

Innovation and SMEs in Interreg policy: Too early to move beyond bike lanes?

JOS VAN DEN BROEK^{‡,*}, ROEL RUTTEN[§] & PAUL BENNEWORTH[†]

[‡] Radboud University Nijmegen and European and Regional Affairs Consultants (ERAC) 's-Hertogenbosch, the Netherlands

[§] Tilburg University, the Netherlands.

[†] Center for Higher Education Policy Studies (CHEPS), University of Twente, the Netherlands.

* corresponding author: josvandenbroek@erac.nl

1. Introduction

Cross-border regions have been seen as laboratories for European integration. Here the people of Europe would meet and experience the benefits of European integration. To support and sustain this claim there has been generous funding for cross-border regions by the European Commission from 1989 onwards. At that time 14 cross-border pilot projects were initiated, soon followed by the first Interreg program in 1991 (OECD, 2013). The budget allocated to Interreg by the EC has increased ever since and at the end of 2014 the fifth Interreg funding period started with a total budget of 10,1 billion euros. The increase of funding for the Interreg programs has gone alongside a shifting of priorities. The Interreg V program, especially in the northern European countries, is now for a large part directed at innovation and collaboration between SMEs and knowledge institutes. However, the Interreg programs seem to lack a clear idea about the goal of their innovation policy attempts.

Innovation is increasingly pursued in cooperation between companies and between knowledge institutes and companies. In order to spur their innovative potential and create economic growth, governments have put in place policies that stimulate cooperation amongst firms and knowledge institutes directed at innovation.

This policy idea is now applied to cross-border regions. Yet, the question is whether this kind of innovation policy, focused on cooperating SMEs, is the most accurate policy for cross-border regions. Cooperation between firms for innovation requires the build-up of linkages; in order to cooperate you need to have a network of firms to cooperate with. It also requires the build-up of trust, as cooperating for innovation adds an extra dimension of uncertainty and risk to the innovation process. For most SMEs cooperation is already a rare phenomenon, within their own region and nation-state, let alone cooperating cross-border for innovation. Furthermore, most SMEs lack the necessary linkages across the border and, perhaps unjust, expect cultural, juridical and administrative barriers.

In this paper we seek to answer the question whether the focus of the Interreg V programmes is missing necessary elements in the development of cross-border innovation systems (Trippel, 2010), whereas cross-border linkages still have to be built up and nurtured. In the paper we analyse the development of the Interreg policies and compare this to the concept of building and development of an innovation system in border regions. We suggest that the development of a cross-border regional innovation system (CBRIS) encompasses four qualitatively different phases of development, calling for qualitatively different policy measures. The comparison is made to the construction of bike lanes using Interreg funding, which is often seen as an example of what Interreg policies should move beyond. Whilst this might be true for infrastructure development in Northern European countries, for innovation connections, we question whether an integrated transport system can be built when there is only a limited amount of bike lanes.

Empirically we explore this issue by reflecting upon a case study of the Flemish - Dutch border region where cross-border contacts and cooperation have a long history. Cooperation for innovation in this border region is especially relevant, as it

comprises the so-called Top technology region Eindhoven-Leuven-Aachen, established in 2004, which the OECD (2013; 228) sees as *'one of the most advanced European experiments in building an innovation-driven functional cross-border region'*. We look at the development of Interreg policy in this region by using documentary material and results from a recent case study on cooperating innovative SMEs in this region.

This empirical reflection provides the basis for a more general discussion on Interreg policy and the development of cross-border regional innovation systems (Lundquist & Trippel, 2011). While borders and border regions are being studied from a range of perspectives, there are only few studies taking innovation and innovation systems in cross-border regions as their departure point (Hansen, 2013). We aim to contribute to this discussion by suggesting a phased development, using a case study of a cross-border region where cross-border innovation is getting considerable policy attention. This helps to shed light upon the way that a cross-border regional innovation system might develop and the way policy makers can contribute to this. Thereby aiming for a structural contribution of Interreg funding to cross-border regional innovation and trying to avoid the general disillusion on the achievements of Interreg (Jacobs & Kooij, 2013) to be transferred to the domain of cross-border innovation.

