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ERMIS
Effective Reproducible
Model of Innovation System

ERMIS

POLICY RECOMMENDATIONS FOR AN EFFECTIVE REPRODUCIBLE MODEL OF INNOVATION SYSTEM

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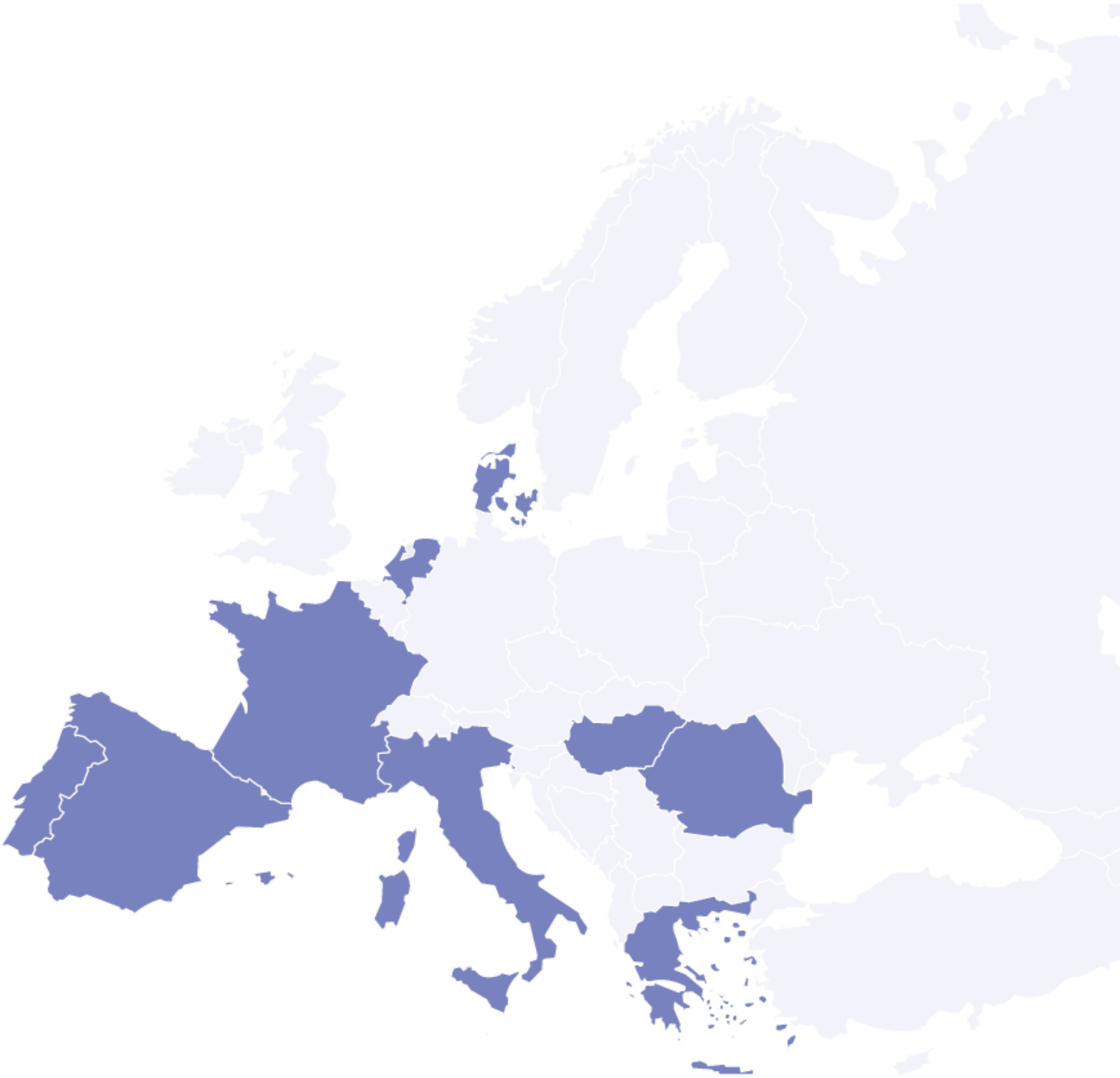

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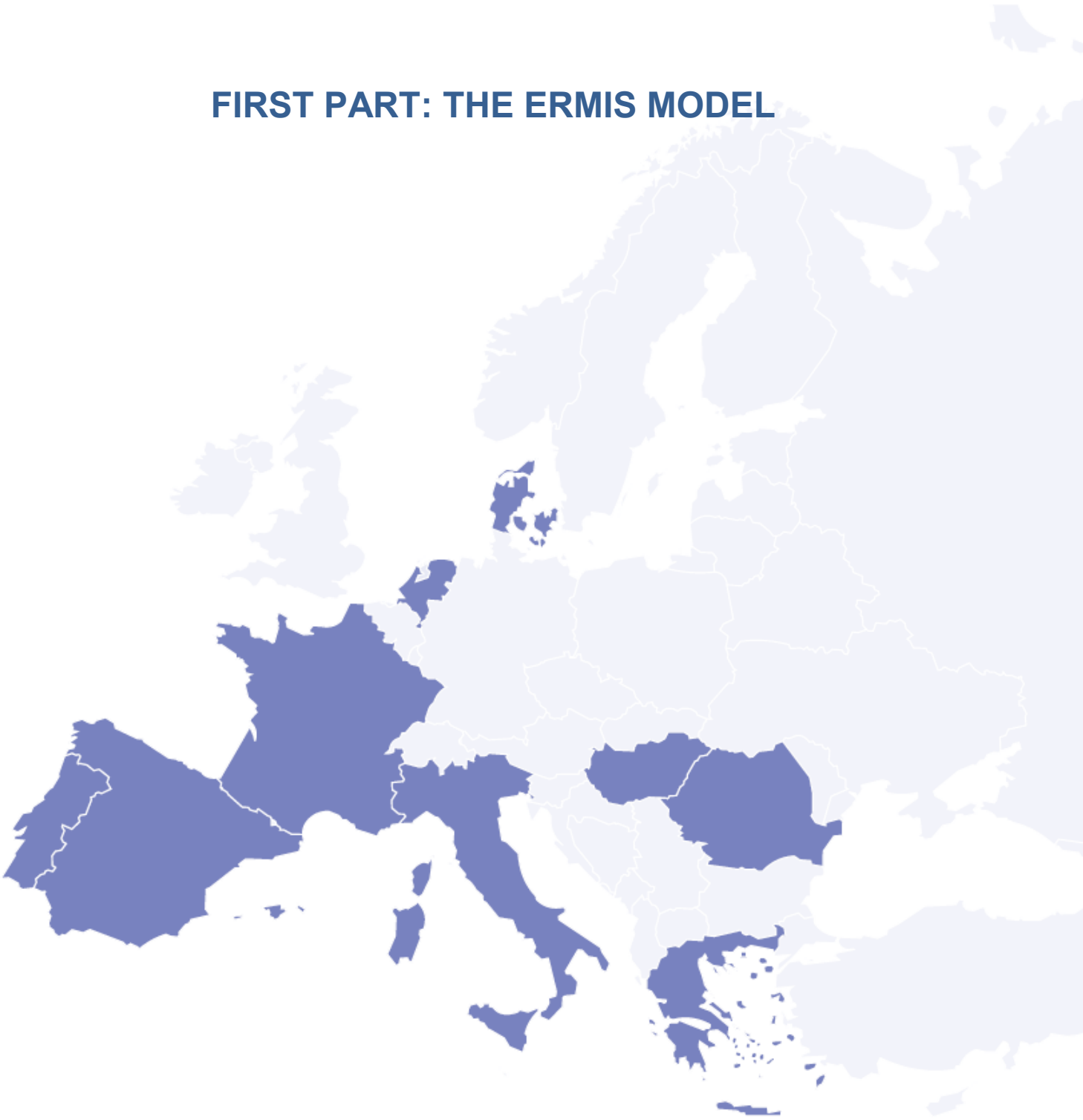


1. EU Regions and innovation challenges: the ERMIS approach

The ERMIS approach

The ERMIS (Effective Reproducible Model of Innovation System) project aims to open the "black box" of the regional innovation system through a solid analysis of place-based innovation assets, to establish:

a) the state of the economic environment and the business context of regional and local innovation, stressing the peculiarity of each locality or region (confirming the paradigm that "*one size does not fit all*" in innovation strategies[1]);

b) what are the reproducible assets of local or regional innovation policy (assuming that the place-blased approach to innovation can be strengthened by interregional exchange of best practices as a form of *knowledge diffusion*).

ERMIS is a joint response from a regional perspective to the UE challenge to develop a regional policy for smart growth through Europe 2020. The ERMIS contribution is centred around:

- Taking a place based approach to innovation (recognizing the importance of local capacities and local knowledge bases);
- A recognition of regional/local interdependencies and externalities based on degrees of diversification and maturity of the economic base[2];
- A recognition of the dominant role of high growth SMEs.

[1] See Todtling, Franz, Trippl, Michaela, One size fits all?: Towards a differentiated regional innovation policy approach, 2005.

[2] ERMIS lays down a methodology to measure the diversification/specialization of a regional economy and the level of maturity of its sectors.

Box 1 – The concept of Smart Specialisation

According to the European Commission Smart Specialisation Strategy (S3) means identifying the unique characteristics and assets of each country and region, highlighting each region's competitive advantages, and rallying regional stakeholders and resources around an excellence-driven vision of their future. It also means strengthening regional innovation systems, maximising knowledge flows and spreading the benefits of innovation throughout the entire regional economy[3].

The ecosystem concept behind the ERMIS model

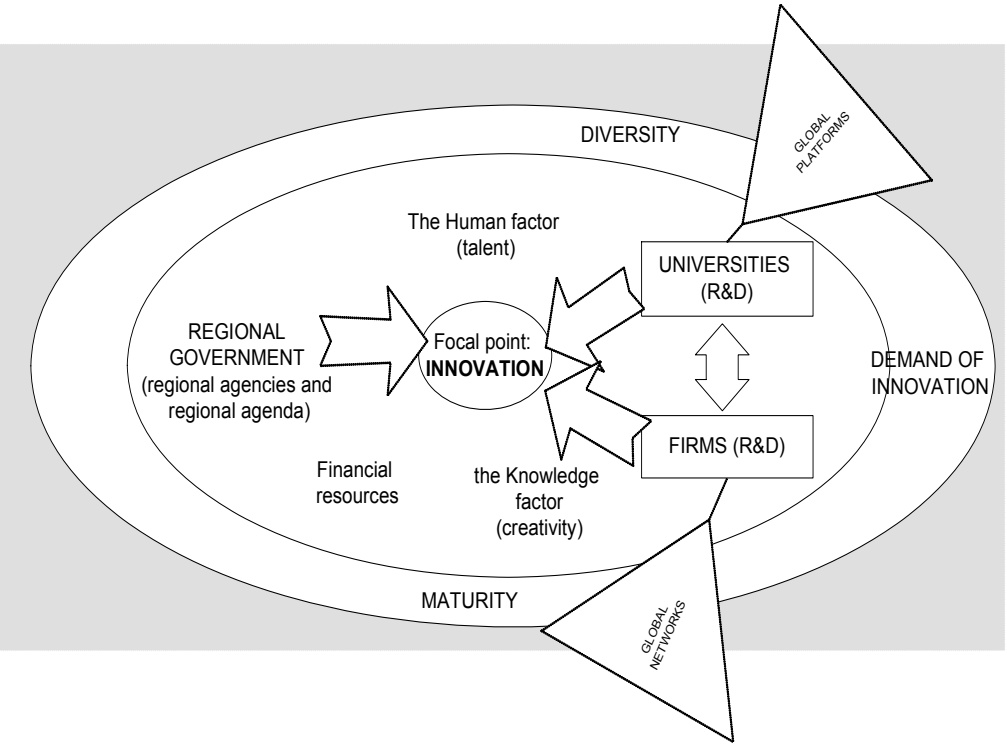
The ERMIS approach is based upon the idea that a local system of innovation (LIS) can be conceived as an "ecosystem".

