10th International Regional Innovation Policies Conference

Book of Abstracts

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Cluster policies in the context of smart specialization - Impressions from Germany

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The idea of 'smart specialization' became quite rapidly publicly endorsed by DG Regional and Urban Policy in 2010 and was transformed into a political tool shortly afterwards. While the cluster concept is foremost based on the economic principle of localization economies, smart specialization is a political tool, although the idea of the advantages of specialized economic activities is one of its basic constituents. What we observe today is that all European regions develop smart specialization strategies (RIS 3) in order to qualify for structural funding in the period 2014-2020. We also observe a coexistence of clusters, cluster policies and smart specialization policies. The question to be analyzed in this paper is whether the new strategic ambition that comes with smart specialisation strategies will in any way affect the way in which existing (or new) cluster policies are implemented. Based on three hypotheses regarding the relationships between a general innovation strategy framework and the importance of RIS3 and cluster policies, we will analyze four German case studies (Baden-Württemberg, Saxony, Bavaria, and North Rhine-Westphalia) regarding their overall approach to innovation policy, their cluster policy, and their smart specialization strategy. These four cases reflect different regional policy approaches within a common national innovation system. In our conclusions we will seek to establish if there are indeed some more general lessons that can be learned regarding the impact that the overall RIS3 agenda will have on cluster policy.

Keywords: smart specialization, cluster policy, Germany, case studies

Smart Specialisation, new path development and transformation of regional innovation systems

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Smart specialisation is very important in the European policy context. EU member states and regions are required to develop Research and Innovation Strategies for Smart Specialisation (RIS3) in order to access the European Regional Development Fund for innovation activities. In this paper we first clarify what smart specialisation means and introduce theoretical perspectives supporting this policy approach. We will discuss the role of related variety and combinatorial knowledge base dynamics for new path development. Secondly, we aim at identifying the sources for new path development in Scania (Sweden) and Møre and Romsdal (Norway). Thirdly, we shall analyse how the transformation of the organisational and institutional support structures can promote new path development in different types of regions. In this context, we will examine both conceptually and empirically the role of active policy intervention consisting of concerted, long-term efforts at both firm, system, organisational and institutional levels for path renewal and new path creation in the two regions. Thus, it is our aim to advance the understanding of the role of the organisational and institutional structures in general and regional innovation systems specifically in promoting new path development as a strategic part of a Smart Specialisation/regional innovation strategy in European regions.

Keywords: smart specialisation, regional innovation systems, new regional industrial path development

Smart Specialisation: Diagnosing the potential of regions

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Smart Specialisation is a new innovation policy concept as part of Europe's growth strategy. Its aim is to support regions in their economic advances. It means identifying the unique characteristics and assets of each region and thus highlighting each region's true competitive advantages and unique potential. But Smart Specialisation requires a substantial amount of knowledge in order to be designed and implemented successfully.

The paper develops a possible stepwise process and defines the tools in regional economic analysis and benchmarking necessary for a successful use of the Smart Specialisation policy tool.

This process can include the following 10 steps:

1. Defining the region (Functional Urban Regions)

1. Assessing the region's international position
2. Assessing the region's own position (region focused status quo)
3. Global megatrends and their validity for the region
4. SWOT-Analysis
5. Thinking Smart (e.g. regional innovation systems)
6. Defining the strategy
7. Implementing the strategy
8. Acting according to the strategy
9. Monitoring and evaluating

The paper focuses on steps 1 to 6 and how a "smart" economic analysis can support the design of a regional Smart Specialisation strategy. A "smart" economic analysis means analysing in depth, re-arranging and re-combining standard approaches and relying on facts and data. The paper demonstrates the interplay between the process of Smart Specialisation strategy development and economic analysis based on a number of examples, particularly on the development of a Smart Specialisation strategy for Ticino.[1]

Keywords: Smart Specialisation, economic analysis, strategy process, regional economic development

[1] BAKBASEL (2015): Analyse der Tessiner Branchen: Internationales Benchmarking und Smart Specialisation (download: http://www.bakbasel.ch/publikationen/berichte-studien)

Is ACAP a suitable tool for improving the effects of regional innovation networks?

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A huge amount of publicly funded policy initiatives are made to initiate and support Regional Innovation Networks (RINs). The aim of most of these RINs is to support and increase the innovative ability of the participating firms. The program descriptions, however, often suffers from a lack of explanation of this ability, and tend to emphasize output measures such as number of patents and percentage of company turnover originating from innovative products. While such long term goals may provide some initial direction for RIN facilitators and participants, they do not provide much practical guidance for the design and planning of specific network activities. Also financers and policymakers could benefit from more direct goals for, and measurements of, the effects of RIN activities.

This paper examines the use of Cohen and Levinthal's Absorptive Capacity (ACAP) construct to analyse different categories of network activities and participants in a Norwegian RIN called Maritime Forum Oslofjorden. The same RIN is also examined by the use of data from the Norwegian Innovation Survey, corresponding to the EU Community Innovation Survey. Findings indicate there are differences in both innovation ability (ACAP) and innovation output between categories of network participants and industries. It is also clear that network activities addresses some aspects of ACAP, but in a random manner. The paper concludes with a discussion on the suitability of using ACAP as a tool for goal setting and measuring the effects of RINs.

Keywords: regional innovation networks, absorptive capacity, innovation ability, maritime industry, measurement

Innovation through deliberate and strategic networks? Exploring regional innovation networks (RINs) in Eastern Norway

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This paper discusses the *regional innovation-network* (RIN) concept as an appropriate approach to exploring organizationally and spatially proximate network configurations that are more or less deliberately established as strategic instruments for regional innovation. As such, these networks may be actively initiated or supported by regional authorities. In the paper we explore 7 RINs in the Oslo, Akershus and Vestfold regions in eastern Norway that vary considerably in terms of size, age, organization and lifecycle. These include *Electronic Coast, Engineering Coast, Clean Water Norway, Vestfold Film Forum, The Oslo network for ICT-management, The Oslo Renewable Energy and Environment Cluster, and finally, Oslo Medtech.* As opposed the more spontaneous and competition-oriented cluster concept we argue that the RIN concept entails a strong sense of *strategy* when it comes to setting up collaborative ties in regional innovation systems. The goal of RINs is to speed up already existing development processes through creating and subsidizing new linkages and meeting places that can lead to improved absorptive capacity among its members and cluster dynamics between them, but it can also be about reaching public policy goals. The project of establishing or maintaining a RIN is an enduring challenge, and the network must offer potential benefits to its members in their endeavor to become more innovative in a way that would not have been realized without the network. As such, it is crucial that the RIN manages to maintain enthusiasm among members through appropriate network practices and events that establish common or complementary goals and projects.

Keywords: regional, innovation, networks, strategic, events

Measuring #socialcapital with Twitter: the case study of the Electronic and Information Technologies cluster in the Basque Country

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Many strands in the literature state that 'soft' attributes such as the atmosphere of the cluster are important intangible assets that facilitate collaboration and trust among cluster members. Accordingly, public initiatives (such as the cluster policy started in the Basque Country in the early 1990s) attempt more and more to set a social infrastructure with a high presence or creation of social capital.

In the internet era, social media platforms such as Twitter enable the creation of virtual environments where online communities of interest are formed around specific firms, brands, or products. These platforms can be used as another means to spread information and build a network of contacts.

The target of this paper is to perform a case study of the Electronic and Information Technologies cluster, one the 12 clusters regarded as strategic by the Basque Government. Primarily, the study will focus on the relations of cluster affiliates via Twitter and a map of interactions will be made depending on who is following who and who is followed by whom. And in a further step, we will try to deep on this analysis elaborating quantitative data (number of retweets, replies or mentions received) along with other information of qualitative nature (most frequent words or hashtags).

This paper's aim is twofold: first, to present the Twitter network as a valid proxy to measure social capital, especially for clusters related to Computer Sciences and Telecommunications; and second, to give the preliminary results of this empirical exercise conducted on the Basque Country.