2. The development of Interreg policy

Numerous cross-border projects, Euroregions and policy initiatives were born in Europe after the Second World War. The European Commission has played an important role in this development of cross-border cooperation, although cross-border cooperation existed before the European Commission started specific policy measures. The first Euroregions, a form of cross-border cooperation between European regions, started in the 1960s and 1970s (Klatt & Herrmann, 2011; Perkmann, 2007).

However, the establishment of the Interreg policies from 1991 onwards has speeded up this process and nowadays (Prokkola, 2011; 1191): *'..cooperation within the Interreg framework is often considered to be a concrete manifestation of cross-border regionalization in the EU area.'* Cross-border cooperation is not limited to Interreg programmes and projects, ideally Interreg is only an enabling and accelerating force for cross-border regions, but the development and implementation of Interreg policy can be used as a proxy for the analysis of the development of cross-border cooperation in general. Here we are specifically interested in the role of innovation and SMEs in the Interreg framework. Innovation is thereby narrowly defined, encompassing private sector innovation. We are not looking at public sector innovation, although this played an important role in cross-border policy development (Perkmann, 2007).

The formal introduction of Interreg in 1991 was preceded by 14 pilot projects in 1989 directed specifically at cross-border issues. Within the Interreg I program, started in 1991, the main investments were done in infrastructure, tourism and environment. There was only minimal private sector involvement, and support to SMEs, although named as a goal, was very limited. Interreg II (1994-1999) was also strongly directed at tourism, culture, media and environment, with only marginal involvement of the private sector. However, the support of SMEs and the promotion of innovation were already goals in this program period (INTERACT, 2010; Panteia, 2009). In this period, the still largely existing, distinction between Interreg A, B and C was made. The 'A-programs' were directed at cross-border cooperation between regions with contiguous borders, for example the Flemish - Dutch and Dutch - German Interreg programs. The 'B-programs' aimed at transnational cooperation between nations that shared a border, an example is the North-West Europe (NWE) program comprising Belgium, France, Germany, Ireland, Luxembourg, The Netherlands, Switzerland and

the United Kingdom. There is only one 'C-program', called Interreg Europe from 2014 onwards, targeting the whole of the European Union. As the focus of this paper is on regions with contiguous borders, in the rest of the paper when Interreg is discussed we mean Interreg A.

Interreg III (2000-2006) was directed at a broad set of eight topics ranging from integration of the labour market to protection of the environment, support of SMEs and cooperation between citizens and institutions. Increasing attention was given to SMEs and innovation with 28% of the budget allocated to the '*development of business spirit and SMEs, tourism and local development / employment initiatives*' and 17% of the budget to '*R&D, education, culture, communications, health and civil protection*' (European Commission, 2010). This seemed to imply a stronger focus on innovation and SMEs, though; as these are very broad categories this picture remains rather vague. In Interreg IV there came more focus in most Interreg programs with specific attention in all programs for the Lisbon and Gothenburg agenda's aimed at innovation and economic and social cohesion. This focus was expressed in the allocation of 21% of the budget for '*improving knowledge and innovation for growth*' (European Commission, 2015).

In the Interreg funding period 2014 -2020 Interreg became an integral part of the Cohesion Policy with a focus on 11 thematic objectives. The main focus of the European Regional Development Fund (ERDF) of which Interreg is part, was on four thematic objectives of which two were directed at SMEs and innovation: '*strengthening research, technological development and innovation*' and '*enhancing the competitiveness of SMEs*'. Most Interreg V programs, at least in Western Europe, are strongly directed at innovation support. The Interreg V Flanders – The Netherlands program directed 40% of the budget to innovation and for Interreg V Germany – The Netherlands this was even 61,1%. Next to this percentile increase of the focus on SMEs

and innovation, the total budget of both these programs also increased with 60%. Although this focus on innovation follows a more general trend of government policy directed towards innovation, the combination of a highly increased budget and a firm concentration on innovation represents a considerable shift in focus of the Interreg programs.