Regional specialization can be represented through the dimensions of maturity and diversity. These dimensions refer to the collection of economic activities and related routines and practices that influence the potential for innovation and that represent the "knowledge basis" of each region. The focal point of such ecosystem is innovation. Dynamics of innovation arise both from a "technology push" from firms and universities R&D and from demand-driven innovation[4], among others, from the public sector. Around this focal point there is a web of interdependencies among actors that contribute with their actions and activities to feed the ecosystem's functioning. The system is not closed, since it entertains national, European and global networks. These networks are developed through relationships of its firms and research institutions and can greatly benefit from public sector international networks (Figure 1).

[3] See "Regional policy for smart growth in Europe", May 2011: http://ec.europa.eu/regional_policy/information/pdf/brochures/rfec/2011_smart_growth_en.pdf)

[4] Demand-side innovation policies aim to: increase the demand for innovations; improve the conditions for the uptake of innovations; improve the articulation of demand in order to spur innovations and the diffusion of innovations. It has been recognized that demand-driven innovation is not the same as demand-based approach of science policy whereby support is geared to the supply side (i.e. the knowledge creation), nor it is about improving or accelerating diffusion of off-shelf technologies (Edler, 2009). Within a smart strategy the concern should be how to assure the effectiveness and relevance of public sector intervention in fostering innovation from the demand-side, complementing mechanisms also on the supply side.

Figure 1 - ERMIS representation of an innovation ecosystem



Box 2 - The ERMIS ecosystem of innovation

In the literature, "innovation ecosystems" have been recognized to include at least three complex patterns of interaction:

- the "economic dynamics of the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation"[5];
- the "self regulating systems of interacting elements such as start-ups, incumbent firms, universities, financing institutions, specialised services and talented people […[this presupposes cross-functional cooperation between all partners and stakeholders"[6]
- a way to analyse and describe "the dynamics of value creation and their implications for value capture to the structure on interdependence in a firm's ecosystem […[to distinguish among the different roles played by various actors in the firm's environment"[7].

The innovation ecosystem notion is steadily growing in importance to explain the (lack of) success of regional and local/urban systems of innovation. One of the best illustrated cases in the world is actually the ecosystem of Eindhoven, a partner in the ERMIS project.

[5] See Deborah J. Jackson , *What is an Innovation Ecosystem?*
[6] See A. Hautamaki, *Innovation ecosystem in city policy: the case of Helsinki*
[7] See R. Adner, R. Kapoor, *Value creation in innovation ecosystems*

The Eindhoven case points to the presence of 5 key variables that shape an ecosystem[8]: a generative mechanism that in the case of Eindhoven is represented by proximity among knowledge workers; the context, with a history of collaboration between private and public sector, stemming from Philips's involvement as a local innovation player; actions to promote diffusion of knowledge, as triple helix mechanisms, several campuses, development of an advanced practice of pre competitive R&D collaboration); a regional agenda for innovation and development (as in the case of the Brainport 2020 Strategy).

An ecosystem conveys the idea of a comprehensive mechanism in which all pieces should be in place to foster innovation. An ecosystem is dynamic in that its actors adapt their relationships and actions to new needs within the system.
Evidence from ERMIS programme reveals two important elements to understand how an ecosystem works. The survey among ERMIS innovation experts[9] revealed that the two key factors behind an innovation system are:

a) the "knowledge factor" that is today central to all innovation strategies at national and regional level and is confirmed by the attention given to knowledge absorption as a key factor to improve regional innovation;
b) the "human factor" of talented young workers and potential entrepreneurs is the second most important factor.

Other factors include: financial instruments, advanced knowledge services, triple helix mechanisms.
Besides the survey, the transfers of best practices within the ERMIS programme suggest that innovation actors conceive the presence of a "value chain" approach to innovation, whereby the recognition of weak or missing activities may reveal missing elements or "blind spots" within the ecosystem which should be addressed by careful policy selection. An example within ERMIS is provided by the adoption of a set of best practices by the North Aegean region in Greece that will combine the experiences of sectoral innovation platforms observed in the French Riviera and the exchange mechanism between universities, technical schools and firms from Eindhoven to form a new policy package for smart growth in a peripheral region.

Table 1 - The elements of an innovation ecosystem

Elements	***Description***
Generative mechanisms	Proximity and interactions among actors
Public-private partnership	Large firms, SME's and regional institutions
Knowledge diffusion	Triple or quadruple helix mechanisms, campuses, research labs, start-ups, spin-offs, etc.
Regional agenda	Multiannual innovation blueprint

[8] See G. L. Romme, The Eindhoven ecosystem: http://prezi.com/7wmquzhp2var/open-innovation-in-eindhoven-brainport-ecosystem/
[9] Telephone survey with a semi-structured questionnaire conducted in May 2012 with 8 ERMIS innovation experts (one from each ERMIS region).

2. Regional strategic intelligence: the ERMIS dataset and the ERMIS SWOT analysis

The ERMIS approach starts from a comprehensive assessment of a region's economic environment. The first step is a regional self-evaluation check list as illustrated in box 3.

Box 3 – ERMIS self-evaluation check list for regional innovation

QUESTION 1: what are the priorities of the region?
QUESTION 2: what is the right area to focus on for a R.I.S to exist (emerge)?
QUESTION 3: what is the industrial structure of the region?
QUESTION 4: is my region dependent on a limited number of industries?
QUESTION 5: are there opportunities for (small) new firms to grow and survive?
QUESTION 6: which European regions can be compared with my region (same size, same profile)?
QUESTION 7: does my region perform as expected?
QUESTION 8: is my region better than other region in my country /reference regions and why?
QUESTION 9: does my region provide the necessary elements for SMEs to perform as expected?
QUESTION 10: are SMEs with high innovative potential in my region able to access and absorb human, financial and technological resources?
QUESTION 11: do institutions (local institutions, culture, etc.) promote knowledge exchange?
QUESTION 12: given the industrial profile of the region, what are the required policy actions? Are policy actions consistent with each other's? Are local policy actions consistent with national and European policy actions? Are local governance structures adapted to promote the right policy actions?

Data collection and data mining for the ERMIS approach

Central to the ERMIS methodology is the data collection phase. This is a crucial step since it implies access to an wide range of data at regional and sub-regional level10.

This stage requires a careful study and selection of data from national and European sources and a blending of quantitative and qualitative information.

Box 4 – ERMIS data requirement

- General indicators: demographic and global economic indicators
- Structure of economic activity: e.g. high tech/medium tech/low tech specialization;
- Human resources: human capital, mobility;
- Financial resources;
- Environmental conditions: cultural and technological conditions, diffusion of innovation;
- Innovation outputs: patents, publications;
- Qualitative information (interviews)

[10] Depending on the functional system that we wish to analyse, data can be needed at NUTS 2 or NUTS 3 level.

Crucial to a study of regional evolution is the availability of data over a time line, covering a lapse of time sufficient to assess the intensity and nature of change.

Building on the aforementioned considerations, the ERMIS methodology is based upon the creation of a "regional profile" starting from two dimensions: the first axis is the level of industrial specialization; the second axis is the level of industry maturity of regional clusters.

Box 5 - Diversity and maturity indicators[11]

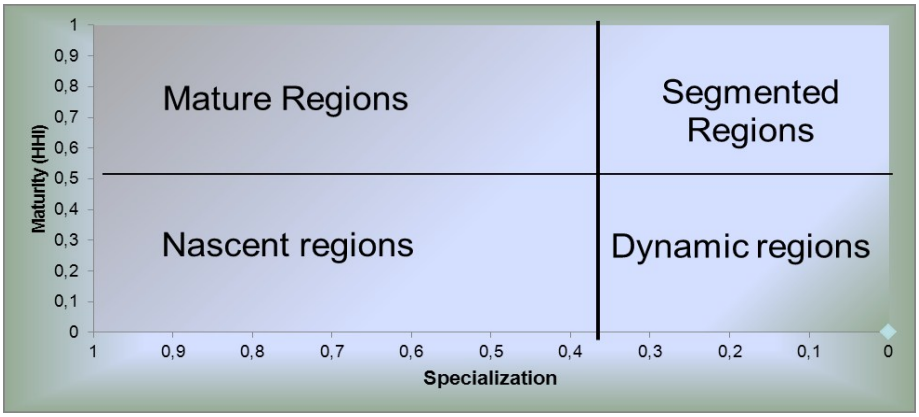
To measure diversity, we suggest using the Herfindhal index (HHI) which is an absolute value of the regional specialization.
Maturity results from a combination of indicators (the business concentration index; entry rate; the rate of product and process innovation). It aims to characterize the objective likelihood of SMEs to innovate. Mature industries are concentrated and exhibit a very low rate of entry, while young industries let new firms enter and allow a higher level of competition.
A further useful indicator is the location quotient (LQ), which measures the under or over-representation of a certain industry in a given region compared to the whole of the national economy.

How to measure the regional dynamics?

A fundamental aim of the regional profile is that of estimating which industries/industrial sectors/clusters the region (should) focus on in terms of smart specialisation . The key questions are what are the most important industries currently and which of these have a growing weight in the regional structure relative to national weight. This analysis also permits testing whether the governance and support structures fit with the specific needs of the most strategic industries/clusters.
Subsequently, a transition analysis enables each region to compare the importance of each cluster with clusters gaining size and strategic position. Further, looking at the type of the industries that are growing, one can see whether growing industries are related with or independent from currently dominant industries and could benefit from common resources/competences.

[11] For a technical presentation see ERMIS step by step guide.

Fig. 2 - The ERMIS profile matrix



Box 6 – Recommendations for an effective data collection strategy

Building a regional profile can be a tricky exercise that requires basic notions of data collection, data mining and data processing.
The ERMIS project has produced a step by step methodological guide to build the regional profile, with technical annexes in excel to calculate the required indices.
However, the basic notion behind this crucial step is that even data gathering can be a governance approach that entails collaboration among the different regional or local institutions that have access to databases or develop their own data warehousing systems.
Having access to EU databases at regional level (i.e.: EUROSTAT) is definitely an advantage. National and regional statistical offices are also crucial in the data collection strategy.

A regional innovation benchmark

A crucial step in this direction is the benchmark with other regions. Benchmarking is the process of comparing one's business processes and performance metrics to industry bests and/or best practices from other industries. Dimensions typically measured are quality, time and cost.

In the process of regional benchmarking, a region should identify the best performing regions, or the regions with similar structural patterns and compare their innovation performances. In this way, they learn how well they perform on the set targets and, more importantly, they identify the factors that explain why these regions are (more) successful.

We advise to select reference regions on structural specificities such as population, population density, industrial structure and GDP and then make a comparison on economic, industrial and innovation performance, which leads to investigate the causes (i.e. the practices) for performance differences.

Box 7 – Selecting reference regions: the example of Emilia Romagna

Emilia Romagna selected its own reference regions on the basis of "nearest neighbour" technique which helps identify areas with similar profiles. The selected reference regions offer the opportunity to gauge the innovation potential of Emilia Romagna, confronting its characteristics with a leading region in Europe (Stuttgart), a leading region in Italy (Piedmont) and a fast growing but lagging behind region in Europe (Comunidad Valenciana). All reference regions are localities specialized in industry (according to Eurostat) and therefore present the common challenge of innovation vis a vis the transformation and evolution of manufacturing.

