Henning Kroll

Understanding the "Regional Policy Mix" - A Classification and Analysis of European Regions' Support Policies

Fraunhofer

ISI

Contents   Page

Tables

Figures

Abstract

In recent years, no small number of studies have emphasised the importance of "getting the policy mix right". What that term, "policy mix" relates to, however, remained less than clear, not least as a result of the absence of an appropriate database on regional policies. With the Regional Innovation Monitor repository, such a database has now become available. Using this novel source of data, this paper identifies specific types of "policy mixes" common among European regions as well as external and internal factors that determine regional policy makers' choices of policy mixes. Finally, it demonstrates that regions' choice of a particular policy mixes may have influenced their economic resilience during the recent years of crisis.

1 Introduction

In recent years, no small number of studies and reports on regional innovation policy have emphasised the importance of "getting the policy mix right" (Asheim et al. 2006; OECD 2010; 2011a; 2011b). Despite its common use, however, it has remained less than clear what that term, "policy mix" actually relates to. Instead, many studies left the impression that its use reflects little more than a general acknowledgement of regional idiosyncrasy and place-specific particularities (OECD 2014a; 2014b). At best, it could be interpreted as an argument in favour of dedicated place-based policies (Asheim et al. 2011; Barca et al. 2012; Foray et al. 2012), at worst, it could be (and has been) read as the mistaken idea that there is some sort of good-practice 'recipe' for regional innovation policy that all regions should apply (Nauwelaers and Reid 2002; Technopolis et al. 2012; 2013; Tödtling and Trippl 2005).

Nonetheless, the idea of looking at regional policy from a systemic, rather than from a one-dimensional perspective remains relevant and a suitable approach towards understanding the challenges that come with, for example, new policy agendas under the headline of smart specialisation. Arguably, much of the conceptual and political confusion that can be perceived around the term "policy mix" may in any case mostly result from the absence of an appropriate, Europe-wide database on regional policies that would enable us to think about "mixtures" of policies in other than case-specific terms. If the only option to consider policy mixes is the study of particular regions' dealings with innovation policy, the resulting impression will inevitably be one of story-telling (OECD 2014a; 2014b).

Following the conclusion of the first phase of the European Commission's Regional Innovation Monitor (RIM) project, however, a new database has become available that allows us to quantitatively analyse the composition and place-specific "mixture" of re-

gional innovation policies from a broader perspective (Technopolis et al. 2012). For the large majority of European regions, this database contains detailed information on the six most important policy measures that are implemented within their boundaries. Furthermore, each of these policy measures has been classified with a view to its main thematic and target group orientation and the amount of funding allocated to the respective action has been identified. Using this dataset, a structural approach more can be taken towards the identification and characterisation of specific regional innovation policy mixes in the European Union – if any such mixes should exist.

Using the newly available RIM data, this paper will establish whether the European system of approaches to regional policy is an arbitrary array of case-specific solutions or if specific types of "policy mixes" can be empirically distinguished. To resolve this question, the analysis will use cluster analysis to identify specific types of regional policy mixes in European regions. Furthermore, it will seek to analyse the role of two main factors that influence regional policy makers' choices of any of these specific policy mixes, the region's location in a particular Member State and its overall degree of economic development.

Finally, the proposed paper will seek to understand whether there is some truth to the notion that "getting the policy mix right" is important for the relevance and efficacy of regional innovation policy. Evidently, it is different to analyse relevance and efficacy of regional innovation policy in a one dimensional sense as the target system that it relates to is multi-faceted and complex. Nonetheless, most observers agree that it should be a main role of regional policy to prevent that the regional economy is adversely affected by detrimental external influences. Hence, it will analyse whether regions' choice of a particular policy mix has influenced their economic resilience during the past recent years of crisis.

2   Conceptual Framework

In general terms, different schools of thought can be identified with a view to the question how – and to what ends – the terms policy mix should best be deployed.

Throughout the better part of the past two decades, policy makers at the European Union level as well as within many regions were convinced (or at least hoped) that there could be a standard recipe for regional policy that could be learned from best-practice studies and implemented in the large majority of regions (Bachtler 2001; Bachtler et al. 2003). Effectively, this was an understanding prevalent not only at the European level, but also internationally with e.g. the raise of various sorts of Silicon Valleys, Hubs for the Creative Class and High-technology Clusters across both centres

and the periphery (Technopolis et al. 2012; 2013). In this framework of thinking, "policy mix" refers to a template, a puzzle in which individual parts may be missing (OECD 2014a) – and have to be added to make regional policy a success. Also, it may refer to a prescription regarding an "optimal balance" of certain policies in terms of budget and political attention committed (Capello and Nijkamp 2009).

While, in the meantime, both OECD and the European Commission have openly dismissed this approach (e.g. European Union, DG Regional Policy 2011; OECD 2011a) and replaced it with a new paradigm around place-based policies, the old idea continues to linger in the heads of many and to influence political decision making.

In the new policy paradigm of "smart specialisation", "constructed competitive advantage" and related approaches, however, the notion of "policy mixes" or, more precisely, "desirable policy mixes" plays an entirely different role (Asheim et al. 2011; Barca et al. 2012; Camagni and Capello 2013; Foray et al. 2012);. Grounded in a "place-based" and "challenge-oriented" understanding, regional policies under the heading of smart specialisation are based on the proposition that interventions should be designed in response to, or at least in reflection of concrete strengths and weaknesses or the regional economy as well as needs of the local population. Naturally, this novel understanding of the need for a regionally contingent policy mix is to a large extent irreconcilable with the original one. In fact, it is this understanding which during the past years has given rise to the impression that, in normative terms, there may, righteously, be no characteristic policy mix at all. If all regions are to respond to locally specific challenges in a place-based, individual manner, the main point of reference for policy makers must be the match of challenges and policies *within* their region. Cross-regional standards, in contrast, should be both conceptually undesirable and, given the diversity of European regions, empirically unlikely.

Beyond this general, conceptual perspective that, implicitly, mostly relates to the political choices of regional policy makers "policy mixes" can be considered as subject to external influences.

