis on high-tech sectors (neglecting innovation in other fields), challenges related to data availability and completeness, and concerns over collinearity between certain indicators. Additionally, the EIS methodology is largely oriented towards research and development (R&D) activities (Schibany, Streicher, 2008). These limitations highlight the need for alternative approaches to assessing the innovation capacities of R&D ecosystems and projects as such (Albuquerque 2024) but also EU countries in general, which

could offer a more comprehensive and nuanced understanding of innovation performance (Aytekin et al., 2022, Brodny et al., 2023).

In light of the importance of accurately assessing innovation levels in EU countries and the validity of developing alternative evaluation frameworks, this article proposes an approach to enrich the issue by providing a case study of the innovation ecosystem created and enhanced within EU Strategy for the Baltic Sea Region.

The Baltic Sea Region was selected as the subject of the analysis since by investigating its institutional setup, created by the EU Strategy for the Baltic Sea Region and involving multiple multi-level and cross-sector stakeholders, it is possible to contribute to the broader discourse on transnational innovation environment and transnational innovation-supporting networks. Understanding how such transnational innovation ecosystem, encompassing countries of different level of development but also innovativeness, evolves and function, can provide a wider perspective and develop new knowledge of their contribution, not only to overall regional innovativeness but also to regional competitiveness and development.

The countries in the Baltic Sea Region vary in terms of geography, politics, economy, and society, which has posed and continues to pose challenges in creating a unified "Baltic" strategy and its macroregional innovation ecosystem. On one hand, there are the highly developed Nordic countries and Germany, which rank among the world's top in economic and social development, as evidenced by GDP per capita and indicators such as HDI or more subjective- the life satisfaction index (Eurostat, 2024) but also are perceived as top-innovators by i.a. European Innovation Scoreboard (EIS, 2024). On the other hand, there are post-communist countries that joined the EU in 2004, which although still lagging behind, managed to decrease significantly the income gap. In fact, the degree of convergence in this region has been much faster than in other parts of Europe.

The primary objective of the research is to analyze the transnational innovation ecosystem, concentrating on innovation-supporting networks in the EU macroregional context over the period from 2009 to 2024 and assess the opportunities, streaming from this cooperation for a country from the ‘new EU’, lagging behind the ‘old EU’ members in terms of socio-economic and innovativeness indicators.

The research is inspired by the notion that the innovation-friendly ecosystem is not only determined by economic and financial variables but also institutional, cultural and socio-psychological factors (Costantiello et al., 2023, AlMalki, Durugbo, 2023), and it is guided by three key research questions, which help to structure the investigation, organize the analysis, and provide insights into the results, conclusions, and potential directions for future research:

RQ1: What is the EUSBSR approach to innovativeness and how it evolved from the Strategy’s inception in 2009 until now?

RQ2: What are the key transnational, innovation-supporting networks within the EUSBSR?

RQ3: How Poland, a country that represents the ‘new EU’ members, benefits from the EUSBSR innovation-supporting ecosystem?

To address these questions comprehensively, the research employed a methodology that integrates both quantitative and qualitative approaches, using a basic Eurostat and European Innovation Scoreboard-based set of indicators to analyze the innovation landscape across the Baltic Sea Region as well as desk review, document analysis and network analysis focused on innovation ecosystem of the EUSBSR, based on official documents of the European Commission concerning macroregional policies, EUSBSR, Action Plan, reports on implementations of macroregional strategies and the information and data published on the official EUSBSR website.

2. Literature review

The key role of innovation, innovativeness, and institutional frameworks in driving entrepreneurship and development of enterprises, but also their impact on economic development of countries and regions resulted in widespread popularity of these issues in academic literature. The presents review sketches only some of the research and underlines only selected concepts related to innovation and innovativeness their role in fostering economic development, and the notion of Institutions' impact on innovation-led development, which serve as theoretical background for the case study of the Baltic Sea Region transnational innovation ecosystem.

2.1. Defining Innovations and Innovativeness

Innovation is a multifaceted and interdisciplinary concept, with various definitions depending on the discipline and context. In the realm of economic development, the term "innovation" was first coined by Joseph Schumpeter in 1934. Schumpeter's perspective primarily emphasized technological innovations, defining them as the introduction of new or significantly improved production processes, products, market structures, or organizational methods (Śledzik, 2013, p. 90). He conceptualized innovation as a key driver of economic evolution, contributing to a process of "creative destruction" wherein new innovations replace outdated technologies and systems. Central to Schumpeter's definition is the notion of "newness," which implies that innovations disrupt and replace existing economic structures with more efficient ones (Brodny et al., 2023).