The ERMIS SWOT analysis

Building on the regional profile, the aim of the SWOT analysis is to illustrate strengths, weaknesses, opportunities and threats of partner regions in order to define and support the development of local and regional policies stimulating the innovative performance of SMEs as a source of sustainable growth.

Box 8 – The ERMIS SWOT Analysis

Strengths rely on resources, conditions, or capacities firms can effectively exploit and leverage to innovate and thereby enjoy a competitive advantage

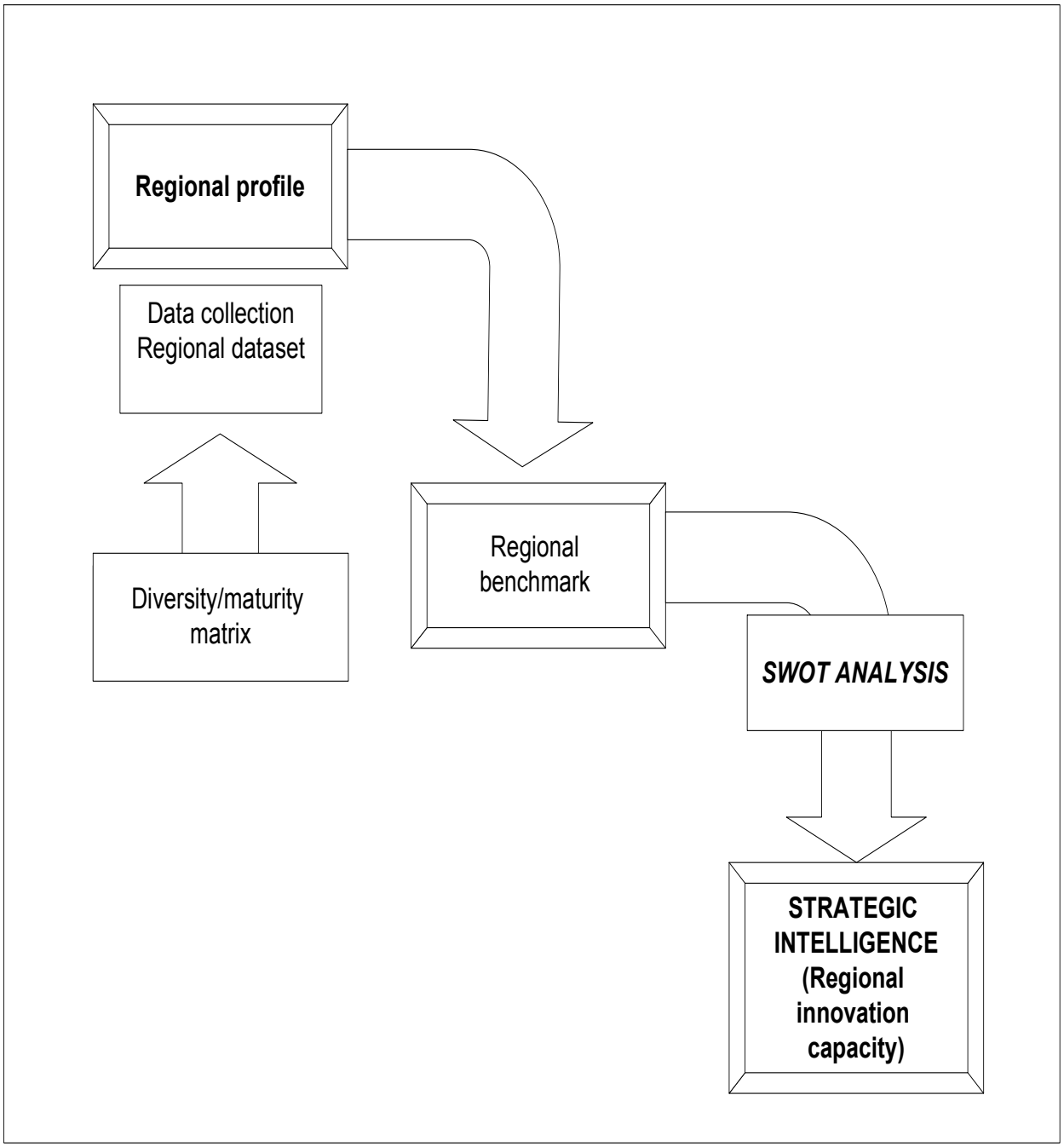
Weaknesses are limitations, defects or lack of necessary resources, conditions, or capacities to take up innovation and achieve a competitive advantage

Opportunities are favourable situations or conditions in the firms' environment that could be exploited to increase the firms' innovating capacity and achieve a competitive advantage

Threats are unfavourable situations in the firms' environment that could damage the firms' competitive advantage if required resources or capacities to face and overcome these situations are not accessible

Summing up our methodological approach so far: we have produced a regional profile that helps us benchmark the regional innovation performance with other reference regions. All this information permits the identification of the relative position of our system in terms of innovation capacity. The entire profiling processed is summarised in fig. 3.

Fig. 3 – The ERMIS model: Building regional strategic intelligence



4. Evidence from ERMIS: towards a dashboard for smart innovation policy

A statistical Dashboard is a tool designed to create charts and statistics on trends related to a given phenomenon.
The idea behind an ERMIS dashboard is that of a tool designed to monitor and evaluate the effect, on a region's competitiveness, of a series of factors (the variance across a selection of reference systems, the innovation performance of SMEs, R&D investment, the logistic and infrastructural centrality of the system, the quality of the governance system, the economic efficiency of local investment, FDI flows, etc.), controlling for the intersection between diversity and maturity ("the evolutionary stage" of the system).

A dashboard to guide innovation policies

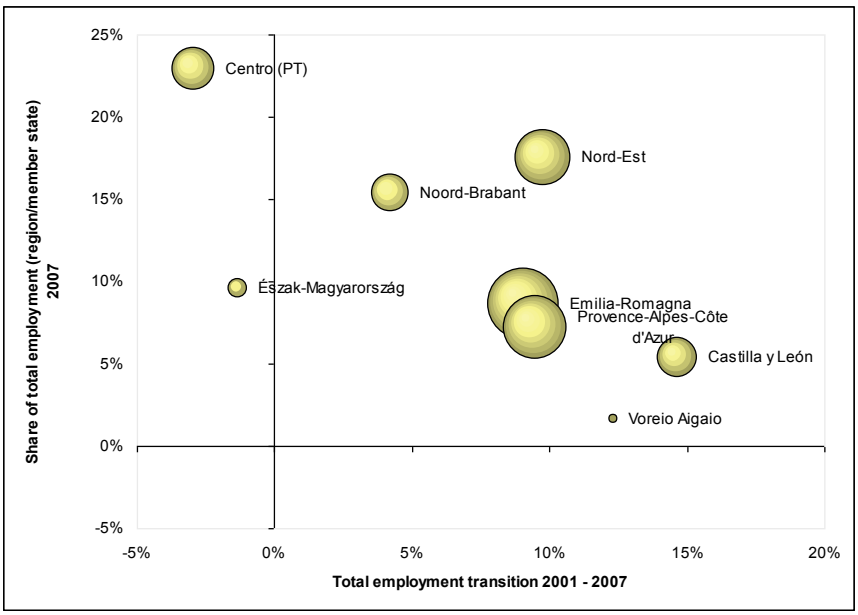
This dashboard reveals its importance especially when completed with the best practices assessment (see the second part of this document) since it allows a comprehensive approach to understand where a regional innovation system is heading, where it could head with intervening policies and what kind of failures it may avoid along its decision making process.

In this section, we carry out an exercise that can be helpful to project the idea of an ERMIS dashboard. The data comes from the regional profiles and SWOTs completed by the ERMIS partners. In order to harmonise the use of different sources, a common dataset has been built to complement data from the ERMIS SWOTs, with data referring to employment at NUTS 3 level from Eurostat database[12].

The first step in a comprehensive ERMIS profile is the calculation of employment shares of each single region over the total employment at member state level as a way to assess the regional weight in employment. The second step is the reconstruction of a time series of employment to assess total employment transition. The overall result is depicted in fig.4.

[12] Eurostat indicator: nama_r_e3empl95-Employment (in persons) at NUTS level 3.

Fig. 4 – Structural and transition matrix of ERMIS regions. Data on employment (2001-2007). Size of spheres=total employment in 2007

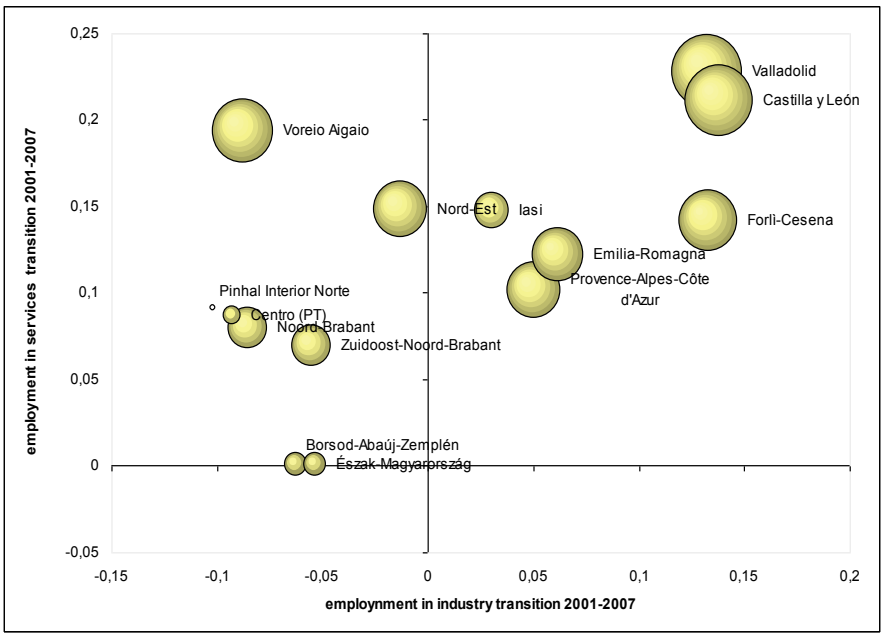


Source: elaboration on Eurostat

Further elaborations of this analysis may include a focus on the specific transition of the industrial and service sectors, to highlight the regional composition of labour[13].

[13] In fact composition in terms of industry and services may reveal the different patterns of industrialisation, de-industrialisation, quasi-manufacturing or intangible services.

Fig. 5 –Transition matrix of ERMIS regions. Data on service and industry employment (2001-2007). Size of spheres=total employment transition



Source: elaboration on Eurostat

Following the ERMIS methodology to build a regional profile we can proceed to assess the level of diversification, specialisation and maturity of each single region.

Table 2 illustrates sectoral specialisation on the basis of the Eurostat dataset on regional employment.

Table 3 illustrates ERMIS regional specialisation on the basis of partners' regional profiling and SWOT analysis.

Table 4 illustrates the positioning of ERMIS regions according to the maturity and diversity profiles.

Table 2 - ERMIS sectoral specialisation on the basis of Eurostat dataset on regional employment. Sectoral share on total regional employment (2007).

	Voreio Aigaio	***Castilla y León***	***Provence-Alpes-Côte d'Azur***	***Forlì-Cesena***	***Borsod-Abaúj-Zemplén***	***Noord-Brabant***	***Pinhal Interior Norte***	***Iasi***
agriculture	**15,56%**	**10,09%**	2,20%	4,84%	8,57%	3,23%	**23,45%**	**45,32%**
industry	14,54%	**29,38%**	16,59%	**33,85%**	**31,96%**	**26,20%**	33,28%	20,93%
manufacturing	6,76%	15,95%	9,48%	25,72%	25,45%	18,70%	18,45%	14,55%
construction	7,78%	13,43%	7,11%	8,18%	6,51%	7,49%	14,83%	6,38%
services	**69,13%**	60,53%	**81,20%**	61,32%	59,51%	**70,58%**	43,28%	33,75%
wholesale distributive trades	**33,04%**	24,04%	26,96%	25,62%	24,89%	24,58%	17,24%	14,03%
financiale services	5,36%	8,22%	15,26%	11,93%	7,11%	19,70%	3,45%	3,71%
Public Administration	30,87%	28,27%	38,98%	23,77%	27,51%	26,29%	22,76%	16,01%

Source: Eurostat

Table 3 - ERMIS regional specialisation on the basis of partners' regional profiling and SWOT analysis.

