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Mapping Innovation and Entrepreneurship Policies: A Comparison of Italian Region in the EUSAIR Area

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Abstract

The European Union Strategy for the Adriatic and Ionian Region is a macro-regional strategy aimed to promote economic and social prosperity and growth in the macro-region by improving its attractiveness, competitiveness, and connectivity.
The debate related to the territory's growth, attractiveness, and competitiveness is still ongoing. The recent literature has revived the innovation and entrepreneurship topics as drivers of development. Scholars have embraced the concept of the entrepreneurial ecosystem, emphasizing the need to create the conditions for regional development to take place. To determine what policies can be activated to support an ecosystem's development, this study draws on the entrepreneurial ecosystems literature, deepening the literature on top-down interventions. It also examines measures that favor and support regional development in line with the EUSAIR strategy.
Therefore, this study analyses entrepreneurship and innovation policies adopted by three Italian regions belonging to the macro-region, i.e., Lombardy, Molise, and Calabria. Specifically, this work aims to answer the following research question: "How do Italian regions approach the EUSAIR challenges through entrepreneurship and innovation policies?"
We analyse and apply a Thematic Content Analysis on the Regional Operational Programmes that include the macro-region objectives.
The main results show three policy groups i.e., remedial and basic, reinforcing, and shooting policies. According to the regions' development level and the policies implemented, this study linked the three policy groups to the entrepreneurial ecosystem stages, i.e., nascent, strengthening, and resilient ecosystems. We create a theoretical model that highlights this link between regions, policy directions, and the entrepreneurial ecosystem stages.

JEL Classification: R58; L20; L38

Keywords: *EUSAIR strategy, policy, regional development.*

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1. Introduction

The Adriatic and Ionian Region - the area defined by the Adriatic and the Ionian Sea basin - is composed of ten countries and many regions (European Commission, 2017) highly diversified in the socio-economic and physical dimensions (Krzykowska-Piotrowska et al., 2022). The European Union Strategy for the Adriatic and Ionian Region (EUSAIR) strategy supports and guides the regions on specific topics and actions to improve the macro-region attractiveness, competitiveness, and connectivity (Migkos and Onsoy, 2020). Some studies focus on specific issues related to EUSAIR as sustainable transport (Krzykowska-Piotrowska et al., 2022) or agro-waste production (Liuzzi et al., 2021). Other works underline EUSAIR objectives as a means of increasing the level of cooperation and networking within and between the regions of the area (Migkos & Onsoy, 2020). The debate related to the territory's growth, attractiveness, and competitiveness is still ongoing. The recent literature has revived innovation and entrepreneurship topics as drivers for competitiveness, social development (Ianioglo, 2022), and regional development (Crudu, 2019). According to this perspective, scholars have embraced the concept of the entrepreneurial ecosystem (Stam, 2015; Roundy, 2016), emphasizing the need to create the conditions for the development of a region to take place. In order to determine what policies can be activated to support an ecosystem's development, this work draws on the entrepreneurial ecosystems literature (Stam, 2015; Mack and Mayer, 2016; Spigel and Harrison, 2018). In particular, this study deepens the literature on top-down interventions. It also examines measures that favor and support regional development in line with the EUSAIR strategy.

This work is positioned within the academic field that explores innovation and entrepreneurship policy to develop a territory (Zelin et al., 2021; Gilbert, Audretsch & McDougall, 2004). Many studies investigated policy in order to categorize and define a specific path to follow to achieve higher regional development (Barca, Mccann, & Rodriguez-Pose, 2012), others investigated the efficacy of this type of policy (Arshed, Carter & Mason, 2014). However, no study focused on the EUSAIR area or presented a categorisation of policies and measures typical of different regional development levels.

This work aims to fill this gap answering the following research question: How do Italian regions

approach EUSAIR challenges through entrepreneurship and innovation policies? Besides, this study links the entrepreneurial ecosystem development (Mack and Mayer, 2016; Colombelli, Paolucci, and Ughetto, 2019), with this kind of policy.

We analyse innovation and entrepreneurship policies adopted by three EUSAIR Italian Regions (Lombardy, Molise, and Calabria) to explore how they are aligned with the objectives of the EUSAIR strategy. Since the Regional Operational Programmes (hereafter ROPs) include the EUSAIR objectives as they are regional objectives, we analyse ROPs to trace the Italian approach.

The analysis of the policies is done through a Thematic Content Analysis (hereafter TCA), with which we observe and investigate the contents of a regional strategy.

We derive policy groups based on the EUSAIR objectives and the economic and innovation development level.

The paper is organized into the following sections. Section 2 describes the theoretical background; Section 3 presents the methodology used; Section 4 shows the results; Section 5 focuses on the discussion, and Section 6 concludes.

2. Theoretical Background

The regional development literature has highlighted the growth and full employment of the workforce as important drivers that are essential to achieving the objectives of strengthening regional competitiveness and territorial cooperation (Antonescu, 2014). Ricotta and Basco (2021) underlined how the development of a region depends on the relationships and functioning of three main dimensions, i.e., the regional factors, the regional processes, and the regional proximity dimensions. On these dimensions, the institutions could play a pivotal role in creating the enabling conditions through policies to foster and increase human and social capital (Content et al., 2020), entrepreneurial spirit and network capability (Cunha et al., 2020), spillovers, and partnerships creation (Ricotta & Basco, 2021). Indeed, the governance institution is the actor who establishes the rules and norms (North, 1990) within a specific territory to coordinate and guide entrepreneurial activity (Colombo, 2019). Therefore, governance institutions act through an important tool, i.e., the policies (Shearer et al., 2016).

