ESPON

AMCER

ADVANCED MONITORING AND COORDINATION OF EU R&D POLICIES AT REGIONAL LEVEL

Targeted Analysis 2013/2/18

Final Report | Version 10/12/2012

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This report presents the Draft Final results of a Targeted Analysis conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

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This basic report exists only in an electronic version.

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Executive summary

The present Report constitutes the Final Report of project: ESPON Targeted Analysis Based on User Demand 2013/2/18: Advanced Monitoring and Coordination of EU R&D Policies at Regional Level (AMCER). ESPON 2013 Programme Project number 102_PR2_18_0283; Contract Number 097/2011.

1 Analytical part incl. key messages and findings

Introduction

European Union (EU) R&D policies have a substantial impact on regional R&D systems and territorial cohesion, both at a European level and in the regions. Against the backdrop of the aims of Europe´s 2020 strategy, policymakers need sound territorial evidence on the state of R&D activity, investment and support structure in their regions to improve the impact of EU funding programmes on more competitive R&D systems.

The AMCER- Advanced Monitoring and Coordination of EU R&D Policies at Regional Level, aims to equip the 9 regional actors with an accurate picture of their R&D systems, EU R&D Policy activity and its territorial impacts. This should provide these regional actors with the evidence needed to formulate and manage R&D policy more effectively.

A broader aim of the AMCER project is to provide a framework for the analysis and monitoring of the impact of EU R&D policies at regional level, for creating strategic knowledge and building better synergies between regional and EU R&D policies.

The project proposes general guidelines with a set of recommendations in order to improve the monitoring at regional level and moving toward an harmonised methodology that other regions can use. The recommendations suggest how data collection can be improved by region and delivered by European Commission so that it contributes more effectively to the management of R&D policy and territorial cohesion initiatives.

AMCER project is an ESPON priority 2 Targeted Analysis Based on User Demand project, (Targeted analysis based on user demand: European perspective on development of different types of territories). Therefore the project was carried out at the express demand of a group of stakeholders regions through the ESPON 2013 Programme.

The AMCER stakeholders Regions involved in the project are: Tuscany Region, Italy (lead stakeholder); Andalusia, Spain; Brittany Region, France; Catalunya, Spain; East of England, United Kingdom; Flemish Government, Belgium; Lower Saxony, Germany; Ostrobothnia, Finland; Provence-Alpes-Côte d'Azur Region, France.

Description of the methodology followed by the AMCER project

Overall approach

The approach (presented at annex of this Report) is largely based on the regional actors accessing to relevant of FP/CIP/Horizon detailed data and the verification of the information against information gathered by regions from other sources, notably the matching between contracts information from EU databases and local information, to validate effective regional participations.

The AMCER methodology present elements which can serve as a guide to other regional decision makers for devising their own approach based on their specific characteristics and requirements in terms of data with a view to improve planning and their approach to Regional Smart Specialisation.

Detailed approach

1. Synthesis of the R&D systems and territorial challenges at the regional level for each of the nine case-study regions involved.

2. Information and data was collected and analysed concerning the participation of the 9 regions in EU R&D programmes. Assessment of the regional participation in FP6, FP7, CIP and ERDF for each region.

3. The matching between regional information and contracts information was carried out to obtain a list of regional participations. This data was subsequently aggregated to produce regional indicators.

4. Headquarters effect correction was carried out and R&D Budget breakdown calculated from the data gathered on regional participations.

5. Regional participations and budgets for Framework Programme on R&D, Competitiveness and Innovation Programme (CIP), and Structural Funds were distributed into R&D sectors at intra-regional level (NUTS 3 generally) to obtain a first set of aggregated indicators.

6. To identify the number and the intensity of the collaborative links generated by the AMCER regions participation in EU R&D programme, a Social Network Analysis (SNA) for FP and CIP was carried out. This highlights the main European networks in which regional stakeholders are involved. It also allows mapping collaboration patterns in the FP; both between project participants and between regions and countries involved.

7. Finally, the impact of the participation in EU R&D programmes was assessed in terms of results regarding employments level in R&D sector and patenting activity in the 9 AMCER regions.

Links with ESPON project

Similar to the KIT project, the AMCER project analyses the territorial dimension of innovation. However, AMCER has a narrower focus as it covers only nine regions and it concentrates the results of their effective participation in EU RDI programmes and integrates also the Governance Dimension. Nevertheless the results of the two ESPON projects show a degree of compatibility and could constitute the basis of further research within future ESPON programmes about territorial dimension of R&D and innovation in Europe.

TIGER project also provides an analysis of the context of globalisation affecting the European territorial development. This is of particular interest for knowledge and innovation challenges faced by different type of European Territories with an unequal potential strength/vulnerability of in the context of globalisation.

Main findings

The analysis of the Regional Innovation Systems of the AMCER regions reveals that despite the current economic and financial crisis, the regions which have already managed to build up a knowledge-driven regional economy (at least to a certain degree) are likely to have better, more sustainable, and less volatile growth perspectives

A further challenge is the rise of general unemployment and the long-term and youth unemployment figures that remain high in most of the regions (e.g. Catalunya, Andalusia, etc.). The population development and the Demographic Change are challenging all the regions studied. The regions are facing lower population growth, demographic ageing, and outmigration. The availability of human capital (secondary and tertiary education) is often sufficient. However most regions are confronted with high numbers of early leavers and a low participation rate of adults in further education (e.g. Tuscany, PACA).

Furthermore, except East of England, all regions need to increase their R&D capabilities (some most urgently, such as Andalusia, Tuscany, Catalunya, and Brittany). Additional spending and personnel will help to strengthen the competitiveness of the regions in terms of knowledge and technology production. Moreover, in some regions (e.g. Andalusia, Tuscany, Lower Saxony) the structural change towards a more diversified and knowledge based economy has to be fostered. Existing potentials in high-tech sectors have to be strengthened. For this, SMEs play a crucial role. But so far, SMEs in the AMCER regions are not so strongly involved in innovation activities. Additionally, the link between businesses and research institutions is in some cases rather weak (e.g. Tuscany, Catalunya, Brittany, PACA, and Andalusia). More support is needed to support and encourage SMEs to conduct R&D.

In terms of the participation of AMCER Regions in EU RDI programmes, the analysis carried out in the context of the project, notably on the programmes contacts databases, indicate that AMCER regions have benefitted from their participation in EU programmes. Certain regions, possibly given their existing RDI capacities and potentials have been more successful than other in attracting FP 7 funds, this is the case notably of regions with a strong network of HEI such as East of England, and/or with a strong relationships between research and innovation notably through SMEs (Flanders, Catalunya, Tuscany). Some however are less successful than the national or EU average (Ostrobothnia, Lower Saxony, Andalusia, PACA). However it is difficult to establish a clear link between their participation in EU programmes and their respective overall economic performances.

As noted already in academic research and also in conclusions of the ESPON KIT project, in many regional situations increasing R&D investment does not have a significant automatic and immediate impact on growth and job creation because technological change, as an outcome of research, is only one way to generate wealth.

In the context of monitoring the EU R&D programme, the information concerning effective localisation of project beneficiaries is in some cases biased (Headquarter effect) by the fact that the projects are allocated to national R&D organisations or companies which Headquarters are located in regions which are different from those were effectively and ultimately the RDI activity is performed. Following the AMCER research, the influence of Headquarter effect is estimated at 7,5% of the total participations. Therefore a significant number of the AMCER regions participation in FP7 (5 590 over 74 460) had been misplaced.

In most regions[1] the number of ingoing participations identified is considerably higher than outgoing participations. The analysis of the headquarter effect highlighted a high number of participations that would have been otherwise been attributed to other regions in the country. Ingoing participations mainly concern research organisations; while private commercial and public organisation are less prone to generate a headquarter effect.

This effect can in some cases significantly distort the image of the overall RDI activity performed in a given region for the purpose of monitoring, allocation of support resources, prioritisation of public support actions, avoidance of duplication of resources, etc. that the authorities in charge of regional policies should be carrying out in the context of their normal monitoring and strategic planning actions.

The analysis of regional participation in FP7 showed that the weight of each region in total national FP7 is generally lower or equal to that of their weight in gross domestic expenditure on R&D. Tuscany and Catalunya are the only two exceptions to this.

SME in the regions analysed account for an average of 15% of FP7 funding. However, there are considerable differences among them. In Flanders for example, SME account for 43% of total national SME participations, while in Brittany SME participation represents only 4%.

In terms of employment, a part of the AMCER regions specialized in medium knowledge intensive sectors. Exceptions are Catalunya, East of England and PACA with stronger share in High knowledge areas; on the other end Andalusia and Tuscany have a stronger concentration on low knowledge sectors.

Patenting activity also vary significantly, with some regions where this activity is supported by dedicated intensive patenting organizations or significant technology corporations. Sometimes patenting activities are strongly focussed on one or two key areas (notably electrical engineering).

[1] Only in Catalunya, East England, Flanders and Tuscany the rate is lower than 10%

2 Options for policy development

Contribution to regional smart specialisation strategies

The European Commission has released guidelines for regional smart specialisation strategies which aim at coordinating existing tools within the EU policies and Regulations. The individual RIS3 strategies would take the form of an annex to the Operational Programmes for the next Financial Framework of Cohesion programmes.

The AMCER project results could constitute a useful contribution for the participating regions in the context of preparation of their respective Smart Specialisation Strategies and more generally in the context of the planning for the next cycle of the EU Financial Framework 2014-2020.

Indicators provided by AMCER such as participations indicators, numbers of patents, clusters analysis contribute each to the design of indicators for the Regional innovation smart specialisation strategy that have to be delivered jointly with the next ERDF Operational Programme for the 2014-2020 programming period.

In particular, AMCER results on FP 7 participation, collaboration patterns, possible headquarter effects, main R&D sectors to be targeted, etc. should contribute notably to assessments concerning: identification of priorities; definition of an action plan with a coherent policy mix; and monitoring and evaluation.

AMCER approach can also contribute to the identification of 'niches' or specific domains for (present and future) competitive advantages, from an international stance, inform on the positioning of the regional economy in international value chains and on identification of specific key assets.

The AMCER analysis is based specifically on the drawdown of EU/FP7 (cooperation programme) funding and should be assessed in this context. It may not give a complete picture of regional/localised strengths and specialisations on the ground.

Therefore, for the participating regions, on the basis of the Commission guidelines for regional smart specialisation strategies, the AMCER project results can contribute to preparation of Smart Specialisation Strategies and more generally in the context of the planning for the next cycle of the EU Financial Framework 2014-2020.

Issues related to the data on EU Programmes on RDI

It should also be noted that access to EU databases have been problematic and has created substantial delays in the project implementation, which had not been foreseen in the planning phase of the project. Among the challenges encountered during the project implementation, it should be noted that the quality of the data collected by the EU about the performance of the EU RDI programmes could be improved to provide useful, readily accessible conclusions for policymakers and practitioners within regions.

The AMCER activities and research have demonstrated that EU databases should be improved in the context of the next Framework Cycle till 2020, by integrating geographical information and localisation, notably in order to effectively localise the research departments that effectively carry out the work related to the EU programmes. Possibly this should be made into an effective reporting/monitoring requirement in the programme manual. Concerning the CIP, the monitoring structure should converge towards the FP structure. The ultimate aim would be to make the regions more self-reliant in terms of data analysis concerning the EU programmes.

At regional level, links should be established (or enhanced where existing already) between the administrative departments in charge of EU Programmes and those implementing ERDF by establishing effective communication and coordination mechanisms. Possibly the administrative capacity should be concentrated in the context of regional agencies together with standardised and mandatory set of procedures. For Member States like the United Kingdom this may be a challenge given the absence of English regional agencies.

In the context of the planning for the next Financial Framework, the European Commission could also provide guidelines concerning data harmonisation. In this context, the regional scoreboards prepared in the context of the AMCER project could serve as a basis or model as a possible way to harmonise the data coming from different sources/programmes.

It should be noted that there is no regional agenda within the Framework Programmes which were not conceived to have a territorial dimension and were not evaluated on a geographical basis. Rather the FP was and would continue within next cycle to support excellence.

Each financial instrument has its specificities and focus, and it is not the purpose of the present report to assess them. However, it appeared in the course of the project activities and in particular in contacts with regional stakeholders that better coordination and exchange of information should be sought between the bodies in charge of their implementation at Commission level (DG Regio and RTD) and the authorities in charge of regional policies in charge of RD policies and ERDF implementation.

Confidentiality aspects should be taken into account: for example, information related to individual financial contributions should not be divulgated. It is also considered by some regions that the information about failed applications to R&D programmes should be kept confidential.

Recommendations for policy development

1) Participating AMCER regions and countries

At regional level, better coordination is needed between services in charge of the follow-up of the ERDF programme and the services in charge of the monitoring of the FP/CIP. Notably, links should be established (or enhanced where existing already) between the administrative departments in charge of the ERDF participation analysis and FP/CIP participation monitoring through effective communication and coordination mechanisms in order to develop a common frame for monitoring and for developing indicators. Possibly the administrative capacity could be concentrated in the context of regional agencies with standardised and agreed procedures. The exception to this could be Member States like the United Kingdom given the absence of regional agencies.