	Voreio Aigaio	Castilla y León	Provence-Alpes-Côte d'Azur	Forlì-Cesena	Borsod-Abaúj-Zemplén	Noord-Brabant	Pinhal Interior Norte	Iasi
	Agriculture, Forestry & Fishing Wholesale & Retail Trade Hotels & Restaurants	Agro-food Automotive ICT Energy Chemistry	Perfumes, fine chemistry, life sciences Micro-electronics and ICT Tourism Support services	Food fashion mechanics tourism support services	Construction Manufacturing ICT Mechatronics	High-tech systems & Materials Automotive Life tech Design Food	Wood, Paper and Forest Home Equipment and Materials Health Services and Products Moulds and Plastics Agro-Industries Energy Production ICT	Textile Industry Wood Industry

Table 4 – Maturity and diversification in ERMIS regions according to partners' profiling (Name of ERMIS main locality with indication of NUTS 3 region)

		Maturity and diversification
GREECE	Voreio Aigaio	North Aegean Region is a diversified area. Low degree of cooperation among the industry sectors active in the industry. Small firms, mostly focusing on the region's markets (which are small too).
SPAIN	Castilla y León	Castilla y León is a medium-high specialized area. The agro-food sector represents the 18% of the employment in Castilla-La Mancha and the 30% GDP of the region. It is its main industry. Other relevant industry in Castilla y León is ICTs. They have similar specialization and mature level.
FRANCE	French Riviera (Provence-Alpes-Côte d'Azur)	Medium maturity characterized by a balance between dynamic (Tourism, Support services) and relatively mature (perfumes, micro-elect.) clusters.
ITALY	Forlì-Cesena	A segmented and mature region with a core in mechanics and food industries, but not highly specialized.
HUNGARY	Miskolc (Borsod-Abaúj-Zemplén)	Specialisation level of Miskolc is high. Relatively low rate of high tech companies, slow evolution phases.
NETHERLANDS	Brainport Eindhoven (Noord-Brabant)	Brainport Eindhoven is a region with a low overall maturity characterized by a mix of immature sectors (high tech systems & materials, automotive and design), medium mature sectors (food) and high mature sectors (life tech).
PORTUGAL	Coimbra (Pinhal Interior Norte)	Regional production structure diversified with traditional areas of expertise evenly distributed throughout the territory. Serious structural weaknesses in terms of production structure: entrepreneurial tissue consisting of small institutions (70% are micro enterprises), low strength in technology and innovation, and lack of export capacity (only 12% of companies are exporting).
ROMANIA	Iasi (Nord est)	Nord –Est Region is a highly specialized area. 9.4% is the rate entry for the industry wide in the Nord-Est Region, - a low entry rate, and also nearly 20% failed companies (one year of existence), so it shows a high degree of maturity.

Source: ERMIS SWOTS

Table 5 illustrates the regional business concentration and is expressed as a share of the five largest activities (NACE divisions) in total non-financial business economy employment). Business concentration can be interpreted as a further measure of maturity.

Table 5 - Regional business concentration, by NUTS 2 regions, 2007[14]

	(%, share of the five largest activities (NACE divisions) in total non-financial business economy employment)		Class
GR41	Voreio Aigaio	74,6	5
ES41	Castilla y León	64,0	4
FR82	Provence-Alpes-Côte d'Azur	63,3	4
ITD5	Emilia-Romagna	49,0	1
HU31	Észak-Magyarország	43,6	1
NL41	Noord-Brabant	64,0	4
PT16	Centro (P)	55,4	3
RO21	Nord-Est	50,7	2

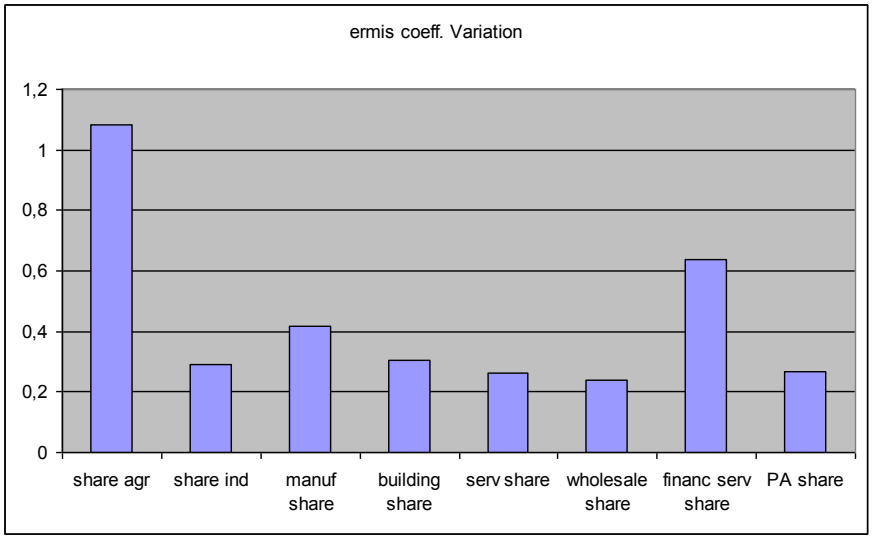
Source: Eurostat Regional Outlook 2010

A further piece of evidence on diversity across regions can be obtained from Eurostat data, (NUTS 2 level) on sectoral and innovation diversity among ERMIS regions. In figure 6 diversity is calculated through a coefficient of variation[15] applied to sectoral data regarding the regions. The largest diversity (i.e. the higher coefficient of variation) is related to the agricultural share of regional employment. In fact ERMIS regions encompass regions with a very low specialization in the agricultural sector (French Riviera, Emilia Romagna and Noord Brabant) and regions with a very high specialization in agriculture (Portugal's Centro, but most notably Romania's Nord-Est). The second sector with the highest diversity is financial services.

[14] Classes: 1 <= 50; 2 > 50 and <=55; 3 > 55 and <= 60; 4 > 60 and <= 65; 5 over 65

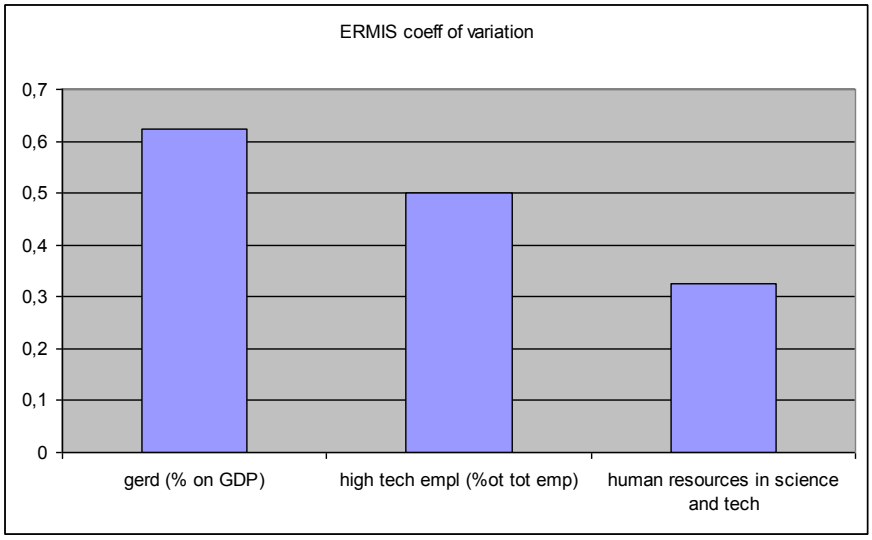
[15] A statistical measure of the dispersion of data points in a data series around the mean.

Figure 6 – diversity in the economic structure



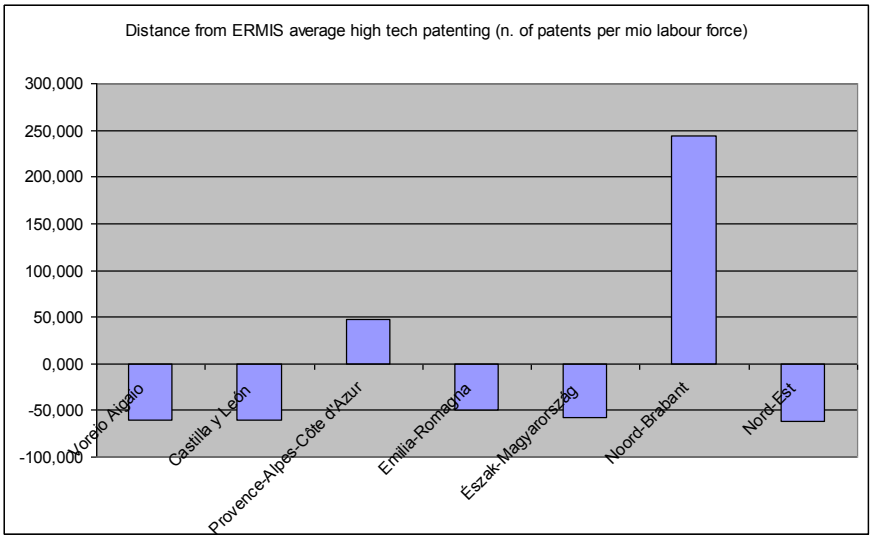
A second area of diversity is input in innovation policy, measured on the basis of total intramural R&D expenditure, employment in high technology sectors and human resources employed in science and technology. The highest diversity among ERMIS regions (again calculated with a coefficient of variation) is in gross domestic research expenditure (GERD) as a share of GDP: the highest share being in Noord Brabant and the lowest in Romania's Nord-Est.

Figure 7 – diversity in innovation input



Finally, an area of diversity is represented by innovation output as measured by high tech patents per million of labour force. Within ERMIS the average number of patents per million workers is 63; the only region high above the average is Noord Brabant.

Figure 8 - Diversity in innovation output



ERMIS regional SWOTS provide a detailed analysis of innovative performances of each single regional system. For the sake of homogeneity and cross regional purposes an analysis can be carried out by means of the Regional Innovation Scoreboard (RIS)[16]. Regions are ranked into groups from high to low innovation performance and for profiles and relative strengths for the different dimensions of innovation performance (only for regions with available data):

- Enablers (Tertiary education, Life-long learning, Public R&D, Broadband);
- Firm activities (Business R&D, Non-R&D expenditures, SMEs innovating in-house, Innovative SMEs cooperating with others, EPO patents); and
- Outputs (Technological innovators, Non-technological innovators, Resource efficiency innovators, Employment in medium-high & high-tech manufacturing, Employment in knowledge-intensive services, Sales of new-to market and new-to-firm products).