The context is an important element that influences the policies in terms of types, objectives, and recipients. Regions present different aspects in terms of territory typology (rural, or urban); resources (capital, human, and natural); the innovation level; their responsiveness to external shocks (Terzidis and Ortega-Argiles 2021); cultural heritage, connectivity, local norms, and interregional knowledge spillovers (Ortega-Argiles, 2022). Regional policy has an important European and national role to play in mobilising local resources and concentrating on the economic, social, and endogenous development of potential (Antonescu, 2014). All these elements play an essential role in conceiving entrepreneurship in a local context and represent the base on which to construct a policy framework to increase the potential efficacy of measures implemented (Ortega-Argiles, 2022; Pita et al., 2021). This means that, without considering the specific determinants that stimulate entrepreneurship in each context, policies could become imperfect, ineffective, or defocused (Pita et al., 2021).

Among the different types of policies, this study focused more on entrepreneurial or entrepreneurship policies. Different definitions of entrepreneurship policy exist in the literature, according to different understandings of entrepreneurial activities (Zelin et al.,2021). Some scholars defined entrepreneurial policies as those focusing on entrepreneurial activities (Audretsch & Keilbach, 2004); others (Woolley and Rottner, 2008) underlined the aims of policies, i.e., promoting entrepreneurship; or the measures aimed at increasing the quantity and quality of businesses within a specific territory (Ortega-Agiles, 2022). Entrepreneurship policy covers all measures focusing on encouraging people to launch a new business

before actually launching one; but also measures to support and protect entrepreneurial activities after launching the business (Reynolds et al., 2005). Zelin et al. (2021) provided a more complete definition of entrepreneurial policies as "relevant guidance, preferential, auxiliary, and protective measures promulgated and implemented by the government to develop the economy and encourage domestic or regional economic entities to carry out entrepreneurial activities" (Zelin et al., 2021, p.2). Entrepreneurial action depends on individual motivations and the context in which they are inserted (McMullen & Shepherd, 2006). Entrepreneurial policies are classified as hard policies or soft policies (Storey, 2005; Banerjee, Savani, and Shreedhar, 2021). The former refers to measures that aim to support financially businesses (Ortega-Argiles, 2022; Storey 2005). The latter includes counseling activities to entrepreneurs, fostering technology adoption; creating mechanisms for facilitating interactions among the regional actors (Banerjee, Savani, and Shreedhar, 2021); SME support; educational measures (Schneider & Ingram, 1990); incentives in green energy adoption (Thaler & Sunstein, 2008).

The challenge faced by the EE policies is complex because of the diversity of the actors involved - i.e., firms, government, capital providers, the academic sector, markets, and social communities (Isenberg, 2011; Mason and Brown, 2014) - with different, sometimes opposing, and therefore conflicting objectives (Colombo, 2019). An EE includes cooperation among the actors, which creates a network of relationships (Flores, Pereira, & Graca, 2017) as they contribute to the productive performance of a territory (Spigel and Harrison 2018), making the network of relationships one of the structural elements of an EE (Spigel, 2017; Ianioglo, 2022). EEs are analysed at different geographical scales (Mack and Mayer, 2016; Spilling, 1996); in this study, we undertake a regional perspective. The region is considered an appropriate scale due to its institutional and political boundaries that facilitate the implementation of target policies for increasing local development and levels of innovation (Wei, 2022). The region, indeed, plays an important role as it reflects the characteristics of the context in which the EE was born and developed; and determines the configurations, relationships, and actors, giving rise to EE with different elements and profiles (Spigel, 2017; Spigel and Harrison, 2018) and different outcomes (Stam, 2015). Moreover, some important regional social and cultural factors could positively create entrepreneurial activity (Brown and Mason, 2017).

This study focuses on regional development, analysing the policies implemented, as a key element in driving its development. There is evidence supporting the important role of institutions in nurturing entrepreneurship at the regional level (Xing, Liu, and Cooper, 2018); indeed, the attitude, characteristics, and performance of startups and SMEs are influenced by the institutional context (Bosma et al., 2018).

Studies on the evolution of EEs explored the changing view on ecosystem development dynamics, assuming that an EE evolves. In this vein, Mack and Mayer (2016) created an evolutionary model, identifying four EE stages (birth, growth, sustainment, and decline), each characterized by a different configuration in terms of the number of firms, financial capital, support infrastructure, and regional policies. Cantner et al. (2021) presented a dynamic EE lifecycle model that describes five phases typical of an entrepreneurial ecosystem (birth, growth, maturity, decline, and re-emergence).

Moving to the recognition of different types of EE, based on specific characteristics and development levels, Brown and Mason (2017) distinguished two EE types, i.e., embryonic ecosystems and scale-up ecosystems. The former is a developing EE, that presents elements such as cooperation, and entrepreneurship initiatives, but is not fully formed yet. The latter, on the contrary, presents all the signs of a developed EE and aims to foster and support not just the birth of new firms but especially the growth of larger companies. Finally, Spigel and Harrison (2018) identified four types of EEs (strong, arid, irrigated, and weak) based on two elements, i.e., their network strengths and available resources. They individuate three main stages of EE development: nascent ecosystem, strengthening ecosystem, and resilient ecosystem. Nascent ecosystems are characterized by few links between entrepreneurs because of the lack of resources and the culture that fosters these interactions. The strengthening ecosystem is

defined by the entrepreneurial success, that leads to new resources creation and sharing. More investments are addressed towards labor up-skilling and the new firms' creation. Finally, the resilient ecosystem presents a strong entrepreneurial culture that sustains the ecosystem and attracts more resources, entrepreneurs, and workers to it. The connections and interactions between these actors become more solid and allow the ecosystem to resist an external shock.