2) European regions generally

In order to improve coordination, benchmarking and monitoring efforts, the following aspects would be useful:

- A set of common definitions among the programmes would be useful. For instance, a common approach for counting the regional participations, in particular for those participations spread into many laboratories.

- A set of common scientific themes would also be useful, based on FP7 common themes, in order to improve comparability and monitoring.

- For the planning for the next Financial Framework, compatible and coordinated guidelines concerning data harmonisation could be devised.

- The AMCER regional scoreboards could serve as a basis or model as a way to harmonise the data coming from various sources/programmes.

- A common set of indicators for monitoring R&D participation, these indicators should be useful to feed regional policies.

3) European Commission

On principles, there should be a structured and coordinated debate, possibly in the context of the Smart Specialization Strategy process concerning an overall and coherent approach combining:

- Territoriality elements of RDI programmes,
- Access to data by authorities in charge of regional policies,

- Harmonized monitoring approach and indicators,
- Coordination with other related programmes (EU/national).

The ultimate aim would be to make the regions more self reliant in terms of data analysis concerning the EU programmes.

Permanent and effective governance mechanisms of coordination of financial instruments should be devised to improve the management, performance and efficiency of the synergies between Horizon 2020 programme and Common Strategic Framework (CSF) Funds, notably ERDF but also ESF as it concerns Human Resources support for R&D.

EU databases should be improved in the context of the next Framework Cycle till 2020, by integrating geographical information and localisation, notably in order to effectively localise the research departments that carry out the work related to the EU programmes. Possibly this should be made into an effective reporting/monitoring requirement in the programme manual.

However, improvements of the information provided by contracts' databases FP7 database has been noted. Within those surveyed during the course of the AMCER project, the FP contract database appears as the most complete and reliable database. DG RTD has significantly improved the quality and the reliability of the data. The FP7 database provides useful information on the localisation of research departments.

Concerning the FP7 database the recommendation would be to always request (make mandatory) the information about the localisation of the research department. CIP sub-programmes' databases should adopt the same structure as that of the FP7.

In order to better understand SMEs' role in regional RDI development, it would be useful for the data concerning their participation in EU programmes to be collected in a systematic way on the basis of common definition (possibly harmonized with Cohesion Funds requirements).

Need for further analysis/research

Regional typologies for R&D

Further investigate the possibility to achieve Regional typologies on the basis of the results of the KIT project and taking account of the other similar classifications of regional performance in terms of knowledge, innovation, research and development, such as Erawatch, the RIM and RIS.

Regional Innovation Systems (RIS)

Consideration may be given to further explore the possibility of using the Regional Innovation System model of analysis on the basis of Cooke's approach[2] to complement place-based analysis of RDI regional systems.

AMCER methodology and approach

The AMCER methodology which integrates the RIS analysis approach, together with the effective results and effects of the regions' participation in EU RDI programmes, and with their overall performances in terms of RDI output, can usefully contribute to:

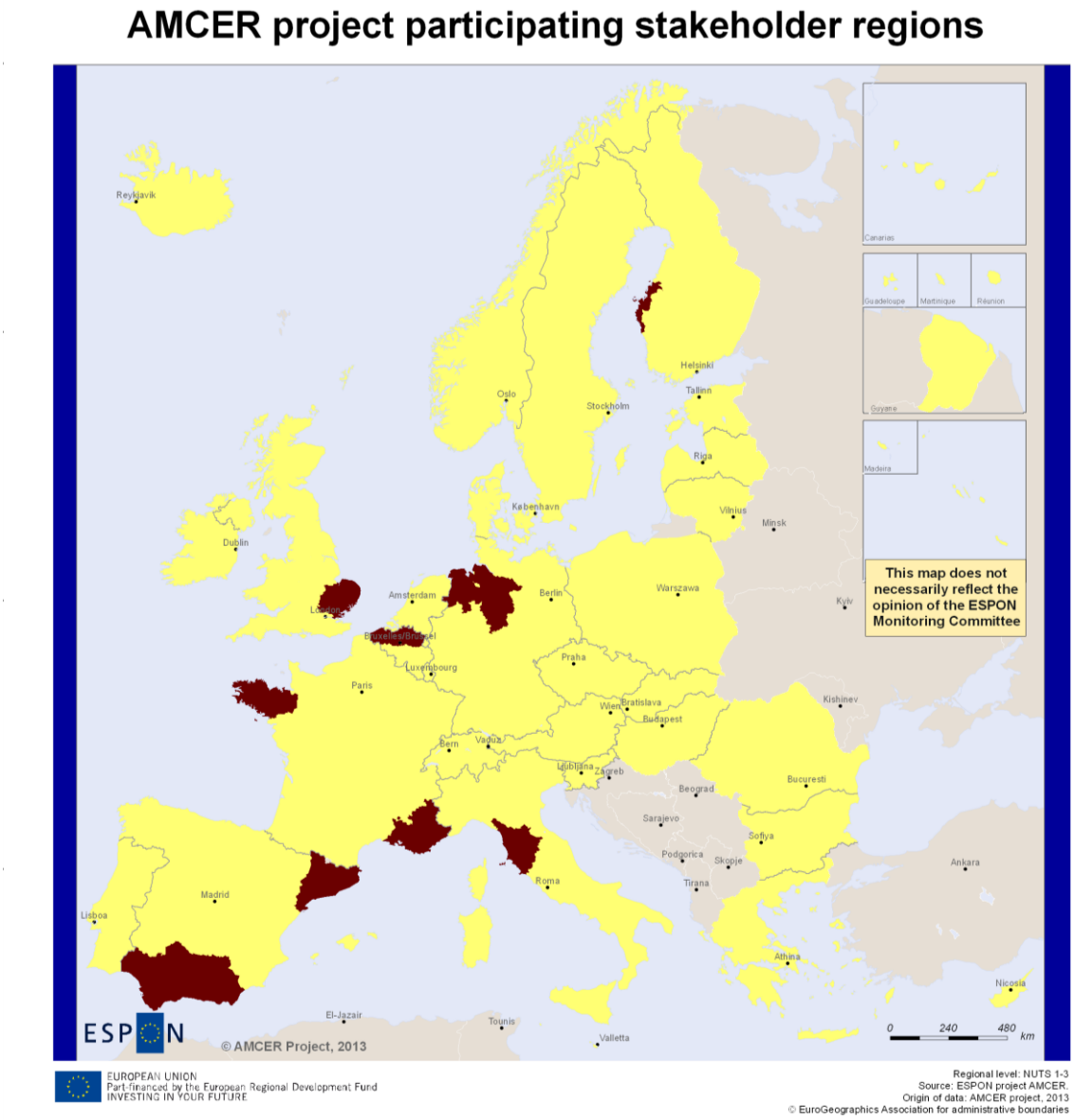
- The design of targeted and comprehensive innovation policy strategies
- Complement place- based analysis of regional RDI systems
- Improve efficiency and effectiveness in design, delivery and assessment of RDI policies and programmes at regional level.
- Develop related monitoring tools to monitor regions' performances in RDI policies and programmes.

In particular, the AMCER project results can constitute a useful contribution for the participating regions in the context of preparation of their respective Smart Specialisation Strategies and more generally in the context of the planning for the next cycle of the EU Financial Framework 2014-2020.

Therefore as expressed by some of the stakeholders in the AMCER project, further consideration could be given at making the AMCER approach of collection, analysis and dissemination into a permanent and ongoing process also for other regions.

[2] COOKE, P.: Regional Innovation Systems: Competitive Regulation in the New Europe. In: Geoforum, 23, p. 365-382. 1992. COOKE, P.: Introduction: origins of the concept. In: BRACZYK, H.-J., COOKE, P., HEIDENREICH, M. (Eds.): Regional Innovation Systems: The Role of Governances in a Globalized World. (1. Ed.). London: UCL Press, p. 2-25. 1998. COOKE, P.: Introduction: Regional innovation systems – an evolutionary approach. In: BRACZYK, H.-J., COOKE, P., HEIDENREICH, M. (Eds.): Regional Innovation Systems: The Role of Governances in a Globalized World. (2. Ed). London: UCL Press, p. 1-18. 2004.

Figure 1: Map of AMCER regions



ESPON 2013 Programme

Advanced Monitoring and Coordination of EU R&D Policies at Regional Level (AMCER).
Final Report
Main Report

Overall considerations

1. The concept of the project

The Advanced Monitoring and Coordination of EU R&D Policies at Regional Level (AMCER) project aims to provide a framework for the analysis and monitoring of impacts of EU R&D policy at the regional level and current coordination in order to create strategic knowledge for building better synergies between individual regional R&D policies and EU ones. The study is carried out in nine European regions involved[3] and through a set of specific tasks divided into five components. At their own initiative, the regions requested that ESPON priority 2 Targeted Analysis Based on User Demand project be established in order to build on the experiences on specific data on the results of FP6/FP7 and CIP on some of their territories.

Main objectives of the research

Provide a framework for the analysis and monitoring of impacts of EU R&D policy at the regional level and its current coordination in order to create strategic knowledge for building better synergies between individual regional R&D policies and EU ones. In furtherance to this main objective, the project will deliver the following results:

- A synthesis of the main R&D challenges and the territorial and R&D systems of the regions involved in the project;
- The development and/or consolidation of data with regard to the investments funded through EU R&D policies in the regions involved in the project;
- The development of a harmonised methodology for the development and consolidation of regionalised data concerning the investments funded in the framework of EU R&D policies in the regions involved in the project; a methodology for advanced monitoring that is able to control for headquarters effects and with recommendations for the next generation of EU R&D and innovation programme, Horizon 2020;
- The analysis of the impact of the investment funded in the framework of EU R&D policies in the regions involved in the project both in terms

3 AMCER Regions: Tuscany, Andalusia, Catalunya, Bretagne, Provence Alpes – Cote d'Azur, Ostrobothnia, Lower Saxony, Flanders, East of England.

of: a) R&D performance, territorial cohesion, R&D specialisation and b) territorial trends like geographical concentration of R&D activities in regions, links and the eventual parallels between the territorial dynamics generated by EU funding for R&D in terms of geographical concentration of activities and the ones observed more globally;

- An inter-regional comparison of the results obtained for each of the regions involved, at horizontal level (all R&D sectors taken together), and at the level of specific R&D sectors to be defined.

AMCER project is a priority 2 Targeted Analysis Based on User Demand project, Targeted analysis based on user demand: European perspective on development of different types of territories. This priority responds to a clear demand of practitioners for user and demand driven actions within the ESPON 2013 Programme. By convening an analytical process where ESPON findings are integrated with more detailed information and practical know-how, new understanding of future development opportunities and challenges may arise, which could be transformed into projects and actions.

Targeted analyses under Priority 2 enable stakeholders to obtain customised and up-to-date information on their particular territorial context and opportunities for development which can be used for policy development. Given the targeted focus of these projects on specific territorial entities, targeted analyses will contribute to the use of ESPON results in practise and to the involvement of policy makers, practitioners and scientists in a joint synergetic process.

The project objective is to study and illustrate the influence of EU programmes related to Research, Development and Innovation on the regional systems involved; to discuss ways of improve monitoring and coordination of RDI activities at regional level; and to encourage the transfer of good practices at the European level.

The aim of the project has been to provide a tool for strategic governance and that the results of this component and the eventual results of the project at large cannot be considered as a fully fledged evaluation or audit of the participating regions. This would help the regions concerned (and possibly serve as a model for other regions too) prepare independent assessments of the regional participation in the EU Programmes.

Therefore the importance of this project lays in setting out a path for making R&D data more territorial – through a methodology that regions can use and through suggesting practical improvements for EC level R&D data collection.

The AMCER analysis is based specifically on the drawdown of EU/FP7 (cooperation programme) funding and should be assessed in this context. It may not give a complete picture of regional/localised strengths and specialisations on the ground.

The project provides an assessment on various aspects (inputs, outputs, SNA, cooperation, patent, etc.) that will inform participating regions on effects

of their participations in EU programmes on RTD. However, this analysis does not constitute and should not be considered as an impact assessment as it is methodologically not feasible without longitudinal data.

AMCER Methodology

An aim of the AMCER project has been to deliver a harmonised methodology on the databases and recommendations on the shape of future databases so as they support evidence-based policymaking.

The methodology focus on a description of the process followed to achieve access to data, analyses performed and results to be achieved, based on practical measures and, proposals on a common structure for databases related to RDI. The goal has been to develop a practical 'how to' guide for other regions so that their efforts built upon the learning of the AMCER project.

The approach (presented in detail at annex of this Report) is based on the regional actors accessing to relevant of FP/CIP/Horizon detailed data and the verification of the information against information gathered by regions from other sources, notably the matching between contracts information from EU databases and local information, to validate effective regional participations.