Firstly, there is, necessarily, a socio-political dimension to the idea of policy mixes. Different Member States of the European Union have not only different policy traditions but also differ notably with regard to their current understanding of the way policy should be delivered (Bachtler 2001; Bachtler et al. 2003; Crescenzi and Rodriguez-Posé 2011). It is beyond the scope of this paper to develop these differences in detail but it can be shown that they touch upon all relevant dimensions of governance such as the centralisation of decision-making processes, the degree of devolution of power to lower level, the role assigned to participation, the understanding of the general role

of policy in a market economy etc. (Acemoglu and Robinson 2000; Barca et al. 2012; Farole et al. 2011). In this regard, the European Union covers a variety of different set-ups from countries with strong legacies of planned economy times and a generally quite centralist understanding of policy to countries in which participatory processes have played a strong role forever (Kroll 2015; Rodríguez-Pose et al. 2014). All this can be expected to have a substantial impact on the question which measures appeal to decision makers or can find approval within the relevant authorities. Moreover, national constitutions assign different roles and remits to the regional level of government, so that local policy makers' scope of action is to a degree predetermined.

Secondly, policy mixes are by definition a result of the amount of budget allocated for the purpose of regional innovation policy (Bachtler 2001; Bachtler et al. 2003; McCann and Ortega-Argiles 2011; 2013). Some type of policy measures need a certain amount of budget to be deployed effectively (Capello and Nijkamp 2009). If this budget is not available, regional policy makers will inevitably have to turn towards other options irrespective of how conceptually desirably and generally appealing they may consider a certain type of measure. Implicitly, there is a direct connection with the degree of economic development of a region as certain types of measures can only be financed by those regions that receive substantial allocations from the European Union (former Convergence regions). Without a critical mass of funding behind them, certain types of policy measures can therefore only meaningfully be implemented by those regions that possess the needed resources. This, naturally, would not in principle keep them from implementing other measures as well or to simply proportionally expand the activities of regions with smaller budgets. Theory suggests, however, that administrations have an interest to maximise and safeguard budgets once obtained and prioritise measures that can be deployed to that end (Foray and Rainoldi 2013). In practice, this suggests that Convergence regions may have a preference for measures that allow them to actually allocate the budget at their disposal as well as to choose a policy mix that allows them to politically justify their choice by showing-off large-scale projects with short-term and high-profile visibility.

Against the background of these considerations, four overall hypotheses can be put forward:

H1:   Given the fact that a paradigm of best-practice has long prevailed and that some region's challenges may indeed be quite similar, the European system of regional policy mixes is unlikely to be a completely arbitrary array. Empirically, it will be possible to distinguish certain "characteristic types".

H2:   The geographical distribtion of these characteristic types of policy mixes will, for both socio-political and legal reasons, be determined by the nation that regions are located in.

H3:   A region's type of policy mix will be strongly co-determined by its general degree of development not only because of the related impact on regionally specific challenges but also because of the notable differences in the budgets that are available for regional policy in leading and lagging regions.

H4:   Irrespective of the question whether it is influenced by other factors, a region's choice of a particular type of policy mix can influence its economic resilience in times of crisis.

3   Data and Methodology

Since 2009, the Regional Innovation Monitor database covers all European Union Member States with the exception of the small Baltic nations, Slovenia, Croatia, Malta and Cyprus that have to regional policy. Most commonly, "regions" are defined at the NUTS2 level, with the exception of the UK and Germany where they are defined at the NUTS1 level. Overall, care was taken to in the best possible manner take into account the level at which decisions in "regional policy" take place. Overall, the Regional Innovation Monitor thus covers 207 regions.

In the course of the Regional Innovation Monitor project, information on policy measures was collected by different Regional Correspondents. These Regional Correspondents were put in charge of regions in one or more nations, but not necessarily for all regions within one Member State. As such a decentralised model invites differentiation in style and assessment, clear guidelines for the collection and display of information were provided by the lead partner and a central quality review was implemented. While it can thus not be fully excluded that individual styles of assessment may influence the comparability of data, the remaining effect is likely to be offset by the respective Regional Correspondents' in-depth knowledge of the regional situation that,

compared to centralised data collection, helps to avoid distortions based on a misinter-pretation of available documentation.

In detail, Regional Correspondents were asked to provide information on six policy measures per region, making the choice on a well-founded assessment which of them they considered most important. Once selected, each of the measures was studied in-depth to, for the purposes of the RIM project, develop a qualitative description of the intervention – taking into official guidelines as well as existing evaluations. Based on this information, the measure was classified according to a typology commonly used on other EU studies, notable those in the framework of ERAWATCH that distinguishes between measures

- supporting classic (often public) R&D: institutionally, through competitive calls or infrastructure,
- supporting Science-industry co-operation,
- supporting the creation of human resources for science, technology and innovation,
- supporting Business R&D and innovation,
- supporting Innovation climate and business eco-system.

Additionally, they were classified regarding the (main) method through which support is delivered

- grants, direct subsidies,
- public loans at favourable conditions,
- public guarantees for private loans,
- venture capital,
- tax incentives,
- other (e.g. non financial).

By taking into account both aspects, each measure is characterised in two content-related dimensions. Additionally, the database contains information on the amount of budget allocated to each measure and the share of overall budget that stems from EU sources.

In the following, the paper's search for empirically identifiable "standard types" of characteristic policy mixes draws on three main aspects, taking budget rather than a mere count of measures as the basis of reference. More precisely, cluster analyses are conducted with standard procedures for centroid-based clustering in SPSS, based on the z-transformed values of the following variables

- share of funding in the respective intervention types (6 variables by type),
- share of funding in the respective RIM-target categories (5 variables by type),
- share of EU funding in all regional measures total funding (proxy for EU-Orientation).

Detailed descriptive are not included as the most important aspects become evident in later tables.

4 Results

In the following, the section will describe the analysis' findings in line with the original hypotheses.

With a view to Hypotheses 1, direct attempts to centroid-based clustering and hierarchical analysis do not immediately yield telling results. In the raw data, several regions appear distinct from all others and preclude meaningful explorations of structures within the remaining majority of regions. In the sample of 207 regions, around 10 regions display such irregularities which, irrespective of the precise method of clustering chosen, prompted the creation of small (in two cases 'one-region') clusters far away from the centroids of the rest of the sample.

Conceptually and practically, there are few reasons to assume that these region's policy mixes are in fact that outstandingly different. Methodologically, in contrast, a decentralised system of data collection is prone to produce some faulty data points due to errors in data entry or, on singular occasions, incorrect assessment or classification. Hence, two cases of very substantially diverging data were treated as technical outliers and removed from the list. Together with those 25 regions, for which data was either missing or substantially incomplete, these two regions were removed from the sample of 207, leaving 180 cases for detailed analysis. Following an in-depth analysis of centroid distances between the clusters resulting from a first analysis, it was decided not to remove the other eight cases, as it appeared less evident that they were based on faulty data.

