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This is the accepted version of a paper published in *Environment and Planning C: Politics and Space*. This paper has been peer-reviewed but does not include the final publisher proof-corrections or journal pagination.

Citation for the original published paper (version of record):

Miörner, J., Tripl, M., Zukauskaitė, E., Moodysson, J. (2018)

Creating institutional preconditions for knowledge flows in cross-border regions

Environment and Planning C: Politics and Space, 36(2): 201-218

<https://doi.org/10.1177/2399654417704664>

Access to the published version may require subscription.

N.B. When citing this work, cite the original published paper.

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:hj:diva-35400>

Creating institutional preconditions for knowledge flows in cross-border regions

Johan Miörner* (johan.miorner@circle.lu.se)
CIRCLE, Lund University, Sweden.

Elena Zukauskaitė (elena.zukauskaitė@hh.se)
CIRCLE, Lund University, Sweden
Halmstad University, Sweden

Michaela Trippl (michaela.tripp@univie.ac.at)
University of Vienna, Austria

Jerker Moodysson (jerker.moodysson@ju.se)
Jönköping University, Sweden

* Corresponding author. Address: CIRCLE, Lund University, Box 118, 221 00 Lund, Sweden. Phone: +46-(0)46-2220576

Abstract: In recent years we have witnessed an intensive scholarly discussion about the limitations of traditional inward looking regional innovation strategies. New policy approaches put more emphasis on promoting the external connectedness of regions. However, the institutional preconditions for collaboration across borders have received little attention so far. The aim of this paper is to investigate both conceptually and empirically how policy network organizations can target the institutional underpinnings and challenges of cross-border integration processes and knowledge flows. The empirical part of the paper consists of an analysis of activities performed by four cross-border policy network organizations in the Öresund region (made up of Zealand in Denmark and Scania in Sweden) and how they relate to the creation of institutional preconditions and the removal of institutional barriers. Our findings suggest that cross-border policy network organizations have limited power to change or facilitate the adaptation of formal institutions directly. They mainly rely on mobilizing actors at other territorial levels for improving the formal institutional conditions for knowledge flows. Informal institutions, on the other hand, can be targeted by an array of different tools available to policy network organizations. We conclude that institutional preconditions in cross-border regions are influenced by collective activities of multiple actors on different territorial levels, and that regional actors mainly adapt to the existing institutional framework rather than change it. For innovation policy this implies that possibilities for institutional change and adaptation need to be considered in regional innovation policy strategies.

Keywords: cross-border region, innovation policy, institutions, knowledge flows

Acknowledgements: The research for this paper was undertaken as part of the FP7 project Smart specialisation for regional innovation (grant agreement no. 320131).

1 Introduction

Regional innovation policy has since the 1990s been heavily inspired by theories of clusters, regional specialization and the benefits of intra-regional network dynamics. In recent years those region-centred “inward looking” views have been complemented with studies paying more attention to the openness and inter-connectedness of regional systems. This new approach has found its way into policy circles and has essentially informed the discussion about new policy approaches such as smart specialization. A central element of these new approaches is to move beyond traditional inward looking regional innovation policies that focus mainly on promoting intra-regional connectivity. Instead, they advocate a stronger emphasis on complementary external connectedness of regional economies (see, for instance, Uyarra et al. 2014; Radošević and Stancová 2015). This may include long-distance linkages (trans-regional cooperation) as well as interaction between adjacent regions (cross-border collaboration). This paper seeks to shed new light on preconditions for the latter.

Adopting an outward looking approach to regional innovation policy and establishing cross-border collaboration as a strategic element of regional innovation policy may have many beneficial outcomes, ranging from new combinations of knowledge and competencies to complementarities and synergies that could be capitalized on through such linkages. Cross-border knowledge flows are seen as core ingredients of such innovation-driven integration processes and new path development in regional economies (Lundquist and Trippel 2013).

A main point of departure for the present study is that cross-border knowledge flows are essentially shaped by institutional structures of regions (and nations) that constitute a cross-border area. National and regional institutions may create important barriers and enablers for the emergence and maintenance of cross-border interaction in these areas. Apart from a few exceptions (see, for example, Trippel, 2010; Lundquist and Trippel, 2013; Broek and Smulders, 2015), the institutional dimension of cross-border collaboration has hardly received attention in the literature on outward looking regional innovation policy hitherto.

The aim of this paper is to gain a better understanding of how (if at all) policy network organizations can target the institutional underpinnings and challenges of cross-border integration processes and knowledge flows. We argue that outward looking policy approaches need to be complemented by a more developed institutional perspective. This is because the exploitation of opportunities for cross-border knowledge links is inextricably linked to the presence or creation of institutional preconditions that support such processes, and to the removal of institutional factors working as barriers.

Improving the institutional preconditions for cross-border knowledge links can take different forms. First, there might be institutional barriers due to i.e. differences in regulations in different countries that need to be removed for knowledge exchange activities to take place. Second, provision of information about barriers and ways to overcome those as well as about institutional complementarities might contribute to an enhancement of the institutional conditions for cross-border knowledge flows. Finally, designing institutional incentives to engage in knowledge exchange activities may be a sound strategy.

In the empirical part of the paper, we look at the Öresund region, which is often portrayed as one of Europe’s most successful and innovative cross-border areas (Nauwelaers et al., 2013). We investigate activities performed by cross-border policy network organizations to create institutional preconditions for promoting integration in general and intensifying knowledge

flows in particular. It is beyond the scope of this paper to examine the impact these activities have had on knowledge flows. We rather seek to provide a nuanced analysis of how these organizations address the challenge of institutional change by performing various roles.

The paper is organized as follows. Section 2 provides a literature review and establishes the conceptual framework. In section 3 we present and discuss the results of our empirical analysis. Finally, section 4 summarizes our main arguments and concludes.