Box 1 Outline of AMCER methodology stepped approach

1. Regional Innovation System (RIS) analysis – Framework analysis
    - The 'Governance Dimension'
    - The 'Business Dimension'

2. Access to data and information on participation of the region

3. Methodological overview: matching and cleaning of regional information contained in EC contracts' databases
    - The matching process
    - Geographical information change process – HQ analysis

4. European funding and the regional R&D system

    - Input - Attractiveness of FP 7 funds and research specialization
    - Network: the space of collaboration created by the European FP 7 projects at regional level and the connections with other European areas
    - Output: the regional employment profile, focusing on the relevance of high tech and knowledge intensive sectors
    - Output: patenting activity
    - Coherence and potential: the degree of coherence and the possible synergies between EU funding and the regional R&D system depicted by employment and patenting figures.

This allows to evaluate the possible role of Headquarter effect. It would also allow to achieve a more precise monitoring of the aspects related to the rate of participation of the region in the FP 7, distribution of funding at infra-regional level, distribution of funding by participant type, distribution of funding by participant type at infra-regional level, SMES' participation in FP7/Horizon, and distribution of funding by programme and by theme.

In addition, it is possible to integrate additional information from possible additional analyses regarding cooperation and networking and outputs in terms of employment and patents.

This AMCER methodology present some elements which can serve as a guide to other regional decision makers for devising their own approach based on their specific characteristics and requirements in terms of data with a view to improve planning and their approach to Regional Smart Specialisation.

The main aspects to be taken into account in this context are their governance and therefore their planning and coordination capacities should also be considered their capacity for data managements in relation or in parallel between the various actors in charge of programme management and their respective degree of (financial) responsibility, ie whether at local, regional, interregional, national or EU level.

Cut off date

This document provide a localisation analysis of research activities executed in the respective AMCER region in the FP7 and other EU programmes relevant for RDI activities in the period between 2007-2011. In particular, the information related to FP7 is based on the data included in the contract database as of 15 October 2011.

The employment profile for each AMCER region covers the period 2004-2009, by paying particular attention to knowledge intensive and research dynamic sectors. Concerning patents-analysis produced in the region the reference period is 2002-2007.

Results of the ESPON KIT project and their influence for AMCER

The ESPON KIT (2010-2012) studies the territorial dimension of the innovation and knowledge economy. It reviews the current state, patterns and potentials of regions with respect to the knowledge and innovation economy and identifies new development opportunities through innovation for Europe and its territories.

AMCER TPG has been invited to explore and reflect on the KIT results at the regional level and ensure their consideration in recommendations.

Within the KIT project an overall concept is used which includes product

innovation, process innovation and organisational innovation. KIT takes into account the current state, patterns and potentials of regions with respect to the knowledge and innovation economy and identifies new development opportunities through innovation for Europe and its territories.

In this context, the KIT project identified "territorial patterns of innovation" by applying empirical analyses. In summary, they found five groups with different characteristics: 'science-based areas', 'applied science areas', 'smart technological application areas', 'smart and creative diversification areas', and 'creative imitation areas'. Similar to the KIT project, the AMCER project analyses the territorial dimension of innovation. In the context of the first component of the AMCER project, the RIS approach by Cooke has been applied.[4]

Although some characteristics or findings which are embodied in the observed patterns of the KIT project bear similarities with the aspect analysed within the innovation dimension in the AMCER project, the approaches´ comparability is limited due to various conceptual and methodological reasons:

- The focus of the two projects varies: KIT uses the wider concept of Knowledge and Innovation and covers NUTS 2 regions. AMCER has a more limited scope as it focus on only nine regions more in depth and focus on their participation in EU RDI programmes (FP7, CIP, etc.)

- Within the KIT project the patterns have been identified by applying empirical analyses. To the contrary, in the AMCER project an existing approach (Cooke's RIS) has been applied.

- AMCER also considered the governance and policy dimension. Moreover, we incorporated an analysis of trends and challenges.

- KIT project patterns are based at NUTS2 level. In Cooke´s approach the dimensions and their basic types have been developed on the basis of empirical studies from regions from different scales.

- Within the KIT project the classification of regions is based on rather quantitative data. AMCER uses of both quantitative and qualitative data.

[4] Cooke, P. (1992). Regional Innovation Systems: Competitive Regulation in the New Europe. *Geoforum* n. 23: 365-382. This approach distinguishes between two major dimensions: the 'Governance Dimension' and the 'Innovation Dimension'. The Governance Dimension shows how the controlling and managerial competences of a RIS are formed in interaction between economic and political actors. The Innovation Dimension reveals how the R&D sectors is structured and set up with regard to RTDI relevant aspects (e.g. collaboration, R&D participation, sharing of knowledge).

In the context of the ESPON KIT project, five main patterns of Territorial patterns of innovation in Europe have been identified[5], the following table attempts to match AMCER regions to KIT regional typology:

Table 1: AMCER regions and KIT regional typology

Pattern type	KIT Region Type	AMCER regions
1a	European science-based area	East of England and Flanders
1b	Applied science area	West Finland (Ostrobothia) and Lower Saxony
2a	Smart technological application area	Cataluña and Tuscany
2b	Smart and creative diversification area	Bretagne, PACA and Andalusia
3	An imitative innovation area	None

(Source Espon KIT, AMCER TPG elaboration)

The AMCER regions represent a selection of case studies. The nine regions participating in the project are not meant to represent an ideal model typology of the EU RDTI regions in terms of Research or Innovation performances.

Some are characterised by the presence of important RDTI Knowledge production centre in the form of important urban centres or high education and research centres. Not all of them correspond to NUTS2 definition.

At the same time there are different model of typologies developed in the context of evaluation or Structural Funds, ERA, OECD, etc. Most recently, the ESPON KIT proposed a classification of Territorial patterns of innovation in Europe. The various approaches may not necessarily be overlapping or fully compatible. The evaluation of various forms of typology or patterns of regional innovation was not the aim of the AMCER project. On the basis of the useful results achieved by ESPON KIT and taking into account the results of other relevant research also mentioned above, additional research may be undertaken to further investigate possible links between regions performances in terms of RD and Innovation and the governance model and performance of regions in the context of EU RD programmes (including ERDF), by integrating the AMCER approach/methodology.

[5] Similar attempts of classifications or taxonomy have been carried out within the ERAWATCH, RIM and RIS initiatives.

Results of the ESPON TIGER project and their influence for AMCER

TIGER analysis focuses on the position of the EU vis-a-vis globalisation and from a territorial perspective and to analyses its territorial aspects and its dynamics at different geographical scales in particular to the consequences for the development of EU Cities and macro-regions. The main aim of the project is to look into the territorial dimension of the globalization process and analyses its significance for an enlarged Europe.

Main results envisaged[6]

- Identification of the territorial aspects of the globalisation process with most relevance for Europe and its regions.
- Provision of an operational concept of globalisation, encapsulating the European context.
- Overview of position and profile of Europe in the global urban structure.

TIGER conclusions identify a set of challenges for different types of regions

1- *Gateway cities at a global, European and national scale:* Those are important for the European economy. Connected gateway city tend to perform better and seem more resistant to economic crisis.

2 – *"In between" manufacturing areas:* These regions are specialized in medium functions and intermediary sectors in the global economy. They have increased their technological skills during the past decades, but they have not able to upgrade beyond a certain threshold. They depend from external investments notably from big multinationals and have a weak entrepreneurial fabric. Notably, Mediterranean territories face competition from Central European regions, with lower labour costs but qualified workforce.

3 - *Low value manufacturing areas:* Low value functions continue to decline, mainly in the Balkans, Northern Portugal and other small Mediterranean areas. These regions have low capacity to move up in the value chain when their firms are locked into subcontracting positions.[7]

- TIGER provides a global perspective which constitutes a useful basis for other ESPON project such as AMCER. AMCER has a more limited scope as it focus on only nine regions more in depth and focus on RDI.

- As with KIT, identification of types of regions is an interesting element for reflection, while AMCER regions would fit to this typology with difficulty. They include connected cities, and mostly would fit intermediate manufacturing regions type.

[6] Espon Project Overview, July 2012.
[7] TIGER Draft Final Report, Version 29 February 2012, p. 90.

Common definitions

Innovation: An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relation. The minimum requirement for an innovation is that the product, process, marketing method or organisational method must be new (or significantly improved) to the firm.[8]

Innovation activities: All scientific, technological, organisational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Some innovation activities are themselves innovative, others are not novel activities but are necessary for the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation.[9]

Headquarter effect

Box 2 Brief definition of the headquarters effect and the inflow/outflow model

The headquarter effect occurs when the legal entity who signed a contract with the European Commission and the research implementation funded by the project is not localized at the same place:

From the analysis of contract database, three cases can be distinguished. According to the type of the participant and project, the place where the contract has been signed and the research activities are performed may be different. 4 cases are possible:

1 There is no headquarters effect. The participation reported in the EC database is located on the same territory where the research is performed.

2 There is an Ingoing headquarter effect when the research is performed in the targeted region and the headquarter localised out of the targeted region. These participations have to be added to the regional assessment.

3 There is an outgoing headquarters effect when a headquarters of a company or research organisation is located on the territory but the research in performed outside of it. The regional participation must then be subtracted. This participation flow is called outflow participation.

Evaluation of impact: The AMCER project provides a degree of assessment concerning the possible impact of EU programmes in the 9 target regions. It does not provide an extensive evaluation of regional RDI policies, as the project was not intended as a technical ex post impact evaluation. In principle each programme should foresee the evaluation of impact of the assistance deployed, therefore the responsibility for this task would depend on the EU competent services or in the case of ERDF on the implementing agencies at regional level.

For other relevant definitions, please refer to the annex to the present Report.

[8] Source DG ENTR Glossary
[9] Source DG ENTR Glossary

2. Results of Project Analysis

Economic factors related to RDI

Regarding ***economic output***, the strongest regions are Flanders and Ostrobothnia, followed by Tuscany, PACA, East of England, Catalunya, Lower Saxony, Brittany, and Andalusia. Except for Andalusia, all regions are above the EU-27 per capita GDP average.

The regional ***economic structures*** and their specialisations vary. Although all regions are shaped by service activities, in some cases industrial sectors or industry-related services play a more significant role. This is the case for Catalunya, Ostrobothnia, Tuscany, Lower Saxony, Flanders and the East of England. Other regions are focussed rather on agriculture, tourism and related activities, and have little industrial tradition (e.g. Andalusia, Brittany, PACA).

Except of Lower Saxony, all regions suffer from the rise of ***unemployment*** rates due to the ongoing economic and financial crisis. However, even though much of this increase arose from effects of the crisis, more specific unemployment figures such as long-term and youth unemployment suggest that in most regions there would be an urgent need to apply structural reforms.

RDI Indicators

R&D-related indicators indicate that East of England currently is the region where the R&D activity is most intensive among the AMCER regions. Other regions that are relatively active and above, or at least in line with, the EU average are Ostrobothnia, Lower Saxony, Flanders, and PACA. These regions already put a relatively strong emphasis on knowledge-driven development, at least in some key sectors. Brittany and Catalunya increasingly trying to foster their regional potentials, but suffer from structural weaknesses. Tuscany and Andalusia are the regions with the lowest R&D performance; even though also these regions have existing potentials (see App. Tab. 6). Moreover, East of England is by far the most *technologically sophisticated* region, followed by Flanders. Catalunya, Ostrobothnia, Brittany, PACA, and Lower Saxony are relatively medium-high to high-tech oriented. Tuscany and Andalusia have few technologically exposed sectors; however, most activities are in low-tech fields.

The education of the ***human capital*** forms the basis for productive and innovative activities. In general, there is not much difference in the relative numbers of tertiary level students. However, Ostrobothnia has a very marked advantage regarding the number of higher education students, whereas Lower Saxony has by far the lowest figures. Despite East of England´s rather average values in terms of human capital, the region benefits i.a. from the presence of an excellent HES (including Cambridge University). The figures

for early leavers generally show positive development. The Spanish regions have by far the highest share. Flanders and Brittany have the lowest figures. In addition, the further education of adults plays an important role. In this area, most regions have values below the European mean. The French regions PACA and Brittany have the lowest figures; whereas Ostrobothnia and East of England show by far the highest participation share.

Potentials for innovation are very unevenly distributed between the regions. The highest relative values are held by Ostrobothnia, Lower Saxony, Flanders, and East of England. Andalusia´s figures are very low, reflecting the region´s weaknesses in knowledge and technology creation, although some significant efforts have been undertaken. However, the productivity of R&D shows a more mixed picture: Brittany and Lower Saxony seem to have the most effective R&D system.

Governance:

The nine AMCER regions display an interesting variety of types of governance structures.