Further exploratory work showed that a predefinition of either 5 or 6 clusters in centroid-based clustering yielded the most meaningful classifications with a view to inter-

pretation. As will be shown below, both solutions yield characteristic results geographically as well as with a view to the key clustering variables. Specifications forcing the number of clusters below 5, in contrast, become too coarse to interpret while those allowing for more than 6 clusters become confusing. Likely, the former cannot reflect a factual complexity there is, while the latter start to reveal the "personal styles" of regional correspondents rather than actual differences in policy.

In the five cluster solution (Table 1), clusters are clearly distinguishable not only with respect to the main target groups addressed in the respective regions (business-oriented approach vs. systemic approach) but also with regard to the characteristic type of funding instrument deployed (mostly grant based vs. broader mix of approaches). This suggests a general policy option to choose between a mostly allocation based and a more comprehensive support approach, irrespective of the core target group that a region's policy is focusing on.

The six cluster solution (Table 2), in contrast, does not differentiate as strongly by main type of intervention. In all clusters but the first one, the share of grants is between 80% and 98%, with the deviation in the first one easily explained by the limited amount of funding available in those regions. More interestingly, the core message six cluster solution is that with a relative increase in EU funding in regional support measures from very low to very high, the main type of policy mix moves from business-oriented (low) to systemic (mid-range) back to business-oriented (high).

In detail, the resulting clusters of the five-cluster solution can in writing be characterised as follows:

Cluster 1
Business-Oriented Policy Mixes, based on grants, myopic on business

A cluster that covers Baden-Württemberg, Northrhine-Wetsphalia, Wallonia, Ireland, North West England, Western Poland, Denmark, Southern Finland, Lombardy, Catalunya, Castilla y Leon, Sicily, Piedmonte, Trentino, Molise, Campania, as well as some Eastern European and French regions . Policy Mixes in this cluster are characterised by a limited share of EU funding (~14%) in support policies and a strong focus on grants. Also, venture capital plays a noticeable role. The focus of support policy is on business R&D and innovation policies.

Cluster 2
Business-Oriented Policy Mixes, based on grants & loans, addressing framework

A Western European cluster including many regions in South Eastern Spain and France, Flanders, Stockholm, the UK with the exception of London, much of Austria, Corse, Sardegna, and parts of Middle Italy, some German, Swedish, Finnish and Czech regions and finally, Western Romania. Policy Mixes in this cluster are characterised by notable share of European funding (~38%) in regional support policies and split focus on grants (2/3) and loans (1/3). Furthermore, policies are focused on business R&D and innovation measures (38%) as well as measures supporting the innovation climate and the business ecosystem in a broader sense (50%).

Cluster 3
Systemic Policy Mixes, based on grants & investments

A cluster that covers much of Germany, the Netherlands, Central France, the Basque Country, Northern Scandinavia, some coastal regions and France (Languedoc-Rousillon) and Italy (Lazio, Puglia, Calabria, Liguria, Aosta). Policy Mixes in this cluster are characterised by a relevant share of EU funding (~28%) in regional support policies and a next to exclusive reliance on grants. The focus of support policy, however, is on science-business collaboration (2/3), complemented by notable public R&D and business R&D investments (10% each)

Cluster 4
Systemic Policy Mixes, based on other approaches

A cluster that covers South Sweden, Alsace, London, Emilia-Romagna, Veneto, Carinthia, Navarra, Galicia, and Overijssel. Policy Mixes in this cluster are characterised by a relevant share of European funding (~27%) in regional support policies and a focus on 'other measures' – often of a more institutional nature – that are difficult to classify. Also, venture capital plays a noticeable role.

Cluster 5
Convergence Cluster

An "basic convergence cluster" with many members in Bulgaria, Hungary, Slovakia, Eastern Poland, North Eastern Germany, Portugal and singular regions in Spain, Portugal and Italy. Policy Mixes in this cluster are characterised by a high share of European funding (~78%) in regional support policies and a next to exclusive reliance on grants as a funding instrument. Furthermore, support policies are very strongly focused on business R&D and innovation measures.

Table 1:   5 Cluster Solution based on Key Policy Mix Variables

	1	2	3	4	5
Number of Regions	**53**	**35**	**39**	**13**	**42**
Share of EU funding in total Budget	0.14	0.38	0.28	0.27	0.78
Grants, direct subsidies,	0.94	0.65	0.98	0.27	1.00
Public guarantees for private loans	0.00	0.00	0.00	0.00	0.00
Other (e.g. non financial)	0.02	0.01	0.01	0.71	0.00
Public loans at favourable conditions	0.01	0.28	0.01	0.00	0.00
Tax incentives	0.00	0.00	0.00	0.00	0.00
Venture capital	0.03	0.01	0.00	0.02	0.00
Classic R&D, mostly public	0.03	0.06	0.11	0.05	0.08
Science-Industry co-operation	0.06	0.04	0.67	0.37	0.09
Human Resources for STI	0.01	0.01	0.01	0.01	0.03
Business R&D and innovation	0.81	0.38	0.11	0.28	0.72
Innovation climate and business eco-system	0.09	0.51	0.04	0.29	0.06
User driven / procurement	0.00	0.01	0.01	0.00	0.00
Public sector / social / internationalisation	0.00	0.00	0.05	0.01	0.03

Source: Own Analysis, based on RIM database

The alternative six cluster solution reveals further differentiation as follows.

Cluster 1
Policy Mixes that focus on **Business Support**

This cluster covers German, French, Austrian, Belgian, Spanish, Italian and next to all UK regions. Policy Mixes in this cluster are characterised by a low share of European funding (~10%) in regional support policies and an above average focus on loans (17%) and venture capital (3%) rather than mere grants (73%) evcen if still dominant. A dominant focus is on business R&D and innovation (89%), only weakly complemented by other activities e.g. in science-industry collaboration (5%).

Cluster 2
Policy Mixes that focus on **Science-Industry Collaboration**

This cluster covers German, Italian, French, Dutch and Swedish, but also Czech and Greek regions. Policy Mixes in this cluster are characterised by a relevant share of EU funding (~29%) in regional policies and a pronounced focus on grants (87%) and other measures (12%). A clear focus is put on science-industry collaboration (81%) complemented by some activities in business R&D and innovation (12%).