[16] See: http://www.proinno-europe.eu/page/regional-innovation-scoreboard

Table 6 - Regional Innovation performance of ERMIS regions according to Scoreboard by PRO-INNO EUROPE (2006)

	RIS	Enablers	Firm activity	Outputs
Voreio Aigaio	LOW	LOW	LOW	MED HIGH
Castilla y León	MEDIUM LOW	AVERAGE	MED LOW	MED LOW
Provence-Alpes-Côte d'Azur	AVERAGE	AVERAGE	MED HIGH	MED LOW
Emilia-Romagna	MED HIGH	MED LOW	HIGH	HIGH
Észak-Magyarország	LOW	MED LOW	LOW	LOW
Noord-Brabant	HIGH	MED HIGH		
Centro (P)	MED LOW	MED LOW	MED LOW	MED HIGH
Nord-Est	LOW	LOW	LOW	LOW

A final dimension of our dashboard is the centrality VS peripherality of each single region. Metrics for centrality/peripherality are complex and not much widespread. However, there are some reference indices that can be used to our purposes. One example is given by the European Peripherality Index (E.P.I.)[17], developed within the trans-European transport networks programme and aimed at the development of an interactive GIS-based software in order to identify those peripheral regions, whose geographical location is handicapped. The peripherality index with respect to population is shown in Figure 3. Regions in the Benelux countries, most of the regions in Germany and regions in northern France show accessibility above average, i.e. can be considered as the most central regions. We know from studies on innovation that accessibility is a good proxy for the spillovers effect that can be beneficial to the regional system.

As will be shown in part 2 of this document different accessibility is also associated with different patterns of policy selection.

[17] See: http://www.raumplanung.tu-dortmund.de/rwp/ersa2002/cd-rom/papers/224.pdf

Figure 9 - European Peripherality Index (E.P.I.)

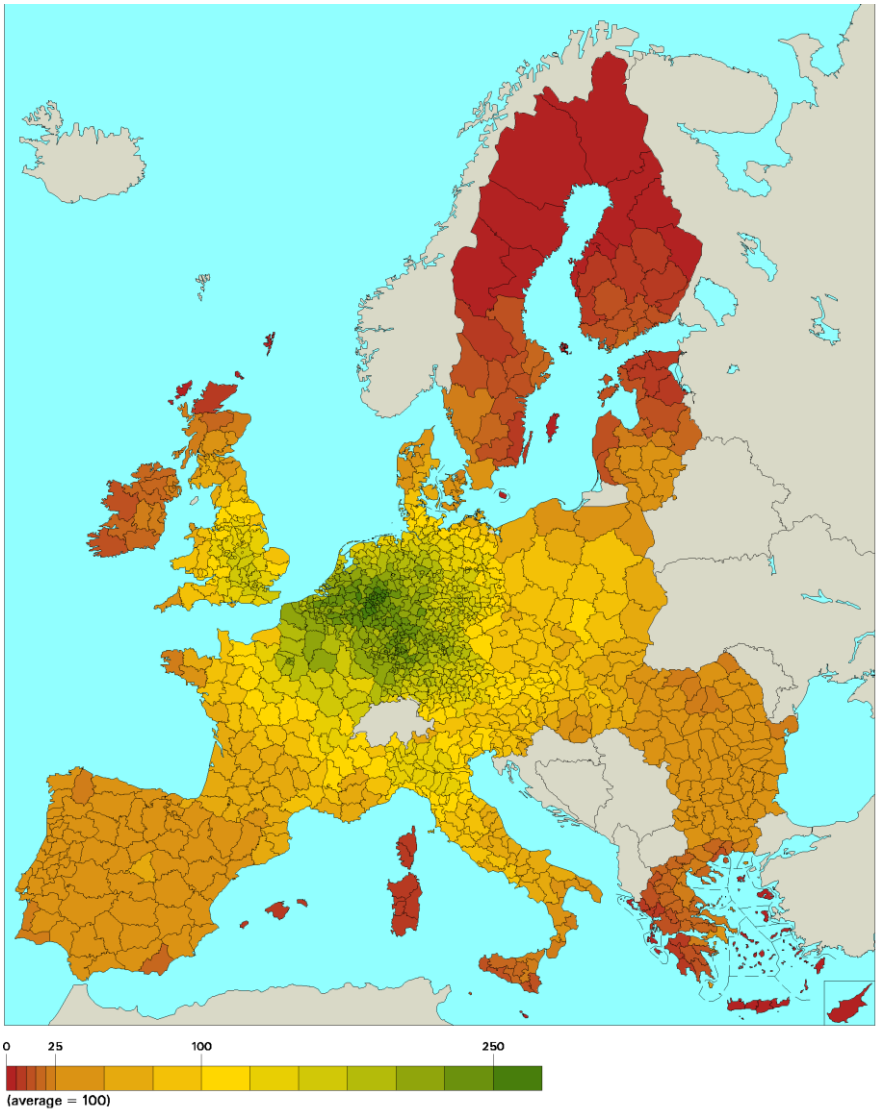


Table 7 – Centrality of ERMIS regions

Voreio Aigaio	LOW
Castilla y León	MEDIUM
Provence-Alpes-Côte d'Azur	MEDIUM HIGH
Emilia-Romagna	MED HIGH
Észak-Magyarország	MEDIUM
Noord-Brabant	HIGH
Centro (P)	MED LOW
Nord-Est	LOW

In terms of institutional governance we can distinguish between infrastructural and superstructural levels.

Table 8 – the governance mechanism

	Infrastructural level (the governance mechanism)	**Superstructural level (the innovation enablers)**
Voreio Aigaio	No decentralisation of innovation policies	research labs, research centers, incubators, tech transfers offices, technopoles, etc
Castilla y León	Significant control of innovation policy by region	
Provence-Alpes-Côte d'Azur	Some decentralisation of innovation powers to regions	
Emilia-Romagna	Significant control of innovation policy by region	
Észak-Magyarország	No decentralisation of innovation policies (but regional innovation strategies)	
Noord-Brabant	Some decentralisation of innovation powers to regions	
Centro (P)	No decentralisation of innovation policies (but regional innovation strategies)	
Nord-Est	No decentralisation of innovation policies	

Source: elaboration on OECD

We can finally proceed to sketch the structure of the ERMIS dashboard.

Table 9 – The variables for an ERMIS dashboard

Variables	Explanation
Structural composition	It positions the regions according to the sectoral distribution of its economy and employment
Structural evolution	It positions the region according to the evolution of the sectoral employment composition and relative weight
Maturity	It positions the region according to the stage of maturity of its clusters and industries
Diversity	It positions the region according to the diversification VS specialisation of its economy
Innovation performance	It positions the region according to R&D and STI inputs and outputs
Innovation governance	It positions the region according to the institutional and federal framework and detects innovation powers and resources of the regions
Centrality	It positions the regions according to accessibility, infrastructural endowment and centrality *vis à vis* spilling over effects

5. Towards policy formulation: the ERMIS best practice methodology

The regional profiling based on the two dimensions of diversity and maturity and the relative positioning of the regional system provide a robust base for moving on to consider four crucial aspects for the evolution of a regional innovation system:

The normative questions to build a BP approach

- How does a system tackle its weaknesses?
- How does a system seize opportunities?
- How does a system innovate by capitalising on its strengths and by introducing diversity not too distant from its knowledge bases?
- How does a system introduce innovation into regional mature firms or clusters?

These four are normative questions and indeed they provide the starting base to create a policy approach to regional innovation.

The answers to the four above questions should ideally represent the rationale for the selection of Best Practices.

According to the *Business Dictionary*[18] a best practice is "a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark".

The ERMIS BP definition

The ERMIS project stretches this definition to encompass also the notion of transferability and reproducibility (external to the originating region): a best practice is a method, tool or policy that is implemented to correct a regional weakness or to capitalise on a regional strength and that can represent a potential method, tool or policy also to complement a region's innovation assets. Thus, a "best practice" is a practice that brings value to a territory. The value could be : business increase or diversification, job creation or job repositioning, research and innovation enhancement, culture development, infrastructure improvement, network building, student
number increase…. To evidence the value created, the practice must have been successfully experimented and be related to at least one dimension of the SWOT analysis. Then, specificities and context dependence of the practice should be clearly stated in order to highlight the scope and the breadth of its application[19].

ERMIS Best Practices should represent valuable tools to tackle regional weaknesses and to capitalise on strengths as detected from the regional profiling. They also should possess an external (to the region) validity in terms of knowledge diffusion and reproducibility.

BP as regional added value

From the internal perspective (i.e.: BP bringing value added to the region), the selection process should take place, according to the relative regional innovation positioning.

The two guiding principles should be:

- BP must be designed to accompany regional and local diversification;
- BP must be in an implementation stage.

BP's can be then classified according to the kind of strategy they pursue vis à vis the results of the regional profiling and the positioning.

[18] http://www.businessdictionary.com/definition/best-practice.html
[19] See ERMIS Charter of best practices

The ERMIS partnership, for example, has classified Best practices according a series of goals that the regions are pursuing, as illustrated in table 8.

Table 10 - An ERMIS classification of BPs goals

tackling barriers and developing SMEs skills
internationalisation and mobilisation of SMEs
promoting networking and channelling information to SMEs
SMEs participation in decision making and programming
RDI infrastructure and cooperation serving SMEs
complex LED and support for the external investments

Source: ERMIS best practices catalogue

BPs as a knowledge diffusion model

From an external perspective (i.e.: the knowledge diffusion perspective), BPs should be interpreted as knowledge diffusion tools within an ERMIS based strategy.

Each single Best Practice to be transferrable should be described then taking into consideration:
the institutional and political context for building the BP;
the Key Success Factors for a proper implementation of the BP;
the details of the action plan, and who does what among stakeholders (this content should cover the various aspects of the mix of the offer: the content (Product), the way to communicate it (Promotion), the budget related to the offer (Price, or cost of BP to reach the objectives), the clients (Place: direct and end users)
the schedule of the forecasted action plan of BP

Within the ERMIS perspective, BPs offer the base to think of policies of "promotion of local capacities" to help places develop an innovation policy tailored to local needs.

In order to achieve these aims the two guiding principles for selecting BP according to their external dimension should be:

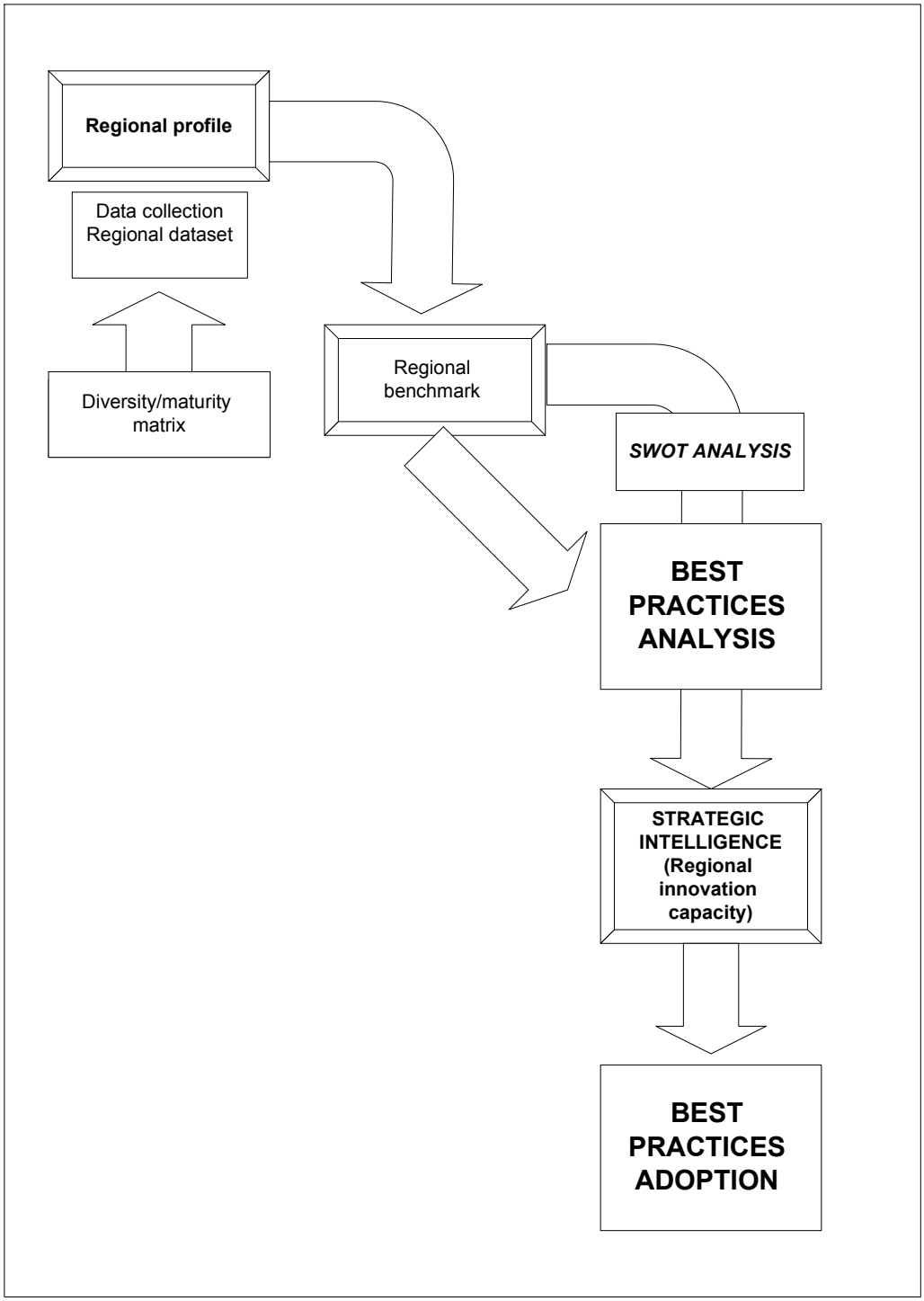
- BP must put together the interest of a transferor and a transferee;
- BP must be reproducible in a different region, adapting to regional specificities