Keywords: social capital, clusters, networks, Twitter, Electronic and Information Technologies

Knowledge base combinations and innovation performance in Swedish regions

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The literature on geography of innovation suggests that innovation outcomes depend on the type of knowledge base employed by firms. While knowledge bases are distinct categories with regards to the nature and the rational of knowledge creation, existing studies also stress that innovation usually involves more than one knowledge base. In fact, new ideas often occur when analytical, synthetic and symbolic knowledge intertwines. It remains unclear, though, which combinations of knowledge bases are most conducive to innovation at the level of the firm, and how this is influenced by the knowledge bases available in the regional milieu. Therefore the contribution of this paper is threefold: i) to measure knowledge bases of firms and their regional heterogeneity in a more comprehensive way than the existing empirical literature has been able to do so far, ii) to quantitatively assess the impact of combinations of knowledge bases on innovation output, iii) to analyze the interplay between firm- and region-level knowledge bases (and combinations thereof) in generating innovations. Empirically, the paper applies econometric analysis on firm- and region-level data from Sweden. The knowledge base of firms is captured using detailed occupational data derived from linked employer-employee datasets that is merged at the firm-level with information from Community Innovation Surveys. The empirical analysis reveals in a quantitative way the extent to which the knowledge base combinations affect innovativeness of firms.

Keywords: knowledge bases, knowledge combination, regions, innovation performance, microdata, cross-level interaction, Sweden

Relational universities: stressing bi-directional linkages in regional innovation

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Conceptually and empirically, relations between university and innovating firms have been centre stage for some time. The regional development effect of universities is framed in the literature on regional innovation systems emphasising university-industry relations.

Is has become an widely accepted premises that geographical proximity is vital for knowledge exchange. What is currently lacking is some inquiry into the physical distance – measured in km and time – of firms subcontracting research to university and the locational motives of firms in general. The research question looks into the spatial reach of university research with regard to private firms, and also accounts for the specific knowledge offered by universities in terms of their scientific disciplines.

The paper views this relation from the industry point and their relation with universities. Our main proposition is that a firm sources its relevant university research wherever it is offered and thus not necessarily from the most nearby university. As such we reduce the location of a university with respect to the firm as being of second order importance. However, if similar knowledge is offered at multiple universities, the location does play a role.

Based on a panel of three consecutive waves of R&D surveys conducted in 2006, 2008 and 2010, the linkages of universities with R&D active firms are empirically examined. A total of 1252 relationships with various research partners are examined based on data for 680 firms.

The distance between firms and universities seem to be mostly influenced by the R&D intensity of the firms.

Keywords: R&D collaboration, University-industry linkages; Geographical proximity; bi-directional linkages

Spatial Proximity to Research Institutions and Firm-Level Innovation in Germany

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Empirical evidence points to a raised in uence of robotics in various industries. We observe that relevant products and services require an increased level of knowledge-intensive components. In order to understand this growing complexity, we analyze the renewed machine importance from the perspective of knowledge creation and innovation networks of institutions. Knowledge spillovers depreciating over space increase the role of networks (Brenner et al. 2011), proximity (Shearmur 2011) and collaboration in innovation processes (Powell et al. 1996, Katz and Martin 1997, Cooke 2001, Cunningham and Werker 2012, Lavie and Drori 2012).

This paper addresses the spatial implications of firm-level innovation in robotics by exploring whether spatial proximity to universities and non-university research institutions fosters innovation activities in robotics technology. We see if an impact of proximity to institutions on firm-level innovation varies according to the type of research institution. Based upon a unique dataset that matches various databases for the whole German economy, our empirical model integrates both a neo-regionalist and a spatial-analytic approach by covering control variables on NUTS 3 level for regional economic structures (i.e. MAR- or Jacobs externalities) as well as fine-grained distance variables based on German five-digit postal codes. Thus, our assessment of the growing economic importance of robotics accounts for heterogenous regional structures and varying distances. The results yield policy implications regarding the optimal allocation of institutions and the optimal degree of institutional decentralization.

Keywords: Innovation System, Research Institutions, Spatial Analysis, Germany, Robotics

External “energy” for regional industrial change? Attracting and anchoring of non-local knowledge for new path development

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The role of exogenous sources of new path development and the inflow of global knowledge have been underplayed in the literature on regional industrial change so far. The aim of this paper is to explore in a conceptual way under which conditions and how knowledge from non-regional sources can lead to new path development in different regional innovation systems (RIS). We argue that different types of RIS vary in their needs, attractiveness and exploitation capacity of global knowledge. Organisationally thick and diversified RIS have a lower need for exogenous sources but exhibit a high degree of attractiveness and exploitation capacity. In organisationally thick and specialised RIS and organisationally thin RIS the situation is the other way around. These RIS types have a higher need for exogenous sources but show a lower attractiveness and exploitation capacity. However, a closer look reveals that these RIS types can increase their attractiveness for non-local knowledge and can strengthen their capacity to anchor it regionally. We conclude that new path development is less endogenous in nature than commonly thought. The findings are important for the current debate on smart specialisation shedding new light on the role of exogenous sources of new path development in different RIS types and respective policy implications.

Keywords: regional innovation systems, new regional industrial path development, smart specialisation, exogeneous development impulses

Regional Specialization and Labor Mobility - An Empirical Analysis of German Microdata for 2000-2010

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This study analyses regional specialization and employment growth in German regions and provides evidence for the employees' origin. Spatial patterns of industrial strengths are of increasing interest since the rise of "smart specialization" strategies. The attraction of skilled labor is supposed to play an important role in this process. The approach is based on micro data of firms and employees for the period from 2000 to 2010. Two indices are constructed for three major sectors and spatial patterns are described.

By means of regression analyses at the industry-region level the effects of skill intensity and the regional share on employment growth in different (other) industries are tested. Correlations are found especially favoring nkim industries and computer and related service activities. Positive growth effects of kis industries are also found.

Multinomial logit regression analyses of employees' origins (region and labor status) in the preceding year suggest that, first, skill intensity is positively correlated with attraction from other regions, and second that in contrast to workers from other German regions especially migrant workers enter specialized labor markets.

To sum up, regarding the attraction of workers highly specialized regions are not advantaged per se but rather regions with an intermediate specialization level. Since growth is spurred in combination with skill intensity the development of regional skill supply is still of importance. Furthermore, employment effects from other co-located industries are not systematically found. The results therefore suggest a more differentiated view on the effects to be expected from smart specialization strategies.

Keywords: regional specialization, labour mobility, German regions, regression analyses

Smart Specialisation approach and development of Advanced Manufacturing Technologies in the case of less-develop countries.

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The paper discussed the potential for development of advanced manufacturing technologies (AMTs) in the EU-28 less-developed countries/ regions basing on the Polish example. The studies relies on the desk research of smart specialisation strategies and case studies.

According to report findings of KET's Observatory, the EU-28 has a dominant position on the AMTs in the World compared to other main global competitors or their blocks (Nord America, Eastern Asia). The indicators which were used show that the leading positions within the EU-28 is occupied by the well-developed Member States like Germany, the Netherlands, France, Sweden, the United Kingdom, Austria. The lagging EU Members, with only few exceptions in some categories of assessment, are invisible at the top positions of rankings.

According to literature the poorer countries try to catch up with the better-developed ones by transferring technical knowledge from them and trying to concentrate on the investment in human, physical and institutional capital. The Polish way of development seems to confirm that. But this might neglect the ambition of such countries to use their capacity to improve their position in e.g. AMTs by developing R&D-based innovation in this field as well.

The article discussed the smart specialisation concept as an approach which helped identify AMTs capacities and potentials of lagging countries as well. The findings suggest that within the smart specialisation process AMTs related-areas were selected. The case studies confirm that the less-developed ones use the uptake of AMTs as a one of key vehicle towards economic regional development.

Keywords: economic development, innovation strategies, smart specialisation, advanced manufacturing technologies

A complexity theory approach to understand of the economic resilience and natural disasters.

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Socio-economic resilience studies rise from the epistemological complexity framework, which allows the understanding of socio-ecological systems nature's and their multiple interactions at different scales. In this context, the adaptive complex systems and the panarchy model are choose as a suitable structure for the analysis of economic resilience dynamics in the communities affected by natural disaster. The disaster is the disruptive element of the system, which generates a cross-scale impact that destabilizes the community forcing it to innovate or to collapse. The evolutionary success will depend on the richness of its elements, the level of connectivity between each other and also depends of the historical memory of the system.

The more connectivity and wealth of the variables of the systems the more possible is a process of "creative destruction" that promotes development and innovation based on the experiences and memory of the community. In the other hand when the connectivity and the poverty of the elements of the systems are poor, are expected a change to a qualitatively different system with negative effects of hysteresis. Resilience is presented as a control element that seeks an evolutionary adaptation to a new panarchical cycle. This control element is composed of variables that are interdependent and that have been classified into five dimensions: ecological, social, economic, institutional and community. This work present an explanation of these variables, their relevance and their behavior in a place affected for a natural disaster.