3. Cross-border innovation policy development

With the increased availability of Interreg funding for cross-border innovation questions arise about the goal of cross-border innovation policy. Cross-border funding programs have now existed since at least 1992. Around the same time, in the 1990s, innovation became more important in regional economic policies (McCann & Ortega-Argilés, 2013). However, the meeting of cross-border policy and innovation policy is relatively new. To understand the rationale of such a policy and the possible policy measures we need to reflect upon the characteristics of cross-border innovation and how cross-border innovation builds up. Moreover, we then can sketch the aims and rationales of a cross-border regional innovation policy.

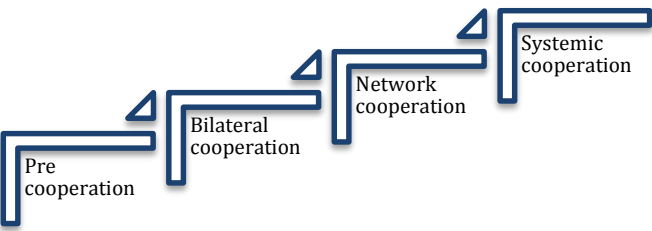
3.1 Cross-border innovation

Innovation is the driving force behind the knowledge-based economy (Lawton Smith, 2007), in which 'knowledge is the crucial resource and learning the most important process' (Lundvall & Johnson, 1994). For firms to become innovative, they need to tap into knowledge resources that are increasingly found outside the boundaries of the firm. Firms need to cooperate to remain or become competitive and thus need to engage in learning processes outside their organisations. However, for most firms, especially SMEs, this a process associated with a lot of risks. For example, risk of violation of intellectual property and the risk of unreliability of a partner. At the same time it is

not a choice anymore to cooperate. Due to increased pressure on time to market, shorter product life cycles and increased complexity of innovations, firms have to cooperate with others because they can hardly possess all necessary knowledge in-house (Barney & Clark, 2007; Marshall et al., 2007). As cooperating is already difficult, cooperating across the border adds to these risks. Not cooperating across the border then seems to be an easier path to take, considering the amount of time and money that needs to be invested in order to successfully cooperate across the border (Leick, 2012). Firms will thus only cross the border when learning or market opportunities exist that are not available in their own country, because national alternatives are less costly in terms of time, money and risk (Klatt & Herrmann, 2011). However, the existence of opportunities is not sufficient for cross-border activities to take place. When the costs of exploiting these opportunities are too high, it is likely that no interaction will take place at all. Moreover, before actors decide to participate in cross-border activities, they need to have knowledge of the possible opportunities. This means that besides opportunities and costs, information is essential.

In an earlier paper (Van den Broek, Benneworth, & Rutten, 2015; *to be submitted*) we have looked at the barriers that firms experience when collaborating cross-border for innovation. Thereby we used a staged model (Koen, 2011; Marxt & Link, 2002) to identify the different kinds of barriers in four different phases: initiation, partner selection, setup, realisation. We found that in the initiation phase, the partner selection phase and the realisation phase, there were qualitatively different processes at work. From this model we derive the phases of the build-up of a CBRIS. The first phase is the initiation or pre-cooperation phase where firms make the decision about whether or not to cooperate for innovation. Here the choice of working cross-border is not discussed per se. The second phase we can distinguish is a combination of the partner selection and execution phase. Here the right partners are sought and the bi-lateral

cooperation is started. The right partner then could be on the other side of the border. However, firms in that case study reported that after carrying out one cross-border project they would consider working across the border again. This suggests they would



incorporate this in their next initial decision and their next cooperation would not start in phase, but in phase 2. This leads us to a third phase where bi-lateral cooperation starts acquiring network properties and the bi-lateral cooperation's develop into cross-border networks. The final

stage would be for these networks to gain systemic properties and a CBRIS with multiple connections between different sets of actors in the border region emerges.