2 Literature Review and Conceptual Framework

2.1 The outward looking dimension of innovation policy

Modern innovation policy approaches such as smart specialization go beyond overly inward looking perspectives, which were a dominant characteristic of past policy approaches and practices. They advocate an outward looking approach to innovation policy, that is, an approach that focuses not only on mobilizing endogenous potentials and intra-regional connections to support innovation and new growth paths. Fostering external connections to tap into non-local knowledge pools and resources and combining it with endogenous potentials should also rank high on policy agendas. The need for an outward looking policy approach is well supported by academic research that has shown that the inflow of non-local knowledge through various channels (foreign direct investment, mobility of labour of entrepreneurs, trade linkages, R&D partnerships, etc.) is often vital for regional innovation (for an overview, see Trippel et al. 2017). This work challenges traditional models, which have conceptualized regional development and innovation as purely endogenous phenomena. Adopting such a complementary outward looking approach to innovation policy and establishing inter-regional collaboration as a strategic element of policy may have many positive effects. These range from an increase of critical mass of actors and innovation activities, to new combinations of related and unrelated knowledge, access to locally scarce research capacity, production expertise, finance, and so on (OECD, 2013; Uyarra et al., 2014).

Such potentials might exist between regions located in the same nation state, between neighbouring regions belonging to different nation states (cross-border areas) or between geographically distant regions. The focus of this paper is on cross-border areas, which are likely to have a higher degree of institutional proximity than regions belonging to different nation states that are not as geographically close to each other (Lundquist and Trippel, 2013). Nevertheless, many of the arguments raised below may also hold true for collaboration between regions located farther apart and to a limited extent also for interactions between regions situated in the same country.

Exploiting inter-regional opportunities for innovation in cross-border areas requires intensive knowledge flows between neighbouring regions. These may take different forms, including the buying of knowledge embodied in patents or new machinery or knowledge intensive services, collaboration for innovation through R&D and innovation partnerships, knowledge flows through labour and student mobility, informal contacts and so on (Trippel et al., 2009). Promoting various types of cross-border linkages is one of the core features of the new outward looking policy orientation proposed by new policy approaches but activities to establish such connections have been on the policy agenda in many cross-border regions for a long time.

However, so far the academic and policy discussion about outward looking approaches has mainly focused on organizational and economic configurations and governance practices of regions rather than normative and regulative strengths and weaknesses (McCann and Ortega-Argilés, 2016). Little attention has been paid to the institutional underpinnings of cross-border integration processes and the ways by which formal and informal institutions facilitate or hinder the formation of cross-border knowledge connections. Those institutional underpinnings are of crucial importance since the ambition of cross-border regions, especially in the EU context, is a creation of a region as a functional space where institutional conditions allow for labour mobility, informal interactions, education processes, and other cross-border activities (Klatt and Hermann, 2011).

2.2 Institutions and cross-border regions

In this paper institutions are understood as rules of the game that enable and constrain the behavior of organizations and individuals (North, 1990). Institutions are structural preconditions for human interactions, not least for interactions that aim for knowledge exchange for innovation (North, 2010). Institutions can be divided into formal rules that are legally sanctioned and informal rules that are morally governed and culturally recognized and supported (North, 1990; Scott, 2008). Formal rules refer to regulations. They are codified in laws, standards and sanctions, and regulate areas such as social welfare, education, taxation and migration. Informal rules refer to norms and beliefs that are enacted via traditions, values, attitudes, and behavioral modes embodied in individuals and organizations (Scott, 2008; Zukauskaitė, 2013). Formal and informal institutions are experienced in an interrelated manner. Thus, both laws and norms depend on each other when it comes to enforcement and institutional change processes (Scott, 2010).

Institutions are often embedded in space (Martin, 2000; Boschma and Frenken, 2006). National regulations such as laws regarding labour markets, social security, educational systems, and intellectual property rights are good examples of how geographical boundaries delineate institutions. Many studies of the relation between institutions and innovation activities focus on these macro-institutional frameworks (Wood, 2001; Whitley, 2002; Hage, 2006). Informal institutions are also often place-specific. They refer to shared norms, values, attitudes among individuals and/or among organizations located in the same region or country (Storper, 1997; Gertler, 2010), but they can also, under certain circumstances, evolve through interaction in spatially distributed communities. The frameworks consisting of formal and informal institutions play a crucial role in national and regional development in general and organization of innovation activities in particular (Storper, 1997; Gertler, 2004; Rodriguez-Pose and Cataldo, 2015). In addition to geographical boundaries, institutions might be delineated by organizational fields such as formal and informal rules guiding behavior of actors in the fields of academia, health-care, private sector and others (Scott, 2008; Cartaxo and Godinho, 2017). To summarize, actors in a cross-border region are embedded in a complex institutional matrix of nation- and region-specific regulations and norms as well as formal and informal rules of organizational fields that might cross national boundaries.

Institutions should not be conflated with organizations¹. Organisations such as firms, universities, and governmental bodies generate, change and/or follow (disobey) rules and

¹ There might be conceptual reasons for conflating institutions and organizations (see, for example, Zukauskaitė et al., 2017). However, in this paper we are interested in the ways by which policy network *organizations* create

should thus not be confused with the rules themselves. However, organizations and individuals are not only influenced by institutions but may also change institutions (North, 2010). Institutions change when actors are involved in collective sense making and problem-solving (Scott, 2008). In other words, by getting involved in collective activities, organizations and individuals generate certain beliefs of what is appropriate and develop joint norms, attitudes and values around the phenomenon. In this line of thinking institutional change is a side-effect of a collective action. However, institutions might also change via deliberate efforts of actors to control and adapt their environment. They may identify a need for change and try to mobilize other stakeholders in order to make change happen (North, 2010). According to Scott (2008), informal institutions are more likely to change via collective sense making and joint problem solving, while formal institutions always call for purposeful action. However, even informal institutions can be a target of purposeful change, e.g. by creating explicit codes of conduct. Finally, institutional change implies not only the emergence of new or revised laws, rules and norms, but also a new enforcement and interpretation of an existing institutional framework (North, 2010).

Previous work on cross-border regions revealed some insights into institutional conditions that are of relevance for our study. It has been shown that differences in national regulatory frameworks create both barriers and opportunities for cross-border relations. Easily accessible information about these regulatory differences is an important precondition for cross-border cooperation to take place (Klatt and Herrmann, 2011, Terlouw, 2012; Broek and Smulders, 2015). Cultural differences (that is, informal institutions) are perceived mainly as barriers for successful interaction across borders (Klatt and Herrmann, 2011). Furthermore, most of these studies suggest that regional actors exploit existing institutional structures to their advantage or adapt to them without actively engaging in institutional change processes. That is, institutional change taking place mainly as change in interpretation rather than dismantling and redesigning old institution or creating new ones (Hansen and Serin, 2010).