Keywords: economic resilience, adaptive complex system, panarchy, complex theory

From a wheel to a Mercedes: Technology network and its emerging properties

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In this study we aim to understand the role of technology linkages in a formation of complex goods and how economic forces shape this process. We propose a model, where each new technology is a result of a combination of two (or more) already discovered ones forming a complex network structure of technological interdependencies. All technologies, and firms employing them, are distributed along different stages of a value chain. Firms maximizing their profits and consumers optimizing their utility by demanding certain goods shape the evolution of the technology network. This is achieved by allowing firms to invest in product and process innovations from their profits. As a result, new products tend to cluster both, in terms of time of their discovery and specific technological relatedness. Furthermore, technologies differ in their applicability, efficiency, and innovation complementarities competing with each other for demand. This process generates path dependencies and irreversibility of investments making some products obsolete. A model also allows for a formation (discovery) of general purpose technologies (GPTs) by differentiating technologies in 'core' and 'periphery' ones according for their network position.

Keywords: complementarity, GPT, innovation, technology network, value chain

Don’t lose sight of the forest for the trees: Minalogic and presto engineering as a “new argonaut” in a french ict ecosystem

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In this paper we focus on the invisible social structure of a leading ICT ecosystem sustaining a knowledge cluster in micro-electronics, embedded software and nanotechnology, around Grenoble, France. MINALOGIC fosters key enabling technologies underpinning growth and competitiveness, from its beginning in 2005 and up to now. We map the network architecture of the MINALOGIC cluster through 107 collaborative projects supported by both government and industry, for the past decade or so. We use social network analysis and visualization to identify and pinpoint the key actors in the socio-technical networks that underpin and drive collaborative innovation in France and beyond. The centrality measures and “small world” connectivity of the ecosystem highlight the leading role that a public research center, CEA Grenoble, plays in the ongoing development of this ICT ecosystem. We also discuss the role of “new Argonauts”, such as Presto Engineering, returnees from Silicon Valley with operations in France and Israel, who occupy peripheral positions in the MINALOGIC cluster.

Keywords: Minalogic cluster, ICT ecosystem, France, social networks, new argonauts

Innovation and the Geography of Collaboration: A Panel Data Approach

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The relative benefits of regional, national and international collaboration for the ability of firms to develop new product and process innovation has been a topic of hot debate in recent years. While the traditional view in economic geography is that regional collaboration is more effective as it enables the development of trusting relations and face-to-face communication, recent empirical contributions have questioned the effectiveness of regional collaboration and placed more emphasis on the importance of international collaboration (e.g. Fitjar and Rodríguez-Pose 2011 in the case of Norway). However, most of these contributions have relied on cross-sectional data, and they have also relied exclusively on self-reported data on firm innovation activities. This paper exploits the panel structure of the Community Innovation Survey to examine the impact of regional, national and international collaboration in one wave of the survey on innovation activity in the subsequent wave. In addition, we use accounts data from firms to examine actual growth and development patterns in the firms in terms of sales and productivity. The results show that regional collaboration has a significant negative impact on the firms' probability of innovation in the subsequent wave of the survey, while international collaboration has a significant positive effect.

Keywords: collaboration, innovation, distance

Urbanity and institutions as drivers of innovation in knowledge intensive service firms

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Knowledge intensive service firms (KIS) are nowadays seen as innovative business units and drivers of economic growth. Their output increases the technology palette available for other firms and they thus significantly foster technological progress and economic development. Regarding their geographic location, KIS not only exhibit a tendency to concentrate in geographical space; their location pattern also reveals a preference towards urban regions.

This paper aims to explore this empirically observable location pattern by analysing the effect of geographical proximity to cities on technological and non-technological forms of innovation within KIS firms. The overall effect of proximity to cities on innovation is decomposed by a stepwise introduction of distances to governmental institutions, universities, non-university research and development institutes as well as indicators representing the regional economic environment in the analysis. City heterogeneity is represented by three city types: small cities with more than 50,000 to 100.000 inhabitants, larger cities with more than 100,000 to 500,000 inhabitants and metropolitan cities larger than 500,000 inhabitants. Distance variables and regional variables are modelled using a distance matrix of about 8,200 five-digit postal codes in Germany. First results show that proximity to cities fosters innovation of KIS firms. However, some of these positive effects are partly explained by institutions and regional economic structures. We also find substantial differences regarding the type of innovation pursued by the individual KIS firm.

Keywords: proximity, innovation, KIS firms, urbanity, institutions

Firm Performance in the Periphery: On the Relation between Firm-Internal Knowledge and Local Knowledge Spillovers

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One of the most established arguments in regional studies is that knowledge dynamics shape the geography of economic activities and, more specifically, that knowledge intensive activities benefit from collocation due to knowledge spillovers, local buzz and access to labor. This implies that knowledge-intensive firms should be less competitive in peripheral regions. This paper challenges this view andelaborates why knowledge intensive firms may be less dependent on local knowledge sources than often presumed and provides empirical evidence for this proposition.The empirical study uses Swedish micro-data on 32,535 firms from 2004-2011. It provides strong evidence that firms with high internal competencies located in the periphery can compensate for a lack of local knowledge spillovers. In other words, local knowledge spillovers are important for the performance of weak firms but much less so of strong firms.

Keywords: Periphery, firm performance, spillovers, agglomeration, knowledge intensive firms

Addressing orientation failure: Conceptual thoughts on how to integrate directionality in the systems of innovation heuristic

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Our point of departure is the diagnosis of an “orientation failure” in the innovation system (IS) heuristic. By this, we refer to criticism of the IS concept for its lack of openness to address objectives beyond the role of innovation for economic growth. However, there is a growing importance of normative directions in science, technology and innovation (STI) policies to address the so-called Grand Challenges. This poses significant challenges for STI policies. How to cope with issues of directionality and different perceptions of challenges e.g. depending on geographical origin is still not adequately addressed.

Building on literature on the governance of technology and innovation, which provides a rich reservoir of approaches on how to orchestrate collective action in complex actor settings, we propose to integrate a reflexivity “layer” into the IS concept. Reflexivity means a set of system qualities and processes underpinning the ability to address directionality of innovation. It stretches onto three procedural steps (Situation analysis, Goal formulation, and Strategy development and implementation), and comprises four types of capacities:

• Self-reflection capacities

• Bridging and integration capacities

• Anticipation capacities

• Experimentation capacities

Our conceptual contribution shall assist in the analysis of the ability of different types of IS to address directionality and help to identify sources of directionality failures as a first step towards the creation of instruments to strengthen individual system capabilities. In particular, although challenges might be perceived as global, the problem definition and solution paths might be different at national, regional or even local levels.

Keywords: Innovation Systems; Grand Challenges; Directionality; Reflexivity

3D printing: State of the art, modes of industrial politics and impacts on regional innovation systems

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Internets of things, additive manufacturing, fablabs or prosumers (in this paper summarized by the notion “3 D printing”) are topics - often hypes – in the discussion about the future of industry. The paper aims at exploring the impact of these new technology (and business models) on regional innovation systems. It starts with an overview about the state of the art and the potentials for industrial transformation. Further on, it works out key challenges for industrial politics framing and fastening the rise of 3D printing. After this, it compares strategies in industrial politics that is framing and implementing of 3 D printing in different countries. It can be shown that industrial politics focusing on 3D printing is embedded in the specific path of the national production and innovation systems. Nevertheless, all approaches include a strong regional focus. The paper discusses different modes of impact on regional innovation systems: Transferring given production based regional innovation systems by reshaping local-global links, establishing new regional innovation systems centered on research and innovation hubs, renewing regional (and local) innovation systems centered about fablabs and overcoming regional innovation systems by linking decentralized prosumers linked with global communities.

Keywords: industrial politics, 3D printing, additive manufacturing, fablabs, varieties of capitalism

From a knowledge-based to a value-generating innovation policy: The case of TechnologieRegion Karlsruhe

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With the rise of the knowledge-based society, policy and research have treated knowledge as a value in itself and tried to maximise knowledge production assuming that knowledge would be stimulating economic development. However, there is a lack of understanding in terms of how to achieve a high return on (public) investments into knowledge generation. Regional policy is in demand of a model which explains how societal values can be effectively achieved by investing into knowledge generation and exploitation. Such an understanding would form the basis of designing and implementing a new generation of regional policies. The focus of this paper will therefore be to analyse from where contributions can be won and how they can be integrated in order to initiate the jump from a knowledge-based regional development to the next generation of regional value-generating innovation policies.