Subsequent researchers, expanded the scope of innovation by categorizing it into various forms, including technical innovation (e.g., novel production methods), non-technical innovation (e.g., new market development or organizational restructuring), product innovation (e.g., new products or services), and process innovation (e.g., improved production techniques) (Brodny et al., 2023). These distinctions reflect the growing complexity of the innovation process and the widespread in the topic by scholars, practitioners, and policymakers.

More recent definitions, such as those by Knowles et al. (2008) and Rogers (2003), have evolved further. Knowles et al. (2008) define innovation as the creation of new products, processes, or business systems, while Rogers (2003) highlights the perception of novelty, defining innovation as an idea, practice, or object that is perceived as new by an individual or organization. The Eurostat offers a more formal definition, describing innovation as the implementation of a significantly improved product or process, a new marketing method, or a new organizational approach in business practices (Eurostat, 20.12.2024).

Innovativeness, often linked with innovation, refers to the ability of an entity—whether a country, region, or company—to generate, adopt, and implement innovative solutions. Wang and Ahmed (2004) define it as an organization's capacity to introduce new products or markets through innovative behaviour and processes. Subramanian (1996) describes it as an enduring trait exhibited by firms over time, suggesting that a valid measure must account for this temporal dimension. Nasierowski (2010) distinguishes between two perspectives on innovativeness: the macro-economic, which focuses on large companies and uses composite indexes to measure inventiveness, and the micro-economic, which emphasizes the commercialization of ideas. While these perspectives reflect different drivers—state policies and internal company dynamics—they should be reconciled for improved innovativeness, as both are critical for economic development and competitiveness (Nasierowski, Arcelus, 2012).

2.2. The Role of Innovations in Enhancing Economic Development

Innovation plays a crucial role in the economic development of nations and organizations, as it is directly linked to productivity growth, competitiveness, and sustainability (Ketels, Porter, 2021). According to the neoclassical theory of economic growth, technological progress—often a product of innovation—is a key determinant of long-term economic growth. Solow (1956) argued that technological advancements, driven by innovation, are essential for sustaining per capita income growth, as they enable economies to develop more efficient production methods and improve overall productivity.

The connection between innovation and economic growth has been further explored through empirical studies. Researchers such as Aghion and Howitt (1992), Grossman and Helpman (1991), and Romer (1990) have demonstrated that technological capital, primarily driven by innovation, is positively correlated with economic growth. Their findings underscore that investment in research and development (R&D) is fundamental to fostering innovation, which in turn fuels economic expansion. Furthermore, there are many studies on innovation, underlining that high R&D activities lead to innovative products enabling enterprises to reach competitive advantages and to gain market shares (Armbruster et al., 2008).

Many studies on non-technical innovations and factors that contribute to broader societal benefits, demonstrated that the rate of innovation affects not only economic growth but also factors such as life expectancy, health outcomes, literacy rates, and social equity (Guzel et al.,

2021; Lin et al., 2012). This highlights the broader implications of innovation for sustainable development, suggesting that innovation is integral not just to economic prosperity but also to improving the quality of life and addressing global challenges such as poverty, health disparities, and environmental sustainability.

In the context of the European Union (EU), fostering innovation is perceived as central to enhancing global competitiveness (Rossi, 2022). The EU's approach to innovation is seen not only in its strategies and policies but also in funding programs like Horizon 2020 and Horizon Europe, emphasizes the importance of innovation as a driver of economic development. By investing in cutting-edge research, the EU aims to support the creation of new technologies and solutions that can position its member states as global leaders in knowledge and innovation-based economies. This approach is mirrored in macroregional strategies, which considering the specific conditions, socio-economic contexts and common challenges, aim at enhancing competitiveness and increase prosperity via specially dedicated instruments in a given, geographically-constraint area (Czarnecka-Gallas, 2019).