In line with previous studies, we argue that ‘difference in attractiveness’ (such as possibilities for better access to labour, better career opportunities or better housing prospects across the border due to a more flexible labour market and housing regulations) might facilitate knowledge flows (Klatt and Herrman, 2011). Without such differences interaction can emerge only through third party incentives such as funding. However, without complementarities (differences in attractiveness) the cooperation is likely to terminate as soon as funding expires. On the other hand, although some differences might serve as incentive for collaboration, others will only constitute a barrier (e.g. differences in educational systems or labour market regulations constraining student and worker mobility). Arguably, one not only must identify institutional differences on a regional scale but also consider if these differences are facilitating or hampering knowledge exchange.

Another important aspect when analysing institutional barriers and enablers for cross-border integration relates to issues of multiscalarity. In a European context multiscalarity has become increasingly visible during the past decades as a result of accentuated regionalization processes and cross-national harmonization of laws and regulations with the aim to facilitate free movement of capital and labour. These processes of institutional change feed into regions while at the same time being largely out of reach for influence from actors at the regional level. From a methodological point of view this calls for attention both to the regional level and to the national and international levels of governance. In this paper we primarily address

and change *institutions*. Therefore, it is important to make an analytical distinction between institutions and organizations.

multiscalarly by analysing how cross-border policy network organizations target institutions set at regional, national and EU levels. The role of organizations at national and EU levels is taken into account only to the extent that they are mobilized by or related to efforts undertaken by cross-border policy networks (Figure 1).

To sum up, in this paper we are interested in purposeful actions of cross-border policy networks organizations to improve institutional conditions for knowledge exchange in cross-border regions. Most types of knowledge exchange (labour and student mobility, collaboration for innovation, consulting) require direct human interaction and are thus dependent on a highly interrelated set of institutions. For example, labour and student mobility is influenced by social welfare systems, migration laws and education system related regulations, as well as informal institutions.

We derive theory-led expectations regarding what kind of actions could be performed by policy network organizations (Figure 1 and Table 1). These organizations do not have the power to change formal institutions, but they can identify the need for change as well as mobilize (e.g. via lobbying) actors that have the power to alter existing or introduce new regulations as well as suggest an alternative enforcement/interpretation strategy. Those actors refer to legislative bodies and governmental agencies at the national level. In addition, in the case of the EU countries, EU organizations oversee compliance of national laws with the EU legislation and can put pressure on the national governments to change formal institutions. Furthermore, policy network organizations could also change the ways by which regional actors such as firms, universities and individuals interpret regulatory differences by providing easily accessible information (Terlouw, 2012; Broek and Smulders, 2015). Informal institutions are more likely to be changed via collective sense making and joint activities (Scott, 2008). Policy network organizations can promote joint activities – knowledge exchange – by creating third-party incentives (i.e. attracting and distributing funding) as well as provide information about institutional differences and complementarities in order to reduce uncertainty (Klatt and Herrmann, 2011). Finally, policy network organizations can aim at directly changing informal institutions by explicitly promoting the value of cross-border areas and cross-border identity (Hansen and Serin, 2010; Stöber, 2011).

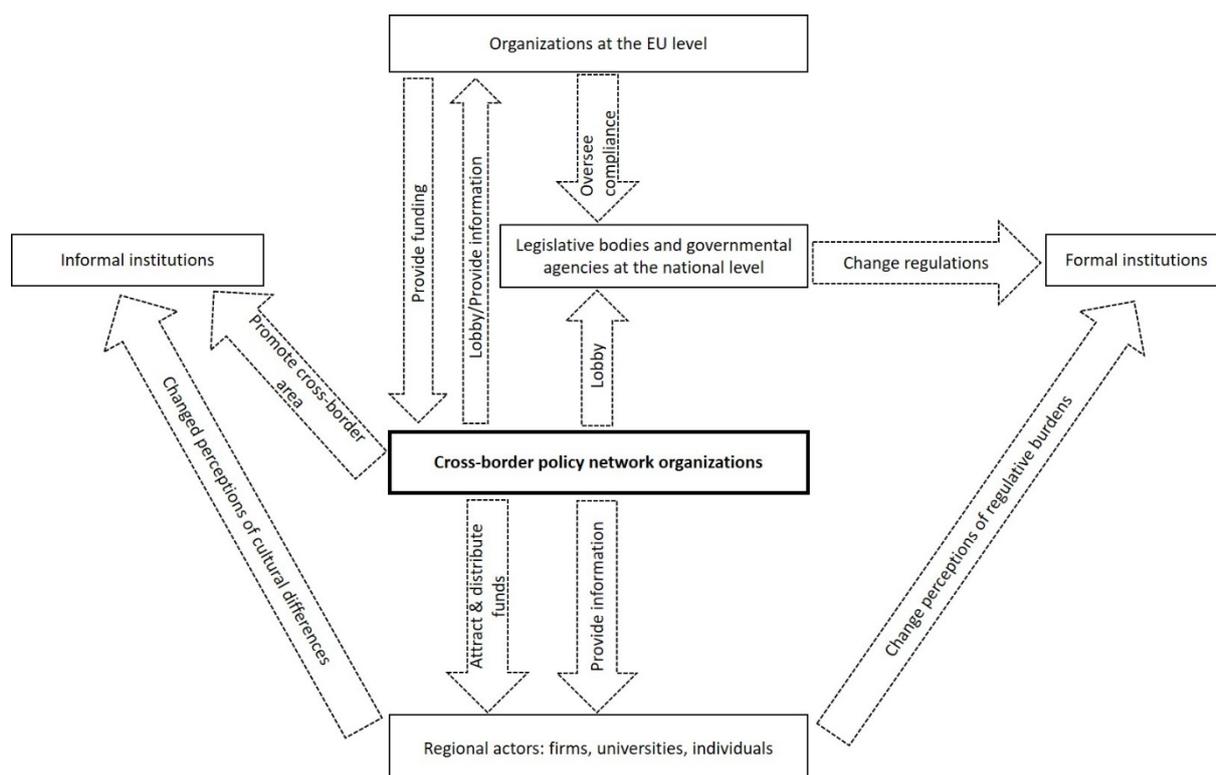


Figure 1: Multiscalarity and Institutional Change (own elaboration)