3. Methods

The EU created macro-regional strategies to effectively address the common challenges and criticalities of all the countries involved while supporting potentialities and best practices. In 2014 the strategy for the Adriatic Ionian macro-region, EUSAIR, was approved. It fosters cooperation for the benefit of the ten countries of the Ionian Adriatic area. This study focuses on Italy, analysing three regions that belong to this area: Lombardy, Molise, and Calabria.

EUSAIR promotes growth and economic prosperity by improving its attractiveness, competitiveness, and connectivity. It also safeguards the sea, coastal environment, hinterland, and ecosystems. Table 1 shows the four pillars articulated on the action priorities contained in the EUSAIR strategy, topics, and thematic objectives referred to the strategy. In addition, we consider two other pillars, named transversal pillars which are cross-cutting aspects across each pillar. i.e., common topics to each pillar that are included and analysed within the pillars and not individually. However, they are important elements of the strategy, and for this reason, they are highlighted as transversal pillars.

EUSAIR STRATEGY		
Pillar	**Topic**	**Thematic Objective**
I-Blue Growth	• Blue technologies. • Fisheries and aquaculture. • Maritime and marine governance and services.	**TO 1** – Research, technological development, and innovation; **TO 3** – Promote the competitiveness of SMEs, the agricultural, fisheries, and aquaculture sectors; **TO 10** – Investing in education; **TO 11** – Institutional capacity.
II-Connecting the region	• Maritime transport. • Intermodal connections to the hinterland. • Energy networks.	**TO 4** – Supporting the transition to a low-carbon economy in all sectors; **TO 7** – Logistics, and in particular transport.
III-Environmental Quality	• The marine environment. • Pollution of the sea. • Transnational terrestrial habitats and biodiversity.	**TO 5** – Climate and environmental risks; **TO 6** – Environmental protection and enhancement of cultural and environmental resources.
IV-Sustainable Tourism	• A diversified tourism offer. • Sustainable and responsible tourism management.	**TO 3** – Promote the competitiveness of SMEs, the agricultural, fisheries, and aquaculture sectors; **TO 6** – Environmental protection and enhancement of cultural and environmental resources.

Transversal Pillar Research, Innovation, and Development of SMEs	-	**TO 1** – Research, technological development, and innovation; **TO 3** – Promote the competitiveness of SMEs, the agricultural, fisheries, and aquaculture sectors; **TO 11** – Institutional capacity.
Transversal Pillar Capacity Building and Communication	**-**	**TO 1** – Research, technological development, and innovation; **TO 3** – Promote the competitiveness of SMEs, the agricultural, fisheries, and aquaculture sectors; **TO 11** – Institutional capacity.

Table 1 EUSAIR's Pillars and Thematic Objectives

This study explores the role of specific policies, i.e., entrepreneurship and innovation measures that change according to the regional EEs' development, analysing regional documents. We conducted a qualitative analysis in the Italian context of EUSAIR, analysing policy programs and measures adopted by three regions (Lombardy, Molise, and Calabria), representing different EE scenarios and facing development challenges. To compare programs and measures, we carried out a TCA inspecting ROPs. The TCA organizes and describes data sets in (rich) detail, identifying, analysing, and extracting themes within data (Braun and Clarke, 2006). TCA supported our analysis in organizing and describing measures and tracing regional policy orientation. Our dataset comprises ROP documents containing a series of measures and policies applied by regions to increase regional development. Coherently with the paper's purpose, we selected only policy programs and measures related to the EE.

3.1. Sample selection criteria

This study focuses on Italy as one of the ten countries that belonged to the EUSAIR area and analyse three regions: Lombardy, Molise, and Calabria. The Italian country has the peculiarity of being very fragmented, historically divided into three areas: the North, the Centre, and the South. The northern regions have a higher level of economic development compared to the other two macro-areas; the central regions present a good level of development; finally, the southern regions show a low economic development level. The differences between these areas regard the per capita GDP levels, employment rates, job opportunities, the number of services offered to citizens, the infrastructural assets, and quality of life.

According to this evidence, the EU classifies Member States' regions into three groups: more developed, in transition, and less developed. The first group shows a GDP per capita above 90% of the EU average; regions in transition present a GDP per capita between 75% and 90% of the EU average; and finally, the less developed regions have a GDP per capita of less than 75% of the EU average. In addition, we used the Regional Innovation Scoreboard (hereafter RIS), a European Union composite index that describes the regional innovation performance, to confirm the sample selection. In 2014 the RIS identified just two groups of innovators in Italy: strong, and moderate.

Therefore, our sample is composed of three regions that represent different scenarios both for economic and social development within the EUSAIR area.

Lombardy is a northern region classified as more developed by the EU and a strong innovator according to RIS. In 2014 it was a developed socio-economic region, with an unemployment rate of about 8% (Confindustria report, 2015) with many businesses in several sectors, and innovation and R&D

investments.
The Molise region is located in the Center of Italy, and it is considered a region in transition according to the EU classification and a moderate innovator by RIS. Molise is a very small territory with an unemployment rate of about 18% (Bank of Italy, 2016); the traditional sectors were still important in 2014 and the region lacks investment in innovation.
Finally, Calabria is in the South and defined as less developed by EU classification and a moderate innovator according to RIS. Calabria's economy in 2014 still counted on traditional sectors, with a high unemployment rate of about 23% (Bank of Italy, 2016), limited incentives to firms, and a low specialized workforce.
Table 2 presents the sample criteria selection.