A good example is the recent development in the TechnologieRegion Karlsruhe (Germany) which over the past fifteen years has implemented a holistic approach aimed at exploiting its knowledge base to secure quality of citizens' lives, environmental sustainability as well as economic welfare and competitiveness. This development is driven by a shared dedication of Karlsruhe's individuals and institutions to innovating with a vision and daring to prioritize.

This paper adapts the transition model by Etzkowitz and Klofsten and employs it to discuss the development process from an immature administrative unit to a self-sustaining growth stage. The transition model describes a virtuous circle growing a region by drawing upon conscious intervention and "institution formation".

Keywords: Triple helix, Innovation policy, Regional Development

Relatedness, knowledge complexity and technological opportunities of regions. A framework for smart specialization

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A smart specialization policy requires a framework to systematically identify technological opportunities of regions. We define a technological opportunity as a potential to develop a technological advantage in a field that (1) draws on the specific knowledge bases of the region, and that (2) leads to technological upgrading of the regional economy. A technological opportunity can therefore be identified as a technological field in which a region does not have a technological advantage yet, but that displays at the same time a high degree of *relatedness* with the regional knowledge base and a high degree of *knowledge complexity*. In this paper, we use USPTO patent data to identify technological fields and compute relatedness and knowledge complexity in European regions, and we assess the extent to which relatedness and complexity of the regional knowledge base, the openness of regions and the regional institutional context impact on the intensity and nature of technological diversification in European regions. Then, we discuss at length the implications of our findings for the implementation of a smart specialization policy strategy.

Keywords: smart specialization, relatedness, complexity, technological diversification, European regions

Constructing inter-regional smart specialisation platforms to optimise regional innovation systems: the case of advanced manufacturing for offshore industries.

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Asheim et al (2011)[1] noted that territorial systems are overlapping and have *open*, often fuzzy, borders within embedded regional, national and global systems that may be complementary and reinforcing or contradictory and dirigiste. In this context, the need to distinguish between spatial (regional, national) and cognitive (sectoral, technological) boundaries of innovation systems is recognised. Similarly, Foray [2] argues "*neither pre-defined regions nor specific sectors can be used ex-ante to determine the boundaries of a smart specialisation dynamics….the collective R&D, engineering and manufacturing capabilities that sustain innovation are not necessarily deployed and contained within strict regional boundaries and their development and evolution is likely to defy administrative frontiers*".

In January 2014, the Commission Communication 'For a European Industrial Renaissance' proposed "… *to create Smart Specialisation Platforms to help regions roll out smart specialisation programmes by facilitating contacts between firms and clusters, enabling access to the innovative technologies and market opportunities*". This paper draws on work to develop a pilot smart specialisation platform[3]. We draw on a mapping of inter-regional value chains in the field of advanced manufacturing for offshore industries, to explore the extent to which innovation systems can be strengthened through fostering entrepreneurial dynamics between regions with specialisation in related but complementary technologies.

Keywords: smart specialisation, advanced manufacturing, value chains mapping, inter-regional platforms

[1] Bjorn T. Asheim, Helen Lawton Smith, Christine Oughton (2011) Regional Innovation Systems: Theory, Empirics and Policy. Regional Studies, Vol. 45, Iss. 7, 2011

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Who is the policy-maker? Agency in regional innovation policy in Greater Manchester and the Basque Country

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There is widespread consensus that the policy landscape around the promotion of innovation-driven economic development is becoming increasingly complex, especially in a regional context. Regions can be seen as 'policy spaces' – stages on which the impacts of policy actions and decisions taken at different levels are played out (Uyarra and Flanagan, 2010). Innovation policies have also "broadened" and "deepened" as more – and more complicated – policies are combined from different domains (Borrás, 2009), making up complex, interacting and multi-level "policy mixes" (Flanagan et al., 2011). Finally, there has been a blurring of boundaries between public and private, political and administrative, and traditional and non-traditional actors in policy design and implementation processes, so that it is no longer clear who the 'policy-maker' is.

Accepting that a wide range of actors may have agency not only in innovation system processes but as active members of policy networks or even policy entrepreneurs, shaping public policies and their implementation (Flanagan et al., 2011), this paper explores multi-actor policy dynamics in two different contexts, namely the Greater Manchester conurbation in the North West of England, and the Basque Country region in Spain.

By exploring these two very different but equally dynamic cases, the paper will generate reflections on the important question of who has agency in innovation policy and how this is evolving.

Keywords: innovation policy, policy dynamics, policy.-maker, agency

Managed clusters: Core versus bolt-on activity

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Policy makers are increasing the attention to industrial networks and clusters, and a growing amount of public money is earmarked this purpose through cluster programmes. The more or less promised outcome of taking part in a managed cluster initiative is innovation, increased business-research collaboration and value creation and industrial and work place development. Firms operate daily within a myriad of networks and several are crucial for business. Thus, a challenge of the managed cluster project is to tap into the business network of the partaking companies. In order to potentially stimulate innovation, the partaking must actually influence internal company development processes, and thereby also the company's existing resources and networks. The question posed in this paper is *What are the value and actual use of managed networks and cluster initiatives seen from the companies' viewpoint?*

The empirical data comes from a larger research project in four of Norway's regions. Cluster classifying techniques developed by Centre of International Manufacturing (CIM), University of Cambridge and additionally contextualized qualitative research has been used to generate data.

The companies' representatives evaluate the cluster project as important for their business. However, partaking are by most companies mainly handled as a bolt-on activity rather than a new way of doing business. Collaborative research projects for a limited group of cluster project participants is the main result. Thus, one of the challenges for publicly funded cluster projects is to launch activities that are perceived as strategically relevant – resulting in resource interaction between the members.

Keywords: cluster programmes, managed cluster projects; collaborative research projects, business networks

The role of local agency in regional path renewal

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The Agder region is an example of a rural region with a less developed research and innovation system. In addition, the mechatronics related industry in the oil and gas sector in the region developed relatively slow paced and incrementally through the 1970s up to the late 1990s through DUI modes of innovation. In the 2000s, the mechatronics industry in the region grows at a fast pace, from 1800 to 10000 employees and increase in turnover from NOK 5 billion to over NOK 40 billion.

Recently, with the fall in oil prices, this industry is in the process of transforming in the sense of developing their technology. Most recently symbolized with a NOK 200 million Centre for Research-based Innovation (SFI), and as one of the first two clusters in Norway being awarded the top tier global center of expertise status. In addition, the University of Agder has recently attracted national funding for building a Mechatronic Innovation Lab in collaboration with the industry.

There is an ongoing debate in the regional development and innovation literature relating to how to conceptualise and understand the role of agency. In the recent literature, this has been conceptualised through concepts such as regional leadership and institutional entrepreneurship.

In this paper, we build on recent contributions to this body of literature and discuss, based on interviews with key actors, processes and events that enabled different types of agency to facilitate regional path renewal of the mechatronics industry in the Agder region.

Keywords: path renewal, industrial transformation, mechatronics, regional leadership, innovation policy

Disintegration and Slow Recovery of Inventory Networks: the Transformation in Slovakia

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The knowledge innovation process can be defined as consisting of two sub-processes, knowledge production process and knowledge commercialization process. Those two sub-processes are supposed to have proper inputs and outputs and they are linked together by technological innovations (patents). The innovation efficiency of knowledge innovation process and its two sub-processes is measured by DEA modelling (data envelopment analysis) in the period of 2004 - 2010. Altogether, 19 countries of the European Union are studied, with a particular focus on the efficiency of innovation processes in the Visegrad countries which joined the EU in the same year 2004. The aim of article is to uncover slacks (surpluses) on the input and output side of knowledge processes. The DEA method shows that majority of countries reach higher relative innovation efficiency in knowledge commercialization than in knowledge production and the most important slacks can be found in financing of research and development. Also, the networks of inventors are studied in Slovakia, to identify the importance of the regional innovation system in relation to national innovation system.

Keywords: regional innovation system, networks of inventors, knowledge innovation process.