3.2 Cross-border innovation policy

In general there are two kinds of arguments for innovation policy: market failure arguments and system arguments (McCann & Ortega-Argilés, 2013). The system arguments dominate modern innovation policy and overcoming system failures is the main justification for most policy measures today (ibid.). Focusing on overcoming system failures suggests that a well working innovation system is the ultimate goal of innovation policy. Translated to the cross-border context the goal of cross-border innovation policy seems to be to establish a well-functioning cross-border regional innovation system (CBRIS), a concept first developed by Trippl (2010) and extended by Lundquist and Trippl (2013) who argue that CBRISs can be seen as *'the most advanced form of transnational integration, resting upon the success of previous incremental and less innovation oriented modes of development'* (Ibid.; 452).

Although they acknowledge that a CBRIS is an advanced mode of integration, their model does not reflect the way innovation connections between firms built up. Smart cross-border innovation policy should reflect this build up of collaborative firm innovation and tries to stimulate and support this process.

The development of cross-border innovation policy is not done in a vacuum, the experiences gained from Interreg policy since 1992 can be used to develop a smart cross-border regional innovation policy. Here we take the example of the building of cross-border bike lanes, which was an often-used policy measure in the early Interreg programs. The good thing about cross-border bike lanes is that they encourage people to cross the border and are relatively cheap to built and gaining consensus about their construction is relatively quick to achieve. When trying to built cross-border A-roads or even more advanced, cross-border metro connections, there is much more money needed and consensus is much more difficult to achieve. In order to achieve this one needs to think about the intermediate steps from the construction of bike lanes towards the construction of an integrated metro system. The same holds true for the build up of cross-border innovation systems. There is a need to think about the intermediate steps between the few bike lanes that are in place and the ultimate goal of systemic integration. By taking intermediate steps also competence is built between policymakers on both sides of the border, easing the process and raising the possibility of success. If the construction of bike lanes was the goal of the 1990s, the goals of the 2010s might be about building innovation connections. If that is the case there is a need for more rigor in the debate about what Interreg is aiming at with its focus on innovation.

4. Development phases in cross-border innovation

We argue that the build up of cross-border regional innovation linkages and the development of linkages into networks and finally an innovation system proceeds through four qualitatively different phases, each with their own characteristics and need for support.

4.1 Pre-cooperation phase

In this phase the problem in a cross-border region is that firms do not consider the firms on the other side of the border when they encounter an innovation problem. This problem has been acknowledged in the context of labour market issues in border regions. In this regard Van Houtum and Van der Velde (2004) developed the concept of a 'threshold of indifference', implying that *"Not commuting or not migrating across a border is not merely a matter of failing to recognise opportunities because of existing differences, but must rather be considered as a matter of habitualised indifference towards the 'other side', the 'market' across the border (Ibid, 105)"*. For a majority of actors, the place across the border might not be present in the mindset (van Houtum & Van der Velde, 2004). This means that working on the other side of the border is not even considered. Only a small part of the population that considers working across the border will actively make a go/no go decision based on the opportunities and costs of moving. The concept of a 'threshold of indifference' might also be an important explanation for the non-existence of cross-border innovation connections. For firms seeking external knowledge, this might imply that, despite availability of opportunities and access to information about these opportunities, mechanisms are in place that lead them to not consider cooperation across the border at all, or in some cases, to consider it and reject it.

Policy intervention in this phase should be focused on helping firms overcome this threshold of indifference. Typical policy measures in this phase are related to

providing information about the possibilities and potential benefits of cooperating cross-border. The availability of funding can be an incentive for firms to start considering working cross-border. However, the step from not considering working cross-border towards actually starting cooperation is a big one. The decision to work across the border for innovation is thereby embedded in other decisions about cooperating for innovation itself.