Lower Saxony and Flanders have strong federal features and a quite high degree of autonomy and self-responsibility concerning their influence on the regional economy or their freedom in designing and applying regional innovation policy measures. With respect to their governance structures, these regions are rather characterised by attributes of what Cooke calls network systems[10] (see methodology part, component 1).

In Lower Saxony and Flanders, RTDI support takes place on different levels, e.g. local, regional, or federal as appropriate. In the manner of a network system funding is guided and assessed by public and private regional banks, government, semi-state-owned, and private agencies or firms as well as regional research institutes.

With respect to their governance structures, Tuscany, Andalusia and Catalunya are a mixture of both federal and centrally-led regions. In terms of Cooke´s typology, Tuscany´s governance dimension could quite clearly be assessed as a *grassroots R&D system*. The innovation system as well as knowledge and technology transfer processes are generated and organized mainly on the local level. Local development agencies and local institutional actors play a predominant role. In the manner of a grassroots system funding is highly diffuse in origin and shaped by a very low supra local or national coordination.

Major funding channels are social networks, local banks and funds, and regional support programmes. In turn, Andalusia and Catalunya have features of a network system, even though, simultaneously, some grass root

[10] Cooke, P. (1992). Regional Innovation Systems: Competitive Regulation in the New Europe. *Geoforum* n. 23: 365-382.

tendencies are discernible. Support of RTDI projects happens on regional or national levels, although the regional level has the most competences due to their Autonomous Community status with strong devolved powers.

Ostrobothnia, Brittany, PACA, and East of England are more centrally-led regions. In terms of Cooke´s typology[11], even though these regions have developed network governance characteristics, their systems still have *dirigiste* features due to their respective strong central state, meaning that the influence of organizations and institutions of the central state on decision making processes related to the regional economy and/or regional innovation policies remains comparatively strong.

By dependence on these structures and the different RIS approaches, all regions follow some kind of RTDI policy support programmes. Moreover, the different regional structures are accompanied with specific characteristics as well as related trends and challenges.

The share of ***public and private actors*** participation within the R&D systems varies, generally reflecting different economic or research setups (see App. Tab. 6). With regard to the innovation system approach, the proportion of R&D performed by the business sector (BERD) is an indicator of the overall innovative capacity of a region. The regions Ostrobothnia, East of England, Lower Saxony, Flanders, Brittany, Catalunya, and PACA are dominated by the business sphere. Nonetheless, also there the public sphere plays an important, often complementary role. Tuscany and Andalusia are much more shaped by the public sphere, as the business sector there is sufficient initiate and carry out RTDI activities by itself.

Within the business sector, ***large foreign and national companies*** often play a major role in the RTDI processes, although all the regional economies are ***greatly characterised by SMEs***. This is mainly due to underdeveloped business innovation cultures, limited absorptive capacities, and low emphases on technological aspects as well as other barriers limiting the efforts of SMEs to conduct R&D. This gap is problematic since SMEs are significant providers of employment and their RTDI activities can have a sustainable impact on regional competitiveness and wealth. In turn, in regions that are highly dependent on RTDI activities of Multinational Enterprises (MNEs) and large national players (e.g. PACA, East of England, Lower Saxony, Ostrobothnia, Brittany, Flanders), this situation could lead to regional dependencies on location decisions of often globally (re-)acting companies. Additionally, some regions such as Brittany, PACA, Catalunya, and Andalusia are likely to suffer more from *headquarter bias* because big companies and research organisation often do not have their headquarters in these regions.

[11] *Ibid.*

Trends and challenges

Despite the current economic and financial crisis, the regions which have already managed to build up a knowledge-driven regional economy (at least to a certain degree) are likely to have better, more sustainable, and less volatile growth perspectives (e.g. Ostrobothnia, East of England, etc).

A further challenge is the rise of general unemployment and the long-term and youth unemployment figures that remain high in most of the regions (e.g. Catalunya, Andalusia, etc.). The population development and the Demographic Change are challenging all the regions studied. The regions are facing lower population growth, demographic ageing, and outmigration. The availability of human capital (secondary and tertiary education) is often satisfactory. However, most regions are confronted with high numbers of early leavers and a low participation rate of adults in further education (e.g. Tuscany, PACA).

Furthermore, except East of England, all regions need to increase their R&D capabilities (some most urgently, such as Andalusia, Tuscany, Catalunya, and Brittany). Moreover, in some regions (e.g. Andalusia, Tuscany, Lower Saxony) the structural change towards a more diversified and knowledge based economy has to be fostered. Existing potentials in high-tech sectors have to be strengthened. For this, SMEs play a crucial role. But so far, SMEs in the AMCER regions are not so strongly involved in innovation activities. Additionally, the link between businesses and research institutions is in some cases rather weak (e.g. Tuscany, Catalunya, Brittany, PACA, and Andalusia). More support is needed to support and encourage SMEs to conduct R&D.

Participation of AMCER Regions in EU RDI programmes

Regions have benefitted from their participation in EU programmes. However it is difficult to establish a clear link between their participation in EU programmes and their respective overall economic performances

As noted already in academic research and also in conclusions of the KIT project, in many regional situations increasing R&D investment does not have a significant automatic and immediate impact on growth and job creation because technological change, as an outcome of research, is only one way to generate wealth.

In the context of monitoring the EU R&D programme, the information concerning effective localisation of project beneficiaries is in some cases biased by the fact that the projects are allocated to national R&D organisations or companies which Headquarters are located in regions which are different from those were effectively and ultimately the RDI activity is performed.

This effect can in some cases significantly distort the image of the overall RDI activity performed in a given region for the purpose of monitoring, allocation of support resources, prioritisation of public support actions, avoidance of

duplication of resources, etc. that the authorities in charge of regional policies should be carrying out in the context of their normal monitoring and strategic planning actions.

The following exhibit shows the number of participations counted for each of the 9 regions according the headquarters localisation (column v) and the number of participations according participant department localisation (column vi). The *expected* headquarters effect is foreseen in relation to the structure of national research systems. It should be noted that the total number of participations of the 9 regions represents 7,5 % of the total FP participations with headquarters effect (5 590 over 74 460).

Table 2: FP7 participations according to Cooperation contracts database (until 31/10/2011)

Region	Country (i)	Expected headquarters effect (ii)	Nuts Code (iii)	Nuts Level (iv)	Number of participations according to the headquarter localisation (v)	Number of participations according to the participant department localisation (vi)	Headquarters effect in % Not checked by stakeholders (vii)
ANDALUSIA	ES	Strong	ES61	2	238	309	22,9%
BRETAGNE	FR	Strong	FR52	2	136	209	34%
CATALUNIA	ES	Strong	ES51	2	1351	1439	6,1%
EAST of ENGLAND	UK	Minor	UKH	1	962	1030	7 %
West Finland (OSTROBOTHIA)	FI	Minor	FI19	2	171	212	19,3%
FLANDERS	BE	Minor	BE2	1	1340	1408	4,8%
NIEDERSACHSEN	DE	Strong	DE9	1	542	656	17,4%
PROVENCE ALPES COTE DAZUR	FR	Strong	FR82	2	321	413	22,2%
TUSCANY	IT	Strong	ITE1	2	591	645	8,3%

(Source CORDIS elaboration AMCER TPG)

The analysis of the headquarter effect in each of the regions considered in the AMCER project revealed a number of commonalities. Firstly, in most regions the number of ingoing participations identified is considerably higher than that of outgoing participations. The analysis of the headquarter effect thus allowed to identify a high number of participations that would have been otherwise been attributed to other regions in their country. In Brittany for example, the analysis revealed 101 ingoing participations and no outgoing participations.

In addition to this, ingoing participations mainly concern research organisations; while private commercial and public organisation are less prone to generate a headquarter effect.

In general, it can be said that regions have certainly benefitted from the contributions provided by EU programmes. However, certain regions, possibly given their existing RDI capacities and potentials, have been more successful than other in attracting FP 7 funds, this is the case notably of regions with a strong network of HEI such as East of England, and/or with a strong relationships between research and innovation notably through SMEs

(Flanders, Catalunya, Tuscany). Some, however, are less successful than the national or EU average (Ostrobothnia, Lower Saxony, Andalusia, PACA).

The analysis of regional participation in FP7 showed that the weight of each region in total national FP7 is generally lower or equal to that of their weight in gross domestic expenditure on R&D. Tuscany and Catalunya are the only two exceptions to this.

The intensity of the headquarter effect varies considerably among each of the regions analysed. While it is safe to say that all regions are impacted by the headquarter effect, the number of participations concerned is not always equal. In Brittany for example, a headquarter effect was identified for 43% of the total number of participations; while in Catalunya this was the case for only 9% of participations.

The leadership rate[12] of the regions analysed also varies. In six out of the nine regions, the leadership rate is higher than the European average. This is notably the case of Catalunya and East of England. The average funding received per European project is either equal or higher to the European average. Ostrobotnia and Britanny however display lower averages in this field.

There is no general trend with regards to the structure of participation by type of participant (research organisations, private commercial, higher of secondary, public). In some cases, the structure and distribution of participation is similar to that of the national level (e.g. Andalusia), while in other it varies significantly (e.g. Brittany). The same applies to the distribution among public and private participants. In approximately half of the regions analysed, the share of participations coming from private organisations is higher than that of public organisations. In most regions (six out of nine), research organisations tend to outperform other types of organisation in terms of amount of funding attracted. This is illustrated by the gap between the share of funding received and the share participations.

SME in the regions analysed account for an average of 15% of FP7 funding. However, there are considerable differences among them. In Flanders for example, SME account for 43% of total national SME participations, while in Brittany SME participation represents only 4%.

[12] Intended as number of participants to FP7 projects which act as Work Package leader.

Thematic specialisation

The analysis of the amount of funding attracted by the regions for each of the programme subthemes, compared to the national and European level, allowed to reveal a first level of thematic specialisation. In terms of participation and predominant R&D themes also the situation is diverse and specific to each region. This is to some extent influenced by national characteristics.

Box 3: Explanation of the levels of specialisation within FP7

Levels of specialisation have been determined based on a 'regional attractiveness' indicator estimated by calculating a ratio between the "funds attracted per inhabitant" by the Region and the "funds attracted per inhabitant" by the country and Europe: a ratio above 1.00 indicates that the region is relatively more attractive than the Country or EU as a whole. A more detailed explanation on how this indicator was developed may be found in the methodological report of the AMCER project.

The strong, no specialisation and under-specialisation categories have been determined using the European attractiveness ratio for each region.

- Under-specialisation = 0 – 0.8;
- No-specialisation = 0.81 – 1.2;
- Strong specialisation = > 1.2.

The following table presents an overview of the main specialisation themes for each of the regions analysed, for the FP7 COOPERATION programme.

Table 3 Overview of the main specialisation themes for each of the regions analysed, for the FP7 COOPERATION programme (source CORDIS elaboration AMCER TPG)

	Research areas in which the regions have a strong specialisation	Research areas in which the regions do not show a specific specialisation	Research areas in which the regions are clearly under-specialised
Catalunya	• Health • Environment • Socio-economic sciences • Environment • Socio-economic sciences and humanities	• Food, agriculture and biotechnology • Nanosciences, Nanotechnologies, Materials and new production technologies • ICT • Transport • Space	• Energy • Security
Ostrobotnia	• Nanosciences, Nanotechnologies, Materials and new production technologies • Energy • Socio-economic sciences and humanities • Space	• Health • Transport	• Food, agriculture and biotechnology • ICT • Environment • Security • General Activities
PACA	• Space	• ICT • Security • Nanosciences, Nanotechnologies, Materials and new production technologies • Energy • Security	• Health • Food, agriculture and biotechnology • Environment • Transport • Socio-economic sciences and humanities
Flanders	• Food, agriculture and biotechnology • ICT • Nanosciences, Nanotechnologies, Materials and new production technologies • Energy	• Health • Environment • Transport • Socio-economic sciences and humanities • Security	• Space • General Activities
Tuscany	• Health • ICT • Nanosciences, Nanotechnologies, Materials and new production technologies • Energy • Socio-economic sciences and humanities • Space	• Environment • Security • Food, Agriculture and Biotechnology • Transport • Security	• General Activities
Lower Saxony	• Transport	• Health • Food, Agriculture and Biotechnology • ICT • Nanosciences, Nanotechnologies, Materials and new production technologies • Energy • Socio-economic sciences and humanities	• Environment • Security • Space • General Activities
East of England	• Health • Food, Agriculture, and Biotechnology	• ICT • Transport • Space • Nanosciences, Nanotechnologies, Materials and new production technologies • Environment • Transport • Socio-economic sciences and humanities • Space	• Energy • Security • General Activities
Andalusia	• General Activities	• Energy	• Health • Food, Agriculture and Biotechnology • ICT • Nanosciences, Nanotechnologies, Materials and new production technologies • Environment • Transport • Socio-economic sciences and humanities • Security • Space
Bretagne	• Food, Agriculture and Biotechnology	• Environment	• Health • ICT • Nanosciences, Nanotechnologies, Materials and new production technologies • Energy • Transport • Socio-economic sciences and humanities • Security • Space • General Activities

Concerning networking analysis the sample of regions is too limited to deduce some general trends as the situation remains specific to each region.