Cluster 3
Policy Mixes that focus on **Innovation Climate & Ecosystem**

This cluster covers many Italian, Finnish and French, as well as all Danish regions and some others. Policy Mixes in this cluster are characterised by a relevant share of EU funding (~34%) in regional support policies and a pronounced focus on grants (81%) and other measures (11%). Also, loans and venture capital play a noticeable role. A clear focus is on innovation climate and ecosystem support (75%)

Cluster 4
Policy Mixes that focus on **Public R&D Investments & Complementary Activities**

Most prominently, this clusters covers Ireland and Slovakia, as well as regions in Italy, Spain, Sweden, France, Hungary, and Poland. Policy Mixes in this cluster are characterised by a notable share of European funding (~44%) in regional support policies and a pronounced focus on grants (82%). Also other measures play an important role (5% designated as such and many unclassified). There is a strong focus on public R&D (52%) complemented by business R&D (23%) and science-industry collaboration (17%).

Cluster 5
Policy Mixes pursuing an **Holistic Approach, including Human Capital**

Regions of this cluster are spread across Europe (e.g. IT, ES, HU, PL), often they are less developed. Policy Mixes in this cluster are characterised by a notable share of European funding (~48%) in regional support policies and a next to exclusive focus on grants. There is a clear focus is on business R&D and innovation (47%), complemented by notable investment in science-industry collaboration (20%), human resources (14%), innovation climate (12%), and some public R&D (5%)

Cluster 6
Convergence Cluster

It covers regions in Bulgaria, Romania, Hungary, Poland, Portugal, North Eastern Germany, Wales, Northern Finland, as well as some regions in France and Italy. Policy Mixes in this cluster are characterised by a high share of European funding (~68%) in regional support policies and a next to exclusive focus on grants. A dominant focus is on business R&D and innovation (78%) complemented by some investment in innovation climate (7%) and science-industry coll. (6%).

Table 2:   6 Cluster Solution based on Key Policy Mix Variables

	1	2	3	4	5	6
Number of Regions	**45**	**35**	**29**	**16**	**11**	**46**
Share of EU funding in total budget	0.10	0.29	0.34	0.44	0.49	0.68
Grants, direct subsidies,	0.73	0.87	0.81	0.82	0.97	0.98
Public guarantees for private loans	0.00	0.00	0.00	0.00	0.00	0.00
Other (e.g. non financial)	0.07	0.12	0.11	0.05	0.00	0.00
Public loans at favourable conditions	0.17	0.01	0.06	0.01	0.03	0.01
Tax incentives	0.00	0.00	0.00	0.00	0.00	0.00
Venture capital	0.03	0.00	0.02	0.00	0.00	0.01
Classic R&D, mostly public	0.03	0.01	0.01	0.52	0.05	0.02
Science-Industry co-operation	0.05	0.81	0.04	0.17	0.20	0.06
Human Resources for STI	0.01	0.01	0.00	0.01	0.14	0.01
Business R&D and innovation	0.89	0.12	0.19	0.23	0.47	0.78
Innovation climate and business eco-system	0.03	0.05	0.75	0.06	0.12	0.07
User driven / procurement	0.00	0.00	0.00	0.02	0.02	0.00
Public sector / social / internationalisation	0.00	0.01	0.00	0.00	0.00	0.06

Source: Own analysis, based on RIM database

In the following, all further analysis regarding Hypotheses 2, 3, and 4 will draw on these five and six cluster solutions in parallel. This approach is chosen to illustrate that this paper's considerations and conclusions are not arbitrarily based on one specific and as such potentially unstable cluster solution but that, quite to the contrary, evidence for certain generalisable conclusions can be found irrespective of the precise specifications of one concrete cluster solution.

With regard to Hypothesis 2, a first indication was already provided in the detailed descriptions of specific clusters above and can be confirmed with a view to Figure 1 and Figure 2 in the Annex as well as Table 3 which provides an overview of the relation between regions' assignment to main clusters, structured by Member State. As illustrated in these figures and tables, the national framework that a region is located in does indeed play a decisive role. Eight out of ten UK regions, for example, have a focus on standard Business-Oriented Policy Mixes. In a similar way, five out of seven Czech regions adopt a Systemic Approach, based on grants and five out of six Bulgarian regions fall into the Convergence cluster. More clearly even, all Danish, all Irish and all Hungarian regions belong to a single group, different ones respectively.

Table 3: Distribution of Policy Mixes across Member States

	DK	FI	IE	FR	AT	BE	UK	CZ	GR	NL	SE	BG	HU	PL	PT	RO	SK	IT	ES	DE	Total
Business, myopic	5	2	2	3		1	1					1		7		1		6	3	2	34
Business , framework		1		11	4	2	8	2		2	1				2	3		5	7	4	52
Systemic, Grants		1		5	2			5	4	4	3				1		1	5	2	6	39
Systemic, Other				2	1		1			1	4							2	2		13
Convergence Cluster									2			5	7	9	3	4	3	3	2	4	42
Outlier/No Data		1		5	2		2	1	7	5						1			3		27
Total	5	5	2	26	9	3	12	8	13	12	8	6	7	16	7	8	4	21	19	16	207

	FR	AT	BE	UK	CZ	GR	NL	SE	DK	FI	IE	SK	BG	HU	PL	PT	RO	IT	ES	DE	Total
Business Oriented	7	3	2	8	2		2			1								5	8	5	43
Science-Industry	4	2			4	4	4	5				1	1			1		3	2	5	35
Inn. Cli. & Ecosystem	5		1	1			1	2	5	2			1		3		1	6	1		29
Public R&D	3				1			1			2	3		1	2			1	2		16
Holistic/H. Resource	1	2												2	1			3	1	1	11
Convergence Cluster	1			1		2				1			5	4	10	5	7	3	2	5	46
Outlier/No Data	5	2		2	1	7	5			1						1			3		27
Total	26	9	3	12	8	13	12	8	5	5	2	4	6	7	16	7	8	21	19	16	207