The second principle of reproducibility cannot be known in advance. It can be only assessed during BPs actual implementation process in a cross regional perspective.

In the end, though, all the BP methodology is the value added part of the entire ERMIS reproducibility strategy.

BPs in the ERMIS context stresses the reproducible part of an innovation policy framework.

Figure 10 – The ERMIS Model with best practices analysis and reproduction



Box 9 – ERMIS Regional action plans

An important step for policy formulation is the definition of Regional Action Plans based on the SWOT analysis and on the best practices' transfer. Each region develops a plan by itself based on the best practices visited. What is meant by Action Plan in this context, is a description of the steps that a region would take when initiating the process of implementation of a selected best practice (or set of best practices, combined or not). This, in the light of the socio-economic situation the region is in at the moment. It will also describe the networks and contacts among regional actors to be developed towards implementation.

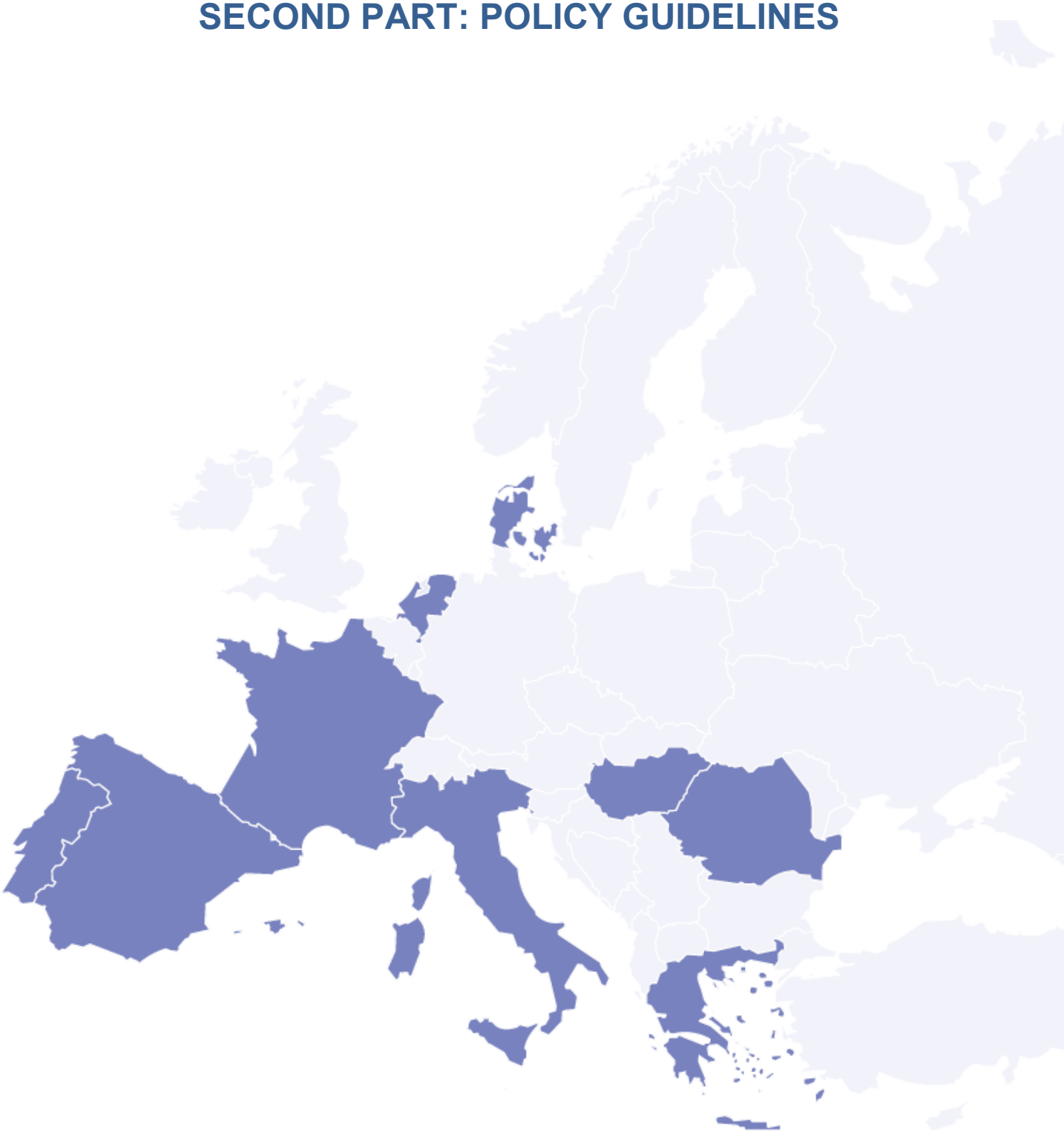
It is important to understand that this section describes a strategy/vision for the future. The ERMIS project does not require us to implement anything in the course of the project, however, the partners are required to think about the steps that they would have to go through when they wish to take up (entirely or part of) a BP they visited.

Questions that need to be addressed include the context (legal, economical, financial, cultural, others) in which the BP has been realised; how does it compare with that in the receiving region; the process that would need to be gone through. Who needs to be addressed and how would that be done.

The BP should be analysed with the actors that have been instrumental to its success. The question to be answered is whether or not these actors have a similar role in the receiving region, and, if not, can other actors take up this role, and, importantly, what could be the role of local/regional government/administration.

Thereby what we mean here for "action plan" is actually a description of the steps the region is going to take to implement a BP or several BPs in the next months and years, giving as much information as possible on the kind of networks and actions that have to be activated and taken to implement the BP in the region.

SECOND PART: POLICY GUIDELINES



6. The ERMIS tool box

Based on a recognition of the need of a diversified approach within regional innovation policy, the EMIS approach provides a tool that goes beyond mere statistical analysis, and builds a set of instruments that allow EU regional policy makers to assess the level of maturity and diversification of the their regional economic structure. It allows them to build innovation policies inspired by the region's uniqueness and other regions' best practices and to "frame" the innovation policy according to current EU societal and economic challenges.

From this perspective, ERMIS represents a useful tool box to lay the foundations of a Smart Specialization strategy whose efficacy can, in turn, only be reinforced by pursuing a Smart Specialization at regional or local level.
ERMIS, in fact, takes the EU Smart Specialization approach to a regional level, by introducing the notion that a local system of innovation (LIS) is indeed an ecosystem built on unique features and the functioning of which can be improved taking inspiration from other regions to assure a smart innovation strategy.

Box 10 - How does ERMIS relate to smart specialization?

Smart Specialization has been defined as a "policy rationale" and "concept for regional innovation" that sees "regional diversity as an asset since it advocates different routes to growth". Smart specialisation is "about placing greater emphasis on innovation and having an innovation-driven development strategy in place that focuses on each region's strengths and competitive advantages. It is about specialising in a smart way, i.e. based on evidence and strategic intelligence about a region's assets and the capability to learn what specialisations can be developed in relation to those of other regions"[20].
The contours of the economics of smart specialization have been shaped by asserting that "smart specialization is about R&D and innovation […], is a process addressing the missing or weak relations between R&D and innovation resources and activities on the one hand and the sectoral structure of the economy on the other"[21]. Three phases of smart specialization policy process can be identified: identification and reinforcement of entrepreneurial discovery; R&D specialization outcome assessment; coordination and complimentary investment.
Failures in implementing a smart policy approach have been recognized to lie in "want of strategic intelligence or political commitment or a lack of regional capacity or long-term political and budgetary commitment to implement such plans"[22].

[20] See "Regional policy for smart growth in Europe", May 2011: http://ec.europa.eu/regional_policy/information/pdf/brochures/rfec/2011_smart_growth_en.pdf)
[21] Foray D., David P. and Hall B.H, *Smart specialization. From academic idea to political instrument, the surprising career of a concept and the difficulties involved in its implementation*, MTEI working paper, November 2011.
[22] See "Regional policy for smart growth in Europe", May 2011.

Since central to the smart approach is the "strategic intelligence" about a region's assets and the building of a "political commitment", ERMIS is about building a methodology and a protocol for gathering strategic intelligence on a region's assets and feeding this "smart" knowledge into the region's innovation ecosystem for the selection of the appropriate and "smart" policy. The Ermis approach and methodology are complements to the smart specialization strategy (S3), launched by the EU as a key innovation strategy towards Europe 2020. The ERMIS approach is smart in that it stresses the idea that an innovation system, especially centered on SME's and SME's clusters, has a specific pattern of knowledge (regional and local knowledge bases) and presents features of diversity VS maturity of its economic base.

Ermis as a knowledge tool

ERMIS offers a readily available, knowledge based tool that enables policy makers to achieve three crucial tasks:

1) Strategic intelligence of the local system of innovation;
2) Selection of policies that correct the weaknesses of the system and capitalize on the strengths;
3) A regional level interpretation and implementation of an S3 strategy

As for the gathering of strategic intelligence of the local system, following the methodological steps illustrated in the first part of this document, the ERMIS project provides conclusive evidence of the existence of different intensities of innovation potential across EU regions, therefore the recommendation is to start with an analysis of the regional system.

As for policy selection, ERMIS leads to recommendations for the construction of place-based policies in tune with the idea that innovation works through a complex set of relationships and actions that can be defined as an "ecosystem". A way to proceed is to assure that no "blind spot" (i.e. activity that can increase the innovation capacity) in the ecosystem is left unchecked.

As for the construction of a regional S3 strategy, ERMIS conveys at least four policy guidelines to build a smart ecosystem.

The following table illustrates the correlation between tasks that the ERMIS tool can help to implement, the contribution of the activity to achieve a regional S3 policy and the main piece of evidence emerging from the ERMIS programme.