Regions	**RIS classification**	**EU classification**
Lombardy	Strong Innovator	More developed
Molise	Moderate Innovator	Transition
Calabria	Moderate Innovator	Less developed

Table 2 Sample selection criteria

3.2. Data source

ROP describes how a region uses the European Regional Development Fund (ERDF) to implement economic growth. The document represents the most important and descriptive program of the strategic plan that a region develops and applies during the seven-year duration of the Programme, from 2014 to 2020.
ROP has a specific structure composed of a) thematic objectives; b) priority axes; c) specific objectives; d) expected results; and e) actions.
A group of thematic objectives (hereafter TO) composes a "priority axis." Each "priority axis" represents regional investment priorities based on the analysis of the socio-economic context. Each investment priority is linked to one specific objective. Then, the document reports the expected results, actions, and allocated resources for each specific purpose. Table 3 presents the documents' characteristics for each region.

Programme Structure					
Regions	**Pages**	**Priority axes**	**Specific objectives**	**Priority axes related to entrepreneurship**	**Specific objectives related to entrepreneurship**
Period 2014-2020					
Lombardy	291	7	18	6	13
Molise	395	11	28	7	18
Calabria	550	14	46	8	19

Table 3 Programs structures.

Each region belonged to the EUSAIR Area included within ROP, measures related to the EUSAIR strategy. Specifically, Table 4 shows for each region analysed the pillars included and the ROP measures implemented to achieve the objective.

Regions	**EUSAIR Pillars**	**ROP MEASURES**
Lombardy	**Pillar 2** Connecting the region: **Pillar 4** Sustainable Tourism:	- CO 2 reduction (**Axis IV**); - Tourism strategy of inland areas (**Axis VI**).

Molise	**Pillar 1** Blue Growth and **Transversal** Pillar: **Pillar 2** Connecting the region: **Pillar 4** Sustainable Tourism and **Pillar 3** Environmental Quality**:**	- Increase of business innovation activity; - Strengthening of the regional and national innovation system; - Increase in the incidence of innovative specializations in knowledge-intensive application perimeters (**Axis I**) and - Consolidation, modernization, and diversification of territorial production systems (**Axis 3)**; - Digitization of administrative processes and dissemination of fully interoperable digital services (**Axis 2)** and - Increase in the share of energy needs covered by distributed generation by developing and implementing intelligent distribution systems (**Axis 4**); - Improvement of the conditions and standards of offer and use of heritage in areas of natural attraction; - Competitive repositioning of tourist destinations (**Axis 6**).
Calabria	**Pillar 1** Blue Growth and **Transversal** Pillar: **Pillar 2** Connecting the region: **Pillar 3**: Environmental Quality: **Pillar 4** Sustainable Tourism**:**	- Research, technological development, and innovation (**Axis I**); and - Institutional capacity (**Axis 11)**. - Logistics, and particularly transport (**Axis 7**); - Climate and environmental risks (**Axis 5**) and - Environmental protection and enhancement of cultural and environmental resources (**Axis 6**); - Environmental protection and enhancement of cultural and environmental resources (**Axis 6**);

Table 4 EUSAIR objectives included in the ROP

Therefore, to investigate the EUSAIR strategy, this study focused only on the measures and policies related to the ROP Axes which included the EUSAIR objectives.

3.3. Data Analysis

The analysis focused on measures related to regional entrepreneurial development. According to Friese, Soratto, and Pires (2018), researchers may not necessarily code the content of the entire data set; in fact, we focus only on objectives and measures that stimulate EE assets. These elements were codified and examined with a Computer-Assisted Qualitative Data Analysis Software (CAQDAS), namely Atlas.ti.7. Following the TCA process, we selected the quotations in ROP paragraphs that describe in detail the specific objectives and actions, then we associated codes at the level of sentences and families at the level of codes.

The units of analysis are codes and categories. Codes are essential for organizing, structuring, and retrieving data, supporting the identifying themes for document interpretation. Many codes already exist in the literature on policy design (Stevenson and Lundström, 2007; Mason and Brown, 2014). We have created others inductively to cover all aspects of the topic under investigation. Our codification process produced 57 codes, considering specific objectives and actions included in ROP documents. Codes are grouped for the themes they represent. These groups of codes are defined as categories. This study highlighted 15 categories. Table 5 illustrates codes and categories.

Categories	Codes
Competitive advantage	Competitiveness; Internationalization; Attractiveness; Promotion; Investment attractiveness.
Education	Education; High-education; Specialised education.
Finance	Access to finance; Credit expansion; Innovative finance; Microfinance; Public guarantee; Risk capital; Venture capital.
Firm creation	Entrepreneurship; Micro-entrepreneurship; Social entrepreneurship;

	Spinoff; Startup.
High-tech industry	Knowledge-intensive; Strategic industries.
Infrastructure	Research infrastructure; Tangible asset; Urbanization.
Knowledge production	Industrial research; Research&Development; Research&Innovation; Innovation; Tech development; Emerging Industry & Technology; Social innovation.
Knowledge transfer	Knowledge transfer; Diffusion of innovation; Diffusion of technology; Digitalization; Technology transfer; Open innovation.
Labor force	Labor force; Skilled people.
Low-tech industry	Agriculture&Fishing; Cultural heritage; Natural resources; Tourism.
Networking	Micro supply-chain; Proximity; Public-private partnership; Private-private partnership.
Social issue	Social equality; Gender equality.
Sustainability	Sustainability.
Technology adoption	Technology; Technology innovation; Modernization; High-technology.
Value-added services (VAS)	Business services; Innovation support.

Table 5 Description of Codes and Categories

To analyse codes and categories, the frequencies of codes and the weight of categories are used as a metric. The sum of the codes' frequencies that make up the category represents the weight of the category.

