Regional Innovation Patterns and the EU Regional Policy Reform:
Towards Smart Innovation Policies

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Aim of the paper

- To present an alternative and more appropriate taxonomy of innovative regions on which innovation policy strategies can rely;

- to present the rationale for a regionalised conception, design and delivery of innovation policies.

The suggestions come from our KIT ESPON project developed over the last 3 years.

The importance of a territorial approach (1)

The reasons for the importance of a **territorial approach** to innovation policies are the following (Camagni and Capello, 2012):

A) informal sources of knowledge are linked to creativity, culture, taste, that grow in local communities;

B) there are also regions developing product innovations in their specialization fields, either using off-the-shelf general purpose technologies developed elsewhere, or acquiring some crucial knowledge from outside;

C) the capacity of an economic system to get advantage from knowledge created elsewhere is dependent on its culture, creativity and openness to external stimuli; in a word, on its 'cognitive and social capital';

The importance of a territorial approach (2)

D) economic growth is not necessarily dependent on cognitive or technological catching-up. Forms of knowledge spillover generated from large multinational plants into the local fabric of SMEs can also determine technological advances;

E) the ability to organize financial capital, general information, consolidated technologies and codified knowledge into continuously innovative production processes and products is by no means pervasive and generalised, but instead exists selectively only in some places where tacit knowledge is continuously created, exchanged and utilized, and business ideas find their way to real markets (Camagni and Capello, 2009).

But …

The translation of a sectoral policy (as innovation policy traditionally is) into a regional setting is not easy.

It calls for a truly place-based approach, considering specificities of the single regions and of their specific innovation processes and modes.

The breakthrough suggestion emerged from the convergence of the Barca Report to DGRegio (2009) and the Report of the *Knowledge for Growth* expert group, working for DG Industry (Foray et al., 2009).

Regional innovation taxonomies and S3

Phase 1 in S3 (->2010): dichotomous territories (core-periphery);
Phase 2 in S3 (2011->): each region has to find its strategy.

In fact, specificities of single regions are fundamental for the implementation of projects.

However

the implementation of strategies calls for the identification of **common approaches for similar types of regions** in order to prevent misallocation of public resources and unlikely local strategies.

A **territorial taxonomy** is necessary for the development of a regional innovation strategy.

Limits of existing taxonomies

Existing regional innovation taxonomies are inadequate to grasp the specificities of each mode of innovation.

OECD taxonomy (OECD, 2010 and 2011) identifies 'knowledge regions, industrial production zones, non-S&T driven regions'.

Verspagen (2010) develops a 'spatial hierarchy' of innovative regions in Europe according to both regional innovative (i.e. patenting), regional economic performance and regional sectoral specialization.

Both are exclusively based on the regional intensities of formal knowledge production.

Limits of existing taxonomies

Hollanders et al. (2009) propose taxonomies of European regions on *Regional Innovation Scoreboard* data.

Advantage:
They depart from the knowledge-innovation equivalence typical of the previous taxonomies, using knowledge indicators such as R&D or patent intensity as proxies for innovation outputs.

Limits:
They merge together different indicators.
They give no role to external knowledge.

Limits of existing taxonomies

Wintjes and Hollanders (Regional impact of technological change, 2010) partition the European space on the basis of different indicators on:

- knowledge inputs and outputs;
- territorially enabling elements;
- economic performance indicators.

No theoretical expectations on the linkages among the different variables and the final grouping of regions, other than that of linking knowledge to innovation and economic growth through some "enabling factors".

Summing up…

Existing taxonomies merge together indicators as diverse as innovation performance, knowledge inputs like R&D, sectoral structure, presence of spatial innovation enablers,

- with no a priori on the conceptual links among the variables used,
- with no clear differentiation among the local pre-conditions necessary in each phase of the innovation process;
- with no attention to knowledge external to the regions;
- with no **deep and rich territorial roots**.

Basic requirements for a regional innovation taxonomy useful to S3

• A conceptually-driven taxonomy is required to be consistent with a specific view on how knowledge and innovation take place and mix at the local level, and

• A taxonomy able to emphasize the context (pre-)conditions supporting local innovation processes.