Knowledge conversion in a regional aquaculture innovation system

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Lundvall (1992) and others have firmly placed learning at all system levels (person, organization, network, region, ...) as a core function of innovation systems. However, even in the latest attempts (e.g. Asheim and Parrilli 2014), learning processes in innovation systems are cautiously approached from outside rather than actually understood from within. In this paper we make an attempt at understanding interactive learning as *knowledge conversion* – originally conceptualized by Nonaka and Takeuchi (1995) at the tacit/codified nexus in firms – in encounters between different types of actors in a regional innovation system. We illustrate this with data from the aquaculture industry of Mid-Norway. Preliminary findings reveal that a fair number of these bi-lateral and multi-lateral interactions contribute to a wide range of knowledge conversion processes. We characterize the knowledge domains that meet and how the relevant conversion processes unfold, with a particular focus on the conversion of extramural R&D to innovative solutions and practices in the industry and in its governance.

Keywords: learning, knowledge conversion, aquaculture

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Struggling for autonomy – implementation of the Norwegian VRI program

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Regions become increasingly popular as the key spatial level driving industrial development and innovation (Lagendijk 2011, Cooke 2012). Policy efforts in Europe address the regions in their attempts to facilitate for cooperation between different parts of the innovation system. In Norway, the national program VRI (tools for regional R&D and innovation) has since 2007 funded regional projects aiming to develop regional innovation systems.The VRI-program have combined a broad RIS approach (i.e. they included various types of firms (both DUI and STI) and institutions in the region as their target group) with a focus on stimulating cooperation between R&D institutions and firms (Jakobsen et al 2012, Asheim and Mariussen 2010).

In this paper we analyze the implementation of the program. Through document analysis and interviews with key stakeholders in all 15 regions, we find evidence that instead of a tailor made program for regional innovation system development, the program has more characteristics of a regionally implemented national innovation policy. From the outset the regional adaptation and tailor-made solutions have been held forth as ideal, but the resulting project organizations and selections of tools are strikingly similar throughout the country. This tendency has increased through the three program periods. Theoretically we want to use our discussion to cast light on the national – regional nexus in innovation policy formulation, and we are especially investigatingthe link between national policy priorities and regional strategies and approaches.

Keywords: RIS, innovation policy, autonomy

Tell me why? Persistence of Entrepreneurship in the Kaliningrad Region in Spite of Extreme Disruptions

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We investigate the persistence of entrepreneurial activities over time and space based on the case of Kaliningrad region (former East Prussia) in time period between 1925 and 2010. Kaliningrad region is a particularly interesting case for investigating persistence of entrepreneurship because the region has been subject to a number of extreme external shocks such as massive destruction during World War II, a nearly complete replacement of the native German population by Soviets, 45 years under a socialist economic regime, and a subsequent transition towards a market-type of economy. In spite of those extreme circumstances we find a surprisingly high level of persistence of self-employment rates in different sub-regions and industries over time. In this paper we discuss various sources of persistence of regional entrepreneurial activities over time. The case of Kaliningrad region is particularly interesting in this respect for several reasons. Firsly, we can completely rule out the endurance of any formal institutions as a reason for long-time regional persistence of entrepreneurial activity because the entire legal system has been replaced by the Soviet rule, which prosecuted any type of private entrepreneurship. Also informal institutions, such as pro-entrepreneurial attitudes of the regional population, can hardly explain our findings, since almost the entire population of Germans has been expulsed and replaced by Soviets after World War II. The results of empirical analysis suggest that the most likely reason for the observed persistence of entrepreneurship is the persistence in infrastructure, despite heavy destructions during the WWII.

Keywords: Entrepreneurship, regional culture, persistence, Kaliningrad region

City regions and local networks and global pipelines for collaboration in innovation

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We combine insights in geographical clustering and the formation of global pipelines to identify differences in collaboration patterns in innovation according to the characteristics of the firm's location.

A comparison is made between innovation active companies located in three hierarchies of city regions (city and its agglomeration). Belgium is used as a case with Brussels capital city (international administrative and service oriented capital city), the four large city regions (Antwerp, Liège, Ghent, Charleroi), and the regional city regions. Attention is paid to generalizability to other countries.

We rely on firm level data from two waves of the Community Innovation Survey for Belgium, covering the period 2008-2012. Based on stratified sampling we have a representative dataset including 705 innovation active companies, nicely balanced over firm size, sector of activity (we rely on the renewed Pavitt classification – including services), and city region hierarchy. We account for the firm's propensity to collaborate and apply a multivariate probit model with (different types of partners) involvement in local networks and (combinations with) global pipelines as dependent variables. Besides city region we include MAR specialization and Jacobs diversification, level of competition, and the type of network (within value chain, industry-science, other firms including competitors and consultants). We control for company size, age, sector, and whether or not the firm belongs to a (multinational) group.

We find significant differences in the propensity to collaborate as well as in the formation of local and global networks according to the hierarchy of the city region.

Keywords: City region, innovation, collaboration, clusters, knowledge pipelines

Creativity, Education or What? On the Measurement of Regional Human Capital

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This paper substantiates the debate following Richard Florida's suggestion to measure regional human capital by indicators of creative occupations rather than by indicators of formal education. The paper suggests a microfoundation of creativity that, consistent with Florida's notion of creativity, relates creativity to workers' cognitive and noncognitive skills. It also shows that this microfoundation is similar to that of human capital in recent labor economics, which has facilitated important new insights. Authors like James Heckman show that cognitive and noncognitive skills contribute significantly to explaining a variety of individuals' labor market outcomes at the micro level, including wages, labor market participation and occupational choice. These skills arguably affect outcomes not only through education but also directly, i.e., reflect human capital more comprehensively than formal education alone. These findings suggest that there should be scope for improvement in the measurement of human capital also at the aggregate, regional level. Unfortunately, the measures of creative occupations developed so far by Florida and others are not too successful in this respect. Reviewing the relevant empirical literature, the paper finds little evidence for creativity-based measures outperforming the formal education-based measure in explaining regional outcomes. The creativity-based measures are obviously too crude to make a difference. The paper concludes that occupations may still help in developing superior measures of regional human capital. They may be used to project workers' cognitive and noncognitive skills, which are observable only from surveys, from the micro to the regional level.

Keywords: Human Capital, Education, Creativity, Cognitive Skills, Noncognitive Skills

Understanding the “Regional Policy Mix”, A Classification and Analysis of European Regions’ Support Policies

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In recent years, no small number of reports on regional policy have emphasised the importance of “getting the policy mix right”. What this term, “policy mix” relates to, however, has often remained unclear. Instead, many studies left the impression that its use reflects little more than a general acknowledgement of regional idiosyncrasy and place-specific particularities.

To the authors mind, much of the resulting conceptual confusion around this terminology has in fact been a result of the absence of an appropriate, Europe-wide database on regional policies. Following the conclusion of the EC's Regional Innovation Monitor project, such a database has now become available.

Using this novel source of data, the proposed paper will establish whether the European system of regional policy approaches is indeed but an arbitrary array of case-specific solutions or if specific types of “policy mixes” can be clearly distinguished. The analysis will use cluster analysis to identify specific types of regional policy mixes and seek to analyse the role of two main factors of influence on regions’ choices, its location in a particular Member State and its overall degree of economic development.

Preliminary research suggests that it is possible to distinguish 5-6 types of regional policy mixes that can be interpreted meaningfully. Apparently these are not only the result of national policy regimes but as well of regionally specific choices and framework conditions. Finally, the paper will establish whether European regions' choice of a policy mixes has influenced their economic resilience during the recent years of economic turmoil.

Keywords: Regional Policy, Europe, Policy Mix, RIM

Policy-Initiated Regional Path Development? Multiple Roles of Policy for the Emergence and Evolution of New Media and Biogas in Southern Sweden

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Over the past few years, there has been a growing interest in economic geography and related disciplines in forms and determinants of new regional industrial path development. Recent scholarly work has essentially enhanced our understanding of industrial change processes and the nature of path development activities at the regional scale. Little is known, however, about the role of policy in the emergence and development of new growth paths. The paper extends current evolutionary models of path development with an institutional perspective and suggests that the regional innovation system approach can essentially contribute to a sound conceptualization of the role of policy for regional industrial change. Particular emphasis we put on multiple roles of policy and multi-scalarity of policy processes. In the empirical part, we analyse the emergence and development of two new industrial growth paths, biogas and new media, in Scania, Sweden's most southern province. Based on personal interviews with regional policy makers, representatives from supporting organizations and firms as well as a document analysis, we investigate how policy interventions and initiatives at the national and regional scales have influenced the rise and evolution of these two new growth paths. Even though the industries have little in common when it comes to organizational structures and modes of innovation, policy-led initiatives have played an important role in enabling new path development in both cases. We find that policy can play multiple roles in nurturing and maintaining new growth paths and that these are closely interlinked with particular policy capacities of RIS.