3. Method

The article is based on a case study methodology, which according to Yin (2009), is suitable for understanding a real-life phenomenon in depth. A case study was selected as a methodology for this study, because its aim was to gain rich and holistic picture of transnational innovation environment in the Baltic Sea Region. One of the reasons for selecting the Baltic Sea Region as a subject of the case study for transnational innovation ecosystem and innovation networks, in the same being its distinctive features is the economic convergence between the Nordic countries and Germany, often classified in the relevant literature as the ‘old EU’ and Poland the Baltic States, representatives of the ‘new EU’ (Brodny et al., 2023), for many years much faster than in other regions within the EU. This is evident in i.a. income convergence, impressive when we compare the current figures of the GDP per head in PPS with those from 2004, when the value for Estonia, Latvia, Lithuania and Poland were respectively only 50, 48, 43 and 47 per cent of those of the EU average (Eurostat database, 2024).

A case study relies on multiple sources of evidence (Yin, 2009). In this study, the data was collected from various secondary data sources (like Eurostat, European Innovation Scoreboard, keep.eu - European projects databases, Interreg projects databases), policy papers – mainly the EU Strategy for the Baltic Sea Region documents and the Internet -especially in terms of concrete examples of innovation-supporting networks- Policy Area Innovation and the relevant projects or projects’ clusters, combing both quantitative and qualitative data. Setting the institutional and economic context for the EUSBSR transnational innovation environment, a comparative analysis of the approach to innovativeness is carried out, illustrating its evolution

from the initial years of the EUSBSR to its current form, by comparing the first and latest EUSBSR Action Plans.

4. Discussion and Findings

As empirical studies confirm that institutions play a critical role in national innovation systems (Bentzen et al., 2021; Ventura et al., 2020; Rodríguez-Pose, Zhang, 2020; Kang, Jiang, 2020) and provide many examples confirming the impact of the institutions and governance structures on innovativeness a country, policymaker should aim at creating innovation-friendly ecosystem. According to the study by Costantiello et al. such an environment is found to be positively associated with "Basic-school entrepreneurial education and training", "Government procurement of advanced technology products", "Employment share Manufacturing", "Finance and support", "Human resources" (Costantiello et al, 2023). Therefore, it seems reasonable to concentrate on these aspects, while designing innovation-supporting policies and mechanisms.

Institutional innovation drives economic growth by enabling new organizational models and adapting to technological, political, and economic changes (Ruttan, Hayami, 1984). In the Baltic Sea Region, which constitutes the EU's first macro-region, having its own Strategy, it can be claimed that there is a favorable transnational innovation-supporting ecosystem, encompassing all its member countries. Since its founding in 2009, the EUSBSR has developed to play a significant role in strengthening innovative cooperation and regional innovation in the Baltic Sea Region. Through its mechanisms and actions, EUSBSR creates frameworks for knowledge transfer, technology exchange, and best practice sharing while facilitating access to funding and networks. Poland, as an active participant in the EUSBSR structures, also as a co-coordinator of the Policy Area Innovation (PA INNO), benefits from these opportunities to enhance its own innovativeness.

The comparison of the two Action Plans of the EUSBSR, the one from 2009 and the most recent one, updated in 2021, analysed for the purpose of this article show that the approach of the macroregional policy for the Baltic Sea Region has shifted from identifying and overcoming challenges and barriers of the Region's competitiveness to implementing targeted, cooperative, and inclusive strategies that enhance competitiveness, which have had a strong impact on designing and supporting EUSBSR innovation ecosystem and its transnational innovation-supporting networks. The 2009 Action Plan was largely market-oriented, focusing on removing barriers to integration. Its primary strategy centred on regulatory and institutional reforms to improve cross-border market access, particularly for SMEs. The focus was on expanding markets by reducing administrative burdens, and enhancing cooperation in sectors like agriculture, fisheries, and forestry, with sustainability considered within individual sectors. Labor market goals revolved around increasing mobility, while innovation systems were

underdeveloped with limited transnational cooperation. Competitiveness was mainly used in sectoral contexts, and relatively small attention was given to overall, macro-regional competitiveness as well as international competitiveness of the Baltic Sea Region (EC, 2009, pp. 49, 63, 31). In contrast, the 2021 Action Plan is much more innovation-driven, with a strong emphasis on promoting sustainability. Competitiveness is advanced through disruptive, challenge-driven innovation in sectors such as the bioeconomy, tourism, and cultural industries but also an outcome of the whole macro-regional cross-sector and multi-level cooperation. Support for SMEs has shifted toward fostering startup ecosystems and creating co-creation platforms. Sustainability is a central theme, with a focus on the bio-based economy, green tourism, and climate resilience. Labor markets are addressed through upskilling, reskilling, and preparing for a digital future. Innovation systems are stronger, with more emphasis on digital transformation (e.g., AI, IoT), and cross-sector collaboration is more integrated, involving multiple industries.