Table 1: Organizational Activities and Institutional Outcomes

Organization	Activity	Institutional outcome
Cross-border policy network organizations	Provision of information	Changes in perceptions of regulatory and cultural burdens (formal and informal institutions)
	Lobbying	Persuasion to change formal institutions
	Attraction & distribution of funds	Incentives for collective sense making (changes in informal institutions)
	Promotion of cross-border area	Changes in informal institutions
Organizations at the EU level	Provision of funds	Incentives for collective sense making (changes in informal institutions)
	Overseeing compliance with the EU law	Pressure to make changes in formal institutions

National governmental agencies and legislative bodies	Alteration/creation of new laws, changing enforcement of law	Changes in formal institutions
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Source: own elaboration

In the next section we examine these theory-led expectations. Focusing on the Öresund region, we analyze the activities undertaken by policy network organizations to improve the institutional preconditions for knowledge exchange across borders.

3 Empirical Analysis: Creating institutional preconditions for integration and knowledge flows in the Öresund region

This section investigates the ways by which the institutional dimension of cross-border knowledge linkages has been addressed by policy network organizations in the Öresund region. This cross-border area consists of the Capital Region of Denmark (Region Hovedstaden) and Zealand (Sjælland) in Denmark and the Swedish region of Scania (Skåne), with the metropolitan area Copenhagen and the cities Malmö and Lund as key centres. The Öresund region covers a territory of about 21,000 square kilometres and hosts around 3.8 million people.

With the selection of the Öresund cross-border area as the case study region, we look at a cross-border region in which integration has been promoted for nearly two decades, but still experiences institutional barriers to integration. The Öresund region is often portrayed as one of Europe's most innovative and successful cross-border areas (Nauwelaers et al. 2013). However, even though Sweden and Denmark often are perceived as being similar in terms of both culture and regulatory systems, scholars have argued that differences are not insignificant. For example, there are differences in legislation, educational- and taxation systems (Edquist and Lundvall, 1993; Garlick et al. 2006) as well as in terms of culture and social identities (Löfgren, 2008). Arguably, despite long-term policy efforts, there are still considerable differences influencing knowledge linkages between the Danish and Swedish side of the region.

We analyse if and how the creation of institutional preconditions has been on the agenda of cross-border policy network organizations and we seek to explore how institutions (formal and informal ones), set at different spatial scales, have been targeted and by what means. The period of observation starts in the years before the opening of the Öresund bridge in 2000 and ends in 2015. Our analysis draws on an extensive document analysis of secondary data, such as academic papers, policy reports and newspaper articles, as well as on ten semi-structured interviews conducted with Swedish and Danish representatives from cross-border organizations. The secondary data was collected through systematic searches in the Swedish media archive (Retriever) which indexes Swedish and Danish newspaper sources, through searches in the main academic content providers and by accessing archived versions of the organizations' websites. The selected interview partners were in all cases current or former senior executives in their respective organization. The main focus of the interviews was how those organizations perceived institutional conditions for knowledge exchange and how (if at all) they aimed at influencing those. The document analysis informed the identification of those institutions that were most likely to matter for cross-border knowledge flows, which provided the basis for interview questions. These were continuously redefined throughout the interview process according to findings regarding what institutions mattered most for our interview

partners. All interviews have been transcribed and analysed by the authors. Analytical categories derived from the theoretical framework have been used to structure the analysis of both transcribed interviews and documents. In addition, triangulation between sources of data (between primary and secondary data, as well as between different interviewees) was used to check the consistency and robustness of the findings.

Our analysis covers activities performed by four main policy network organizations with activities spanning across the border. We have focused on the activities of the Öresund Committee (ÖC), which had an explicit agenda for shaping institutional conditions in the cross-border region. Thus, it had a mandate to identify needs for institutional change. In addition, we have looked into the activities of Öresund University (ÖU), Medicon Valley Alliance (MVA) and Öresund Food Network (ÖFN). They were working on issues related to knowledge flows by creating networks for interactions, providing information and facilitating labour and student mobility. Thus, they were the actors who, on the one hand, had an active interest in establishing structural conditions favouring cross-border knowledge exchange, and on the other hand, they have promoted joint problem solving which, as suggested by the theoretical framework, could lead to institutional change.

The Öresund Committee has been the main cross-border policy network organization in the region. Founded in 1993, it was a political organization, initially made up by political representatives of the Danish and Swedish national, local and regional governments. Since 2007 the national levels were no longer represented in the committee. ÖC's objectives were centred round three main areas: border issues and how to make daily life less complicated, research and innovation, and labour market integration. In addition to lobbying at the national levels, ÖC also worked to attract EU INTERREG funds to various cross-border collaboration projects. The ÖC was dismantled in 2015 and replaced by Greater Copenhagen and Skåne Committee, which continues to address cross-border integration questions, in parallel to efforts targeting international branding.

The Öresund University consortium was established in 1998 with the objective to foster cross-border collaboration between universities. It consisted of 14 universities, with all the large universities on both sides of the border being members. The objective of ÖU was translated into promoting student mobility and the creation of research networks. As a result of the latter, the Öresund Science Region (ÖSR) was created as a sister organization of ÖU. In ÖSR, representatives of the industry and the regions also took part and the organization received funding from The Capital Region of Denmark, Region Skåne and Region Zealand, as well as from industry organizations and the national governments in both Sweden and Denmark. However, ÖU and ÖSR were both dismantled in 2012.

Medicon Valley Alliance was established in 1997 (then named Medicon Valley Academy) and later became a platform within ÖSR. It was an initiative taken by the universities in Lund and Copenhagen and strongly supported by the major pharmaceutical companies in the region; Novo Nordisk, Lundbeck and Astra-Zeneca. The idea was to create a platform which would enhance cross-border collaboration among firms in the life science sector, by facilitating networking between public and private actors. The organization is perceived as one of the most successful cross-border collaboration initiatives in the region (Collinge and Gibney, 2010). After having moved towards focusing on international marketing, MVA decided to re-align the strategy of the organization during 2015, partly going back to the original idea of addressing cross-border issues in the area of life science.