4.2 Bilateral cooperation phase

Once the decision has been made to search for cooperation across the border, and thus the threshold of indifference has been overcome, firms need a network across the border in order to know with whom to connect and possibly collaborate. For effective knowledge transfer firms need to gain connections and relations across the border, which might be referred to as social capital, as "good social relations facilitate knowledge transfers while absence of relations or bad relations do not" (Westlund, 2006; 91). Social capital has a clear spatial dimension because "social capital pertains to the social relations between humans, and since these social relations have a spatial dimension, so too does social capital." (Rutten et al., 2010; 863). When social capital is low, this negatively affects the development of a (cross-border) region. Social capital might be bonding, bridging or linking people (Woolcock, 2004). Bonding social capital refers to a dense network of actors in which norms and values are shared and trust builds up (Rutten et al., 2010), whereas bridging social capital is related to a brokerage function that individuals or organisations can perform within networks connecting people (Malecki, 2012; Rutten et al., 2010), linking social capital is about the access to people with authority (Malecki, 2012). Across the border most firms lack all three kinds of social capital, which hinders their ability to connect with firms on the other side of the border and to effectively transfer knowledge. Both the number of links and the

quality of these links decrease with distance. The border effects leads to a faster decrease of the numbers of linkages than could be expected based on the distance in both kilometres and travel time. At the same time once social capital across the border has been acquired, this can accumulate and lead to the build up of links across the border. However, before bonding social capital can accumulate, bridges are needed to gain access to social capital on the other side of the border. Brokers or gatekeepers in regions are necessary to fill structural holes in the cross-border network (Malecki, 2012).

This second phase, actually cooperating, can be divided into two interrelated parts. First you have to know possible cooperation partners and second you need to actually cooperate with them. Getting to know possible cooperation partners can be done in two manners: broadly getting to know all kinds a people and firms on the other side of the border or specifically searching for a partner you need at this moment. Intuitively the second option seems the most efficient. However, solving an innovation related issue often requires knowledge that is held by firms and knowledge institutes that are outside the regular network of a firm. Whereas firms know their main competitors and suppliers across the border, the needed resources for their innovation problem are often found outside this circle. Policy measures in this phase need to address the problem of acquiring social capital on the other side of the border. Especially boundary spanners are necessary who set up bridges between two firms on both sides of the border. In terms of policy measures we can think of setting up cross-border networks, these can be general networks or more industry-specific networks.

4.3 Network cooperation phase

The evolution of dyadic relations between two firms into a network of relations represents a different phase in the development of a CBRIS. In this phase several firms

and knowledge institutes on both sides of the border know each other and different sets of cooperation emerge. The formation of a network can be seen as an emergent property of the cooperating actors. They do not necessarily all know each other and cooperate together, but there are linkages between them, supposedly through certain central actors. Gluckler (Gluckler, 2007; 620) argues that *'regional growth and innovation largely result from the bridging and brokering of unconnected networks or network clusters'*. To achieve cross-border economic growth the evolution of a few dyadic cross-border relations into a network of cross-border relations for innovation is important. However, firms can only maintain a limited amount of network connections (Gluckler, 2007) and the investment in one tie might prohibit the connection with another firm. At the same time it can also be reverse, when a firm becomes an attractive partner for others because of their relationship with a certain firm. The emergence of cross-border networks is about the establishment of new ties between firms. An important mechanism at play in this evolution is retention: *'the structural effect of past choices on the propensities for future tie selection within the network'* (Gluckler, 2007; 624). This leads to path dependent processes of network formation in which the existing network constrains the entry of new ties. The nationally bound networks of firms then influence the built-up of cross-border network connections. This can be both positive, when a network is receptive of new ties, and negative, when a network is relatively locked-in, for the evolution of a cross-border network. Once one bridge is established different mechanisms are at work that increase the chance that path dependence is broken and more external linkages can be incorporated in the network (Gluckler, 2007). Also developing cross-border ties can be a way for locked-in national networks to gain access to new knowledge relatively close by, thereby still having the advantages of geographical proximity. The problems in this face are thus (1) that firms can only have a limited amount of relations, (2) the path dependent

character of networks influences the establishment of new ties, and (3) that retention mechanisms can lead to locked-in national networks.

Then the question is what kinds of policy measures are possible to facilitate the build-up of cross-border networks. The needed measures for a large part depend on the type of region we are dealing with (Tödtling & Trippl, 2005). Based on the ideal types that Tödtling & Trippl (2005) distinguish, policy action could range from actively linking firms with each other and setting-up university-industry networks in more advanced regions, opening up traditional networks in old industrial regions or link firms to knowledge sources outside the region in peripheral regions. These policies can be operationalized in measures like organizing network events, setting up joint projects and network organizations.