The findings are organized around the issues of analysis of the innovation ecosystem and innovation-supporting networks concentrated around the Policy Area Innovation, and the analysis of Poland's participation in the EUSBR innovation ecosystem and its main innovation-supporting networks.

4.1. The innovation ecosystem and innovation-supporting networks concentrated around the Policy Area Innovation

One of the main goals of transnational cooperation in the Baltic Sea Region is to increase the Regions prosperity i.e. via enhanced innovativeness. Although this objective is to be achieved by interlinked and multiple EUSBSR Policy Areas, some of the crucial Strategy's mechanisms and actions contributing to this goal are grouped within the Policy Area Innovation (PA INNO), serving as a specific sub-governance structure that stimulates innovation in the Baltic Sea Region. Interregional collaboration through Smart Specialization, cooperation platforms, and flagship projects provides the cooperating countries and regions with access to knowledge, funding, and networks, while supporting technology transfer and the commercialization of research.

PA INNO is managed and coordinated by a network of key actors across the BSR with the main Coordinator, Baltic Institute of Finland and Co-coordinators: Estonian Ministry of Economic Affairs and Communications and Polish Ministry of Science and Higher Education. Moreover, it has the Steering Group (SG) including representatives from national and regional governments within EUSBSR member states. It also invites non-EU neighbouring countries, such as Norway and Iceland, to participate. The Steering Group ensures that Smart Specialisation principles guide innovation activities, addressing local and subregional needs by involving local level representation. A representative from the European Commission's Directorate-General for Regional and Urban Policy (DG Regio) also provides strategic advisory support (PA INNO on clustercollaboration.eu; retrieved on 02.02.2024).

By working through this governance structure, PA INNO ensures that innovation actions are well-coordinated, relevant to regional priorities, and aligned with broader European and global objectives. The 2021's Action Plan underlines several EU, regional, and international strategies aimed at advancing innovation, that constitute a vital reference point for the PA Innovation. They include European Strategic Cluster Partnerships (COSME), Smart Specialisation Strategy, Digitizing European Industry, with particular focus on supporting Digital Innovation Hubs for SMEs' digital transformation, Cultural and Creative Industries Support, Digital Single Market, EU Blue Bioeconomy Roadmap and Bioeconomy Strategy, Horizon Europe Policy Goals, Circular Economy Action Plan for a Cleaner and More Competitive Europe (PA Inno on clustercollaboration.eu). Moreover, PA INNO is directly connected to the European Green Deal and its associated initiatives, such as the new industrial strategy, the circular economy action plan, and the farm-to-fork strategy, which all emphasize sustainability, innovation, and the circular economy (EUSBSR Action Plan, retrieved on 02.02.2024).

The "Innovation" Policy Area (PA INNO) within the EU Strategy for the Baltic Sea Region (EUSBSR) aims to foster sustainable economic growth by strengthening the innovation ecosystem and enhancing regional cooperation. Its main objectives include promoting the region's global competitive position in innovation, supporting entrepreneurship, business development, and scientific progress, and facilitating knowledge exchange and transfer. PA INNO also focuses on creating and strengthening networks across the Baltic Sea Region, adapting resources and regulations, such as coordinating funding sources, and fostering joint programs and investments to address shared challenges. Additionally, the policy area seeks to increase the region's attractiveness as a partner in international innovation cooperation. (EUSBSR Action Plan 2021, retrieved on 22.12.2024; PA Inno website, retrieved on 22.12.2024). The 2021 Action Plan for the EU Strategy for the Baltic Sea Region (EUSBSR) outlines three key focus areas for the "Innovation" Policy Area (PA INNO). The first, Challenge-Based Innovations, aims to drive breakthrough innovations that address pressing 21st-century challenges, including climate change, resource efficiency, demographic shifts, and environmental issues in the Baltic Sea, with a strong emphasis on smart specialization (S3) and interregional cooperation to align regional priorities and innovation investments. The second, Digital Innovations and Transformation, focuses on leveraging emerging technologies like AI, VR/AR, blockchain, robotics, and IoT to tackle societal challenges and unlock new business opportunities, supporting smart cities, start-up ecosystems, and the digital transformation of SMEs. Finally, Co-Creation-Based Innovations seeks to strengthen innovation ecosystems in the region by fostering collaboration among entrepreneurs, scientists, and public institutions to address gaps in knowledge, skills, and market access, while promoting cross-border cooperation in research, technology transfer, and joint public procurement for innovation (PA Inno website, 23.12.2024).