Source: Own analysis, based on RIM database

In general terms, however, the picture is less clear. Most notably, three large regionally diverse Member States with relatively autonomous regions Spain, Germany and Italy display different approaches. Typically, no more than 50% of all regions can be attributed to one group and the range of approaches differs widely, up to covering all policy mixes within one single nation. Evidently, therefore, national attribution does not predetermine the choice of a particular policy mix – probably, as regions are to a certain extent free to take their own choices. In summary, it is thus clear that while some of the variance in policy mixes that can be observed is indeed due to national particularities, national particularities alone do not suffice to explain.
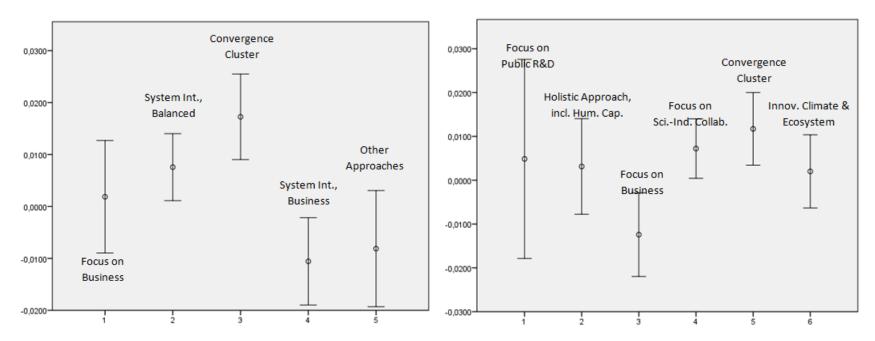
Concerning Hypothesis 3, the analyses' findings are equally ambiguous (cf. Figure 1 and Figure 2 in the Annex). On the one hand, the abovementioned cluster solutions illustrate that there seems to be a characteristic "Convergence Policy Mix" that emerges in many Eastern European and Portuguese regions which have both the opportunity and obligation to process large amounts of European funding. On the other hand, classic business-oriented policy mixes, drawing on limited amount of European funding and often taking recourse to public loans to save budget were next to exclusively found in Western Europe's Competitiveness and Employment regions. At the same time, systemic policy mixes, using grants and investments (5 cluster solution) or policy mixes focusing on innovation climate and ecosystem (6 cluster solution) can be found across the continent, evidently quite irrespective of concrete socio-economic framework conditions.

Hence, the relation between socio-economic development and policy mix seems to be no more deterministic than that between a region's location in a specific Member State. While a low level of development and the associated endowment with EU funding appears to be a necessary condition to develop a expenditure-based policy regime and a lack of relevant funding tends to prompt a recourse to narrow and standardised business-support policies, neither seems to be sufficient one for these policy mixes to actually emerge. Naturally, an expenditure-based regime with a heavy reliance on grants would be difficult to implement in regions with no budget to sustain it and/or use up scarce resources too quickly. Even in Romania and Bulgaria, however, single regions opt for other policy strategies. Likewise, while small budgets do limit choices, several UK, French or Spanish regions strategically depart from the standard, business-oriented approach that others pursue.

With respect to Hypothesis 4, an analysis structured by the five cluster solution finds that the highest average growth rate can be found among the regions of the Convergence cluster, i.e. those that deploy a traditional policy mix and distribute a lot of funding (Figure 1). This at first surprising finding has to be qualified by taking into account

the low income character of many of the group's regions in which even small changes – in part spurred directly by the allocation of EU finding – can result in notable changes in growth figures. Moreover, there seems to be a clear indication that regions deploying an integrated, systemic approach that addresses both public and private sector research and innovation fare economically better than those which put a focus on business only. These findings are corroborated by an analysis structured by the six cluster solution (Figure 1). Again, growth was highest among the regions of the Convergence cluster, followed by those focusing on Science-Industry Collaboration, Innovation Climate and Ecosystem, and, to a lesser extent, those pursuing a holistic approach. The growth performance of those that focused mostly on business-oriented measures, in contrast, once more remained below average, even negative. That of those focusing on measures focused on public R&D, finally, was so diverse that no clear indication can be given and any robust relation between their choice of policy mix and economic development remains unlikely at all.

Figure 1: Average Growth Performance of Regions with different Policy Mixes according to five and six cluster solution (left/right)

Source: RIM database, Eurostat Data on regional growth, own analysis

5   Summary

Concluding, the hypotheses-based findings of this first comprehensive, quantitative data-based analysis of European region's policy mixes can be summed up as follows.

Firstly, it is possible to identify and clearly distinguish various types of regional policy mixes in the European regional policy system. Apparently, there are different types of overall policy concepts that European regions pursue (or not) and which confirm that, despite all idiosyncrasy, the notion of certain policy mixes is indeed a useful one. Irrespective of the precise number of predefined cluster centres, a meaningful and distinct picture emerges. The most instructive classification is one that distinguishes five to six types of European regional policy mixes.

Secondly, regional policy mixes do indeed reflect national particularities and preferences in policy making. In many cases, however, there is also a large degree of variation of policy mixes among regions of the same nation. Often, large Member States do not even display a clear preference for one single model as framework conditions, societal challenges and available budgets differ broadly among their regions. Characteristically, this situation can be federal or regionalised countries but, interestingly, also in as such more unitary states.

Thirdly, the overall level of development or, more specifically, the availability of European funding is indeed a relevant impact factor with a tendency to favour certain policy choices. All cluster analyses identify a characteristic 'Convergence Policy Mix' which is specific to many regions that have money to spend. However, even Convergence regions retain autonomy in designing their policy mixes and not all follow the same path. Likewise, small budgets tend to favour a recourse to basic business-support policies yet by no means bind regions to stick to those. Many Western European regions pursue more ambitious agendas.

Finally, economy-wide factors come to play and may counteract regional policy's direct implications or effects. Consequently, the juxtaposition of different Policy Mix Clusters' average growth rates should be interpreted with care and in the light of these regions' quite different starting conditions. Nonetheless, we remarkably find that the choice of certain policy mixes, notably more systemic ones, to a significantly stronger extent associated with regional resilience than others.

In light of the large regional variance and non-deterministic nature of both national context and European funding endowment, these differences can hardly be explained by either of them alone. Instead, strategic choices seem to play a relevant role, in particu-

lar with respect to the beneficial impact of systemic policy mixes – which can be found all across Europe.

Overall, this study has confirmed that the use and further elaboration of the term "policy mix" is indeed useful. Empirically, it can be shown that the combination of certain generic types of regional policies is by no means arbitrary and haphazard but follows certain identifiably distinct rationales. While these policy mixes a in multiple ways the result of various external factors of influence such as national particularities and the concrete availability of funding they are also due to strategic choices of and in individual regions.

Their main, overall message is summed up in the below figures (Figure 2).

Firstly, the availability of European funds and national policy traditions predetermine if regional policy makers are prone to develop a 'hands-off' (i.e. rel. small EU budgets, free market traditions) or an 'allocator's' mentality (i.e. rel. large EU budgets, traditional planning traditions). Both share a focus on business support.

Secondly, there is an orthogonal possibility of strategic departure from the baseline connecting either of these two options. Rather than either of the two or some in-between option focused on businesses, more strategic approaches can be chosen that address a more complex set of relevant target groups in a systemic manner.