Importance of a regional taxonomy

A taxonomy does not deny the importance of a place-based approach for the identification of projects and local productive vocations,

but

the **general strategy** should be consistent with wider rationals that only an approrpiate taxonomy can point out.
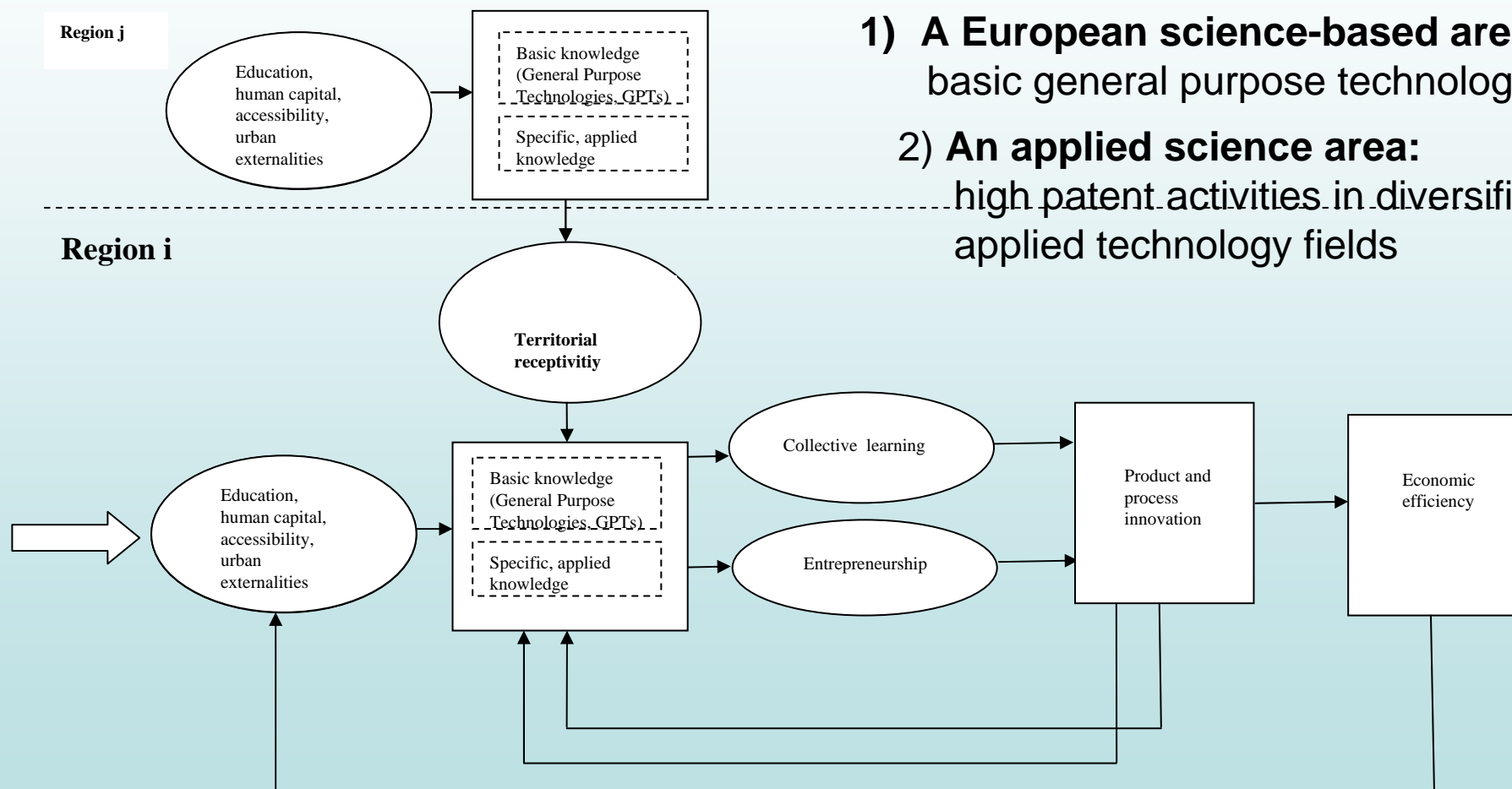
Territorial patterns of innovation

A territorial pattern of innovation represents:

- different **modes** of performing the **different phases of the innovation process**,
- built on the **presence/absence** of the **context conditions** that support knowledge creation, knowledge attraction and innovation.