Öresund Food Network was initiated in 1999 by members of the food industry and universities on both sides of the border. It was created as a platform within ÖSR with the objective of increasing collaboration between academia, industry and other actors in the food- and related industries. ÖFN was dismantled together with the closure of ÖSR, but cross-border collaboration in the food industry continues in some of the projects initiated by ÖFN. For example, FoodBEST, involving actors from Denmark and Sweden as well as other European countries, was a part of ÖFN but is now an independent consortium working to attract a Food KIC² to the Öresund region.

In a next step we analyse the activities of each organization in relation to different types of institutions they have targeted. We differentiate between formal institutions, such as regulations, and informal institutions such as values, attitudes and behavioural modes. Due to their interrelated character, the division into formal and informal institutions is however not completely clear-cut. In some cases, it has been necessary to target informal institutions in order to mobilize the support necessary to solve regulatory barriers. In other cases, institutional proximity with regard to norms and attitudes has been used as a tool for overcoming issues arising from regulatory barriers.

3.1 Activities targeting formal institutions

It is important to note that neither regional governmental bodies in Sweden or Denmark nor any of the four policy network organizations addressed in this study have a mandate to introduce regulatory changes. This power lies with the national governments. It leaves cross-border policy network organizations with a limited set of activities for enhancing the institutional preconditions for knowledge exchange.

ÖC has had as one of its main objectives to tackle cross-border barriers. These barriers have been identified by the committee together with a number of other stakeholders from different spatial scales. In total, 42 cross-border barriers have been identified, the vast majority of which are directly related to regulatory barriers originating from differences in legislation in Denmark and Sweden, i.e. differences in formal institutions. The identified barriers are related to various aspects of tax systems and social welfare regulations such as sick leave and parental leave, which are argued to influence knowledge flows related to labour mobility, buying of knowledge intensive services and collaboration in innovation projects, as well as differences in education systems such as accreditations and grading standards, argued to influence student mobility. Since they were identified as barriers, they were considered, at least by the ÖC, as being detrimental to integration rather than providing incentives to engage in cross-border activities.

In order to remove regulatory barriers, ÖC has made deliberate efforts to mobilize stakeholders at other spatial scales, through lobbying activities targeting politicians, government officials and public authorities at the national level in Sweden and Denmark. A lobbying process aiming for a change in regulations is very slow, taking several years and is sometimes interrupted due to election cycles. In addition, lobbying can take different forms and include different stakeholders at different spatial scales, reflecting the multi-scalar nature of institutional structures.

² KIC stands for "Knowledge and Innovation Community". KICs are large-scale private-public innovation partnerships funded by the European Union. A KIC obtains 100-150 million Euros per year and consists of several European regions with one co-location centre.

ÖC did not engage only in one-way communication activities with relevant national bodies, but included a wide variety of both regional and national actors in collective sense-making processes, through discussions centred around certain issues. This was, according to our interviews, a way to overcome differences in how politicians and policy makers were used to working on different spatial scales. In other words, ÖC did also consider differences in informal institutions as an important target for action in order to change formal institutions. As one interviewee expressed it:

“...to learn both how we do things, and where is actually the problem in this system, and the old tradition that the state talk to state, region to a region, and a town to a town. How do we change this, this doesn't work with our border. Sometimes a state need to talk to a region, a town to.. And that has been a journey because that is very, very set. It took several years for a minister on the Danish side to understand that you have to talk to the region when you talk about the trains over the bridge, you cannot talk to a Swedish minister”.

There is a general perception that lobbying practices are easier performed on the Danish side due to the physical proximity to the politicians at the national level. Such proximity facilitates trust building and shared world views. National level politicians in Sweden are often perceived as too much Stockholm-focused and not having enough understanding and interest in the processes specific to southern Sweden. This relates back to the challenge of multiscalarity in cross-border governance processes.

However, in most cases where regulatory barriers have been solved, ÖC has lobbied public servants in different agencies (e.g. the Tax Office, Social Insurance Agency, Unemployment Agency) rather than politicians at the national level. These agencies have public servants assigned to work with cross-border issues. ÖC has brought issues to the attention of these public servants and started discussions with them about possible solutions. As an outcome of these discussions, public servants have offered alternative interpretations of existing laws or have signed special agreements benefiting cross-border activities while still being in line with current regulations. Put differently, ÖC has mobilized actors at other spatial scales to suggest new interpretations of regulations identified as being barriers to cross-border integration.

In addition, ÖC has been providing information to increase awareness about differences in formal institutions and how to deal with them. The activities have thus been focused on overcoming differences in regulations and reducing uncertainty for actors interested in cross-border knowledge exchange. A good example are differences in the tax systems of Sweden and Denmark. ÖC introduced an online tool which provided easy comparison of taxes between the two countries. The barrier (differences in tax regulations) is unsolved but for individuals and companies pursuing cross-border activities the tool provided a way of assessing the impact of these differences and thus changed the perception of the regulatory burden of cross-border collaboration.

Some barriers have been solved by drawing on EU regulations. Both private individuals and ÖC can bring violations of the EU law to the attention of the EU organizations. The outcomes of the rulings by the EU were disseminated via ÖC's communication channels regardless of who took the case to the EU. In that sense, even though the formal institutions identified by ÖC are set at the national level, relating to EU institutions and provoking actions by EU organizations was a way to overcome barriers.

Finally, ÖC has been successful in attracting and coordinating EU funds in the region and gained the possibility to foster cross-border activities by creating third-party incentives. For example, ÖC represented the political dimension in a committee deciding on funding of individual projects through the EU Interreg program. They were also involved as an active partner in several projects, for example related to labour market integration. Funding activities as such were not directly addressing regulatory institutions, but rather created incentives for knowledge exchange despite the existence of challenges residing in formal institutional structures.