Thirdly, a strategic departure from the baseline of business support appears least common on either end of the scale. The lower or higher the share of EU funding gets respectively, the stronger its tendency to bind regional policy to a specific, stereotypical type of behaviour. In contrast, a majority of policy-mixes based on mid-range budgets are of a more strategic nature.
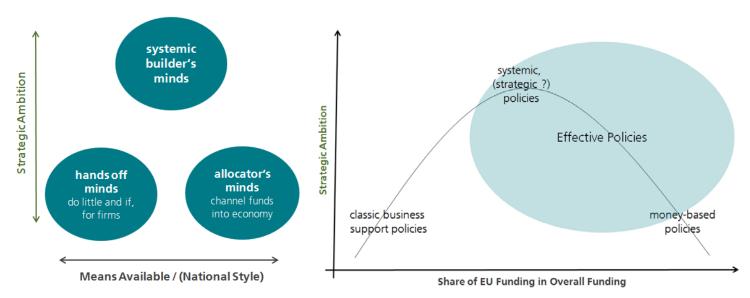
Figure 2:   Conditions and Outcomes of Different Policy Mixes

Source: Own Analysis

6 Policy Conclusions

In conclusion, this paper's findings suggest that regional policy seems to hold two roads to success, a direct one and a sustainable one. On the one hand, the injection of substantial Convergence budgets into regional economies through grants seems to have a positive effect. Likely, however, this effect is a direct one and will cease as soon as funding is phased out. On the other hand, the strategic decision for a systemic and co-operation oriented approach to regional policy seems to pay off without necessarily having to draw on a large budget. Most likely, therefore, this effect can be considered more structural.

As both the five and the six cluster solution illustrate, there is not one "desirable" type of a "more strategic" policy mix that could be learned and implemented by all, different regions find different solutions according to local needs and opportunities. At the same time, there are clear indications that comparatively similar systemic policy mixes can be deployed by quite different regions, so that the option of "going strategic and systemic" by focusing on support co-operation and framework conditions is an opportunity for many.

Other than remaining dependent on the externally determined allocation of ESIF budgets which may at some point cease to be available. Against this background, this study's findings strongly support the usefulness and necessity of the European Commission's smart specialisation agenda to reconsider and re-shape regional policy mixes based on notions of systemic policy design and to strategically depart from a baseline of some or the other type of business support.

At the same time, however, they point towards if not anticipate some of the main difficulties in the implementation of this agenda. In general, it provides evidence of a large diversity in not only socio-economic framework conditions but also policy mixes that existed ex-ante and that would have required a more differentiated RIS3-approach than initially pursued. More concretely, it illustrates notable differences in national cultures of policy making and thus different levels of readiness to adopt the RIS3-specific philosophy of policy making.

Nonetheless, this paper's overall message is that a strategic choice of policy mixes is possible as well as relevant and that evidence-based results of studies like this one should be used to inform future meta-level policy decisions in European regional policy. Arguably, not only RIS3 strategies but also guidelines on how to design such strategies should be more place-based and more research is needed to understand status quo ante policy systems in European regions.

Naturally, this study could only provide a first step towards that end and further research and data collection will be needed to render its findings more robust and to clean any remaining data errors at the level of individual measures. In the meantime, any regionally specific conclusions should be drawn with care and Figure 1 and Figure 2 in the Annex should not be interpreted in an overly detailed manner.

Acknowledgement

References

Acemoglu, D. and Robinson, J.A. (2000): Political losers as a barrier to economic development. *American Economic Review*, 90, 126-130.

Asheim, B.; Boschma, R. and Cooke, P. (2011): Constructing regional advantage: Platform policies based on related variety and differentiated knowledge bases. *Regional Studies*, 45, 893-904.

Asheim, B.T.; Annerstedt, J.; Blazek, J.; Boschma, R.; Brzica, D.; Dahlstrand Lindholm, A.; Del Castillo Hermosa, J.; Laredo, P.; Moula, M. and Piccaluga, A. (2006): Constructing Regional Advantage, principles, perspectives, policies, report prepared by an independent expert group, chaired by Prof. Phil Cooke for the DG for Research. Brussels: European Commission. Online: www.dime-eu.org/files/active/0/regional_advantage_FINAL.pdf (accessed 15-01-2015).

Bachtler, J. (2001): *Where is Regional Policy Going? Changing Concepts of Regional Policy* , European Policies Research Centre, U.o.S. (Hrsg.). Glasgow.

Bachtler, J.; Wishlade, F. and Yuill, D. (2003): Regional policies after 2006: Complementarity or conflict? *Regional and Industrial Policy Research Paper*, 51.

Barca, F.; McCann, P. and Rodriguez-Pose, A. (2012): The Case for Regional Development Intervention: Place-Based Versus Place-Neutral Approaches. *Journal of Regional Science*, 52, 134-152.

Camagni, R. and Capello, R. (2013): Regional Innovation Patterns and the EU Regional Policy Reform: Toward Smart Innovation Policies. *Growth and Change*, 44, 355-389.

Capello, R. and Nijkamp, P. (2009): *Handbook of regional growth and development theories*. Cheltenham: Edward Elgar.

Crescenzi, R. and Rodriguez-Posé, A. (2011): Reconciling top-down and bottom-up development policies. *Environment and Planning A*, 43, 773-780.

European Union, DG Regional Policy (2011): *Regional Policy for Smart Growth in Europe 2020*. Brussels: European Union.

Farole, T.; Rodríguez-Pose, A. and Storper, M. (2011): Cohesion policy in the European Union: Growth, geography, institutions. *Journal of Common Market Studies*, 49, 1089-1111.

Foray, D.; Goddard, J.; Goenaga Beldarrain, X.; Landabaso, M.; McCann, P.; Morgan, K.; Nauwelaers, C. and Ortega-Artilés, R. (2012): *Guide to Research and Innovation Strategies for Smart Specialisation (RIS3)*: European Commission, Smart Specialisation Platform.

Foray, D. and Rainoldi, A. (2013): *Smart Specialisation Programmes and Implementation Report EUR 26002 EN. 2013* (= S3 Policy Brief Series No. 02/2013). Seville, Spain: European Commission, JRC-IPTS.
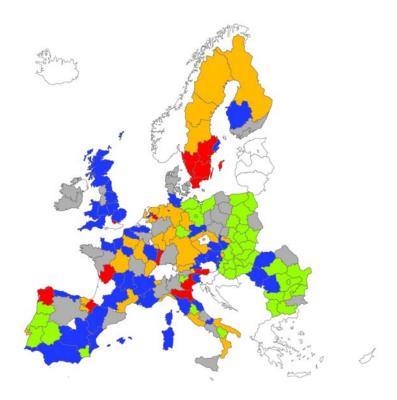
Kroll, H. (2015): Efforts to Implement Smart Specialization in Practice-Leading Unlike Horses to the Water. *European Planning Studies*, http://dx.doi.org/10.1080/09654313.2014.1003036.