Innovative region taxonomy and a territorial approach (1)

Phases	Territorial preconditions for knowledge creation	Knowledge output	Territorial preconditions for innovation	Innovation	Economic efficiency

Region j

Education, human capital, accessibility, urban externalities

Basic knowledge (General Purpose Technologies, GPTs)

Specific, applied knowledge

Region i

Territorial receptivitiy

Education, human capital, accessibility, urban externalities

Basic knowledge (General Purpose Technologies, GPTs)

Specific, applied knowledge

Collective learning

Entrepreneurship
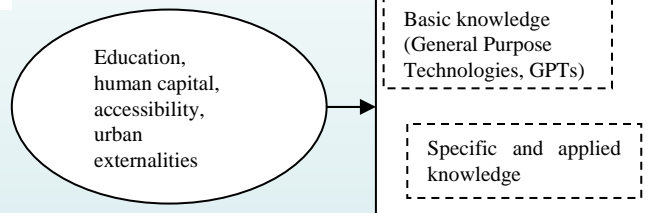
Product and process innovation

Economic efficiency

1) **A European science-based area**: basic general purpose technologies

2) **An applied science area:** high patent activities in diversified applied technology fields

Innovative region taxonomy and a territorial approach (2)

Phases	Territorial preconditions for knowledge creation	Knowledge output	Territorial preconditions for innovation	Innovation	Economic efficiency

Region j

Education, human capital, accessibility, urban externalities

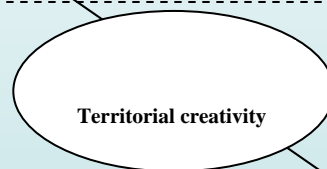Basic knowledge (General Purpose Technologies, GPTs)
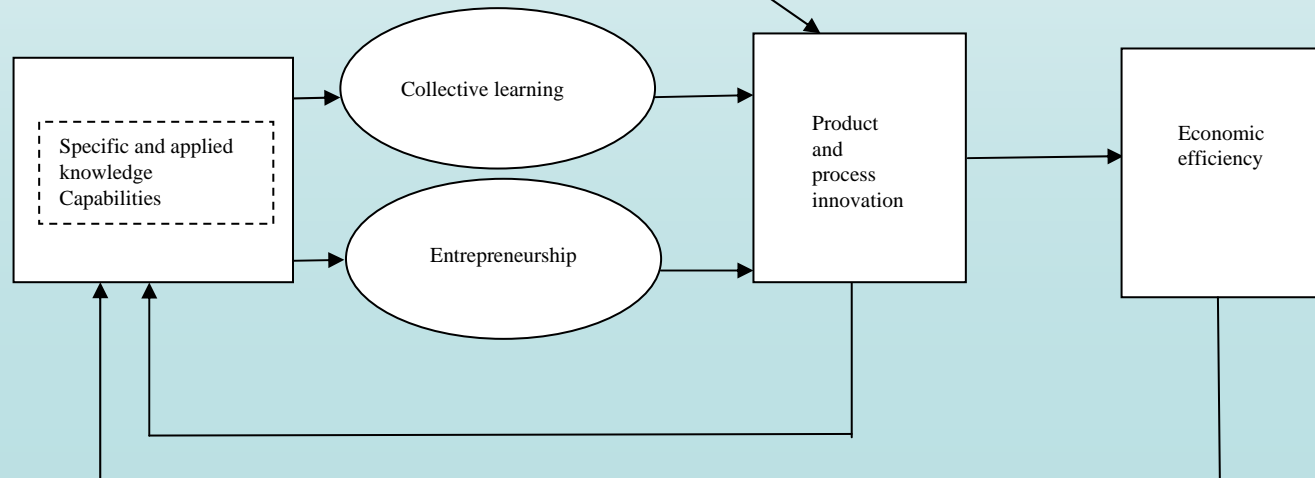
Specific and applied knowledge

3) A **smart technological application area**
External specific technologies enhancing the upgrading of local innovation