The analysis of the EUSBSR Action Plan and the data published on PA Inno website, which serves as the main communication hub of the network, revealed two mechanisms supporting innovation that are particularly vital in this ecosystem: flagship projects and platforms, and collaboration platforms and networks. While the first ones address specific regional challenges, testing and implementing innovative solutions with the involvement of multiple stakeholders (and are funded with relevant EU Programmes, e.g. Interreg), the second ones, are more general, and encourages the creation of platforms that bring together stakeholders to exchange knowledge, share best practices, and support technology transfer. The Flagships may transform into a regular collaboration platform and function beyond the funding period, which was the case of e.g. ScanBalt project.

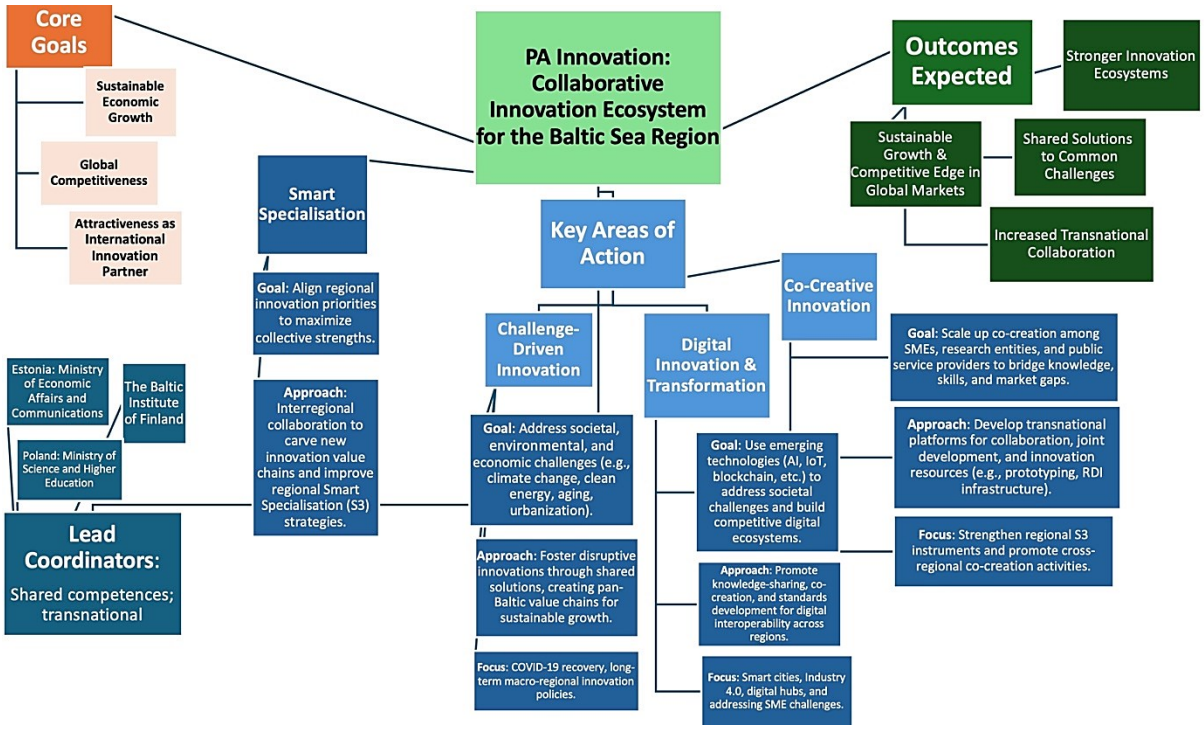

Figure 1. PA Innovation as a collaborative innovative ecosystem in the Baltic Sea Region.