4.4 System cooperation phase

The fourth phase is about systematizing the relationships in the cross-border region. The different networks operating in the border region are then becoming integrated in a coherent innovation strategy that is governed by a stable institutional governance system (Trippl, 2010). In this phase working across the border would become a natural state of affairs and collaboration partners are found easily on both sides of the border. Cross-border connections ideally are becoming evenly important as domestic connections. Important barriers in the evolution from the network phase to this systemic phase are in the governance domain (Lundquist & Trippl, 2013). To develop a cross-border innovation strategy requires for policymakers on both sides of the border to engage in policy entrepreneurship (Perkmann, 2007). National and regional administrators define the space and scope for this kind of policy entrepreneurship that has to do with the allocation of funding and resources to cross-border initiatives, opening up research infrastructure, and the set-up of cluster organisation, technology

transfer clubs or economic boards for the border region. These kinds of actions then represent the idea of thinking collectively about the border region, rather than in two (or more) sub regions.

Policy measures in this phase are less related to system failures and more about actively constructing and strengthening cross-border institutions, in other words thickening the institutional environment (Asheim, Moodysson, & Tödtling, 2011). In border regions this institutional environment might be present or absent in both regions, or present in one region and absent in the other. Depending on the specific situation policy measures can be developed directed at setting up specific cross-border institutions on both sides of the border. These might be new organizations or a cooperation of existing organizations. The defining feature of these organizations is that they are geared towards the strengthening of the border region as a whole.

5. Case study: the Flemish - Dutch border region

The Flemish - Dutch border region is a non-typical border region. On both sides of the border people speak a relatively similar language, there is a long history of cooperation and formal border controls have been removed since early 1960s. Also in terms of economic growth and prosperity it represents an atypical border region, as both the Southern-Netherlands and Flanders are prosperous regions. In terms of regional innovation performance the region is mainly typified as innovation follower, and the province of North Brabant in the Netherlands is even an innovation leader according to the EU regional innovation scoreboard (European Commission, 2014). The OECD (2013) sees the border region as a leading example of cross-border cooperation for innovation. These characteristics make this border region a well-suited example to analyse cross-border innovation policy initiatives. Here we specifically focus upon the Interreg IV program Flanders – the Netherlands (FL-NL), which consists

of the Dutch provinces of North Brabant, Zeeland and Limburg and the Flemish provinces of West Flanders, East Flanders, Antwerp, Flemish Brabant and Flemish Limburg (see figure 2).

Figure 1 Eligible program area Interreg IV Flanders - Netherlands



6. Applying the phased model on the Flemish – Dutch border region

We have showed that there is an increased focus of the Interreg-programs on innovation and SMEs. This also applies to the Interreg V Flanders – Netherlands program. The Interreg V 2014-2020 program builds upon the previous cooperation in the region, which makes it interesting to look at the projects funded in the Interreg IV program and see to what extent the funded projects reflect the staged model we have developed.

6.1 Pre-cooperation phase

In the program area of Interreg FL-NL there is one project funded in the 2007-2013 period directed at general awareness raising or providing information specifically on the possibilities of cross-border innovation. This project aimed at informing and inspiring

SMEs to engage in more sustainable business practices. Next to this Interreg project, regional development agencies on both sides of the border inform firms in their regions about the possibilities and advantages of collaboration. Thereby cross-border collaboration is one of the possibilities. Another initiative in this region is BIELAt, a private foundation promoting collaboration between entrepreneurs, knowledge institutes and government in the Eindhoven Leuven Aachen triangle (ELAt). This foundation organises events and promotes the collaboration possibilities on the other side of the border.

6.2 Bilateral cooperation phase

In the FL-NL program there are three projects directed at funding concrete cross-border innovation project. One project was a bilateral cooperation between two knowledge institutes directed at developing better methods for the diagnosis of cardiovascular diseases. A second project was cooperation between two knowledge institutes and a firm on a feasibility study of geothermal energy in the border region. The third project was aimed at stimulating cross-border cooperation between firms in the high tech sector. In this project 21 collaboration projects between SMEs were carried out.