4) **Smart and creative diversification area**
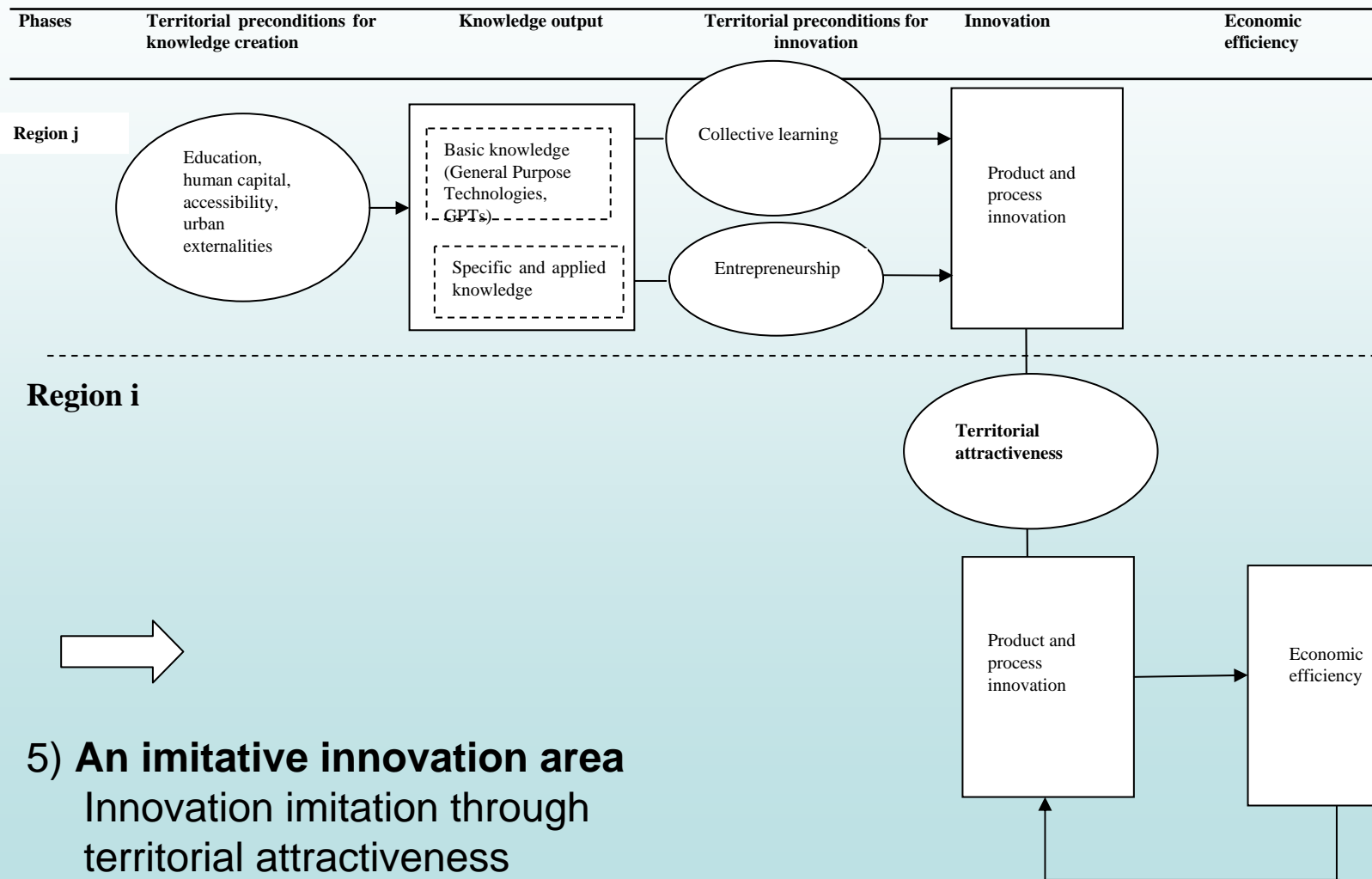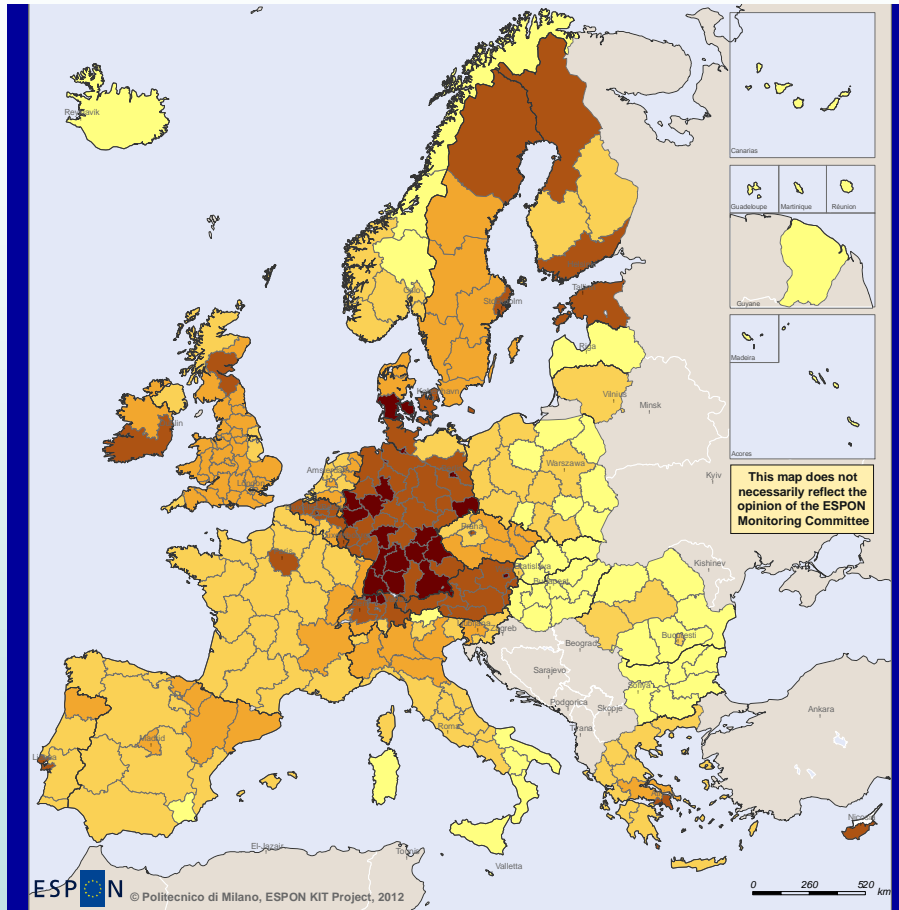External tacit knowledge enhacing local innovation