Keywords: new regional industrial path development, regional policy, regional innovation systems

Drivers for Regional Trade Specialisation in the EU

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Trade specialisation is a measurement for competitiveness in global markets. Disaggregated indicators by categories of goods and their technological content allow for detailed insights into the outcome of innovation systems and innovation policies in terms of international competitiveness. However, indicators for trade specialisation were mainly available for national economies in the past and did, thus, not allow for regional analysis. Recently, considerable efforts have been made in a project funded by the European Commission to break down national trade data to the regional level (Framework Contract “Studies in the Area of European Competitiveness”, ENTR/300/PP/2013/FC).

This paper takes advantage of the new data and identifies drivers for regional trade specialisation in the EU at the NUTS-2 level. The empirical analysis is based on the calculation of revealed export advantages (RXAs) from regionalised trade data. Drivers for regional differences in RXA values are identified by a regression model and an in-depth analysis of case studies for ten regions. Innovation behaviour and industrial structure proved to be of high importance in both parts of the analysis. The results also show that international competitiveness can be achieved in very different industries. Success in global markets is highly dependent on place-based factors and path dependencies. Besides from that we find strong differences in regional policy focus and engagement among the highly competitive regions. The results are potentially useful for making better informed decisions when implementing regional innovation policies based on new paradigms such as smart specialisation strategies or the renaissance of industrial policies.

Keywords: regional trade specialisation, international competitiveness, revealed export advantages, smart specialisation, EU regions

Open Region. A Concept for Regional Innovation Policies that creates and utilizes Opportunities for Innovations

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Innovation has become an integral component in regional development: regional policies regard innovation support as a tool to gain competitive advantages and to foster regional growth while innovation policies often address the regional level for institutionalised actions. Targeted research and development implemented by sophisticated entrepreneurs or organisations are usually considered the leading sources of primarily technological innovation. However, recent studies show that *knowing in practice* – knowledge activated while implementing specific tasks and routines –unfolds an impact as a source and resource of innovation. Innovation processes are also circular processes that seldom take place within a single region. Instead, innovations are participatory processes in time and space involving a variety of stakeholders, such as knowledgeable amateurs, active consumers, startups, producers, but also multinational firms or universities. Territorial innovation models insufficiently address the specific needs of such an open and vast innovation ecosystem.

This paper argues for “Open Region” as a concept for regional innovation policies that creates and utilizes opportunities for innovations. Open Region points towards proactive and reflective policy measures for managing the dialectic between opening and closing regions in order to create and exploit opportunities for innovation processes. Such measures support the innovativeness of regional protagonists as well as strengthen an innovation driven regional development. Empirically this paper builds on three research projects implemented by the IRS research department “Dynamics of Economic Spaces”, that surveyed time-spatial innovation processes through innovations biographies in different communicates of practice and open creative labs as temporary spatial settings for creativity driven activities.

Keywords: Innovation Processes, Policy, Time-Spatial Dynamics

What geographic scale are innovation systems?

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Assumptions about sub-national innovation systems tend to be based on levels of governance in the public sector. Where strong regional governments with powers over research and innovation exist then the regional scale of analysis tends to predominate as attempts are made to align processes of innovation in the private sector, and the identification of clusters with the spatial scale of innovation policy. Inasmuch as a key element of the innovation system is the public infrastructure for innovation, then some form of regional innovation system can usually be identified. However depending on the nature of spatial systems of interaction among firms and a wider set of innovation institutions, then the innovation systems may take a relational form, some parts operating across regional scales and others at a more local, eg urban, scale. The nature of the region in such debates depends in part of the patterns of settlement and inter-relationships between places and actors, but also on the historic evolution of tiers of government, as well as on the physical nature of territory – recognising natural barriers and areas of sparsely settled land. In Europe the effect of European regional policy and its use of NIUTS1 and 2 regions as vehicles for policy design and delivery, has reinforced a tendency to think of regional innovation systems where regions have a particular set if characteristics. This paper examines innovation systems at different scales in the context of innovation policy in several countries and argues for a more nuanced conceptualisation of spatial innovation systems.

Keywords: innovation systems, urban, regional, multiscalar

New modes of innovation in a non-core region: first lessons learned from a multi-case study in Switzerland

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This paper presents the design and the first results of the implementation of a regional innovation system in the non-core region of the Valais (Switzerland) aiming at creating shared value-based business models.

The research at the basis of this policy relies on a partnership between the Entrepreneurship & Management Institute of the University of Applied Sciences of Western Switzerland, and the local economic development agencies: the Valais Excellence association, the Brand Valais, the Valais Tourism Observatory, and the Regions- und Wirtschaftszentrum Oberwallis. Through this partnership, we apply an innovative and qualitative method aiming at co-creating innovative projects from the participation of the academic, economic, politic and social environments.

Based on the methodologies of Crowdsourcing (Howe, J., 2006) and Business Model Design (Osterwalder et al., 2010) applied in the touristic sectors in the Valais, the goal is to foster innovation in a sector of economic activity, and so encourage new partnerships respecting the Sharedvalue paradigm (Porter et al., 2011). This paradigm is based on finding not only financial benefits, but also social, political and ecological benefits.

Following the Internet usage, Crowdsourcing indeed gives a quick and easy way to involve a large community to gather ideas in order to solve a problem (Mendoca et al., 2008). This method aims at bringing together both internal and external knowledge to form new and more complex combinations in the search for new business models that offer win-win situations, in relationships of trust, particularly meeting the needs of consumers and customers (open innovation, user-based innovation).

Keywords: non-core regions, innovation, crowdsourcing, shared value, business models

Towards an Entrepreneurial State: Finding the Courage to Fail

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Recent debates on territorial development have highlighted the need for a more entrepreneurial approach to public policy. Research on innovation in a private sector context is clear on the need for an open approach engaging with a range of different stakeholders (customers, providers, etc.). Seeking to translate the positive aspects of private sector innovation to the public sector however has proven difficult. This paper explores some of the challenges identified and some of the barriers to be overcome in implementing change at a large scale in the policy field. It does so by reflecting on a series of practical cases from both the public and private sector contexts in Scotland and the Basque Country. The particular challenges identified include risk appetite, fear of failure, the speed of feedback and the lack of a 'safe space' to innovate given the political consequences of failure by government. The paper also puts forward some suggestions about how these challenges might be overcome.

Keywords: public policy, innovation, entrepreneurial state, policy failure

Regional styles in enterprise and innovation policies

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The paper identifies different regional policymaking styles, consisting of policy-mixes forms of intervention, ranging from the more minimal to the more proactive, verifies their diffusion in the Italian regions and tries to estimate their effect on regional development. The empirical analysis is based on an original database containing detailed regional allocations to enterprise and innovation policies 2007-2013. Unusual fuzzy-set cluster analysis techniques are used in order to identify different groups of regions, characterised by different policy styles. These techniques allow regions to belong to several clusters at the same time, but with different degrees of membership. This is particularly interesting, as in real-world policymaking it is hard to imagine 'pure' styles corresponding to fully consistent policy mixes. The effect of alternative styles on regional development is investigated through econometric difference-in-differences techniques. The results highlight the existence of remarkable heterogeneity, with some policymakers adopting a proactive, innovation-oriented style, and others adopting a minimal or a hybrid policy style. At least in the short term, policymakers operating in less innovative regions do not get positive effects, in terms of GDP per capita, from the adoption of proactive policies. Indeed, the attitude that leads to better results is to focus on conservation rather than change. In more innovative regions in which the production base is supposedly more responsive to policy stimuli, the opposite happens.

Keywords: enterprise and innovation policy, policy styles, regional governments

Do general innovation policy tools fit all? The regional role of the Norwegian SkatteFunn scheme

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General policy tools are an important part of the portfolio of innovation policy measures, amongst others to strengthen the framework conditions for firms' R&D and innovation activity. A question, however, is if general tools are equally relevant for all types of firms, irrespective of firms' size, sector and location.

The economic geography and innovation study literature, as well as the Smart Specialisation approach, argues that innovation policy tools have to be adapted to specific circumstances in different regions. The argument is then that general tools are insufficient, at least unless these are adapted to individual regions.