Table 11 – How ERMIS can contribute to an innovation strategy

Tasks	Contribution	Evidence from ERMIS

Strategic intelligence of the local system of innovation	How to build a sound knowledge of the system characteristics	"One size does not fit all" and need to tailor innovation policy to regional needs
Selection of policy practices	How to recognize the ecosystem's "blind spots" before proceeding to policy practice selection	Correspondence of regional characteristics with policy practice selection mechanism
Building a smart policy	Understanding of stakeholder's needs and appropriate communication	4 policy guidelines

The following sections provide evidence for each single contribution that the ERMIS tool box offers to innovation policy makers and sum up the key policy recommendations for each task.

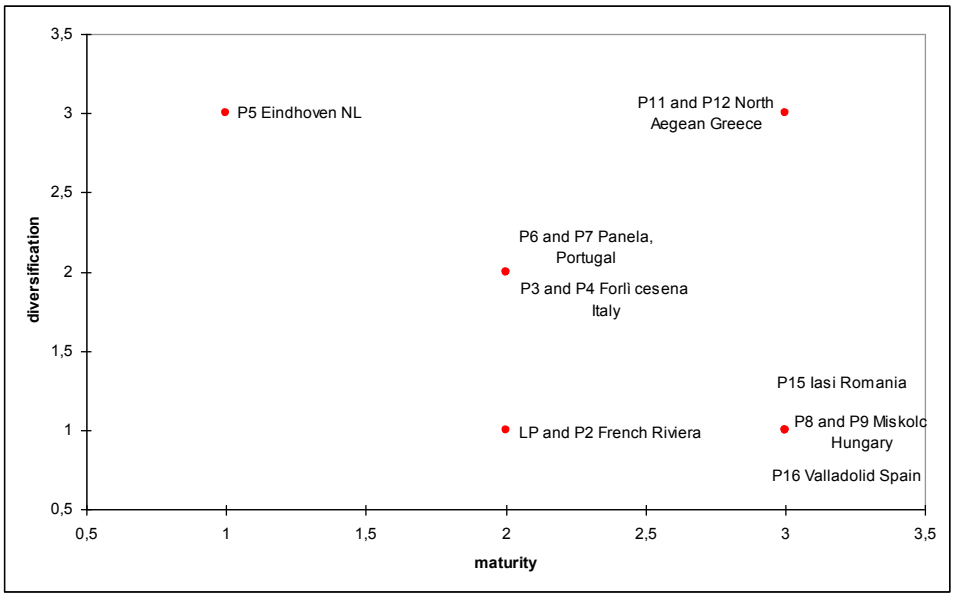
7. Strategic intelligence: "one size does not fit all"

Evidence of diversity in innovation capacity among EU regions is already in place[23]. ERMIS provides strong qualitative support to this evidence (see first part of this document).

Diversity in regional innovation

As described in the first part of this document, a key piece of evidence of diversity among regions comes from maturity and diversification indices of ERMIS regions as obtained from the SWOT analyses[24] (see figure 10). The most diverse and mature region is North Aegean. The cities of Iasi (Romania), Miskolc (Hungary) and Valladolid (Spain) present mature economic structures but very low levels of diversity. On the contrary, the economic base of Eindhoven (Netherlands) is rather diversified and with a low level of maturity.

Fig. 11 - Diversification and maturity in regional economic bases. Evidence from SWOT analyses.



Further evidence of diversity arises from the variance across innovation input and output among ERMIS regions (see first part of the document). This diversity in innovation capacity warrants diversified strategies in terms of innovation policy. This

[23] See, for example, *Territorial Dynamics in Europe. Regions and cities in the global economy*, ESPON territorial observation n. 6, May 2012.

[24] Information from SWOT analyses and Regional Action Plans was used to rank each region' s maturity and diversification in the economic base along the scale arising from ERMIS methodology – see "step by step guide" (and comprising low, medium and high values). To represent this ranking in a scatterplot, a numeric scale was attached to these values: low=1; medium=2; high=3.

conclusion has recently been confirmed by extensive analyses across all EU regions and is confirmed within the ERMIS programme.

Recommendations to Policy makers

Understand the innovation potential of your regional/local system by applying the ERMIS methodology and protocol to map diversity, maturity, weaknesses and strengths.

8. Selecting the most appropriate policy

Diversity in the economic structure and innovation potential of regions lead to a diversified set of policies.

The ERMIS project has shed a systematic light on the link between a regional diagnosis and the policy practice selection mechanism, since it allows to track the decision-making process of each single region in the light of the regional profile and SWOT matrix and the choice of external best practices to be implemented locally.

Following the ERMIS methodology, regional policy makers should in fact select those innovation practices which best fit with the analysis of regional weaknesses and strengths.

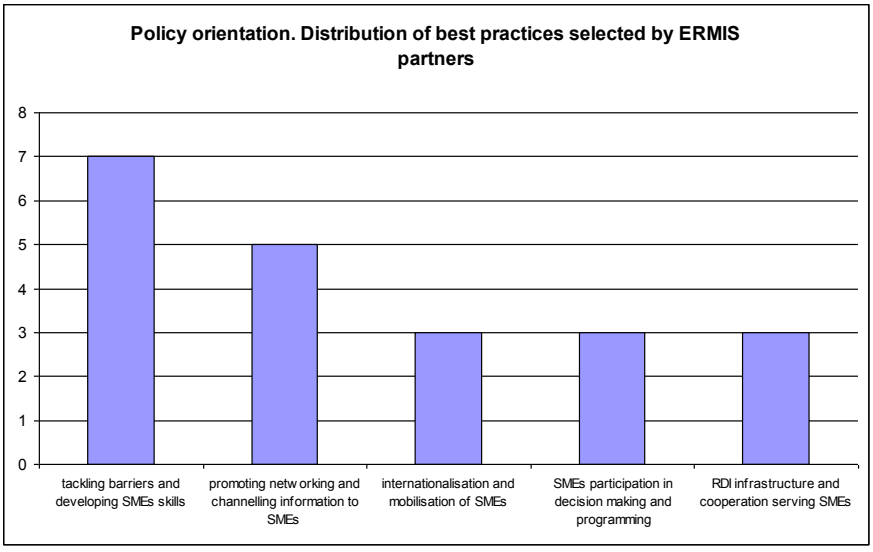
Best practice transfer contribution to policy selection

Accordingly, a look at the actual choice of innovation practices to be implemented regionally (following BP study visits and selection) provides a fair test of policy orientation in regional innovation policy.

The following figure illustrates the distribution of best practices selected for transfer by ERMIS partners according to the preferences expressed in Regional Action Plans and distributed according to the BP goal classification introduced in Table 9 (first part of this document).

The two categories of best practices that have received the highest number of preferences concern respectively the development of SME's skills and the promotion of networks and information channels for SME's.

Figure 12 – Policy orientation. Distribution of best practices selected by ERMIS partners



Interestingly, the preference for policy interventions in the field of SME's skills is stronger for peripheral regions (Greece's North Aegean and Portugal's Centro), whereas geographical centrality (as for Eindhoven, P5) is more associated with a preference for policies oriented to SME networks' consolidation.

Table 11 - Number of selected BPs according to goal classification and receiving region

	France	Hungary	Italy	Spain	Netherlands	Greece	Portugal	Romania	
BP classification	**LP and P2**	**P8 and P9**	**P3 and P4**	**P16**	**P5**	**P11 and P12**	**P6 and P7**	**P15**	**TOT**
Tackling barriers and developing SMEs skills	1		1			2	2	1	**7**
nternationalisation and mobilisation of SMEs	1	1			1				**3**
Promoting networking and channelling information to SMEs	1		1	1	1	1			**5**
SMEs participation in decision making and programming	1	1					1		**3**
RDI infrastructure and cooperation serving SMEs	1		2						**3**
Complex LED and support for the external investments	-	-	-	-	-	-	-	-	**-**

How does this policy practice selection mechanism work? A survey among ERMIS Innovation experts was launched to assess the nature of the linkage between the economic structure of ERMIS partner regions and the innovation policy decision-making process.

Potential barriers that could prevent the selected BP's from taking root point to general but idiosyncratic elements of national contexts (economic situation, legal structure, etc.). Distance from the region where the BP originated (in terms of economic structure) and lack of institutional coordination in the receiving region rank second. Surprisingly, the cost of implementation is often seen as the lesser problem.

Table 12 - Potential barriers in ERMIS regions preventing selected BPs from taking root

Barriers	**% on total answers**
Economic situation, legal structure, etc.	38%
Distance of industrial base	25%
Lack of inst. Coordination	25%
High cost of implementation	13%

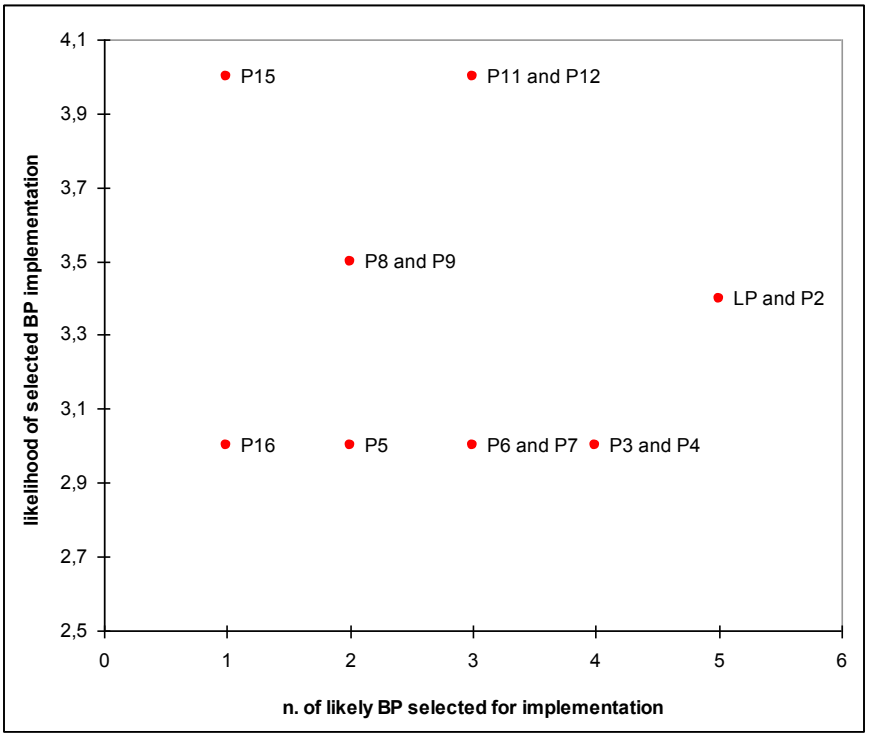
In terms of opportunities stemming from selected BPs implementation, the twin challenge is to upgrade the industrial knowledge base of the region and to have regional actors (especially universities and SMEs) "speak the same language".

Table 13 - Opportunities in ERMIS regions for selected BPs to take root

Opportunities	% on total answers
Upgrading	33%
Dialogue between university and sme's	33%
Awarness of institutions	22%
Knowledge transfer	11%

ERMIS innovation experts were asked to rate the potential that selected BPs take root in their region on a scale from 1 (very low) to 5 (very high). The overall average result among ERMIS partners is 3,4 pointing to a fairly high possibility to see ERMIS selected BP's take root. The distribution of potential is illustrated in the next figure. A higher likelihood of implementation occurs when the adopted BP fills a "blind spot" in the system (it is a complement to already existing activities, as the case of Eindhoven P5 rating the likelihood to implement the Danish practice "connect" very high) or when it serves to introduce a complete set of services (introducing innovation components that are not already in place which helps to "sell" the selected policy solution to regional authorities and policy makers. like the case of North Aegean region, P11 and 12).