Territorial creativity

Region i

Specific and applied knowledge Capabilities

Collective learning

Entrepreneurship

Product and process innovation

Economic efficiency

Innovative region taxonomy and a territorial approach (3)

Phases	Territorial preconditions for knowledge creation	Knowledge output	Territorial preconditions for innovation	Innovation	Economic efficiency

Region j

Education, human capital, accessibility, urban externalities

Basic knowledge (General Purpose Technologies, GPTs)

Specific and applied knowledge

Collective learning

Entrepreneurship

Product and process innovation

Region i

Territorial attractiveness

Product and process innovation

Economic efficiency

5) **An imitative innovation area**
Innovation imitation through territorial attractiveness

Territorial patterns of innovation in Europe

Pattern 1 = A European science-based area

Pattern 2 = An applied science area

Pattern 3 = A smart technological application area

Pattern 4 = A smart and creative diversification area

Pattern 5 = An imitative innovation area

Legend
- No data
- Imitative innovation area
- Smart and creative diversification area
- Smart technological application area
- Applied science area
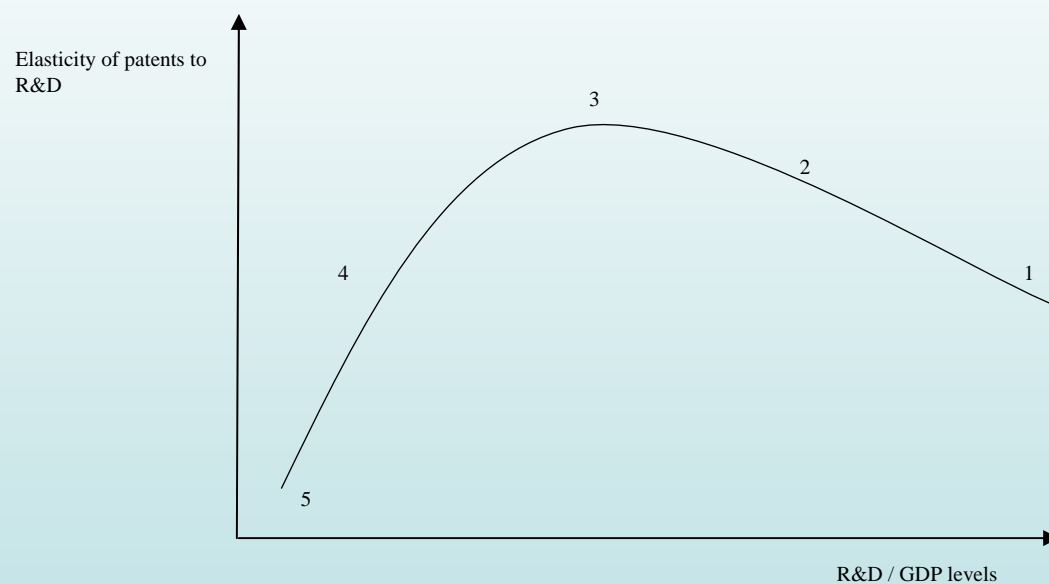- European science-based area