This paper examines the regional distribution of support from the Norwegian SkatteFunn scheme. This is a tax incentive scheme designed to stimulate R&D activity in all types of enterprises that are subject to taxation in Norway. Firms with approved R&D projects have a right for tax reduction. The scheme has been in operation since 2002 with about 26.000 approved projects.

If SkatteFunn projects are used more or less to the same extent in all types of Norwegian regions some of the rationale for regional differentiation of the innovation policy can be questioned. If the scheme on the other hand favours specific regions, for example core regions, the argument for regional adaptation of (parts of) the innovation policy is strengthened in the Norwegian case.

To examine this topic the paper analyses the regional distribution of all SkatteFunn projects, and investigates reasons for a (possibly) skewed regional distribution of these projects.

Keywords: regional innovation policy, SkatteFunn scheme, Norway

Cross-border regional innovation systems: Conceptual backgrounds, empirical evidence and policy implications

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The concept of cross-border regional innovation systems (CBRIS) surfaced in the literature on economic geography through discourses that highlighted the need of broadening innovation systems to cross-border contexts. Since these early discussions, the theoretical backgrounds of CBRIS have been elaborated (through notions of geographical scale, proximity and related variety) in a range of conceptual papers proposing CBRIS as a comprehensive framework for analysing regional cross-border integration. However, the empirical literature on CBRIS has failed to keep up with the advances in conceptualization. This paper discusses the reasons behind the mismatch that the concept still rests upon and scrutinises the usefulness of drawing policy suggestions based on a thin evidence base. Subsequently, directions for further research are suggested by underlining the need for holistic empirical validations of the concept together with the need of understanding how suggested policy measures based on CBRIS reasoning have been implemented in border regions and further, if implemented, how effective have they been in promoting cross-border integration.

Keywords: cross-border regional innovation system, geographical scale, integration, related variety, proximity

Openness and innovation in EU regions

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Regional openness has been pointed out as a major factor for innovation and economic development. In this paper we analyze the importance of openness for innovation and economic performance in European regions. As a novelty, openness will be understood from a triple perspective: intercultural, scientific and physical. Intercultural openness refers to the intercultural interactions reported by the regional population according to a special issue of the Eurobarometer in 2007. Scientific openness will be measured as the regional participation at EU 6^{th} and 7^{th} Framework Programmes. Finally, physical accessibility refers to multimodal potential accessibility, that combines indexes for road, railway and air accessibility and it has been obtained from the EU programme ESPON. Our results confirm that regional openness positively influences the economic performance of regions measured by the GDP per capita levels. Moreover we can affirm that regions showing more openness exhibit also a higher innovation performance measured both by the level of patent applications and by the regional innovation index provided by the EU Regional Innovation Scoreboard. Finally, we have found evidence about a differentiated role of scientific openness as it shows a higher impact on patent activity than on regional innovation index. This finding suggests that different kind of openness will also attract different kinds of knowledge.

Keywords: regions, openness, innovation, intercultural, scientific

The role of cities in regional Smart Specialization Strategies: Towards an integrated territorial strategy

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The concept of *Smart Specialisation Strategies* (S3) that is spread by the European Commission and academics (Foray et al., 2009 and 2011; McCann and Ortega-Argiles, 2013) has mainly focused at the regional level and little attention has been paid to the role of cities within them. This paper reflects on the role of cities in regional innovation policy, concretely in smart specialization strategies, pleading for a role of cities, which goes beyond traditional urban planning. Moreover, cities are proactive in economic development and competitiveness policies and that reality and its relation within the regional context and the regional policy has been understudied.

This paper aims to understand the challenges on policy-making for smart specialization in cities and its relationship with regional strategy making and sheds light to the following research question: *how to address smart specialization in cities framed by regional S3? Which is the role of policy learning in such a process?*

The paper is inspired in an action-research project where both authors are involved together with the members of the city town hall in Bilbao (Spain). The paper starts with a theoretical discussion on S3 within the regional competitiveness policies landscape. Secondly, the paper reflects on the strategic-making process in cities, their evolution and their link to regional strategic processes in order to build a framework useful for understanding the different dimensions to consider in the relationship between regional and urban smart specialisation strategies. After the methodological discussion, the case of Bilbao is analysed from an “inside-out” perspective.

Keywords: Cities, smart specialisation strategies. regional policy, policy-learning, urban policy

Smart specialisation strategies and cross-border integration of regional innovation systems: policy dynamics and challenges for the Upper Rhine

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This paper aims to provide new insights on the meaning and implications of the "smart specialization strategy" (S3) concept. According to the scholars who coined the expression (Foray, David, Hall, 2011), S3 addresses strategies and roles for any region. The paper critically reflects S3 by focusing on the case of a cross-border area: the Upper Rhine Valley. We intend first to position, in an analytical part of the paper, both the S3 concept itself and also the implications for the choice of innovation policy instruments - referring in particular to the idea of "policy mix" design (Borràs, Edquist, 2013).

The conception and application of S3 by most European regions may be seen as a perfect illustration of policy dynamics and complex governance at regional level. The resulting decisions may reframe regional innovation policies and systems, but what happens if we consider several institutional settings in the same perimeter, i.e. in cross-border areas? Our investigations are based on the model of progressive cross-border integration of regional innovation systems developed by Lundquist & Trippl (2009).

The Upper Rhine case helps to explore the issue of possible convergence and coordination of innovation policies in two regions belonging to separate national systems, but exhibiting common features, and a political will of cooperation. The empirical elements encompass an original online survey of European regions engaged in the S3 process which helps to better characterize positions of Alsace and Baden-Württenberg. The conclusion will address possible future policy developments and research desiderata.

Keywords: S3, cross-border regions, policy mix, governance

Opening up the innovation system framework towards new actors and institutions

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The innovation systems framework widely established for analysing regional innovation capacity. Ever since the concept was first suggested it was subject to numerous variations and refinements and became a powerful guiding framework for competitiveness oriented policy strategies most notably within the OECD context. It has long since been argued that in the face of global challenges, the rationale of innovation policy needs to be broadened beyond competitiveness and growth. Subsequently different innovation actors such as cities, social entrepreneurs, activists, philanthropists and ordinary citizens as well as different innovation types such as social, service and organisational innovation received growing attention. At the same time, from within innovation management the understanding of innovation is being "democratized". Notions like user driven innovation, open innovation, collaborative innovation, commons-based peer production, grassroots and common innovation are increasingly recognized. Furthermore, researchers have pointed to the relevance of low-tech innovation and of "frugal innovations" that are emerging in difficult framework conditions. Finally, regional innovation studies increasingly stress the role of social and relational capital and of new innovation mediators such as associations, unions and charities for underpinning regional innovation capacity. We therefore suggest to adapt the regional innovation system concept to reflect the newly emerging rich diversity of innovation rationales, formats, institutions and actors. We will introduce a proposal for such a revised innovation system concept along with a graphical illustration.

Keywords: Innovation System; new Modes of Innovation, New Actors

Power in the context of user driven complex innovations

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The research on user driven innovations are becoming increasingly relevant. The underlying assumption so far is that the user community and the incumbent producers have the necessary resources to bring the innovations to fruition. This might be functional for satisfying the unmet needs of the user for solving short term problems incrementally. *The literature on user driven innovations however do not mention how users can innovate when neither they nor the incumbent producers have the necessary resources on their own to resolve unmet needs.* Complex innovation, when resources are dispersed across multiple entities, requires their active orchestrated efforts within the innovation ecology. In this study we illustrate the different actors in the innovation ecology and the position of the user within it. With case illustrations from the aviation industry, we look at how users can innovate when neither they nor the incumbent producers have the necessary resources on their own to resolve unmet needs. We argue that generating successful user driven complex innovations depend on the different aspects of power wielded by the users with respect to the innovation ecology. This power primarily arises from the demand side knowledge the user possesses and their relative network centrality, while the ability to drive such innovations depend on the power to - orchestrate the ecology; maintain decentralized control; create adequate organizational structures; and influence public policy. The study reveals when and how do users drive complex innovations and what are its implications for the user and the industry.