Sometimes the participation is highly concentrated geographically in one area (ie Ostrobothnia) or in some cases there is one part of the region that is more attractive than the others (cf Andalusia, Flanders, East of England).

Networks

The analysis of intra-regional collaboration patterns allow to understand the types of networks created at the regional level as a result of participation in FP7. Regional reports include a graphic representation of these networks. The following table presents the main indicators used to define regional cooperation networks[13].

The first two rows of the table present the number of *nodes* (actors) and *edges* (links or cooperations among these actors) and provide an idea of the sizes of the networks and the intensity of intra-regional collaboration. The subsequent rows mainly provide indicators on the density of networks, clustering and the gregarious nature of FP7 participants at the regional level.

As can be seen, the nature and size of networks varies considerably from while region to another. In general terms however, networks tend to display relatively high levels of node isolation and fragmentation, as well as weak clustering. These characteristics are in part expected because only collaboration in FP7 projects has been taken into consideration. Still, in the majority of cases a few central actors are highly connected and central.

Table 4 Networking indicators in AMCER regions

	MEASURE							
REGION	Size of the network	Organizations	Projects	Projects with 1 partner	Projects with 2 partners	Projects with 3 or more partners	Fragmentation	Level of aggregation (Clustering coefficient)
FLANDERS	very large	328	730	92	8	3	0,59	0,67
CATALUNYA	very large	312	632	124	8	1	0,70	0,52
TUSCANY	large	158	314	61	7	4	0,78	0,55
EAST ENGLAND	large	190	270	111	7	2	0,90	0,38
LOWER SAXONY	large	170	249	99	7	3	0,91	0,36
ANDALUSIA	medium	111	164	61	9	4	0,96	0,42
PACA	medium	119	160	69	7	8	0,99	0,39
WEST FINLAND (OSTROBOTNIA)	small	69	124	30	2	2	0,80	0,51
BRITTANY	small	60	94	26	4	2	0,85	0,50

(Source EU Commission 2011 elaboration AMCER TPG)

[13] A detailed explanation of each one of these indicators is provided in the methodological annex of the AMCER report.

Employment specialization

In terms of employment, most of the AMCER regions specialized in medium knowledge intensive sectors. Exceptions are Catalunya, East of England and PACA with stronger share in High knowledge areas; on the other end Andalusia and Tuscany have a stronger concentration on low knowledge sectors.

Box 4 Explanation of variations and indicators of employment specialisation

The variation 2004-2009 point out the percentage variation in the employment in high, medium and low knowledge intensive sectors, by comparing the number of employees in 2009 to the number of employees in 2004.

The specialization index with respect to Europe indicates whether the region concentrates more or less employment in certain sector(s) compared to the European average, which is 1.

Table 5 Employment specialization in 9 AMCER regions

		sectors by technology and knowledge intensity		
REGION		high	medium	low
ANDALUSIA	variation 2004-09			
	Specialization	0,74	0,92	1,39
BRITTANY	variation 2004-09	21.48%	6.86%	4.48%
	Specialization	1.01	1.11	0.72
CATALUNYA	variation 2004-09			
	Specialization	0,99	1	1,01
EAST ENGLAND	variation 2004-09	-3.28%	3.93%	-0.38%
	Specialization	1.31	1.03	0.70
FLANDERS	variation 2004-09	0,87%	0,93%	-1,80%
	Specialization	0,92	1,10	0,79
LOWER SAXONY	variation 2004-09	2,23%	1,49%	8,37%
	Specialization	1.01	1.12	0.68
OSTROBOTNIA	variation 2004-09	27.69%	15.98%	11.23%
	Specialization	0.52	1.11	1.05
PACA	variation 2004-09	11.95%	11.66%	9.34%
	Specialization	1.47	0.90	0.92
TUSCANY	variation 2004-09	6.61%	1.94%	-2.27%
	Specialization	0.58	0.87	1.63
	% employment EUROPE	16,5%	60,0%	23,5%

(source Eurostat elaboration AMCER TPG)

Patenting

Patenting activity also vary significantly, with some regions where this activity is supported by dedicated intensive patenting organizations or significant technology corporations. Sometimes patenting activities are strongly focussed on one or two key areas (notably electrical engineering).

Table 6 Patenting – productivity and main sector specialization in AMCER Regions

		Electrical engineering	Instruments	Chemistry	Mechanical engineering	Other fields
ANDALUSIA	total patents	7	15	40	16	5
	specialization*	1,22	3,76	0,63	0,23	0,00
BRITTANY	total patents	373	18	41	21	7
	spec	0,33	0,57	0,14	0,14	0,00
CATALUNYA	total patents	112	159	380	172	55
	spec	1,05	3,39	0,62	0,27	0,00
EAST ENGLAND	total patents	189	96	102	89	22
	spec	1,31	1,86	0,77	0,31	0,00
FLANDERS	total patents	637	196	542	371	109
	spec	1,00	0,94	0,73	0,87	0,00
LOWER SAXONY	total patents	314	164	389	337	57
	spec	0,76	1,78	0,72	0,64	0,00
OSTROBOTNIA	total patents	2	4	1	2	0
	spec	3,01	1,55	0,46	0,00	0,00
PACA	total patents	360	58	93	41	24
	spec	0,70	0,97	0,21	0,37	0,00
TUSCANY	total patents	91	78	71	248	35
	spec	0,72	1,08	0,99	1,42	0,45

* compared to country

(Source REGPAT for years 2002 to 2007, elaboration AMCER TPG)

Analysis of FP7 Themes and sub-themes

FP7 allocates a total of EUR 32 413 million to the Cooperation specific programme. This funding is mainly aimed at supporting cooperation between universities, industry, research centres and public authorities through collaborative research projects. As of October 2011, 3 725 projects were funded through the FP7 cooperation programme representing a total of 14.5€bn.

The FP7 cooperation programme covers 11 themes (Cf. Box 1) which themselves cover a number of research areas. For the purposes of this study, 188 research areas have been selected in order to perform a regional specialization analysis of each theme.

Box 5 The 11 themes of the FP7 cooperation programme (and the number of research areas for each of them)

The 11 themes of the FP7 cooperation programme (and the number of research areas for each of them)

- Health (13 research areas)
- Food, Agriculture, and Biotechnology (17 research areas)
- Information and Communication Technologies (12 research areas)
- Nanosciences, Nanotechnologies, Materials and new Production Technologies (16 research areas)
- Energy (8 research areas)
- Environment (including Climate Change) (9 research areas)
- Transport
    - Aeronautics (17 research areas)
    - Surface transport (15 research areas)

Socio-economic sciences and Humanities (18 research areas)

- Space (5 research areas)
- Security (7 research areas)

The analysis of the themes and sub-themes for each AMCER Region is provided in the regional profiles annexed to the present report.

Social Network Analysis in AMCER

The aim of a Social Network Analysis (SNA) is to develop a mapping of collaboration patterns in the FP; both between project participants and between regions and countries involved.

The SNA allows the assessment of:

- The extent to which the EU programmes contribute to building the ERA through the implementation of trans-regional research projects;

- The degree of integration of regions and the evolution of participation of regions with different research profiles around a core group of regions;

More precisely the analysis will allow the mapping of:

- The links between regional research driven clusters and their partners;
- The evolution in the ERA of the synergies created;
- The regional main players and collaboration patterns.

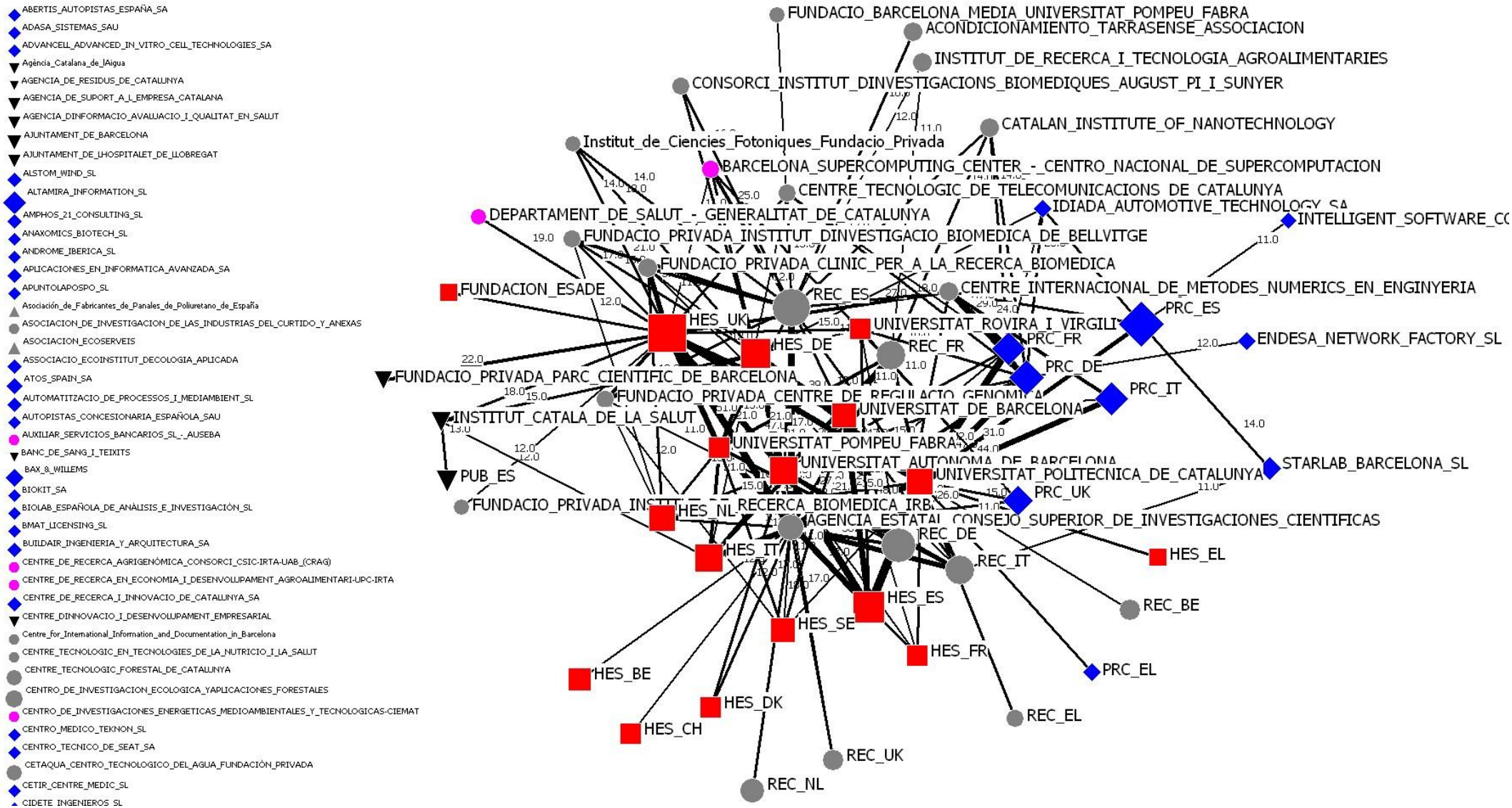
The main objective of the AMCER project is not to provide a detailed SNA for each of the 9 regions. Instead, it seeks to illustrate the utility of this particular tool in the analysis of the impact of European funding on the development of links between research actors, and creation of collaborative networks at the regional, national and the European level.

The SNA tables included in the regional profiles presented at annex to the present report represent an example of how Social Network Analysis can contribute to this type of analysis.

The SNA figures that are presented for each region are meant to provide a starting point that may lead to further enquiries into the collaborative patterns existing within and among regions. The tables included in the regional profiles show the links existing among actors that have been regrouped according to their country of origin and the type of organization (see annex).

They have been built on the basis of aggregated data from several different specific programmes, and as such, do not reflect specific theme-oriented trends. In no manner shall these be considered as offering an exhaustive view of the collaboration networks of each region under the Seventh Framework Programme of the European Commission.

Figure 2 Example of SNA analysis for Catalunya (source EU Commission elaboration AMCER TPG)



The main collaborations between participant of ES51 and European participants in the FP7 cooperation programme (link exists if entities collaborate more than 10 times)

3 Options for policy development

The design of Smart specialisation strategies and AMCER project

The monitoring and the use of several types of indicators have a crucial importance at different moment of the life cycle of a programme or a strategy. These three crucial steps take a part in the design process, each type of output/outcome indicator take different importance according to the stage of realisation of the programme/strategy.

These three steps of the policy cycle can be listed as follows:

1. Indicators to monitor the implementation of the programme strategy
2. Indicators to assess the impact of the programme/strategy (leverage effect measurement)
3. Indicators to design the future programme/strategy to be launched.

Indicators provided by AMCER such as participations indicators, numbers of patents[14], clusters analysis contribute each to the three stages listed previously.