ÖU dealt with regulatory barriers affecting knowledge flows in a quite different way. Student mobility across the border was prevented by regulations such as the length of semesters, course credit systems and the recognition of course credits from foreign universities. Here, similarities in norms and attitudes in the organizational field of academia have led to a high degree of trust between university teachers, facilitating student mobility despite the existence of formal barriers. As one interviewee put it:

“We trust each other. So, it’s open for the students. If he or she is Dane takes the module [course] here [in Sweden], the professor or lecturer just has to call his [colleague] in Copenhagen and say ‘he’s passed’ and they trust each other ... It functioned wonderfully. It wasn’t quite legal, since the student got Danish points, credits, so to speak, but he or she had done them here [in Sweden], but the result was the same.”

However, overcoming formal institutions by relying on informal ones is only possible when enforcement of the rule depends solely on the organization such as universities. When the Danish government introduced new laws requiring all foreign students to pay course fees, universities could not go around it. ÖU and ÖC unsuccessfully tried to lobby the Danish Government to make an exception for Swedish students.

MVA and ÖFN were less engaged in solving regulatory barriers since they perceived it as ÖC’s field of expertise. However, they could contribute to raising awareness about institutional barriers by explicitly mentioning those in project reports or by bringing it to the attention of ÖC.

3.2 Activities targeting informal institutions

Informal institutions are not under official mandate of any policy network organization. Such organizations can initiate activities to promote mutual understanding, joint world views and respect for each other’s values. However, the enforcement of informal institutions depends on voluntary acceptance. All four organizations under study have provided information about opportunities and potential benefits of cross-border collaboration with the intention of harmonizing informal institutions. ÖU, for example, created a database containing information about researchers, projects and courses in the field of material science. The rationale behind this activity was that if information is easier to access, it is more likely that willingness to share knowledge will increase. ÖC, on the other hand, provided information about cultural differences and its implications for the development of Öresund region. For example, ÖC put pressure on the national governments to facilitate access to public TV across the border in order to increase language comprehension and to provide an overview of what it is considered to be

important for the people across the border (via news coverage), which in turn might facilitate knowledge exchange through an increase of mutual understanding.

Networking activities can be also used for providing information about cultural differences, possibilities and benefits of collaboration and they may contribute to the emergence of joint norms, attitudes and values, facilitating trust between actors. Such activities were a prominent feature of both ÖFN and MVA. ÖU was by itself a platform for the large universities to meet and interact in ways not done before.

“Trust was of course number one, two and three. If you have trust, you can organize anything. And also, academics and universities are so similar to each other. There are very few differences when it comes to thinking, culture etcetera, between, say, professors around the world in business administration or radiology for that matter, I mean, it is the same crowd altogether. This means that it is very easy”

Cultural differences are often seen as informal institutions that hinder knowledge flows across the border. Cultural differences with regard to leadership and organizational practices between Denmark and Sweden could lead to uncertainty and misunderstandings. However, opposite to the regulatory barriers, it has also been acknowledged by all our interviewees that these differences can have positive effects if actors are able to exploit the potentials offered by combining the consensus-based decision making culture in Sweden with operational and faster processes in Denmark. Targeting these differences was considered by ÖC to be a task of, for example, industry organizations and consequently ÖC’s activities were mainly focused on arranging seminars to offer possibilities for exploiting complementarities.

Branding activities targeted informal institutions by developing a joint identity and were explicitly intended to increase knowledge flows. ÖFN identified cultural differences between Denmark and Sweden as one particular challenge to be addressed via joint identity building. One concrete example of such activities is the involvement in Food Innovation Network Europe, with the intention to market ÖFN internationally. International visibility was an important task also in MVA, especially during the period from 2007 up until the recent restructuring process begun. For example, MVA initiated the “Medicon Valley Beacons” and “MVA Ambassador” programs, both intended to strengthen the MVA brand on the international arena.

ÖC’s attempts to brand the Öresund region have encompassed a variety of activities, including amongst others the organisation of cultural events such as the Öresund festival. The overall aim has been to create a joint ‘Öresund identity’ among individuals living on both sides of the border. This joint identity would provide a common ground, increase trust and possibly enhance knowledge exchange and collaboration.

Policy network organizations made many efforts to address informal institutions. Due to the voluntary enforcement, it has not been an easy task and the outcomes of such activities have not always had the intended effects. For example, the efforts to create a strong Öresund brand has been perceived as threatening the identities and brands of individual organizations and cities, and has been one of the reasons why ÖC and ÖU have been dismantled.

3.3 Discussion: The role of policy network organizations and other actors in creating institutional conditions for cross-border knowledge flows

Enhancing the institutional conditions in a cross-border region is a complex process including public and private actors with different power and roles at different geographical scales (see Table 2).

Differences in formal institutional structures in the Öresund region have mainly been seen and treated as barriers for cross-border activities, whilst differences in informal institutions have in some cases also been acknowledged as providing opportunities for knowledge exchange across the border. In line with the conceptual arguments outlined in section 2, policy network organizations have been engaging in activities such as lobbying, providing information, attracting and distributing funds and promoting network activities, in order to change institutional preconditions for knowledge flows. Our core findings are summarized in Table 2 and can be synthesized as follows.

First, these organizations performed many different roles in the process of creating institutional conditions in the cross-border area. Lobbying, for example, was done both to raise the awareness about institutional barriers in the region and to facilitate adaptation to the existing institutional framework. In addition, through networking and branding they contributed to the building of trust and a joint identity among regional actors. In other words, change in informal institutions was not merely a side effect of collective action but as intentional and deliberate as efforts targeting formal institutions. We find that policy network organizations combined different types of activities targeting different institutions, reflecting the complexity of institutional change in a cross-border context, and the intertwined nature of formal and informal institutions. For example, targeting informal institutions by learning how to navigate in the different national political landscapes, changing the perception of regulatory burdens and creating incentives for cross-border collaboration were all included as part of activities intended to overcome formal barriers. Thus, in order to understand how cross-border policy network organizations change institutional conditions, it is necessary to conceptualize the roles played by these organizations as combinations of several activities, targeting different institutions.

Second, the interplay between cross-border policy network organizations and actors at other spatial scales, in particular the national level, turned out to be more nuanced than expected. The power of changing national regulations lies with national governments but policy network organizations also engaged in lobbying activities targeting public authorities, who have supported adaptation to the existing institutional framework by offering alternative interpretations of existing regulations. Thus, it was not only regulatory power held by legislative bodies at the national level but also interpretative power held by public authorities that mattered, facilitating a change in interpretation of existing regulatory frameworks.