Source: Own conceptualisation on the basis of the EUSBSR Action Plan 2021 and EUSBSR website (PA Innovation), retrieved on 22.12.2024.

4.2. Poland's participation in the EUSBR innovation ecosystem and its main innovation-supporting networks

As a central member of the Baltic Sea Region, Poland plays a significant role in the regional cooperation framework. The EUSBSR has strengthened Poland's collaboration with neighbouring Baltic states fostering cross-border initiatives that enhance trade, investment, and shared infrastructure. Poland's benefits from the region's focus on infrastructure projects, such as Rail Baltica, improved transport and energy networks but also the R&D and innovation cooperation, to give only some examples.

Experiencing one of the fastest growth rates in GDP, GDP per capita and other economic indicators among the EU member, Poland benefits from various types of advantages connected with deeper integration within the Baltic Sea Region. While the Region's economy is much shaped by Germany and the Nordic states, Poland has made significant economic strides, and the EUSBSR supports convergence by integrating the country more closely with the more advanced economies of the northern Baltic region, which reduces regional disparities and helps Poland improve its economic competitiveness on a European and global scale.

Considering that innovativeness theory but also theories associated with regional development as well as regional competitiveness put much emphasis on the role of the innovations and clusters in increasing the productivity and leading to higher value creation, the EUSBSR cooperation framework that since the beginning highlighted the need for common Baltic R&D and innovation strategy has created or least aspired to create a highly innovative, cross-sector and dynamic environment. The Strategy's focus on creating co-creation platforms and start-up ecosystems can support the development of SMEs in Poland. The shift from earlier focus on regulatory reforms to supporting innovation and entrepreneurial ventures gives Polish businesses more opportunities to engage in high-growth sectors. Moreover, as the EUSBSR places a strong emphasis on innovation-driven growth, particularly in sectors such as the bioeconomy, digital transformation, and green technology, Poland, which has been traditionally strong in sectors like agriculture and manufacturing, now can further diversify and enhance its competitiveness by fostering start-ups, tech innovation, and digital solutions. Moreover, pan-Baltic initiatives supporting AI, IoT, and digital platforms provide Poland with the tools to upskill its labour force and transition into high-value sectors. This is crucial for Poland as it seeks to remain competitive in a rapidly digitizing global economy. The cooperation within scientific networks and clusters in the Baltic Sea Region that have been strongly supported within the EUSBSR has given an opportunity for Polish stakeholders to participate in knowledge and innovation transfer, not only in the academic but also other economic sectors. For example, there have been a fruitful cooperation within public sectors representatives from different administration levels across the Baltic Sea Region. One of the examples of topics that was the subject of such processes was the intelligent specialization of the regions, but the cooperation was successful across themes from enhancing tourism services to infrastructural projects.

As the PA Innovation- supported and promoted innovation ecosystem concentrates i.e. around transfer of innovations within e.g., flagship projects and processes, Poland has been an active member of such initiatives. Moreover, as one of the coordinators of PA INNO, Poland plays a significant role in this process, benefiting from the opportunities offered by EUSBSR to enhance the innovation potential of its regions.

From the flagships, enlisted in the 2021's Action Plan under the Policy Innovation, namely: BSR S3 Ecosystem Platform, BSR Stars Platform, Submariner network, ScantBalt, Baltic Science Link and Baltic Sea Region Digi co-lab, Polish stakeholders are the official partners in

four out of six networks (PA website, EUSBSR Action Plan, retrieved 22.11.2024). More and more Polish stakeholders participate in innovation-oriented projects, although this increase is faster in the ones funded by Structural Funds than the ones centrally managed by the EU Commission.