Fig. 13 – likelihood of best practices implementation



Box 11 - A portfolio of innovation policies

ERMIS offers two additional tools for policy makers. **The Best practices catalogue** and the **Charter of best practices**.
The best practices catalogue illustrates all the innovation practices that were presented during the programme. The charter of good practices adds an analysis of how pre-selected best practices on the part of member partners have subsequently led to a definitive selection of an innovation practice and how the likelihood of implementation depends on regional characteristics and policy choice.

Recommendations to policy makers

A policy selection mechanism should encourage an approach based on the appraisal of regional SMEs' needs and should aim at an upgrading of the regional specialization. Policies should encourage and facilitate a strong dialogue between SMEs and universities. Peripherality and centrality in geographical accessibility terms may dictate diverging implementation strategies (increase of skills or increase of networks) A policy selection mechanism is more effective when it complements already existing activities or introduces entirely new components, in a "value chain" perspective, that are not present in the ecosystem (implying that the policy selection mechanism has to be based on a sound knowledge of the system).

9. Building a regional S3 strategy

Box 12 – What is a regional S3 strategy?

A regional S3 strategy arises from the ERMIS programme experience and combines the gathering of strategic intelligence to pursue a smart specialisation strategy (S3) within a region and the interdependencies among innovation actors and stakeholders within the local context that lead to the notion of innovation ecosystem.
A regional S3 strategy recognizes the diversity both in the region's economic base and the capacity of each region, whether core or peripheral, to innovate and leads to a policy formulation process that, based also on the absorption of external good practices (the reproducibility mechanism). It takes into account the unique diversity and the interdependencies within the system.

ERMIS offers 4 policy guidelines for policy makers to build a place-based smart ecosystem strategy.

1) Check for the blind spots in the regional innovation ecosystem

This policy guideline brings home two key conclusions of the ERMIS programme:
innovation is linked to the diversity and maturity of the local system and occurs within an existing ecosystem of relationships and actions;
there may be weaknesses or "blind spots" in the system, such as, for the example, the lack of policies tailored to guarantee the connection of high level executive expertise at local level and the demand for innovative solutions on the part of SMEs and start-ups (the reason behind some ERMIS regions adopting the Danish best practice named "Connect"[25]); or the lack of a comprehensive system of dialogue between academic expertise and SMEs (the reason behind some ERMIS regions adopting the Eindhoven's practice named "United brains"[26]).

This guideline prompts regional policy makers, both in core and peripheral regions, to measure the system's innovative potential, build explorative actions and conduct cross-regional benchmarking.

[25] See the ERMIS best practices catalogue and the ERMIS charter of good practices.
[26] [26] See the ERMIS best practices catalogue and the ERMIS charter of good practices.

Box 13 – How to check for blind spots

The evidence from ERMIS reveals that intelligence for a S3 strategy is built upon a sound knowledge of the strengths and weaknesses of the system but does not rely solely on a mere statistical analysis. Intelligence has to be shared and agreed upon to become the basis of a strategy. There are two key actors in this process: one that presides over the production of relevant knowledge and often is a University in the region; one that presides over the dissemination and sharing of the knowledge, and can be a regional agency or other institution with a strong mandate in terms of innovation policy. But of course this process of intelligence building is more than a linear process of data sharing. The efficacy seems to rely upon the degree of maturity that the regional debate has reached over innovation prospects. Here maturity does not necessarily correspond to the maturity of the economic base since there can be diversified regions in terms of industry and services with a very mature perception of their potential; it has more to do with the existence of a recognized agenda for regional development.

ERMIS has shown that regions with an established agenda are more endowed with instruments to check for blind spots.

One example is the city of Eindhoven with its well established Brainport Foundation and Brainport Development organisation. The region is already well versed when it comes to stimulating and facilitating innovation and growth in the high tech business sector. The triple helix approach, combining the strengths and specific qualities of private, public and knowledge sectors to achieve a jointly developed innovation and growth agenda are tried and tested and work well. However, selecting the best practice CONNECT, Eindhoven-Brainport feels it could fill several existing weaknesses in the system: the lack of dedicated support to high tech SME's in the region as well as the built up of a strong informal network of business and knowledge representatives across the region.

A second example comes from the French Riviera region where the traditional strategy of inward investment based on high-tech is increasingly accompanied by actions aimed at fostering the capacity of local SME's to access knowledge and improve their innovation potential. The regions is endowed with an internationally renowned academic system, based in Sophia Antipolis and with a rich portfolio of policies to assist regional firms in their innovation pursuit. French Riviera through the ERMIS process has recognized a few blind spots that can be tackled by adopting observed best practices. For example in March 2012, the Community of Municipalities of Sophia Antipolis (CASA) launched its action plan to create a support structure such as the IPN incubator in the heart of Sophia Antipolis. Similarly, based on the best practice of the Sustainable Energy Action Plan of Cesena the region has recognized the need to measure the effectiveness of its actions on energy policy and is building a strategy to develop a departmental energy. Further actions will be based upon the experiences of the mechatronic Club of Reggio Emilia and United Brains of Eindhoven.

ERMIS confirms that the building of an agenda for innovation has to be very well in tune with the regional potential (a pillar of S3 strategy).

Recognition of blind spots id indeed a collective action problem. THE ERMIS methodology offers the tool to build a sound knowledge of the system but it is up to the governance mechanism in the region to adopt the steps to embed the knowledge in the decision-making process.

2) Adapt to the local demand for innovation

Another way to frame this could be "Make it relevant for your regional stakeholders". Often the selected Best practice "ignites the spark" for an emulative effect, following a policy line that was already present ("we were doing something similar, but I like

the way they sell the tool")[27]. What ignites this spark can be the need to anticipate a demand of the business community, the need to strengthen or to build anew a regional dialogue among innovation stakeholders, or to create a portfolio of innovation options to be submitted to regional authorities.

Demand-driven innovation implies the capacity to articulate the needs of the local system and search for a solution in terms of public procurement (even on pre-commercial terms), cluster policy or lead-users schemes[28].

The point is that the regional government can be the intelligent lead customer, provided it has clear objectives; engages with the industry; has supportive culture and management; the end-user is involved.

The recommendations here are that the starting point should be the results, not the process; there should be involvement of relevant stakeholders and a controlled experimentation in all policy areas (learning curve) along a strategy of communication and dissemination[29].

Box 14 –The societal challenges of innovation and the concept of "living lab"

One way to formulate an innovation strategy that pays attention to the demand side is by rising to the challenges at social level within the region. A good example of innovation in tune with society's problems is the application of general purpose technology to health care and disease prevention, especially for the elderly population.

As an example. the "Brainport 2020 agenda", in Eindhoven region, recognises life sciences and homecare as key innovation challenges and the whole Brainport Region is considered to be a "Living Lab", ("Smarter Living") that is a system with a strong focus to introduce technologies in the daily lives of the citizens, to enable citizens to help organize themselves.

Within the ERMIS project we saw how regions are interested to adapt the concept of "living lab" to different contexts and innovation challenges: in Portugal's Central Region, where one of the main products is cheese, a project has been launched to use ICT to "monitor" sheep herds to counter the phenomenon of ageing and disappearance of shepherds; in the Greek North Aegean islands, the concept of "living lab" is being tested on innovative solutions that could enable local women entrepreneur's cooperatives to sell their products world-wide.

One recommendation that has come out from the ERMIS workshop dedicated to demand-side innovation is to make sure your financial programs don't only accept successful projects, but also allow room for failures (this kind of financial program won't only finance projects that are successful but also projects that are not 100% successful, where mistakes may happen). It's impossible to do everything the right way the first time. During the implementation stage of the technology in a living lab, readjustment is possible.

[27] From survey with ERMIS innovation experts.

[28] Elements traditionally recognized within the realm of a demand-driven strategy that were discussed at the ERMIS Eindhoven workshop on April 4th 2012.

[29] All issues emerged during the Eindhoven seminar.

Finally, there's a strong overlap between the areas of health, energy and mobility and the centrality of the individual in policy making is reshaping the way of organization of the work/role of the government.

2) Scan, plug and play

The ERMIS programme showed that the possibility of best practices to take root is very high when the selected BP is ready to be "plugged and played"[30]. In the "plug and play" guideline, policy makers, after a diagnosis of the innovation ecosystem, scan the availability of practices in other UE regions to fill that particular need such as, for example, the practice of "mechatronic club" in Emilia Romagna31 (adopted by the Chamber of Commerce in Nice). A further example could be the need to set up a system where university provides quick answers to SME's needs (like in the Eindhoven's practice of "United Brains"[32]) and the presence of such schemes in other EU regions could enable a "franchise-like" transfer of that practice.

This guideline should help regional policy makers to elicit a systematic scan of good practices and a systematic confrontation with the ecosystem actors on what is needed in terms of innovation policy.

3) Learn and adapt

The potential of a quick transfer of a best practice diminishes when the selection process enters the feasibility study stage[33]. What seems to determine this difference of implementation potential is the "readiness" of the region to adopt a particular innovation tool (based on the actual demand for that kind of innovation tool). In this situation there is a need to learn better how the practice is structured and implemented in other regions following which it can be adapted to the regional ecosystem needs. An example could be the building of a monitoring system for energy efficiency policy at municipal level (like for the example the practice of Cesena with a Sustainable Energy Action Plan[34]) that must be adapted to the energy consumption patterns of the local system. Another one is the application of a monitoring service on European consortia to build EU projects, that is currently an ongoing project in Castilla Y Leon, Spain, and that has raised the interest of many regions among ERMIS: if such service does not exist, it needs strong coordination among regional agencies and this in turn implies that regional actors should learn how to operate this scheme and adapt it to their context.

[30] See analysis in the ERMIS charter of good practices.
[31] See the ERMIS charter of good practices.
[32] See the ERMIS charter of good practices.
[33] Evidence from survey with ERMIS innovation experts.
[34] See the ERMIS charter of good practices.

This guideline could help policy makers to elicit the creation of an innovation "task force" among local experts to solve a specific local innovation problem.

Box 15 – Innovation policy at times of crisis: the role of leadership

A case in point to understand the paradigm shift in innovation perspectives over the last 20 years is best offered by the evolution of the technology park of Sophia Antipolis, France. The inward investment strategy that helped launch the park in the seventies and the capacity to attract world leading firms in ICT and biotech in the 80's and 90's is nowadays confronted with the need to rethink an innovation strategy more based on rising to the challenges of regional SME's and the region's society. The original Sophia Antipolis model was steered to success with a strong leadership and commitment of some key political figures in the region.

What kind of leadership is needed to shape the new smart ecosystems of the next decades?

At times of dire straits for European countries and regions, efficiency in provision of public services and collective goods is a key challenge for every level of government. Innovation is not immune from this major rethinking of costs and results.

ERMIS offers the perception that it will be essential to streamline innovative solutions that actually represent a solution to societal or economic problems of the region. From this perspective, if the solution is viable and effective, money concerns are lower[35].

Within ERMIS, a strong convergence emerged to recognise the regional and city authority as a key actors for innovation policy36. However judgment differentiates on the recognition of key institutions for laying down regional innovation frameworks and key institutions to guarantee success of policy implementation. Business association (that here comprise also the few answers that have indicated chamber of commerce), universities and firms are considered key actors for policy implementation. Universities are very important actors, but not always their role of key knowledge institutions is fully exploited (a concern voiced by some peripheral regions within EMIS), which raises the point that triple helix mechanisms should be particularly encouraged in peripheral regions (despite the fact that they are already a consolidated reality in EU core regions).

A policy selection mechanism should occur within a framework where the regional authority (and city authority) have already laid out the strategic orientation of innovation policy (i.e. innovation strategic plan, innovation agenda, etc.). The example of Brainport Agenda 2020, laying out the strategy and aims for innovation in the Eindhoven region is a good example of strong institutional convergence and collective leadership.

[35] View emerged during ERMIS survey with regional innovation experts.
[36] ERMIS survey with regional innovation experts.