Keywords: User innovations; Complexity; Power

Functional and Geographical Diversity in Collaboration and Scope of Innovation in SMEs

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Innovation active small and medium-sized enterprises (SMEs) play a key role in the renewal and growth of the economy. Globalization and open innovation have brought about challenges as well as opportunities for these firms to constantly innovate despite their smallness. Diversity in collaboration is emerging as one of the key contributions to innovation performance. While it is known that SMEs engage in collaboration for reasons of smallness and a limited in-house knowledge base, insights are scarce regarding the benefits for these firms' innovation performance of collaboration with a diverse set of partners.
This study focuses on the effect of functional and geographical diversity in collaboration on incremental and radical product innovation performance of SMEs, extending previous work by Belderbos et al. (2009) and Van Beers and Zand (2014). The paper addresses whether having a leading-edge functional partner within functional diversity helps to distinguish top performing innovators from the bottom, and whether having a partner from the technological frontier within geographical diversity helps to distinguish top performing innovators from the bottom. Our empirical analysis relies on quantile regression and avoids issues of endogeneity by using two waves – 2008 and 2010 – of the Belgian Community Innovation Survey (CIS) data to answer our research questions.
We find that functional diversity leads to effective development and commercialization of new products, whereas geographical diversity corresponds to successful adaptation of existing products to different local requirements.

Keywords: innovation performance, collaboration, functional diversity, geographical diversity, SMEs

R&D and productivity performance of Belgian regions

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Total Factor Productivity (TFP) is generally considered as a measure of technological change and as a major determinant of economic growth. TFP plays a critical role on economic fluctuations, economic growth and cross-regional per capita income differences. Endogenous growth theory, for instance, views economic growth as being primarily the result of endogenous and not external forces. Large portion of TFP growth is caused by investments in R&D, innovation and human capital. In addition, these investments in knowledge are at the source of important positive knowledge spillovers which also significantly contribute to economic growth. In a similar vein, spatial knowledge spillovers have also been identified in the literature as an important factor driving TFP performance of a region. The aim of the paper is to analyse the determinants of the efficiency levels across Belgian regions at different spatial levels (3 regions, 10 provinces, 43 districts, largest cities,…). First, we derive a regression based measure of regional TFP by estimating a spatial Cobb-Douglas extended production function bases on a representative sample of Belgian R&D active firms over the period 2000-2012. Secondly we investigate the role played by knowledge (private and public R&D stocks), human capital and regional macro-economic determinants (R&D efforts, ICT investment, competition and international trade) on the TFP levels by applying the spatial econometric methods that account for both heteroskedasticity and spatial autocorrelation. It turns out that a large part of TFP differences across the Belgium regions are explained by the disparities in the endowments of these determinants.

Keywords: TFP, TFP determinants, belgian regions, R&D

Public Research Funding and Regional Economic Impact

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The practice of publicly funded science is global, research collaborations span countries and researchers move across continents. The economic impact of such science appears to be regional - Silicon Valley, Munich and Barcelona owe much to the presence of research universities – yet emulation efforts have often failed. The use of public research monies to stimulate regional economic development should be guided by evidence about the multiple ways in which knowledge is regionally transmitted. We use new transaction data on purchases by researchers in four countries – France, Spain, Australia and the United States – to examine one such transmission vehicle, the demand for scientific inputs. Our analysis, based on a new and original data infrastructure, implemented in multiple research organizations in four countries, provides a set of initial "stylized facts" aimed to spur further analysis. Overall we find that the purchase of inputs from any industry is disproportionately local - in the US for example, a firm within a university's state is 20 times more likely to be a vendor than firms outside its state. This is even more true for firms in R&D intensive industries and particularly for small and new firms in those industries. We also find that firms supplying publicly funded research are older, larger, higher wage, and in more technologically advanced industries than the nation as a whole. (Preliminary) investigations show that university laboratories create a stimulus for novel product and organizational concepts via the demand channel, and that such effect is influenced by geographical and social factors.

Keywords: Science policy, Public funding, Regional economic impact, Demand-driven innovation

The role of financial institutions in regional economic development

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An important aspect of industrial policies is concerned with establishing relevant and efficient institutions. The focus of this paper is the role of financial institutions in regional economic development. Although the importance of institutions is increasingly emphasized, the role of institutions in general remains poorly understood, lacking perspectives on individual agency and institutional change. The paper is based on a study of financial institutions such as banks, venture funds, seed capital and private investors in four Norwegian regions. The data is based on around 20 interviews of the top managers in these institutions as well as annual reports etc. We use an evolutionary perspective to see how the institutions change over time, and how this differentiated set of institutions contribute to industrial path extension, path diversification, path transplantation or path creation, respectively.

The requirements to the size of equity in banks have increased after the financial crisis, discouraging risk taking. Most banks prefer to use real estate and other physical assets to secure loans and are reluctant to lend when the project involves substantial R&D investments. Thus, knowledge based new ventures find little support in banks. Venture capital funds have turned into lower-risk equity funds, and more risk willing seed money is hard to find. The tentative conclusion is that the present financial institutions primarily support regional industrial path extensions. The need for renewal of these institutions will be elaborated in the paper.

The Relationship Between Technology Transfer Through FDI and Labor Productivity in Developing Economies

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This paper investigates the relationship between domestic and foreign R&D (Research and Development) capital via FDI (Foreign Direct Investment) and labor productivity in seven developing countries (China, Russia, Turkey, Singapore, Argentina, Mexico, Poland) between 2000 and 2011. The research is based on the theoretical model in Coe and Helpman (1993) which explains the total factor productivity with domestic and foreign R&D capital via import. This paper differentiates from the literature by investigating the effects of foreign R&D capital via FDI on labor productivity. Parks-Kmenta GLS and Beck and Katz OLS estimations are used to implement the panel data analysis. Both domestic and foreign R&D capital stocks are constructed using perpetual inventory method. Ratio of bilateral FDI between five developed (Germany, France, United States, United Kingdom, Canada) and developing countries to real GDP of developing countries are used to weight foreign R&D capital. The evidence shows that there is a "know-how effect" from these five developed countries to developing economies through FDI. Results proved that technology transfer makes labor more productive. It is also shown that effect of private sector R&D efforts on labor productivity is a positive and significant factor. As a policy implication, it can be said that business enterprises of developing economies should invest more on R&D and attract foreign R&D capital from MNE's (Multinational Enterprises) of developed countries.

Keywords: Spillover Effect, Research and Development, Labor Productivity, Technology Transfer, Panel Data Analysis

Is there a relationship between workers experience portfolio and innovation?

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In this article we analyze whether there is a relation between work force composition, labor mobility and firm performance. Labor mobility is one of the key mechanisms through which knowledge diffuses, but the relation between labor mobility and firm innovation can only be assessed when one accounts for the type of skills flowing into the firm. Hence, we distinguish between different types of mobility; mobility from workers with related or unrelated sectors (industry), mobility from workers with related or unrelated educational background and mobility from workers with unrelated or related geographical experience. The Community Innovation Survey (CIS) data are merged with public enterprise registers that provide (career) information on *all* employer firms and *all* individuals (LEE data) above age 16 in the years 2004 -2008. The LEE data is gathered annually and our data cover around 6215 enterprises. Using the LEE data enables us to identify the work force composition in the firms, and hence test whether there is a relationship between workers past experience and various innovation measures, amongst them whether firms are innovation active. We find that firms are more likely to be innovation active when employees come from the same geographical region and have related educational experience, yet unrelated industry experience.

Keywords: labor mobility, innovation, work force composition, related variety

Vocational Training Centers: How to share technological innovations with industrial SMEs

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The aim of this paper is to analyze the role of vocational training centers as the core elements of a local innovation system.

The Durango county, located in the Basque Country, is dominated by a high industrial activity, with a low level of final products, since the firms in the area are providers of large manufacturing enterprises. These firms act as suppliers of large firms operating in sectors such as energy, manufacture of machine tools or the manufacture of heavy machinery. However, the automotive industry is the main customer of these local firms.

Vocational training centers are seldom regarded as key players in knowledge generation and dissemination processes by the innovation systems literature. This stream of the literature does not provide a conclusive evidence of their influence, so their role still remains neglected and under studied.

The most important player of an innovation system is the productive subsystem, this is, the firms. In order to identify the most important players for those firms, in technological innovation process we ask the local firms in the county about their view of the actors they collaborate with.

In order to undertake the research, we develop a multivariate analysis, which clarifies the relevance of some players regarding their role in knowledge diffusion. In it, predictive and segmentation analyses are used. Then a social network analysis is developed in order to identify which players are the most important ones for the knowledge diffusion and acquisition, from the point of view of the sampled firms.

Keywords: knowledge, industrial firms, technology, vocational training