The design of a Regional innovation smart specialisation strategy has to be delivered jointly with the next ERDF Operational Programme for the 2014-2020 programming period. The European Commission, through DG Regio and DG JRC, has launched the concept of smart specialisation strategies and support the regions with guidelines[15] and with various tools such as an internet platform[16] and conferences.[17]

AMCER shows that most of European regions suffer from a lack of reliable Science and Technology indicators. Moreover these indicators are not comparable among regions due to the absence of a common framework. In addition to the use of traditional indicators such as patents and publications, AMCER propose to exploit data on the participation in EU programmes.

The participation information is a proxy indicator. Being upstream of the S&T delivering process, it does not testify of any S&T results but assess stakeholders' behaviour in terms of:

- Choice of research fields which corresponds or does not correspond to economic sectors,

[14] Nikulaien (2008) shows how patent data can be used to a certain extent to assess the progress of the industry toward smart specialisation by looking at the increase in patent applications by P&P firms related to nanotechnology.

[15] http://s3platform.jrc.ec.europa.eu/s3pguide
[16] http://s3platform.jrc.ec.europa.eu/fr
[17] JRC-IPTS is planning to organise a conference about indicators and smart specialisation in Groningen (Netherlands) in January 2013

- Choice of European strategic alliances.

The AMCER project results could constitute a useful contribution for the participating regions in the context of preparation of their respective Smart Specialisation Strategies and more generally in the context of the planning for the next cycle of the EU Financial Framework 2014-2020. In particular, AMCER project shows that EU programme participation indicators can be used smartly in order to draw the specialisation profile of each region and their main European collaboration axis.

Methodological approach of the design of RIS3 and AMCER results

This section aims at presenting the main content of the guidelines distinguishing where indicators and especially AMCER contribution could feed the design process.

A step by step approach has been developed in the design of RIS3. These steps are developed in a guide targeting at Structural Funds Managing Authorities, policy-makers and regional development professionals. It sets out the concept of smart specialisation and provides orientations on how to develop research and innovation strategies for smart specialisation (RIS3). Guidance is structured around six steps:

1) Analysing the innovation potential
2) Setting out the RIS3 process and governance
3) Developing a shared vision
4) Identifying the priorities
5) Defining an action plan with a coherent policy mix
6) Monitoring and evaluating

AMCER results feed the design process for the steps 4, 5, 6 by using EU programmes participation of regions as intermediary outcomes revealing to the regional key players their collaboration patterns and sectors/research fields to target.

The identification of 'niches' appears also as a crucial issue. Within the perspective of a RIS3, it can also be argued that too little emphasis is placed on the *identification of 'niches' or specific domains for (present and future) competitive advantages*, from an international stance. Hence, the work for this analytical step of a RIS3 strategy should combine the above types of analyses with other analyses aiming at shedding light on potential for knowledge-based transformation of the economy, based on information on the positioning of the regional economy in international value chains and on identification of specific key assets.

The Analysis of (matching) Scientific and Technological specialisation: analyses of specialisation of R&D investment, publications and citations, and patent applications and citations by 'field' or the participation in collaborative projects of EU programmes (as AMCER project proposed it). A region has a

comparative advantage in a certain field if it shows an above-average concentration of these indicators compared to the value taken in the country or a group of countries.

Therefore, on the basis of the European Commission guidelines for regional smart specialisation strategies, the AMCER project results could constitute a useful contribution for the participating regions in the context of preparation of their respective Smart Specialisation Strategies and more generally in the context of the planning for the next cycle of the EU Financial Framework 2014-2020. The individual RIS3 strategies would take the form of an annex to the Operational Programmes for the next Financial Framework of Cohesion programmes. In particular AMCER results on FP 7 participation, collaboration patterns, possible headquarter effects, main R&D sectors to be targeted, etc. should contribute notably to assessments concerning: identification of priorities; definition of an action plan with a coherent policy mix; and monitoring and evaluation.

Issues of regional data in EU programmes

The aim of the AMCER project has been i.a. to establish a link between different programmes such as FP7 and ERDF by focussing on the cases of the 9 participating regions. It also confirmed that there is a need to involve more the regional stakeholders in the monitoring of the implementation of FPs in order in particular to allow compatibility with regional monitoring.

It should also be noted that access to EU databases had been problematic and had created substantial delays in the project implementation, which had not been foreseen in the planning phase of the project.

Among the challenges encountered during the project implementation, it should be noted that that the quality of the data collected by the EU about the performance of the EU RDI programmes could be improved to provide useful, readily accessible conclusions for policymakers and practitioners within the regions. For instance, within 6th and 7th Framework Programmes on RD no impact indicators exist. In other programmes data of localisation is not collected in a systematic or harmonized way with other programmes.

Data related to EU Social Fund is not in the scope of the project activities and its inclusion would not be possible at this stage for reasons of accessibility, relevance and comparability of the data.

It should be noted that concerning East England, R&D data predated the end of the RDA structure in the East of England and this was to be borne in mind for exploration where appropriate.

The AMCER activities and research has demonstrated that EU databases should be improved in the context of the next Framework Cycle till 2020, by integrating geographical information and localisation, notably in order to effectively localise the research departments that effectively carry out the work

related to the EU programmes. Possibly this should be made into an effective reporting/monitoring requirement in the programme manual.

The ultimate aim would be to make the regions more self-reliant in terms of data analysis concerning the EU programmes.

Concerning the CIP, the monitoring structure should converge towards the FP structure.

At regional level, links should be established (or enhanced where existing already) between the administrative departments in charge of EU Programmes and those implementing ERDF by establishing effective communication and coordination mechanisms. Possibly the administrative capacity, should be concentrated in the context of regional agencies together with standardised and mandatory set of procedures. For Member States like the United Kingdom this may be a challenge given the absence of English regional agencies.

In the context of the planning for the next Financial Framework, the European Commission could also provide guidelines concerning data harmonisation. In this context, the regional scoreboards prepared in the context of the AMCER project could serve as a basis or model as a possible way to harmonise the data coming from different sources/programmes.

It should be noted that there is no regional agenda within the Framework Programmes which were not conceived to have a territorial dimension and were not evaluated on a geographical basis. Rather the FP was and would continue within next cycle to support excellence.

Each financial instrument has its specificities and focus, and it is not the purpose of the present report to assess them. However, it has appeared in the course of the project activities and in particular in contacts with regional stakeholders that better coordination and exchange of information should be sought between the bodies in charge of their implementation at Commission level (DG Regio and RTD) and the authorities in charge of regional policies in charge of RD policies and ERDF implementation.

Confidentiality aspects should be taken into account: for example, information related to individual financial contributions should not be divulgated. It is also considered by some regions that the information about failed applications to R&D programmes should be kept confidential.

Data Protection

The main rules for recording and processing of personal data (notably in the context of EU programmes, procurement and contracts, is Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the European Union institutions and bodies and on the free movement of such data.

However, for the purposes of safeguarding the financial interest of the Union, personal data may be transferred to internal audit services, to the Court of Auditors, to the Financial Irregularities Panel and/or to the European Anti-Fraud Office (OLAF).

In particular, the rules concerning the access to CORDA data base are outlined in a dedicated Commission document, "Confidentiality rules for Framework Programme data stored in CORDA and E-CORDA". [18]

Therefore, without prejudging the prerogatives of each institution, while preserving confidentiality of data, some measure of access should be provided to authorities in charge of regional policies to the EU data on relevant RTD programmes such as Framework Programme, CIP, etc.

This could take the form of a contract or MoU which will establish an appropriate procedure for the request including format, time for reply, condition of use, and subscription of confidentiality measures.

Summary on access to main sources of data of EU programmes

The overall situation concerning access to data is as follows:

Data from CIP-EIP (Entrepreneurship and Innovation Programme) was not been retained as there is no structured database for this programme.

For CIP-IEE, only partial contract database had been provided and with limited geographical information.

Data from CIP-ICT has been used and corrected for HQ effect, although, following assessment during the course of the project analysis, this programme has little or no influence on the AMCER regions RTDI activities.

Concerning data from Framework Programme on R&D, priority was given to research and analysis of FP7, which provide the most interesting and relevant information for AMCER analysis.

FP7 data was compiled for each region and circulated to Stakeholders for validation and verification, notably to identify certain recipients in their respective regions; verify cases of "suspicious participation" i.e. for beneficiaries where laboratory is located in another region than the HQ.

Information concerning FP6 has been taken into consideration as appropriate for historical/background purposes. FP6 results were already reviewed in part through relevant programme evaluations and other studies. It was not considered interesting for the project analysis as it is outdated and not directly comparable.

Concerning ERDF: Data is in many case difficult to access for various reasons: data is not collected in a systematic and comparable format as FP programmes, notably in terms of terminology and categories; use of national

[18] Ares(2011)185152 - 18/02/2011

language; some beneficiaries are difficult to identify (ex. SMEs); changes in administrative setup, heterogeneous formatting of the databases, etc.

Particular attention should be given to the issue of reliability of the classification of activities in the EU programmes and notably in ERDF. Data collection and its use should also be better codified (both in terms of common definition of fields of template to be filled and type of data) in the context of ERDF

Finally, impact indicators are in many cases weak, non-existent or not filled properly. ERDF contains some indication of impact but it is in general of limited quality. Therefore it is difficult to evaluate the performance of the projects and programmes concerned. Indicators should be reinforced, introduced where lacking and made more explicit. Clear instructions should be given on how to fill these indicators.

in the context of ERDF, data collection and its use should also be better codified (both in terms of common definition of fields of template to be filled and type of data).

Data related to EU Social Fund, notably as possibly related to development of Human Resources for RDI was not in the scope of the project activities and its inclusion could not be possible for reasons of accessibility, relevance and comparability of the data. However, Analysis of relevant ESF data may be considered by some stakeholder as important and may be included in future analyses.

Issues related to EU programmes databases

The AMCER project aims also to recommend improvements to EU Programmes databases so they can be useful at regional level.

Localisation of beneficiaries has been one of the objectives of the project from the start and has proved a source of difficulties in carrying out the project analyses. As already noted in several instances, the headquarter effect has had a distorting influence in general. But this is not the only problem affecting localisation. In many cases, information is provided in diverse formats (NUTS code, postal code, address, PIC code). In some cases the information is not collected at all.

information about localisation of final beneficiaries should be collected systematically in a common format (possibly PIC code), and be the same also for different programmes. This would facilitate greatly monitoring activities.

Coordination of EU programmes

Framework programs and Structural Funds are complementary and together result in high frequency knowledge networks with strong ties, establish and facilitate intraregional linkages, connecting the region to the high-level knowledge networks, stimulate networking amongst companies and other regional institutions.

The Structural Funds have been used on many occasions to establish research and innovation centers as well as to promote co-operation between higher education and applied research bodies and the private sector, whilst the Framework Programs have also been instrumental in promoting such co-operative arrangements.

Such actions are taking place in both economically strong and weak areas, although there is evidence that the relative impact is greater in economically weak areas. However, Framework Programs are particularly prone to reinforcing existing clusters of activity, the benefits are often highly concentrated within regions, and knowledge may be principally retained by the project participants themselves.[19]

It is generally noted that Horizon funds would not be allocated on a geographical basis, however, it was recognised that territorial dimension of RDI and the coordination with CSF/ERDF should be pursued as much as possible.

The following table provides an outline of the points of convergence between the Europe 2020 strategy and Cohesion policy.

Table 7 Outline of convergence point between EU2020 strategy and cohesion policy

	Europe 2020 Strategy			**Cohesion policy**
EU priority	**Objective**	**Headline target**	**Flagship initiative**	**Thematic priorities**
Smart growth	• Improving the conditions for innovation, research and development	• R&D 3% of GDP (A new indicator for innovation)	Innovation Union A Digital Agenda for Europe An Agenda for New	• **Strengthening research and technological development** (IG4) • **Promoting innovation and smart specialization** (IG4) • **Enhancing accessibility to and use and quality of information and**

[19] Espon, 2.1.2 project, Final Report 2006

			Skills and Jobs	**communication technologies**(IG4)
				• **Removing obstacles to the growth of SME's** (IG6)
	• Improving education levels	• At least 40% 30-34 old having completed tertiary education • Reduce school dropout rates to less than 10%	Youth on the Move An Agenda for New Skills and Jobs	• **Improving the quality and performance of education and training system at all levels and increasing participation in tertiary or equivalent education** (EGL9)
Sustainable growth	• Meeting climate change and energy objectives	• 20% reduction of G-emission	Resource efficient Europe	• **Supporting in all sectors the shift towards a low-carbon, resource efficient and climate resilient economy** (IG5) • **Promoting renewable energy sources** (IG5)

(Source European Commission 2012)

On principles, there should be a structured and coordinated debate, possibly in the context of the smart specialization strategy process concerning an overall and coherent approach combining: territoriality elements of RDI programmes, access to data by authorities in charge of regional policies, harmonized monitoring approach and indicators, coordination with other related programmes (EU/national). The ultimate aim would be to make the regions more self-reliant in terms of data analysis concerning the EU programmes.