There are also direct financial benefits to Polish stakeholders by their involvement in EUSBSR -supporting projects, mainly funded from Interreg funds, for example the Baltic Sea Region and South Baltic Programmes. Poland has been very active in participating in transnational and cross-border EU projects. Comparing number of realized projects, it is behind Germany, Sweden and Finland, but ahead of other Baltic Sea Region countries, with a number of approximately 1,5 thousand projects from the area of transnational and cross-border cooperation (data retrieved from Keep.eu accessed on 12.10.2024). Germany remains Poland's primary project partner, considering all funds available for Polish stakeholders. On the other hand, Poland faces some challenges from reduced EU Funding as it needs to adapt to funding reductions. With a 20% reduction in the Interreg budget and a lower co-financing rate (80% from the previous 85%), Poland will need to find ways to maximize the impact of EU funds while mobilizing more national and regional resources. This could place pressure on local and national authorities to align their priorities more closely with EUSBSR goals. Therefore, Poland must ensure that the priorities of the EUSBSR—such as innovation, sustainability, and digitalization—are embedded in its national and regional development programs to access and mobilize EU funding more effectively. The projects funded from these programmes are particularly aligned with the EUSBSR's objectives, especially after the Strategy's revision and within the new financial period from 2021-27.

Poland is in a strong position to capitalize on the evolving macroregional strategy for the Baltic Sea Region. By embracing innovation, digital transformation, and sustainability, Poland can further enhance its regional competitiveness. However, this will require a continued focus on upskilling, cross-sector collaboration, and the alignment of national priorities with EUSBSR objectives to ensure the effective use of available funding and resources. At the same time, addressing geopolitical risks and ensuring regional stability will remain crucial for long-term success in the Baltic Sea Region.

5. Summary and conclusions

The evolution of the EUSBSR's approach to regional competitiveness from 2009 to 2021 reflects a significant shift in the region's development strategy. Initially focused on market integration and sectoral improvements, the strategy has matured into a more comprehensive, innovation-driven approach that emphasizes cross-sectoral collaboration, sustainability, and digital transformation. The role of PA Innovation has been central to this transition, helping

to foster innovation networks and enabling the region to respond proactively to global challenges. As the EUSBSR continues to evolve, the integration of these innovation-driven strategies will be crucial for enhancing the region's competitiveness in an increasingly interconnected and competitive global economy.

The research emphasizes the importance of a transnational innovation-supporting ecosystem, which not only involves technological and economic aspects but also institutional, cultural, and socio-psychological factors. It discusses the mechanisms that have been crucial in advancing innovation, such as flagship projects and cooperation platforms, which are designed to tackle regional challenges and promote knowledge exchange. These mechanisms support sectors like SMEs, AI, and digital transformation. Moreover, transnational cooperation through initiatives like the EUSBSR plays a crucial role in fostering sustainable economic growth, enhancing regional competitiveness, and reducing disparities in innovation capacities across the EU.

The analysis reveals that Poland has benefitted from this innovation framework, which has allowed the country to strengthen its participation in EU-funded projects, engage in technology transfer, and collaborate with more advanced economies in the region, particularly the Nordic countries and Germany. Despite these opportunities, Poland faces challenges related to funding reductions in the new EU budget period and must align its national development priorities more closely with the EUSBSR's innovation goals to maximize the benefits of available resources. Poland has made significant progress in utilizing these cross-border innovation networks, which have contributed to its socio-economic convergence with more developed EU regions. However, Poland must continue focusing on creating innovation-friendly environments, particularly in entrepreneurship, smart specialization, and digitalization, while addressing the challenges posed by reduced funding and evolving EU policies.

The study's reliance on publicly available data and documents limits the depth of primary data. Future research could explore the long-term impacts of EUSBSR on national innovation policies and examine the role of non-EU countries in the region. Additionally, further investigation into the effectiveness of specific flagship projects and platforms in promoting innovation could provide more nuanced insights, also in terms of their role in decreasing innovation- and competitiveness-related disparities between the best performing countries in the Baltic Sea Region, included in the group of the 'old EU' and the 'new EU members': Poland the Baltics. Additionally, future research on transnational innovation-supporting networks should focus on comparative studies between the EU and integration blocs e.g. in North America or Asia. By examining how innovation policies differ in regions such as the U.S., Canada, but also China and the Asian tigers, researchers can identify effective strategies and best practices that could be adapted to the EU context. Key areas of comparison should include policy design, implementation, and outcomes, as well as the influence of regional factors on innovation performance. Additionally, research should explore international collaborations and partnerships, investigating how global networks, cross-border investments,

and technology transfers contribute to innovation. This will help uncover ways for the EU to better leverage these opportunities within its own innovation ecosystem.

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