4. Results

This section presents the results of our analysis. Lombardy presented forty-four codes. The most frequent are innovation, technology, business services, sustainability, attractiveness, and promotion. No measures for high education, specialised education, micro-finance, skilled people, gender equality, proximity, micro-supply chain, technology transfer, knowledge transfer, social innovation, strategic industry, and knowledge-intensive codes. Lombardy presented exclusively the following codes: urbanization and social equality. Table 6 shows the insights.

Lombardy	
Codes	**Frequencies**
Competitiveness	4
Promotion	5
Internationalization	2
Attractiveness	5
Investment attractiveness	2
Education	2
High-education	0
Specialised education	0
Access to finance	1
Credit expansion	0
Innovative finance	2
Micro-finance	0
Public guarantee	1
Risk capital	1

Venture capital	1
Entrepreneurship	4
Micro-entrepreneurship	1
Social entrepreneurship	1
Spinoff	1
Startup	2
Knowledge-intensive	0
Strategic industry	0
Research infrastructure	1
Tangible asset	4
Urbanization	1
Industrial research	1
Research&Development	3
Research&Innovation	1
Innovation	8
TechDevelopment	1
Emerging Industry & Technology	2
Social innovation	0
Knowledge transfer	0
Diffusion of innovation	2
Diffusion of technology	2
Digitalization	1
Technology transfer	0
Open innovation	1
Labour force	2
Skilled people	0
Agriculture&Fishing	1
Cultural heritage	3
Natural resources	2
Tourism	3
Micro supply-chain	0
Proximity	0
Public-private partnership	2
Private-private partnership	4
Social equality	2
Gender equality	0
Sustainability	5
Technology	7
Technology innovation	1
Modernization	1
High-technology	2
Business services	5
Innovation support	1

Table 6 Codes metrics of Lombardy's ROP

Molise region presented thirty-five codes. It is the only region in our sample to have a specialised education code. No measures related to the following codes: investment attractiveness, innovative finance, micro-finance, public guarantee, venture capital, micro-entrepreneurship, strategic industry, urbanization, research and innovation, diffusion of innovation, knowledge transfer, digitalization, technology transfer, open innovation, skilled people, agriculture and fishing, micro-supply chain, proximity, social equality, sustainability, modernization, and innovation support. Table 7 shows the results of the Molise metrics.

Molise	
Codes	**Frequencies**
Competitiveness	4
Promotion	2
Internationalization	1
Attractiveness	2
Investment attractiveness	0
Education	4
High-education	1
Specialised education	1
Access to finance	1
Credit expansion	1
Innovative finance	0
Micro-finance	0
Public guarantee	0
Risk capital	1
Venture capital	0
Entrepreneurship	4
Micro-entrepreneurship	0
Social entrepreneurship	1
Spinoff	1
Startup	2
Knowledge-intensive	1
Strategic industry	0
Research infrastructure	1
Tangible asset	5
Urbanization	0
Industrial research	2
Research&Development	2
Research&Innovation	0
Innovation	7
TechDevelopment	2
Emerging Industry & Technology	1
Social innovation	1
Knowledge transfer	0
Diffusion of innovation	0
Diffusion of technology	1

Digitalization	0
Technology transfer	0
Open innovation	0
Labour force	6
Skilled people	0
Agriculture&Fishing	0
Cultural heritage	2
Natural resources	2
Tourism	4
Micro supply-chain	0
Proximity	0
Public-private partnership	4
Private-private partnership	2
Social equality	0
Gender equality	2
Sustainability	0
Technology	6
Technology innovation	1
Modernization	0
High-technology	2
Business services	3
Innovation support	0

Table 7 Codes metrics of Molise's ROP

Finally, Calabria showed fifty-two codes. The region presented exclusively the strategic industry, knowledge transfer, technology transfer, proximity, and micro-supply chain. The most frequent codes are the following: tangible assets, entrepreneurship, labour force, competitiveness, innovation, technology, business services, education, and public-private partnership. No codes as specialised education, access to finance, urbanization, emerging technology and industry, and social equality. Table 8 shows the result of the analysis for the Calabria region.

Calabria	
Codes	**Frequencies**
Competitiveness	6
Promotion	4
Internationalization	2
Attractiveness	2
Investment attractiveness	2
Education	5
High-education	2
Specialised education	0
Access to finance	0
Credit expansion	1

Innovative finance	1
Micro-finance	1
Public guarantee	1
Risk capital	1
Venture capital	1
Entrepreneurship	8
Micro-entrepreneurship	2
Social entrepreneurship	2
Spinoff	2
Startup	3
Knowledge-intensive	1
Strategic industry	1
Research infrastructure	2
Tangible asset	12
Urbanization	0
Industrial research	2
Research&Development	4
Research&Innovation	3
Innovation	6
TechDevelopment	1
Emerging Industry & Technology	0
Social innovation	4
Knowledge transfer	1
Diffusion of innovation	2
Diffusion of technology	1
Digitalization	4
Technology transfer	2
Open innovation	1
Labour force	7
Skilled people	1
Agriculture&Fishing	1
Cultural heritage	4
Natural resources	3
Tourism	4
Micro supply-chain	1
Proximity	3
Public-private partnership	5
Private-private partnership	4
Social equality	0
Gender equality	3
Sustainability	2
Technology	6
Technology innovation	4
Modernization	2
High-technology	1

Business services	6
Innovation support	3

Table 8 Codes metrics of Calabria's ROP

We compared the results according to the categories, i.e., the groups of codes, and show the metrics in Table 9.