Economic efficiency of the different territorial patterns
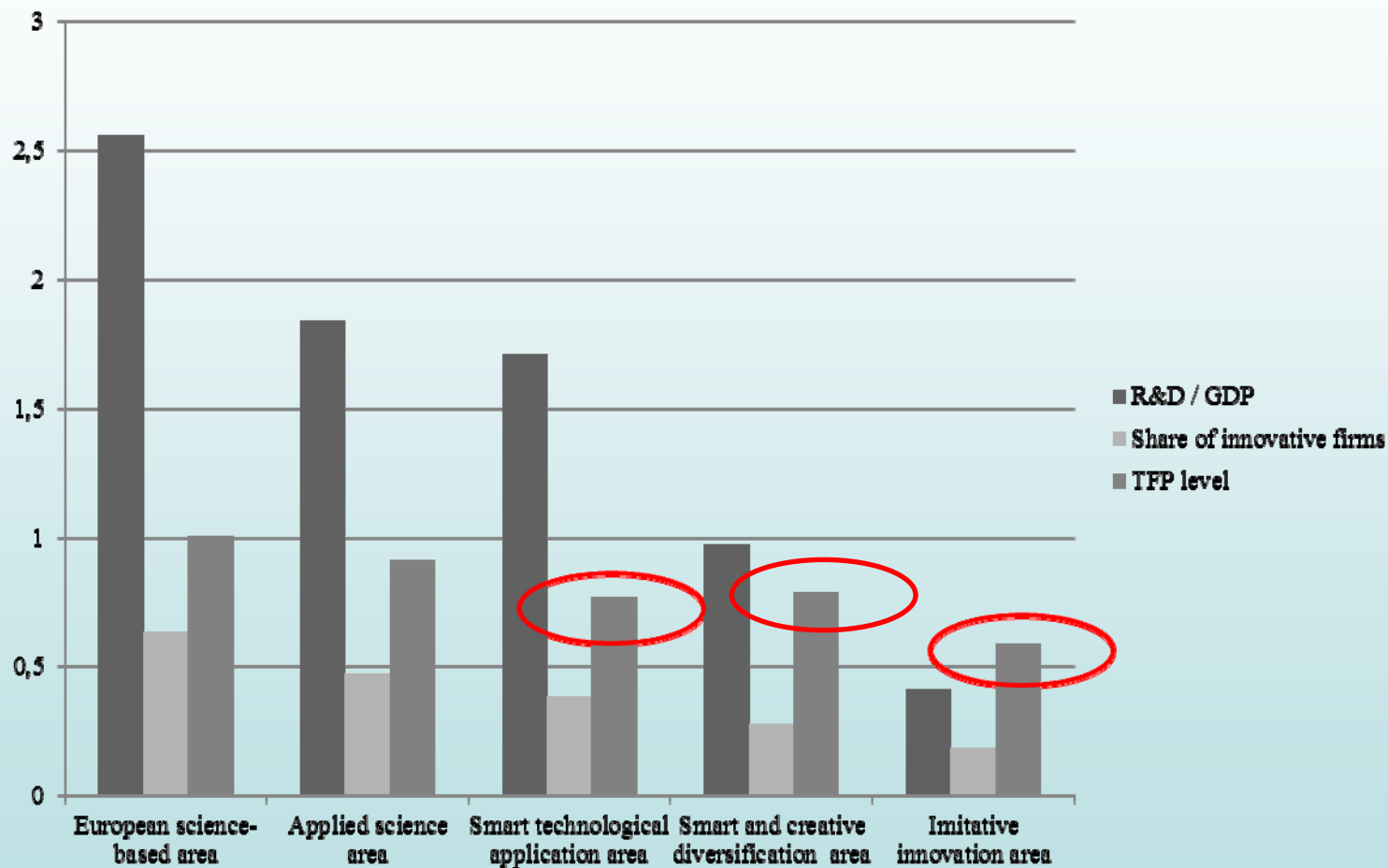
Impact of R&D inputs on knowledge creation

Elasticity of knowledge to R&D by patterns of innovation

Legend:
1 = European science-based area; 2 = Applied science area; 3 = Smart technological application area;
4 = Smart and creative diversification area; 5 = Imitative innovation area