6.3 Network cooperation phase

The FL-NL program has funded ten projects that can be categorized as network cooperation. All ten projects consist of knowledge institutes that cooperate together, sometimes complemented by regional development agencies, municipalities and provinces. One example is a project where small laboratories are set-up by knowledge institutes aimed at providing a test facility for SMEs where they can make use of

innovative computer-controlled tools. Another example is a network of incubators in the border region that facilitates cooperation and exchange between start-ups.

6.4 System cooperation phase

We find two projects that have the contours of a more systemic cooperation and are both direct towards development of a cross-border cluster. The first project is aiming at placing the cross-border region on the map as a bio based cluster. Concretely, the project entails the construction of a pilot plant in Ghent (FL) and a training centre in Terneuzen (NL). The second project wants to develop the border region towards a top position on hydrogen. In this project the concrete activities are coordinating hydrogen related activities in the border region, developing demonstration projects, realising hydrogen stations, developing innovation projects and setting up an education program around hydrogen.

7. Lessons from the Flemish - Dutch border region

7.1 Diagnosis of innovation policy in Flemish - Dutch border region

From this short and narrow analysis of projects on cross-border innovation in the Interreg IV program FL-NL we can derive some observations on the cross-border innovation ambitions of the Interreg V program FL-NL. First, we see that there is a general lack of SME involvement in the program. Only in one project SMEs are involved in cooperation for innovation. Although this might be due to the limited focus on SMEs in this period, this shows the magnitude of the shift that is present in the 2014 - 2020 period. Second, there seems to be a concentration of knowledge institutes, cooperating in networks. Network cooperation is limited to knowledge institutes, with SMEs only selectively involved. But, cooperation between knowledge institutes seems to be relatively advanced, which could be a point of action for cross-border innovation policy. Third, there is almost an absence of activities directed at raising awareness and involving SMEs in cross-border innovation. This might be explained by the long-term investment of Interreg funding and cross-border cooperation in these areas, which might have lead policy makers to think that this has already been done and is not necessary anymore. Another explanation is that the measures are in place, but are not funded by Interreg and are executed by parties on each side of the border independently or are part of non-Interreg funded cross-border initiatives. This relates to a third explanation, which is that these measures might be part of larger Interreg-projects and not per se operate as individual projects. However, this might be true for the two projects in the last phase but seems absent in the other projects. Fourth, there are some attempts aiming at a systemic cooperation. They sketch the contours of a cross-border cluster and take some steps towards the development of such a cluster. Taken together, by applying the staged model we can see that there is an unbalance in the projects that are being funded. Most funding is going towards networking

activities of knowledge institutes, and there is only a limited amount of projects stimulating activities in the first two stages, whilst these are important as firms mostly do not flip from not cooperating across the border towards complex network cooperation.

7.2 Underlying principles for a coherent CBRI policy

From our conceptual model and the empirical reflection from the Flemish - Dutch border region we can distil some underlying principles for a coherent and smart cross-border regional innovation policy.

The first principle is about having a clear idea of what cross-border policy is aiming at. Because a clear aim, which could be the development of a cross-border regional innovation system, helps to identify the necessary policy measures. The policy then should be about addressing different system failures in the different phases. Without a clear aim policy runs the risk of only encouraging and funding initiatives that would have been done anyway, without structural effects upon the functioning of the border region.

Second, not all firms are in the same phase of cooperation, thus actions are needed in every phase of our model in every border region. Even in relatively advanced border regions there is still a vast amount of firms that does not engage in any cooperation. Depending on the border region the amount of measures and the budget allocated per phase might differ. Furthermore a one-off cooperation across the border does not lead to network cooperation per se.

Third, as most firms do not know beforehand which kind of knowledge they are going to need, connecting with random partners seems a time-consuming process with uncertain rewards. In most regions there are already several intermediary

organisations to which they can turn for advice about possible cooperation partners. These parties might function as brokers for acquiring contacts on the other side of the border. A pre-condition therefore is that these intermediaries have already built up connections with their counterparts on the other side.