Categories	**Lombardy**	**Molise**	**Calabria**
	Weight of category		
Competitive advantage	18	9	16
Education	2	6	7
Finance	6	3	6
Firm creation	9	8	17
High-tech industry	0	1	2
Infrastructure	6	6	14
Knowledge production	16	15	20
Knowledge transfer	6	1	11
Labour force	2	6	8
Low-tech industry	9	8	12
Networking	6	6	13
Social issue	2	2	3
Sustainability	5	0	2
Technology adoption	11	9	13
Value-added services (VAS)	6	3	9

Table 9 Category metrics of ROPs: comparison between the regions

Lombardy is one of the most developed Italian regions and the categories with higher weight are "Competitive Advantage," "Knowledge Production," and "Technology Adoption." The region paid little attention to the categories of "education," "labor force," and "social issue." No measures for the High-tech Industry category. Analysing the ROP, we note that Lombardy contributes to the EUSAIR strategy mainly through Axis IV (CO 2 reduction) and Axis VI (Tourism strategy of inland areas). However, the focus on entrepreneurship, innovation, R&D, and SMEs, which represent the transversal pillars of EUSAIR strategy, are included in all Axes of this region. This means that Lombardy has effectively and efficiently integrated the EUSAIR objectives within the regional documents, placing them alongside the other territorial development objectives.

Molise implements the synergies with EUSAIR in Axis I (for TOs: 1.1 Increase of business innovation activity; 1.2 Strengthening of the regional and national innovation system; 1.4 Increase in the incidence of innovative specializations in knowledge-intensive application perimeters); Axis 2 (for the TO 2.2 Digitization of administrative processes and dissemination of fully interoperable digital services); Axis 3 (for the TO 3.3: Consolidation, modernization, and diversification of territorial production systems); Axis 4 (for the TOs 4.3 Increase in the share of energy needs covered by distributed generation by developing and implementing intelligent distribution systems); and Axis 6 (for the TOs: 6.6 Improvement of the conditions and standards of offer and use of heritage in areas of natural attraction; 6.7 Competitive repositioning of tourist destinations). The region presents measures and actions still important in the

"labour force" category. The region focused its efforts on the following categories: "Knowledge production," "Competitive Advantage," "Technology Adoption," "Low-tech Industry," and "Firm creation." Less attention was given to the categories of the "High-tech Industry," "Social Issue," and "Knowledge Transfer." No measures for the "Sustainability" category.

In connection with the EUSAIR goals, Calabria promotes new forms of cooperation and opening processes of the regional territory based on more significant involvement of the local systems and civil society. The EUSAIR perspective is more present in some ROP's OTs, such as the OT for Axis 1 (Research, technological development, and innovation); Axis 5 (Climate and environmental risks); Axis 6 (Environmental protection and enhancement of cultural and environmental resources); Axis 7 (Logistics, and in particular transport); and Axis 11 (Institutional capacity). It presented measures still focused on the "labor force" category. There are measures related to the categories of "Competitive Advantage," "Firm Creation," and "Knowledge Production." Significant efforts also occurred in the "Low-tech Industry," "Infrastructure," "Technology Adoption," and "Knowledge Transfer" categories. At the same time, the region paid little attention to the "Sustainability," "Social Issues," and "High-tech Industry" categories.

5. Discussion

This section discusses the results of the TCA and analyses the EEs' development levels. Each ROP differs in the measures and actions as it responds to the different regional developments and acts on the peculiarities of the territory to which it refers. The EUSAIR regions add specific objectives and measures related to the EUSAIR goals to the common objectives of ROPs.

In this analysis, the concept of EE evolution is conceived in terms of economic development, which is the yardstick for comparing the regions we analysed.

According to this perspective, the above policies respond to different ecosystem development stages. We based our categorisation on the model developed by Spigel and Harrison (2018) as a nascent, strengthening, and resilient ecosystem. These authors defined the development stages based on the resources available, the connection links among the actors within the region, and the infrastructural assets. The former are represented by entrepreneurial knowledge, financial capital, and skilled workers, which are "created or attracted over time by entrepreneurial activity and public investment" (Spigel & Harrison, 2018, pp. 159). On the other hand, the network is a "key criterion of entrepreneurship and innovation as they foster knowledge sharing about new opportunities, new technologies, and the entrepreneurship process" (Spigel & Harrison, 2018, pp. 153). Indeed, strong networks connect entrepreneurs with investments and employees. Finally, infrastructure assets refer to all the regional physical elements that support high-growth entrepreneurship, i.e., research infrastructure, incubators or accelerators, and a region's physical infrastructure (Patton & Kenney, 2005).

According to this vision, the Calabria region's characteristics represent a nascent ecosystem (Spigel & Harrison, 2018). The Calabria ROP for EUSAIR strategy focuses on supporting economic and social conversion to promote Calabria's development and structural adjustment, which experienced developmental delays. The measures refer to the infrastructure creation and equipment for private and public firms, educational programs for unemployed people, incentives for firm creation, business services to facilitate recruiting, and investments in knowledge production and knowledge transfer. Therefore, there are still measures related to education, labour force, and investment, i.e. resources, to foster Calabria's growth; few links between firms and actors as the region invested in more measures related to networking category and knowledge transfer, i.e., connections; the same also for the infrastructural assets. This is coherent with the development level of the region, which showed still delays and was classified as

less developed by the EU.