McCann, P. and Ortega-Argiles, R. (2011): *Smart Specialisation, Regional Growth and Applications to EU Cohesion Policy* (= Economic Geography Working Paper), University of Groningen.

McCann, P. and Ortega-Artilés, R. (2013): Modern regional innovation policy. *Cambridge Journal of Regions, Economy and Society*, 6, 187-216.

Nauwelaers, C. and Reid, A. (2002): Learning Innovation Policy in a Market-based Context: Process, Issues and Challenges for EU Candidate-countries. *Journal of International Relations and Development*, 5, 357-379.

OECD (2010): *Regional Development Policies in OECD Countries*. Paris: OECD.

OECD (2011a): *OECD Regional Outlook 2011: Building Resilient Regions for Stronger Economies*. Paris: OECD.

OECD (2011b): *OECD Reviews of Regional Innovation: Regions and Innovation Policy*. Paris: OECD.

OECD (2014a): *Innovation-driven Growth in Regions: The Role of Smart Specialisation, Preliminary Version*. Paris: OECD.

OECD (2014b): *OECD Regional Outlook 2014: Regions and Cities: Where Poli-cies and People Meet*. Paris: OECD.

Rodríguez-Pose, A.; di Cataldo, M. and Rainoldi, A. (2014): *The Role of Government Institutions for Smart Specialisation and Regional Development* (= JRC Technical Reports, S3 Policy Brief Series No. 04/2014). Luxembourg: Publications Office of the European Union.

Technopolis; UNU-MERIT and Fraunhofer ISI (2012): *Regional Innovation Monitor Annual Report "Governance, Policies, and Perspectives in European Regions". Report to the European Commission, DG Enterprise and Industry, Directorate D – Industrial Innovation and Mobility Industries*. Brussels: Technopolis Group.

Technopolis; UNU-MERIT and Fraunhofer ISI (2013): *Regional Innovation Monitor Annual Report "Credible Actions Key to Regions' Future Innovation Performance". Report to the European Commission, DG Enterprise and Industry, Directorate D – Industrial Innovation and Mobility Industries*. Brussels: Technopolis Group.

Tödtling, F. and Trippl, M. (2005): One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy*, 34, 1203-1219.

Annex

FigureAnnex 1:   Type of Policy Mix According to Five Cluster Solution

blue: business-oriented, grant-based, standard

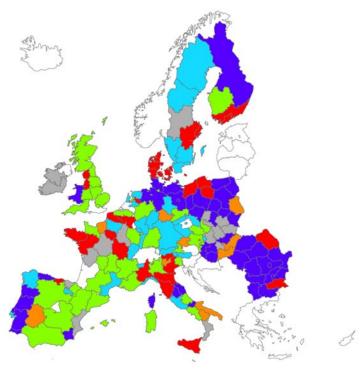grey: business-oriented, grants & loans, addressing framework

orange: systemic, grants & investments

red: systemic, other approaches

green: Convergence cluster

Source: Own analysis, based on RIM dataset, Cartography ESRI ArcMap

FigureAnnex 2:   Type of Policy Mix According to Six Cluster Solution

green:	business-oriented
turquoise:	science-industry collaboration
grey:	public R&D investment & complementary
red:	innovation climate & ecosystem
orange:	holistic approach incl. human resources
violet:	Convergence cluster

Source: Own analysis, based on RIM dataset, Cartography ESRI ArcMap

The series "Working Papers Firms and Region" presents research work of the Competence Center "Policy – Industry – Innovation" of Fraunhofer Institute for Systems and Innovation Research ISI, Karlsruhe, Germany.

No.	Authors	Title
R1/2016	Henning Kroll	Understanding the "Regional Policy Mix" - A Classification and Analysis of European Regions' Support Policies
R2/2015	Knut Koschatzky Henning Kroll Mirja Meyborg Thomas Stahlecker Anne Dwertmann Monika Huber	Public-private partnerships in Research and Innovation - Case studies from Australia, Austria, Sweden and the United States
R1/2015	Henning Kroll	Exploring Pathways of Regional Technological Development in China through Patent Analysis
R4/2014	Knut Koschatzky Esther Schnabl Andrea Zenker Thomas Stahlecker Henning Kroll	The Role of Associations in Regional Innovation Systems
R3/2014	Knut Koschatzky	New forms of regional interaction between universities and industry Evidence from Germany
R2/2014	Henning Kroll Emmanuel Muller Esther Schnabl Andrea Zenker	From Smart Concept to Challenging Practice – How European Regions Deal with the Commission's Request for Novel Innovation Strategies
R1/2014	Henning Kroll Torben Schubert	On universities' long-term effects on regional value creation and unemployment The case of Germany
R6/2013	Friedrich Dornbusch Thomas Brenner	Universities as local knowledge hubs under different technology regimes – New evidence from academic patenting

No.	Authors	Title
R5/2013	Elisabeth Baier Henning Kroll Andrea Zenker	Templates of smart specialisation: Experiences of place-based regional development strategies in Germany and Austria
R4/2013	Thomas Stahlecker Henning Kroll	Policies to Build Research Infrastructures in Europe – Following Traditions or Building New Momentum?
R3/2013	Elisabeth Baier Henning Kroll Andrea Zenker	Regional Autonomy with regard to Innovation Policy: A Differentiated Illustration of the European Status Quo
R2/2013	Henning Kroll	Patterns of Technology Transfer in Chinese Hotspots of Innovative Development – The Perspective of the Recipient Firms
R1/2013	Esther Schricke	Occurrence of cluster structures in knowledge-intensive services
R6/2012	Friedrich Dornbusch Henning Kroll Esther Schricke	Multiple Dimensions of Regionally-Oriented University Involvement – How Motivation and Opportunity Prompt German Researchers to Engage in Different Ways
R5/2012	Natalia Irena Gust-Bardon	Regional Development in the Context of an Innovation Process
R4/2012	Natalia Irena Gust-Bardon	The Role of Geographical Proximity in Innovation: Do Regional and Local Levels Really Matter?
R3/2012	Thomas Stahlecker Henning Kroll	The cluster concept as a multi-dimensional thematic field: Methodological and substantive perspectives
R2/2012	Henning Kroll Esther Schricke Thomas Stahlecker	Developing new roles for higher education institutions in structurally-fragmented regional innovation systems
R1/2012	Knut Koschatzky	Cluster quo vadis? The future of the cluster concept