Furthermore, policy network organizations worked in an interesting symbiosis with EU organizations. The European Commission can rule against national governments and make them change national regulations if those violate the EU law. Policy network organizations can bring such violations to the European Commission's attention and communicate the decisions taken by the EU. In addition, the EU provides funds for cross-border regional development that can be attracted and distributed by the policy network organizations. In this way incentives for overcoming institutional challenges were created. The relationship between different spatial scales is thus complex in the sense that institutions are set at one spatial scale and enacted at another, but some actors at e.g. the EU level are explicitly working towards an increase of inter-

regional collaboration. This was exploited by policy network organizations, extending the scope of activities from lobbying in order to change regulations, to mobilizing actors and available resources in order to target a wider set of institutions set at different spatial scales.

Third, universities and other public and private actors play a more implicit role. They could change formal rules that are under control of their organizational units as well as facilitate adaptation to the existing institutional framework by overcoming formal requirements by relying on informal institutions. This was done by the individual universities as they were part of ÖU. Put differently, these actors were part of processes of collective sense-making and joint identity building, which spurred pragmatism concerning the interpretation of formal regulations.

Such pragmatism, but also how cross-border policy network organizations combine activities and scales, as discussed above, calls for a greater appreciation of strategies taking advantage of the intertwined nature of formal and informal institutions. In addition, it accentuates the need for an inclusive definition of institutions, in which formal and informal institutions are considered in combination and not as separate categories, when analysing efforts to change institutional conditions in cross-border regions.

Table 2: Institutional Conditions in the Cross-border Region: Actors, Roles and Activities

Actors	Roles	Activities	Institutions
Policy network organizations	Raising awareness about institutional conditions	Lobbying; Providing information; Bringing barriers to the attention of the EC/ Communicating EU decisions	Mainly formal institutions
	Facilitating adaptation to the existing institutional framework	Providing information; Lobbying	Mainly formal institutions
	Building of trust among actors	Networking; Providing information	Informal institutions
	Building of a joint identity	Branding	Informal institutions
	Providing incentives to overcome institutional barriers	Attracting and distributing funds	Formal and informal institutions
EU bodies	Providing incentives to overcome institutional barriers	Providing possibilities for funding of cross-border activities	Formal and informal institutions
	Overseeing compliance with EU laws	Use of legislative power at the EU level	Formal institutions at the national level
National governments	Changing institutions	Use of the legislative power at the national level	Formal institutions at the national level
Public authorities (Tax Office; Social Insurance Agency)	Facilitating adaptation to the existing institutional framework	Offering alternative interpretation of existing regulations	Formal institutions at the national level
Other regional actors: universities	Facilitating adaptation to the existing institutional framework	Overcoming formal institutions by relying on informal ones	Formal institutions at the organizational level

Source: own elaboration

4 Conclusions

In recent years, the literature on the geography of innovation has paid increased attention to the openness and inter-connectedness of regional economies and innovation systems. Transregional linkages have also become a central issue in the discussion about modern innovation policy approaches such as smart specialization, indicating a shift from inward looking strategies towards outward looking approaches to regional innovation policy. Little has been said thus far about the institutional challenges that are related with the promotion of interregional knowledge connections.

This paper addresses the institutional dimension of cross-border integration processes and knowledge flows by analyzing how cross-border policy network organizations target formal and informal institutions to facilitate knowledge exchange and enhance collaboration across national borders. Based on conceptual arguments and empirical findings from the Öresund region, we contribute to the academic discussion on institutional conditions in cross-border areas in at least two ways. First, rather than treating institutional conditions as given (i.e. as a purely structural element in society), we advance the discussion on the role of agency, in particular in a multi-scalar perspective. We suggest that institutional conditions in cross-border regions are influenced by multiple actors engaged in collective activities across different territorial levels. Regional actors play multiple roles and engage in different types of activities in order to change the institutional conditions for cross-border knowledge flows. The multiplicity of roles and activities reflect the complexity of institutional change, the intertwined nature of formal and informal institutions as well as the uneven relationship between different spatial scales. Second, we reveal that institutional change in form of dismantling old institutions, introducing new ones and/or adding new aspects to the existing frameworks in order to facilitate cross-border integration is a very rare phenomenon and when it does take place it is often due to factors beyond the reach of policy network organizations, such as EU regulations. In line with other studies, we argue that actors in cross-border areas mainly adapt to the existing institutional framework rather than change it. However, we take this argument further by providing a more nuanced understanding of the variety of processes by which adaptation can take place and the different roles played by regional actors. Our findings suggest that adaptation can be facilitated via information campaigns, overcoming formal institutions by relying on informal ones, and lobbying that lead to alternative interpretations of laws and regulations. It follows that adaptation to a relatively inert institutional framework is a process requiring active involvement of cross-border regional bodies as well as mobilization of actors and resources at other spatial scales. Future studies could further develop these findings by investigating how actors are ‘exploiting’ the existing institutional framework for the benefits of cross-border integration.

Our results and conclusions have concrete implications for regional innovation policy and strategies. Arguably, adopting an outward looking approach, identifying potentials for cross-border collaboration and promoting external connections is not enough. Such an approach will only be successful if taking the institutional dimension into account, identifying opportunities and key institutional bottlenecks calling for institutional change, or processes facilitating adaptation to the existing institutional framework. This is illustrated in the present study by the attempts to promote knowledge exchange through labour mobility. The analysis clearly shows that differences in labour, social welfare, and tax regulations as well as informal routines at a work place need to be considered and addressed, in addition to identifying complementarities in terms of competences and skills.

In our study, we show that the creation of institutional conditions for cross-border knowledge flows is based on multi-actor and multi-level processes. Policy network organizations often have limited power to influence institutional conditions for cross-border knowledge flows. As noted above, the scope for change depends on the institutional barrier, if it is originating from formal or informal institutions, and from which spatial scale. It is however also highlighted that institutional differences can be overcome by providing information regarding how to deal with them, implying that this can be used to improve institutional conditions for knowledge flows also between regions with stronger institutional differences than in the case investigated in this paper. Adopting an outward looking policy approach and establishing interregional collaboration as core element of innovation strategies requires due consideration of the specificities of institutional barriers and complementarities, recognition of the interrelatedness of formal and informal institutions and a variety of activities to change and even more importantly to facilitate adaptations to multi-scalar institutional framework conditions. This should be reflected in innovation strategies, for example by providing a basis for problem formulation and a direction for integration efforts in cross-border regions and between geographically distant regions.