Molise implemented more measures related to resources (education, finance, labour force, and knowledge production), and less to connections (networking and knowledge transfer), and infrastructural assets (infrastructure), showing a strengthening EE. The Molise document, coherent with EUSAIR's objectives, focuses on the attractiveness and competitiveness of firms through investments in technology and innovation, infrastructures, and networking. The ROP supported economic development and employment through programs for the modernization and diversification of economic structures and the creation of stable jobs. Measures to enhance R&D and innovation and actions to foster innovation and entrepreneurship in all sectors are included in the program. Besides, the ROP supported and granted better access to finance by SMEs, new firm creation, and the promotion of firms and research institutions' cooperation. Concluding, the region presented a more robust framework, with less investment in traditional sectors as the firms had a stronger structure, were more prominent, and already employed innovation and technology practices, which are strengthened in the ROP to act on the regional competitiveness and attractiveness. There are still measures for the education and labour force sectors, especially for acquiring workers' skills and competencies, and actions to foster partnerships between public and private sectors to increase knowledge sharing and create a solid and cohesive regional network.

Finally, the Lombardy EE showed a resilient ecosystem as its measures focused on achieving a key position in managing relational and financial resources by inserting them into firms, industries, and projects with high added value (such as technology and innovation). The region presented a solid and cohesive framework with productive and growing firms, a low unemployment rate, and a good level of skilled workers; it offered financial incentives for making access to credit faster and more convenient. All these measures are related to resources. It paid attention to boosting up the partnerships, i.e., connections, between the regional actors; and also to reinforcing the infrastructural assets. The Lombardy ROP for EUSAIR strategy presents measures for increasing the competitive advantage with actions aimed at firms' competitiveness and attractiveness, promoting innovation and technology adoption. It includes actions to foster knowledge production, strengthen innovative sectors, and financial incentives to allow firms to invest in innovation, R&D, and technology to create a more robust and competitive entrepreneurial climate. There are measures related to sustainability as firms aim to be more sustainable and adopt best practices for increasing the level of competitiveness at an international level. ROP encourages partnerships among actors such as universities and research structures with firms and big companies with SMEs and startups.

Analysing the measures addressed toward the EUSAIR strategy contained in the ROPs, we highlight policy directions according to the policies' type and objectives implemented in the region. The Calabria presents policies that support the creation of actors' networks to promote innovation and increase the region's overall attractiveness and competitiveness. In this framework, the policies aimed to reinforce the regional structure and assume the role of remedial and basic policies. The policies and measures are driven by a strategy to invest in regional specializations representing the region's peculiarity and economic value to exploit the competitive advantage. These types of policies are defined in literature as soft policies (Storey, 2005; Banerjee, Savani, and Shreedhar, 2021). Particularly, due to the measures' objective we defined for this region remedial and basic policies, i.e. soft policies aim to create a solid regional structure, investing in traditional sectors, and innovation, with supporting and incentives measures, to reduce the unemployment rate and create an extended regional network, to gain a stronger and more cohesive structure that allows the region to grow. Indeed, Calabria is still in transition but with signs of development, based on policies on reinforcing and expanding the current entrepreneurial climate in traditional sectors, in the creation of new businesses, and in education and employment policies to increase these regional indexes. It also presents actions concerning technology, innovation, and R&D; infrastructures; creating partnerships between the private and public sectors, and actions for increasing

the regional competitive advantage. Support measures for SMEs for adopting innovation, consultancy, and support services for businesses, in general, are included.

The Molise measures, addressing EUSAIR objectives, strengthen the competitiveness and attractiveness of the regions and foster new firms. Policies encouraged innovation and technology adoption within the firms. This type of approach is defined as "reinforcing policies." The reinforcing policies are soft and hard policies mixed. Indeed, we refer to measures that incentivize, foster, and support businesses and innovation but also funding to help firms grow. The region attracts investments from external actors and, through policies to enhance competitiveness, prepares the region to compete with actors outside the region. The region covers an important position about the resources, including them in firms and industries and technological and innovative projects.

Lombardy EUSAIR strategy shows more measures aimed at increasing technology, innovation, and diffusion of technology with many actions related to investments in R&D and the creation of partnerships between the public and business sectors. For these reasons, Lombardy implemented different policy types defined as "shooting". This category of policies is referred to as hard policies (Storey, 2005; Banerjee, Savani, and Shreedhar, 2021). Indeed, the measures strengthen the firms' competitiveness and attractiveness and adopt technology and innovation through funding in startup creation, investments in technology and innovation, and financial support to businesses. Figure 1 shows the EE policies direction and EE development stage.