Impact of knowledge on GDP growth

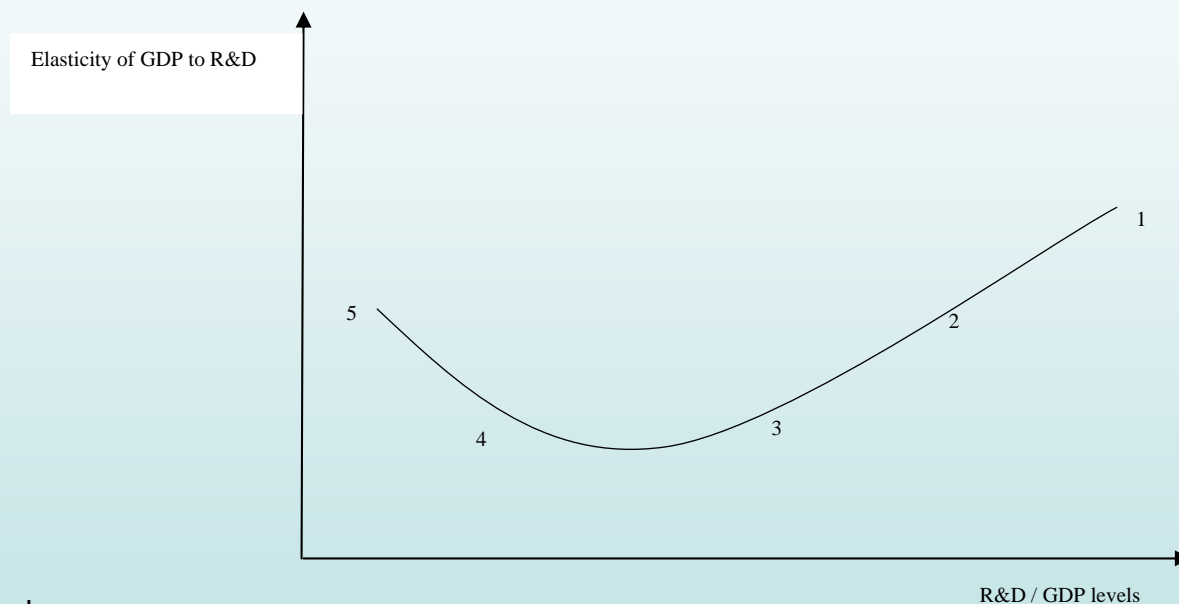Elasticity of GDP to R&D for different levels of R&D / GDP intensity

Legend:
1 = European science-based area; 2 = Applied science area; 3 = Smart technological application area;
4 = Smart and creative diversification area; 5 = Imitative innovation area

Smart innovation policies

''Smart innovation' policies may be defined as:

    those policies able to increase the innovation capability of an area by boosting **effectiveness of accumulated knowledge** and **fostering territorial applications and diversification**, on the basis of local specificities and the characteristics of already established innovation patterns in each region.

Policy aspects	Territorial patterns of innovation				
	European science-based area (Pattern 1)	Applied science area (Pattern 2)	Smart technological application area (Pattern 3)	Smart and creative diversification area (Pattern 4)	Imitative innovation area (Pattern 5)
Policy goals	Maximum return to R&D investments		Maximum return to applications and co-operation in applications		Maximum return to imitation
Policy actions for local knowledge generation (Embeddedness)	Support to R&D in:		Support to creative application, shifting capacity from old to new uses, improving productivity in existing uses, through:		Fast diffusion of existing innovation

Enhancing receptivity of existing innovation |
| | New basic fields

General Purpose Technologies | Specialized technological fields

Variety in applications | Incentives to technological development and upgrading

Variety creation | Identification of international best practices

Support to search in product/market diversification

Support to entrepreneurial creativity | Support to local firms for complementary projects with MNCs

Support to local firms for specialized subcontracting |

Policy aspects	Territorial patterns of innovation				
	European science-based area (Pattern 1)	Applied science area (Pattern 2)	Smart technological application area (Pattern 3)	Smart and creative diversification area (Pattern 4)	Imitative innovation area (Pattern 5)
Policy actions for exploitation of knowledge spillovers (Connectedness)	Incentives to inventors attraction and mobility Support of research cooperation in:		Incentives for creative applications through:		Incentives for MNCs attraction
	GPT and trans-territorial projects (ERA)	specific technologies and trans-territorial projects (ERA), in related sectors/domains Encouraging of labour mobility among related sectors/domains	Co-operative research activities among related sectors Co-operative search for new technological solutions	Participation of local actors to specialized international fairs Attraction of "star" researchers even for short periods Work experience in best practice Knowledge creation firms of the same domains	Bargaining on innovative 'local content' procurement by MNCs

Change in policy styles (1)

- **Transparency**, which means clear **justification** of the spatial allocation of funds in the different measures, from spatial concentration in some cases (reaching a critical mass in R&D, particularly in Innovation Patterns 1 and 2) to spatial pervasiveness in others (tapping local creativity, diversification and adoption capabilities: Patterns 3 to 5);

- **Control on local strategies**, in order to avoid rent seeking attitudes by local élites (in politics, in the economy, but also in the high education and research fields). This means favouring active co-operation among main local actors: universities, research centres and firms.