References

- Boschma, R. and Frenken, K. (2006) Why is Economic Geography not an Evolutionary Science? Towards an Evolutionary Economic Geography. *Journal of Economic Geography* 6: 273-302.
- Broek, J. and Smulders, H. (2015) Institutional hindrances in cross-border regional innovation systems. *Regional Studies, Regional Science* 2(1): 116-122.
- Cartaxo, R., M. and Godinho, M.M. (2017) How institutional nature and available resources determine the performance of technology transfer offices, *Industry and Innovation*, doi/full/10.1080/13662716.2016.1264068
- Collinge, C. and Gibney, J. (2010) Place-making and the limitations of spatial leadership: reflections on the Øresund. *Policy studies* 31: 475-489.
- Edquist, C and Lundvall, B-A. (1993) Comparing the Danish and Swedish Systems of Innovation, in Nelson R. (ed.) *National Innovation Systems*. New York: Oxford University Press, 265-298.'
- Garlick, S., Kresl, P. and Vaessen, P. (2006) The Öresund Science Region: A cross-border partnership between Denmark and Sweden. Peer review report. Paris: OECD.
- Gertler, M. S. (2004) *Manufacturing Culture: The Institutional Geography of Industrial Practice*, Oxford, New York: Oxford University Press.
- Gertler, M. S. (2010) Rules of the Game: The Place of Institutions in Regional Economic Change. *Regional Studies* 44: 1-15.
- Hage, J. (2006) Institutional Change and Societal Change: The Impact of Knowledge Transformations, in Hage, J and Meeus, M. (eds.) *Innovation, Science, and Institutional Change*. Oxford, New York: Oxford University Press, 464-482.
- Hansen, PA. and Serin, G. (2010) Rescaling or institutional flexibility? The experience of the cross-border Øresund region. *Regional and Federal Studies* 20: 201-227.
- Klatt, M. and Herrmann, H. (2011) Half Empty or Half Full? Over 30 Years of Regional Cross-Border Cooperation Within the EU: Experiences at the Dutch–German and Danish–German Border. *Journal of Borderlands Studies*, 26(1): 65-87.
- Löfgren, O. (2008) Regionauts: The transformation of cross-border regions in Scandinavia. *European Urban and Regional Studies* 15: 195-209.
- Lundquist, K-J and Tripl, M. (2013) Distance, proximity and types of cross-border innovation systems: A conceptual analysis. *Regional Studies* 47: 450-460.
- Martin, R. (2000) Institutional Approaches in Economic Geography, in Sheppard, E. and Barnes, T. J. (eds.) *A Companion to Economic Geography*, Oxford: Blackwell, pp. 77-94.

- McCann, P. and Ortega-Argilés (2016) Smart specialisation, entrepreneurship and SMEs: issues and challenges for a results-oriented EU regional policy, *Small Business Economics* 46(4): 537-552.
- Nauwelaers, C., Maguire, K. and Ajmone Marsan, G. (2013), “The case of Oresund (Denmark-Sweden) – Regions and Innovation: Collaborating Across Borders”, *OECD Regional Development Working Papers*, 2013/21, OECD Publishing.
- North, DC. (1990) *Institutions, institutional change and economic performance*: Cambridge University Press: Cambridge.
- North, DC. (2010) *Understanding the Process of Economic Change*. Princeton University Press: Princeton.
- OECD (2013) *Regions and Innovation: Collaborating across borders*. OECD, Paris.
- Radosevic, S. and Stancova, KC. (2015) Internationalising Smart Specialisation: Assessment and Issues in the Case of EU New Member States. *Journal of the Knowledge Economy*: 1-31.
- Rodriguez-Pose, A. and Cataldo Di, M. (2015) Quality of government and innovative performance in the regions of Europe. *Journal of Economic Geography*, 15:673-706
- Scott, WR. (2008) *Institutions and organizations*: Sage Thousand Oaks, CA.
- Scott, WR. (2010) Reflections: The past and future of research on institutions and institutional change. *Journal of change management* 10: 5-21.
- Stöber, B. (2011) Fixed Links and Vague Discourses: About Culture and the Making of Cross-border Regions. *Culture Unbound* 3: 229-242.
- Storper, M. (1997) *The Regional World*. New York, London: The Guilford Press.
- Terlouw, K. (2012) Border Surfers and Euroregions: Unplanned Cross- Border Behaviour and Planned Territorial Structures of Cross-Border Governance. *Planning Practice & Research* 27(3): 351-366.
- Trippl, M. (2010) Developing cross-border regional innovation systems: key factors and challenges. *Tijdschrift voor economische en sociale geografie* 101: 150-160.
- Trippl, M., Grillitsch, M. and Isaksen, A. (2017) Exogenous sources of regional industrial change: Attraction and absorption of non-local knowledge for new path development. *Progress in Human Geography*. DOI: 10.1177/0309132517700982
- Trippl, M., Tödtling, F. and Lengauer, L. (2009). Knowledge sourcing beyond buzz and pipelines: evidence from the Vienna software sector. *Economic Geography* 85(4): 443-462.
- Uyarra, E., Sörvik, J. and Midtkandal, I. (2014) Inter-regional collaboration in research and innovation strategies for smart specialisation (RIS3). *S3 Working Paper Series No. 06/2014*, European Commission.

- Whitley, R. (2002) Developing Innovative Competences: The Role of Institutional Framework. *Industrial and Corporate Change*, 11: 497-528.
- Wood, S. (2001) Business, Government, and Patterns of Labor Market Policy in Britain and Federal Republic of Germany, in Hall, P. A and Soskice, D. (eds.) *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press, 247-274.
- Zukauskaitė, E. (2013) *Institutions and the geography of innovation: A regional perspective*. Lund: Lund University.
- Zukauskaitė, E., Trippel, M. and Plechero, M. (2017) Institutional thickness revisited. *Economic Geography* (forthcoming)