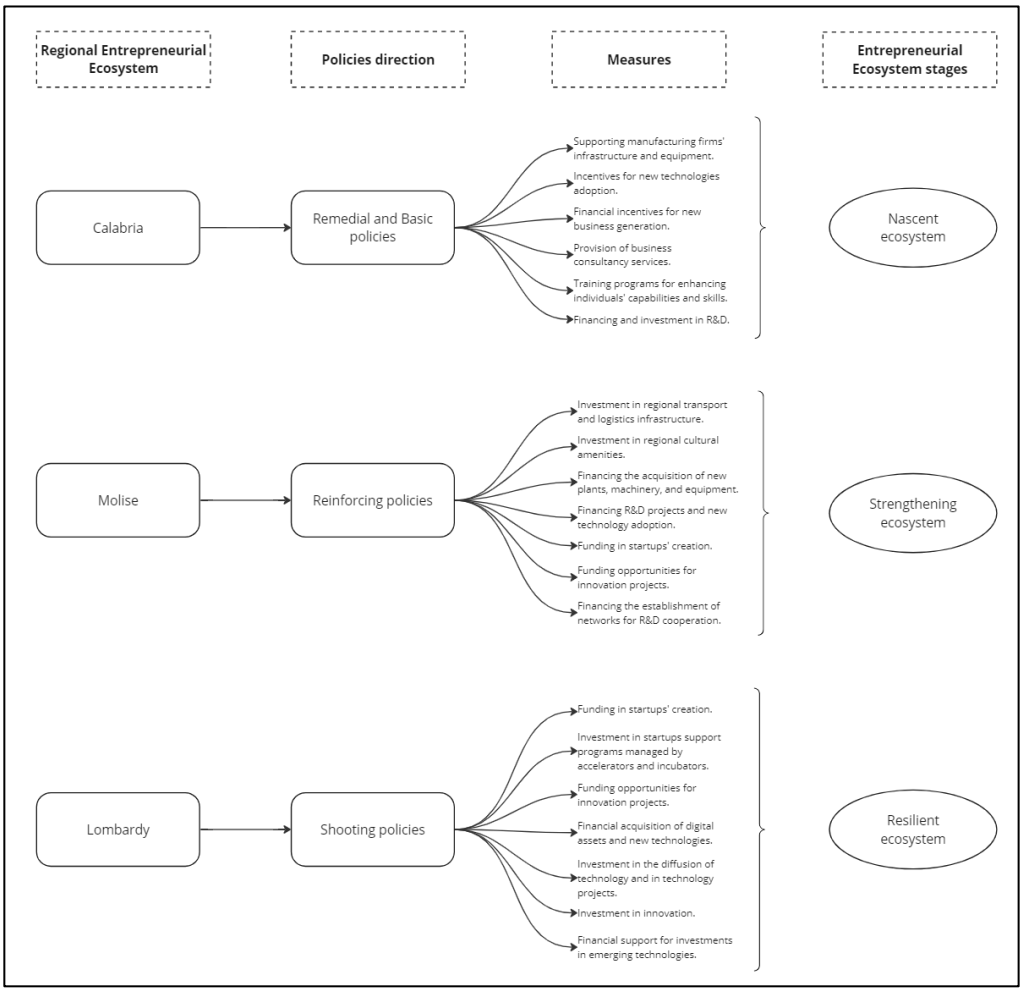

Figure 1 Policies directions, measures, and Entrepreneurial Ecosystem's stages

6. Conclusion

This study aims to investigate the EUSAIR strategy within three Italian regions, i.e., Lombardy, Molise, and Calabria. The EUSAIR objectives refer to supporting the economic growth and prosperity of the macro-region by improving its attractiveness, competitiveness, and connectivity; and protecting the sea, the coastal environment, and the hinterland. In reaching the EUSAIR objectives, we analysed the measures and policies included in the ROP, and in particular we focused on the measures and actions related to the topics of entrepreneurship and innovation.

Starting from the four pillars - i.e., Blue growth; Connecting the region; Environmental quality; and Sustainable tourism - and two transversal pillars - i.e., Strengthening R&D and innovation and SMEs; and capacity building and communication - and the related topics and thematic objectives, this study analysed the measures and actions within the ROP that refer to these pillars and objectives. Then, we operated a TCA on these measures, aiming to codify and identify which are the most important topics within each document. We used TCA to gain insights about policy directions according to measures, activities, and strategic plans created by regions. Finally, we compared the three selected regions and based on the results, we categorise the types of policies adopted that reflect the territory characteristics and the development level.

The policy categorization refers to all the specific measures that have been adopted and implemented by each region within the ROP which includes the EUSAIR strategy. These policies reflect the level of regional and entrepreneurial development that is analysed, in this work, through the entrepreneurial ecosystem perspective.

This research underlined a literature gap on the role of policies in the development of EEs. Most studies do not consider the dynamics of measures and policy actions within the development of EE (Stam, 2015; Roundy et al., 2017). From the policies' typology and through the categorization present in the literature of the different EE development stages, we linked the policies adopted by three Italian regions with territorial and ecosystem development levels. This study highlights different policy types according to the different EE stages. Three policy directions emerged from the analysis of ROPs for the EUSAIR strategy: remedial and basic policies; reinforcing policies; and shooting policies. Regarding the EE stage, this study adopted Spigel and Harrison's (2018) classification, i.e., nascent ecosystem, strengthening ecosystem, and resilient ecosystem.

Therefore, we have concluded that Calabria, which represents a territory with development issues, has applied policies defined as remedial and basics within the ROP for EUSAIR strategy and reflects a nascent ecosystem. Molise, which represents a strengthening ecosystem, adopted reinforcing policies. Finally, Lombardy, which is the most developed region, adopted shooting policies that reflect a resilient ecosystem.

This study contributes to the existing literature from different perspectives. First, it provides a dynamic view of policies from an EE perspective. We investigate the EUSAIR strategy by studying and categorizing the policies that are adopted within the regional territory. We highlight how, depending on the stage of EE development, different types of policies and measures are adopted and implemented. Secondly, it presents a categorization of policies and measures typical of the different levels of development. Each policy typology - i.e., remedial and basic, reinforcing, and shooting - refers to a set of measures highlighted in the ROP documents that are consistent with the EUSAIR strategy. Finally, this study links the three types of policies adopted by the regions analysed with the stages of development of the EE. Indeed, remedial and basic policies mirror a nascent ecosystem; reinforcing policies are typical of a strengthening ecosystem; and shooting policies are adopted by a resilient ecosystem.

However, this paper does not come without limitations. Indeed, the first limit concerns the qualitative approach, as this study uses a TCA on policy documents. Another limit is represented by the size of the

sample as it is composed of only three regions and it would be desirable to expand the analysis to include more regions of the EUSAIR area. Finally, the last limit regards the location of the regions selected as this study analysed the policies and the level of development of the EE only in the Italian context.
Therefore, future research could also take a quantitative approach to analyse the documents and confirm the findings. It would be desirable to expand the small sample as it could overlook other types of policies and specific characteristics of the territories, which are not present in this study. Therefore the analysis should be extended to the entire sample of EUSAIR Italian regions.

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