Change in policy styles (2)

- Peer **ex-ante assessment** of main R&D and innovation projects presented to public support;

- **Knowledge transfer, knowledge diffusion through inter-sectoral and inter-regional co-operation** and general knowledge dissemination should be favoured, in order to boost productivity of the publicly supported R&D;

- **Favour continuity over time in public support decisions** – a crucial precondition for local learning processes – at the condition of fair and effective intermediate and ex-post assessment of outcomes;

Change in policy styles (3)

- Build a **formalized, but flexible, organizational model for supporting the identification of regional specializations**, **in R&D and production,** and for strengthening the search process of new thematic application fields and diversification areas, inside and outside the present technological and production domains: a local, participatory model that could be labelled as 'strategic industrial planning';

- Favour **creativity and entrepreneurial spirit** in all regional conditions.

- Favour the strengthening of **local spillovers from large firms and MNCs** present in the different regional contexts.
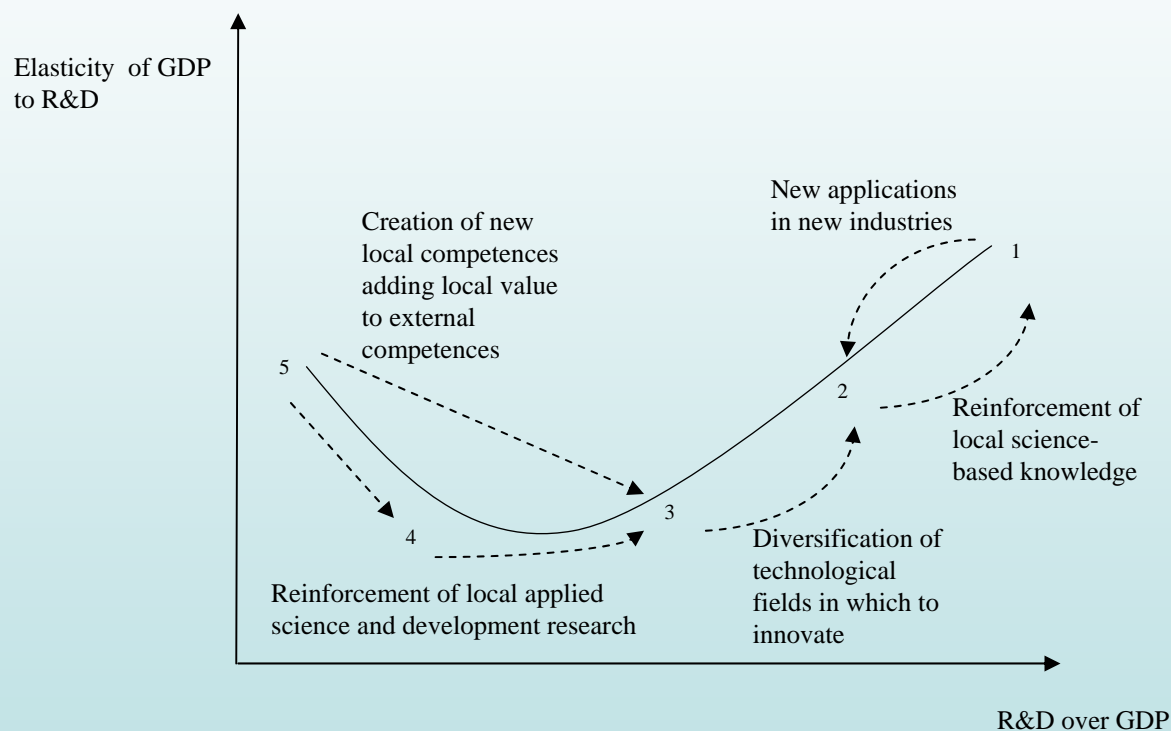
Evolutionary smart innovation policies

- Some regions could be able to 'jump' over different and more complex innovation patterns (empirical evidence collected);

- 'evolutionary' policies could support these paths, with extreme attention and careful assessments, provided that context conditions and reliability of actors and strategies/projects could reduce risks of failure.

Potential evolutionary trajectories
(for the leading regions in each pattern)

Elasticity of GDP to R&D

Creation of new local competences adding local value to external competences

New applications in new industries

Reinforcement of local science-based knowledge

Diversification of technological fields in which to innovate

Reinforcement of local applied science and development research

R&D over GDP

Legend:
1 = European science-based area
2 = Applied science area
3 = Smart technological application area
4 = Smart and creative diversification area
5 = Imitative innovation area

All this and much more can be found in

Camagni R. and Capello R. (2013), «Regional Innovation Patterns and the EU Regional Policy Reform: Towards Smart Innovation Policies», *Growth and Change*, forthcoming

Capello R. and Lenzi C. (eds.) (2013), *Territorial patterns of innovation. An Inquiry on the Knowledge Economy in European Regions,* Routledge, London

THANK YOU VERY MUCH FOR YOUR ATTENTION