No.	Authors	Title
R3/2011	Knut Koschatzky Miriam Hufnagl Henning Kroll Stephanie Daimer Nicole Schulze	Relevanz regionaler Aktivitäten für Hochschulen und das Wissenschaftssystem
R2/2011	Joachim Hemer	A Snapshot on Crowdfunding
R1/2011	Emmanuel Muller Jean-Alain Héraud Nina Menz Mickael Benaim Andrea Zenker	La mesure de l'impact des clusters – quelques éléments de réflexion et de bibliographie
R2/2010	Knut Koschatzky Thomas Stahlecker	The changing role of universities in the German research system: engagement in regional networks, clusters and beyond
R1/2010	Thomas Stahlecker Knut Koschatzky	Cohesion policy in the light of place-based innovation support: New approaches in multi-actors, decentralised regional settings with bottom-up strategies?
R8/2009	Martin Fischer Björn Wolf	Entstehungsbedingungen und Gestaltungsformen von Public-Private-Partnerships als Ausgestaltungsform strategischer Forschungskooperationen zwischen Wissenschaftseinrichtungen und Unternehmen in Deutschland
R7/2009	Emmanuel Muller Andrea Zenker Jean-Alain Héraud	Entering the KIBS' black box: There must be an angel! (or is there something like a knowledge angel?)
R6/2009	Knut Koschatzky	The uncertainty in regional innovation policy: some rationales and tools for learning in policy making
R5/2009	Bärbel Hüsing Thomas Stahlecker	Impact of regionalised RTDI policy measures in Germany: The "Network RNA Technologies Berlin (RiNA)" as an example

No.	Authors	Title
R4/2009	Knut Koschatzky Elisabeth Baier Henning Kroll Thomas Stahlecker	The spatial multidimensionality of sectoral innovation – the case of information and communication technologies
R3/2009	Knut Koschatzky Thomas Stahlecker	Cohesion policy at the interface between regional development and the promotion of innovation
R2/2009	Henning Kroll	Spillovers and Proximity in Perspective A Network Approach to Improving the Operationalisation of Proximity
R1/2009	Henning Kroll	The Regional Development of Science and Innovation in China – A Brief Review of Current Evidence on Matches and Mismatches –
R3/2008	Arlette Jappe-Heinze Elisabeth Baier Henning Kroll	Clusterpolitik: Kriterien für die Evaluation von regionalen Clusterinitiativen
R2/2008	Arlette Jappe-Heinze Knut Koschatzky	The spatial embeddedness of multinational enterprises' research activity A bibliometric analysis
R1/2008	David Doloreux Andrea Zenker Emmanuel Muller	Services à forte intensité de connaissances, contexte régional et comportements d'innovation: une comparaison internationale
U1/2007	Emmanuel Muller David Doloreux	The key dimensions of knowledge-intensive business services (KIBS) analysis: a decade of evolution
R1/2007	Knut Koschatzky Vivien Lo	Methodological framework for cluster analyses
U2/2006	Björn Wolf	Das Finanzierungsumfeld junger Unternehmen in Deutschland

No.	Authors	Title
U1/2006	Björn Wolf	Empirische Untersuchung zu den Einflussfaktoren der Finanzierungsprobleme junger Unternehmen in Deutschland und deren Auswirkungen auf die Wirtschaftspolitik
R1/2006	Emmanuel Muller Arlette Jappe Jean-Alain Héraud Andrea Zenker	A regional typology of innovation capacities in New Member States & Candidate Countries
U1/2005	Björn Wolf Birgit Ossenkopf	Kapitalschonende Entwicklungswege – Ansätze zur Lösung der Finanzierungsprobleme junger innovativer Unternehmen
R2/2004	Thomas Stahlecker Knut Koschatzky	On the significance of geographical proximity for the structure and development of newly founded knowledge-intensive business service firms
R1/2004	Thomas Stahlecker Andreas Koch	On the Significance of Economic Structure and Regional Innovation Systems for the Foundation of Knowledge-Intensive Business Services A Comparative Study in Bremen, Munich, and Stuttgart, Germany
R1/2003	Bodo Kubartz	Wirtschaftliche, soziale und geographische Aspekte in Innovationsnetzwerken – Eine Untersuchung des Nähekonzeptes am Beispiel von Forschungs- und Entwicklungsdienstleistern
R2/2002	Knut Koschatzky	Innovationsorientierte Regionalentwicklungsstrategien: Konzepte zur regionalen Technik- und Innovationsförderung
R1/2002	Ralph W. Bruns Jens Görisch	Unternehmensgründungen aus Hochschulen im regionalen Kontext – Gründungsneigung und Mobilitätsbereitschaft von Studierenden

No.	Authors	Title
U1/2001	Rana Adib Frank Gagelmann Knut Koschatzky Klaus Preiser Günter Hans Walter	An Integrated Microfinancing Concept for Rural Electrification by Photovoltaics in Developing Countries
R3/2001	Knut Koschatzky	The role of higher education institutions for entrepreneurship stimulation in regional innovation systems – Evidence from the network-oriented "EXIST: Promotion of university-based start-ups" programme in Germany
R2/2001	Emmanuel Muller Andrea Zenker	Business services as actors of knowledge transformation and diffusion: some empirical findings on the role of KIBS in regional and national innovation systems
R1/2001	Knut Koschatzky Casper Merkle Martin Berger Volker Meyer	Innovation und Kooperation bei unternehmensnahen Dienstleistern in Baden, Gironde und Südholland – Ein Vergleich zwischen jungen und alten Betrieben
R2/2000	Ulrike Broß Günter H. Walter	Socio-economic Analysis of North Rhine-Westphalia Joint Research Project INCO-COPERNICUS
R1/2000	Knut Koschatzky	The regionalisation of innovation policy in Germany – Theoretical foundations and recent experience
R4/1999	Knut Koschatzky Ulrike Broß	Struktur und Dynamik von regionalen Innovationsnetzwerken unter Transformationsbedingungen – das Beispiel Slowenien
R3/1999	Emmanuel Muller	There is no territorial fatality! (or how innovation interactions between KIBS and SMEs may modify the development patterns of peripheral regions)

No.	Authors	Title
R2/1999	Knut Koschatzky Andrea Zenker	The Regional Embeddedness of Small Manufacturing and Service Firms: Regional Networking as Knowledge Source for Innovation?
R1/1999	Ulrike Broß Knut Koschatzky Peter Stanovnik	Development and Innovation Potential in the Slovene Manufacturing Industry First analysis of an industrial innovation survey