Role SMEs

SMEs play an important role in R&D and particular in translating it in innovations, creating value, wealth and employment in Europe.

The EU has particularly focused assistance on SMES. Between 2007 and 2013, cohesion policy programmes support explicitly the creation and growth of SMEs, including activities related to access to finance, research and innovation, technology transfer, access to information and communication

technologies or environmentally friendly production. About €27bn (7.9% of the total Cohesion policy allocation) are allocated specifically to SMEs.[20]

SME also participate in FP7 and at least 15% of the funding of the Cooperation programme to go to SMEs. By the end of September 2012, SMEs made up 18.5% of all participations on the Cooperation programme.[21]

SME in the regions analysed account for an average of 15% of FP7 funding. For more detail see table below.

[20] European Commission, DG Entreprise.
[21] European Union. (2012) SME participation in FP7

Table 8 SME participation rate in FP7 Cooperation programme

	% of regional participations in national participations	% of regional SME participations in national SME participations	% of regional EC funding in national EC funding	% regional SME EC funding in national SME EC funding	% of regional SME participations in total regional participations	% of national SME participations in total national participations	% of regional SME EC contribution in total regional EC contribution	% of national SME EC contribution in total national SME EC contribution
FLANDERS	51%	42%	61%	43%	18%	21%	12%	17%
LOWER SAXONY	7%	7%	7%	7%	17%	17%	12%	12%
CATALUNYA	28%	23%	31%	22%	17%	20%	11%	16%
ANDALUSIA	6%	6%	7%	6%	21%	20%	14%	16%
OSTROBOTNIA	15%	21%	13%	20%	18%	13%	14%	9%
BRITTANY	3%	4%	3%	3%	16%	16%	11%	11%
PACA	7%	12%	6%	15%	28%	16%	25%	11%
TUSCANY	10%	11%	11%	12%	20%	18%	15%	14%
EAST ENGLAND	12%	11%	13%	10%	14%	16%	9%	12%

(Source EU Commission/CORDIS 2011 elaboration AMCER TPG)

The research and analysis carried out on SMEs in the context of the AMCER project concerning the 9 Stakeholders regions have highlighted that:

- In general, SMEs play a crucial role in diversified and knowledge based economy, in particular in Hi-tech sectors but SMEs in the AMCER regions are not so strongly involved in innovation activities.

- Additionally, the link between businesses and research institutions is in some cases rather weak (e.g. Tuscany, Catalunya, Brittany, PACA, and Andalusia).

- SMEs in the target regions have benefitted substantially of EU RDI programmes.

- The vast majority of regional SME participations is constituted by private commercial SME (in most cases 100%).

- SMEs participations are roughly proportional to the regional share of overall national participations.

- The share of total national SME participation varies from region to region: from 4% in Brittany to 43% of total national SME participations in Flanders (depending whether in number of participations or in value of funding).

- SMEs are often concentrated or clustered in one of the region provinces.

In order to better understand SMEs' role in regional RDI development, it would be useful for the data concerning their participation in EU programmes to be collected in a systematic way on the basis of common definition (possibly harmonized with Cohesion Funds requirements).

Aspects related to territorial perspective

The AMCER project focuses on 9 case regions. Beyond the nine regions, the main offering of the AMCER project is a method/tool for other regions to monitor the performance of EU programmes on RDI and 'territorialise' R&D data.

The AMCER project is not per se based on a purely territorial approach as other previous ESPON studies, which have addressed the topic of the territorial impact of R&D policies (ie EATIA, FOCI, KIT, R&D Policy Impact). These studies did not share the same regional focus as the AMCER project. Equally these projects were generally grounded in more qualitative assessments around impact/significance.

In particular the AMCER proposed Methodology (see annex), allows regions to correct headquarters effect and therefore correctly evaluate the amount of RDI funding which effectively is allocated on their territory.

Additional analyses on participations in EU R&D programmes allows to determine the intensity of i) collaboration with other regions and countries and ii) the level of collaboration within the region between regional actors of different type (collaborative links – Social Network Analysis).

Levels of FP7 specialisation have been determined based on a 'regional attractiveness' indicator which can be a useful tool for region to develop their regional Smart Specialisation Strategy.

Also Comparison of specialisations of the regions is provided in each regional profile based on the comparison of specialisations on RDI, within FP, in RDI employment sectors and patents. This also can be a useful contribution to definition of regional specialisation strategies.

Ultimately, AMCER constitute a tool for regions to better understand how RDI activities are related to territorial perspective. For this purpose it is proposed that regions should be enabled to have access to EC databases on RDI programmes. This would allow to improve monitoring of RDI activities in regions; coordinate the use of Structural funds for development of knowledge and technology activities; develop regional smart specialisation.

For this purpose, improvements to EC databases are suggested in order to allow localisation of beneficiaries, correct headquarter effect, possible harmonisation of themes and topics, etc.

Governance

Policy-formulation level: concerning general legal frameworks, governance processes and 'cultural' issues within or above a given innovation system. In medium to large Member States, there is a clear need to take action to improve coordination amongst regional programmes and policies, both horizontally between regions and vertically with central government departments. An approach via interministerial 'committees' does not necessarily seem optimal (e.g. Spanish experience).

Rather investment in strategic intelligence tools such as policy benchmarking, foresight, inter-regional co-operation programmes can create a voluntary exchange of now-how.[22]

Role of national/regional RTDI agencies:

While this aspect was not the main focus of the project, in the course of the project activities it was noted in several instances the key role played by

[22] See i.a. Regional Innovation Monitor, Innovation Patterns and Innovation Policy in European Regions - Trends, Challenges and Perspectives 2010 Annual Report, 2011.

dedicated public bodies for the coordination of RTD policies and programmes, whether at national level (Spain RDTI)[23], regional (Flanders EWI).

In addition, the negative effects in terms of monitoring and coordination capacities of the reform of the regional policy in the UK have been noted. There is no feedback or capacity to access, evaluate the accuracy and possible distortions within the EU programs datasets.

As Noted in RIM EU report 2010, in most cases regions need to improve their coordination.[24]

Cities

Urban areas are home to main drivers of innovation and economic growth. Within Europe, London, Paris, and the Rhine-Ruhr area stand out as large and highly integrated metropolitan areas. They are followed by Madrid and some other capital cities.[25]

Nano-, bio-, information-technology and cognitive (NBIC) sciences are expected to drive future innovation waves. These sectors are expected to drive the next innovation wave which is expected to emerge by 2020. Accordingly, the location of NBIC centres may influence the future path of the European urban system. The locations and networks of this important sector, mainly in Europe's capitals and university cities, will become increasingly influential in the European urban system.[26]

The 9 AMCER regions, with the exception of Catalunya, do not correspond necessarily to important economic city hubs. Mostly gravitate at the periphery of significant economic and political capitals such as Madrid, Paris, Milan/Rome, London and Berlin. While belonging to the largest EU member states (Germany, France, Italy, Spain, UK), the 9 regions can be considered sufficiently connected taking into account that the most connected regions tend to be those hosting national capitals.

23 In particular it was noted the central role played by Spain national RDI agency (CDTI) in promoting FP7, making available information from CORDA to regions, collecting information at regional and provincial level, including information also about failed proposals, etc.
24 Regional Innovation Monitor, Innovation Patterns and Innovation Policy in European Regions - Trends, Challenges and Perspectives 2010 Annual Report, 2011
25 ESPON Synthesis report 2012
26 *Ibid.*

Transferability of results

The methodology that has been developed for the AMCER project is based on a pragmatic approach. It does not constitute a systematic user guide that would be followed step by step by a new user.

In particular, the approach aims to produce overall scoreboards of performance to aid regions to build their investment monitoring and support strategies. These scoreboards or regional profiles should serve as a model for the regions to develop their own approach based on their administrative set-up, monitoring approaches, policy mechanisms etc.

Also, the proposed AMCER approach is based on the methodology outlined in at Annex to the present report as well as in the nine AMCER regional profiles which can constitute a possible model and a source of inspiration for the authorities in charge of regional policies who wish to further develop their monitoring approach for RDI programmes and activities.

It should be noted that the approach developed for the AMCER project is replicable but implies a deep knowledge in the structure of the European databases as well as in the management tool of databases. The AMCER approach is aimed at describing the general process and the different steps.

However, regional actors who would like to follow the AMCER approach should take into account that:

- Sources are different for each programme and, as a matter of fact, database structure changes from one programme to another.
- Data available at national or regional level are displayed in a format that is specific to each country or region (most often the format depends on the way the statistical services deal with their own statistics and on their own objectives).
- Regional administrative structures are often specific, at least in each country, and the approach need to be adapted to the administrative set-ups and information and decision making mechanisms of the regions.

Therefore, ultimately, authorities in charge of regional policies in charge of planning, managing and monitoring RDI programmes should review the results of the AMCER project and carry out a reflection about the possible relevance and adaptability of the approach devised in this project to their specific situation taking also into account the status of their monitoring efforts.

Policy recommendations

1) Participating AMCER regions and countries

At regional level, better coordination is needed between services in charge of the follow-up of the ERDF programme and the services in charge of the monitoring of the FP/CIP. Notably, links should be established (or enhanced where existing already) between the administrative departments in charge of the ERDF participation analysis and FP/CIP participation monitoring through effective communication and coordination mechanisms in order to develop a common frame for monitoring and for developing indicators. Possibly the administrative capacity could be concentrated in the context of regional agencies with standardised and agreed procedures. The exception to this could be Member States like the United Kingdom given the absence of regional agencies.

2) European regions generally

In order to improve coordination, benchmarking and monitoring efforts, the following aspects would be useful:

- A set of common definitions among the programmes would be useful. For instance, a common approach for counting the regional participations, in particular for those participations spread into many laboratories.

- A set of common scientific themes would also be useful, based on FP7 common themes, in order to improve comparability and monitoring.

- For the planning for the next Financial Framework, compatible and coordinated guidelines concerning data harmonisation could be devised.

- The AMCER regional scoreboards could serve as a basis or model as a way to harmonise the data coming from various sources/programmes.

- A common set of indicators for monitoring R&D participation, these indicators should be useful to feed regional policies.

3) European Commission

On principles, there should be a structured and coordinated debate, possibly in the context of the Smart Specialization Strategy process concerning an overall and coherent approach combining:

- Territoriality elements of RDI programmes,
- Access to data by authorities in charge of regional policies,
- Harmonized monitoring approach and indicators,
- Coordination with other related programmes (EU/national).

The ultimate aim would be to make the regions more self reliant in terms of data analysis concerning the EU programmes.

Permanent and effective governance mechanisms for the coordination of financial instruments should be devised to improve the management, performance and efficiency of the synergies between Horizon 2020 programme and Common Strategic Framework (CSF) Funds notably ERDF, but also ESF as it concerns Human Resources support for R&D.

EU databases should be improved in the context of the next Framework Cycle till 2020, by integrating geographical information and localisation, notably in order to effectively localise the research departments that carry out the work related to the EU programmes. Possibly this should be made into an effective reporting/monitoring requirement in the programme manual.

However, improvements of the information provided by contracts' databases FP7 database has been noted. Within those surveyed during the course of the AMCER project, the FP contract database appears as the most complete and reliable database. DG RTD has significantly improved the quality and the reliability of the data. The FP7 database provides useful information on the localisation of research departments.

According to the experience accumulated by AMCER, the only recommendation for the FP7 database would be to always request (make mandatory) the information about the localisation of the research department. CIP sub-programmes' databases should adopt the same structure as that of the FP7.

In order to better understand SMEs' role in regional RDI development, it would be useful for the data concerning their participation in EU programmes to be collected in a systematic way on the basis of common definition (possibly harmonized with Cohesion Funds requirements).

Aim of further research

Regional typologies for R&D

Further investigate the possibility to achieve Regional typologies on the basis of the results of the KIT project and taking account of the other similar classifications of regional performance in terms of knowledge, innovation, research and development, such as Erawatch, the RIM and RIS.[27]

Regional Innovation Systems (RIS)

Consideration may be given to further explore the possibility of using the Regional Innovation System model of analysis on the basis of Cooke's approach[28] to complement place-based analysis of RDI regional systems.

AMCER methodology and approach

The AMCER methodology which integrates the RIS analysis approach, together with the effective results and effects of the regions' participation in EU RDI programmes, and with their overall performances in terms of RDI output, can usefully contribute to:

- The design of targeted and comprehensive innovation policy strategies
- Complement place- based analysis of regional RDI systems
- Improve efficiency and effectiveness in design, delivery and assessment of RDI policies and programmes at regional level.
- Develop related monitoring tools to monitor regions' performances in RDI policies and programmes.

In particular, the AMCER project results can constitute a useful contribution for the participating regions in the context of preparation of their respective Smart Specialisation Strategies and more generally in the context of the planning for the next cycle of the EU Financial Framework 2014-2020.

Therefore as expressed by some of the stakeholders in the AMCER project, further consideration could be given at making the AMCER approach of collection, analysis and dissemination into a permanent and ongoing process also for other regions.

[27] Tödtling, F., Trippl, M: One size fits all? Towards a differentiated regional innovation policy approach. Research Policy 34, 1203-1219. 2005.

[28] COOKE, P.: Regional Innovation Systems: Competitive Regulation in the New Europe. In: Geoforum, 23, p. 365-382. 1992. COOKE, P.: Introduction: origins of the concept. In: BRACZYK, H.-J., COOKE, P., HEIDENREICH, M. (Eds.): Regional Innovation Systems: The Role of Governances in a Globalized World. (1. Ed.). London: UCL Press, p. 2-25. 1998. COOKE, P.: Introduction: Regional innovation systems – an evolutionary approach. In: BRACZYK, H.-J., COOKE, P., HEIDENREICH, M. (Eds.): Regional Innovation Systems: The Role of Governances in a Globalized World. (2. Ed). London: UCL Press, p. 1-18. 2004.

Appendix Table 1: RIS Types by Governance Dimension

RIS Type	Primary Source of Initiative	Primary Source of Funding	Predominant Competences	Degree of Coordination	Degree of Specialization
Grassroots	Locally organized (e.g. town or district level)	Diffused locally	Applied and near-market	Supra-local degree of coordination is likely to be low	Likely to be low and problem-solving likely to be generic than significant
Network	Multi-level	Guided by agreements among banks, government agencies and firms	Pure, applied, exploration, exploitation	Assumed to be quite high, due to existence on many actors	Rather flexible than dedicated
Dirigiste	Mainly from outside and above the region itself	Centrally determined, with decentralized units located in the region	Basic or fundamental, often to the needs of larger, stated-owned firms	Likely to be very high, because state-run	Likely to be high

(Source: own creation; based on COOKE 1998a and 2004)

Appendix Table 2: RIS Types by Business Innovation Dimension

RIS Type	Enterprise Domination	Research Reach	Associationalism
Localist	Tend to have few or no large indigenous firms and relatively few large branches of externally-controlled firms	- Business innovation culture is not very great, although there may be local research organizations capable of combining with industry clusters within the region - Will probably have few major public innovation or R&D resources, but may have smaller private ones	Reasonably high degree of association among entrepreneurs and between them and local or regional policymakers
Interactive	Balance between large and small firms	- Varies between numerous instances of access to regional research resources - Mix of public and private research institutes and laboratories is balanced, reflecting the presence of larger firms with regional headquarters and a regional government keen to promote the innovation base of the economy	Above-average
Globalized	Dominated by global corporatios, often supported by clustered supply chains of rather dependent SMEs	Largely internal and private rather than public, although a more public innovation structure aimed at helping SMEs may have developed	Normally greatly influenced by the needs of large-sized enterprises, and conducted to a significant extent to their terms

(Source: own creation; based on COOKE 1998a and 2004)

Appendix Table 3: Economic Performance of the nine AMCER-Regions

Region	GDP in Billions of EUR (2008)	GDP per capita (2008)	GDP per capita in % of the EU-27 average (2008)
Flanders (Belgium)	199.3	32,200	128.3
Ostrobothnia (Finland)	5.9	32,000	127.7
Tuscany (Italy)	106.1	28,700	114.3
Provence-Alpes-Côte d'Azur (France)	140.3	28,600	113.9
East of England (United Kingdom)	159.5	28,000	111.6
Catalonia (Spain)	202.8	27,900	111.2
Lower Saxony (Germany)	211.8	26,600	106.0
Bretagne (France)	83.7	26,500	105.6
Andalusia (Spain)	149.0	18,400	73.3

(Source: own creation; based on data from EUROSTAT 2011 and STATFIN 2011)

Appendix Table 4: Economic Structure of the nine AMCER-Regions

Region	Share of agriculture sector in employment in % (2008)	Share of industry sector in employment in % (2008)	Share of service sector in employment in % (2008)
Catalonia (Spain)	2.0	33.1	65.0
Ostrobothnia (Finland)	6.3	32.0	60.7
Tuscany (Italy)	3.0	31.2	65.8
Lower Saxony (Germany)	3.0	28.3	68.7
Flanders (Belgium)	1.9	26.7	71.3
Bretagne (France)	6.1	23.6	70.3
Andalusia (Spain)	7.5	23.2	69.3
East of England (United Kingdom)	1.8	21.5	76.5
Provence-Alpes-Côte d'Azur (France)	3.3	17.2	79.3

(Source: own creation and calculations; based on data from EUROSTAT 2011 and RCO 2011a)

Appendix Table 5: Unemployment in the nine AMCER-Regions

Region	Unemployment rate in % (2010)	Long-term unemployment share in % (2009)	Youth unemployment rate (15-24 year-olds) in % (2009)
Flanders (Belgium)	5.1	30.4	15.7
Ostrobothnia (Finland)	5.9*	28.0	15.9
Tuscany (Italy)	6.1	34.3	17.8
Lower Saxony (Germany)	6.5	46.7	10.3
East of England (United Kingdom)	6.6	22.3	16.5
Bretagne (France)	7.2	25.4	15.5
Provence-Alpes-Côte d'Azur (France)	10.2	36.1	24.8
Catalonia (Spain)	17.8	23.8	37.1
Andalusia (Spain)	28.0	24.9	45.0

* data available for 2009

(Source: own creation; based on data from EUROSTAT 2011 and STATFIN 2011)

Appendix Table 6: R&D-related Aspects in the nine AMCER-Regions

Region	R&D expenditures per capita in EUR (2007)	R&D expenditures per GDP in % (2007)	R&D personnel (FTE) per 1,000 employees (2007)	Share of R&D personnel (FTE) in the business sector in % (2007)	Share of business expenditures on R&D in GERD in % (2007)
East of England (United Kingdom)	1417.8	4.4	18.1	65.7	82.3
Ostrobothnia (Finland)	934.0*	2.55*	16.7**	>80.0**	90.0*
Lower Saxony (Germany)	644.6	2.5	11.5	61.9	69.0
Flanders (Belgium)	631.2	2.0	13.3	60.8	68.9
Provence-Alpes-Côte d'Azur (France)	536.8	1.9	14.1	50.1	58.0
Bretagne (France)	427.9	1.7	12.0	58.5	63.6
Catalonia (Spain)	410.5	1.5	12.3	52.9	62.8
Tuscany (Italy)	288.2	1.0	9.2	33.3	40.5
Andalusia (Spain)	186.7	1.0	6.9	26.0	37.1

* data only available for 2008, ** data only available for 2009

(Source: own creation and calculations; based on data from CISAD 2011; EUROSTAT 2011 and STATFI 2011)

Appendix Table 7: Human Capital Endowment in the nine AMCER-Regions

Region	Share of HRSTC in economically active population in % (2009)	Share of employment in high-tech industries and knowledge-intensive services in % (2009)	Secondary level students (ISCED 2-4) per 1,000 inhabitants (2010)	Tertiary level students (ISCED 5-6) per 1,000 inhabitants (2010)	Early leavers from education and training in % (2010)	Participation of adults aged 25-64 in education and training in % (2010)
Bretagne (France)	18.2	3.0	91.9	31.6	9.8**	5.6
East of England (United Kingdom)	16.3	5.7	92.9	30.0	16.2	19.6
Lower Saxony (Germany)	14.4	2.6	110.1	22.8	13.9	6.7
Andalusia (Spain)	14.5	2.4	75.6	35.4	34.9**	10.2
Catalonia (Spain)	16.6	3.7	60.8	34.4	29.8**	9.9
Flanders (Belgium)	21.7	4.4	116.0	33.6	9.6	8.2
Ostrobothnia (Finland)	20.8*	3.6*	67.6***	69.5***	10.3**	21.7*
Tuscany (Italy)	12.0	2.3	65.5	39.0	14.8**	7.2
Provence-Alpes-Côte d'Azur (France)	16.0	3.0	90.3	30.6	17.2**	4.4

* data available for Länsi-Suomi (superior NUTS-2 region), ** data available for the respective superior NUTS-1 region, *** data available for 2009

(Source: own creation and calculations; based on data from EUROSTAT 2011 and STATFI 2011)

Appendix Table 8: Patent Applications at the EPO in the nine AMCER-Regions

Region	Aggregated patent applications at the EPO, absolute figures (2004-2007)	Patent applications at the EPO per million inhabitants (2004-2007)	Productivity of R&D (EPO patent applications per million R&D expenditures) 2005	Aggregated high-tech patent applications at the EPO, absolute	High-tech patent applications at the EPO per million inhabitants (2004-2007)
Ostrobothnia (Finland)	1195*	897*	0.26*	506*	380*
Lower Saxony (Germany)	4957	620	0.32	708	89
Flanders (Belgium)	3492	576	0.27	903	149
East of England (United Kingdom)	2947	531	0.14	878	158
Bretagne (France)	1382	448	0.35**	784	255
Provence-Alpes-Côte d'Azur (France)	1739	362	0.22**	710	148
Tuscany (Italy)	999	277	0.26	69	19
Catalonia (Spain)	1816	265	0.21	174	25
Andalusia (Spain)	202	26	0.06	31	4

* data only available for Länsi-Suomi (superior NUTS-2 region), ** data available for 2004, Remark: patent figures are rounded

(Source: own creation and calculations; based on data from EUROSTAT 2011)

Glossary of terms

BERD: Business Expenditure on Research and Development.

CSF: Community Support Framework. In some cases, mainly in Objective 1 regions, the adoption of structural programmes is preceded by the adoption of a CSF, which lays down the general strategy for ERDF assistance in a certain number of regions within a Member State.

CSF: Common Strategic Framework 2014-2020.

CIP: Between 2007 and 2013, some 350,000 small and medium-sized enterprises (SMEs) will receive 3.6 bln EUR in EU support to invest in all forms of innovation and growth. The new programme will support actions to help enterprises and industry to innovate. It will also boost energy efficiency and renewable energy sources, environmental technologies and a better use of information and communication technology (ICT).

ERDF: European Regional Development Funds: whose principal objective is to promote economic and social cohesion within the European Union through the reduction of imbalances between regions or social groups.

ESF: European Social Fund: the main financial instrument allowing the Union to realise the strategic objectives of EU employment policy.

FP6: The 6th Framework Programme 2002-2006 supports research co-operation and integration of research efforts, promote mobility and co-ordination and invest into mobilising research in support of other EU policies.

FP7: Between 2007 and 2013, the 7th Framework Programme plans for a budget of 54.6 bln EUR organised into four programmes on Cooperation, Ideas, People and Capacities. The latter in particular provides enhanced opportunities for regions to participate.

GERD: Gross expenditure on Research and Development

Innovation: is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. The minimum requirement for an innovation is that the product, process, marketing method, or organisational method must be new (or significantly improved) to the firm.

Innovation (according to OECD Oslo Manual): "*the implementation of a new (for the enterprise, for the industry, for the world) solution aiming at enhancing its competitive position, its performance, or its know-how*". Innovation is also defined as *"… the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services*".

ICT: information and communication technologies can be defined as a combination of manufacturing and services industries that capture, transmit and display data and information electronically.

IPR: Intellectual Property Rights.

Knowledge-based Economy: The knowledge– based economy describes trends in advanced economies towards greater dependence on knowledge, information and high skills levels, and the increasing need for ready access to all of these by the business and public sectors.

MAP: Multi-annual Programme for Enterprise and Entrepreneurship was a framework plan of activities (2001-2006), which aimed at: enhancing the growth and competitiveness of enterprises; promoting entrepreneurship, simplifying and improving the administrative, regulatory and financial environment for business, especially for SMEs.

NSRF: National Strategic Reference Framework. For 2007-13, this document outlines the national choices made in terms of the community priorities defined in the Strategic Community Guidelines (SCG). The national and local players will draw on this strategic framework to develop operational programmes (OP).

Operational programme. In the context of the Structural Funds, this refers to a document approved by the Commission to implement a Community Support Framework, comprising a consistent set of priorities and multiannual measures, which may be implemented by one or more Structural Fund or other financial instruments.

PPP: Public-Private Partnership.

RIS3: research and innovation strategies for smart specialisation.

RTDI: research, technological development and innovation

RDI: Reserach, Developement and Innovation

R&D (according to OECD Frascati Manual):"*Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications"*.

SFs: The Structural Funds and the Cohesion Fund are intended to narrow the gaps in development among the regions and Member States of the European Union. They represent 35% of the Community budget, and are therefore the second largest budget item (after the Common Agricultural Policy).

SPD: Single Programming Document. In order to speed up and simplify the programming procedure, Member States have had the option since 1993 of presenting a SPD, incorporating both the Plan and the financing request. In this case, the Commission adopts a single decision in respect of elements normally set out separately in a CSF and OP.

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