8. Conclusions

8.1 Answering the research question

This paper started with the research question: is the strong focus of Interreg V programmes on innovation missing necessary elements in the development of cross-border innovation systems? We have developed a conceptual model of the phased built-up of cross-border regional innovation systems to explore this question. In each of these phases firms are facing different sorts of challenges in working cross-border. Cross-border innovation policy thus needs to address different kinds of challenges, which requires a variety of policy measures. The needed mix of measures depends upon the specific character of the border region. At the same time every border region will need measures in every phase, as not all firms and knowledge institutes are in the same phase of cooperation.

When we applied this to the Interreg IV program Flanders - the Netherlands, we saw in general an absence of activities in the first phase, whilst many firms are expected to be in this pre-cooperation phase. We also observed only very limited participation of firms in projects in all the phases. Knowledge institutes on the other hand were relatively well represented, especially in the network cooperation phase. They might be a catalyst for cross-border innovation in this border region, as their cooperation seems to be already quite advanced. However, the strong focus of Interreg V on cooperation for innovation between SMEs seems challenging, as they are not very well represented in the Interreg IV program and this Interreg IV program has not invested

much effort in awareness raising and information. In the Interreg V program document for the Netherlands – Flanders area there is also not much attention for this. It does seem to rely strongly on existing networks within the regions to inform and advice firms on working cross-border. Above all it lacks a clear view of where the policy efforts directed at innovation and SMEs have to lead to, going beyond the general goal of an economically prosperous border region.

8.2 Contribution to the debate

Our contribution to the debate is twofold. First, we contribute to the debate around borders and innovation and the possibilities of creating a cross-border regional innovation system. We add to this debate by developing a conceptual model of a phased built-up of innovation connections across the border. These four phases are qualitatively different and require different policy approaches. This is deepening the model of Lundquist & Trippl (2013) who distinguish between three stages, as it allows gaining insight into how regions can actually go from one stage to the other. Thereby acknowledging that even in a well-developed CBRIS there will be firms and other actors that are not cooperating across the border and thus there will be actors in all stages even in full-fledged CBRISs.

The second part of our contribution is related to the current discussions about the policy concepts of constructing regional advantage (Asheim, Boschma, & Cooke, 2011; Asheim, Moodysson, et al., 2011) and smart specialisation (Foray, David, & Hall, 2009; Mccann & Ortega-Argilés, 2013). Both concepts take as point of departure that policies should be place-based and tailored to specific regional needs (Boschma, 2014). Although both concepts do not define specific regional boundaries a priori, they do not deal explicitly with border regions and the challenges that can pose. Our conceptual model of a phased development of cross-border connections could be

used to develop the way border regions are treated in both concepts, and border regions could benefit from using one of these concepts in developing smart strategies.

8.3 Lessons for policy

On the basis of our analysis we suggest that cross-border innovation policy could benefit from a more conceptually founded idea of cross-border innovation. Our conceptual model can be a tool to develop such a policy. It allows policymakers to analyse the specific needs of the actors in their region. The most important lesson thereby is that policy should be specific for a cross-border region and is not the sum of the bordering regions. The development of a cross-border regional innovation system follows a different logic and actors can be in different development phases than they are domestically.

Although the Interreg V programs have been written and have started in 2015, we hope that this paper can contribute to a discussion about the direction of innovation funding in these programs or the next. A starting point could be to acknowledge for each project to be funded in which phase it is operating and what systemic failures it is contributing to solve. Then it will gradually become clear where measures are missing and needed, and that innovation system equivalent of bike lanes might still be necessary, next to the construction of innovation N-roads and A-roads.

References

- Asheim, B., Boschma, R., & Cooke, P. (2011). Constructing Regional Advantage: Platform Policies Based on Related Variety and Differentiated Knowledge Bases. *Regional Studies*, 45(7), 893–904. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/00343404.2010.543126>
- Asheim, B., Moodysson, J., & Tödtling, F. (2011). Constructing Regional Advantage: Towards State-of-the-Art Regional Innovation System Policies in Europe? *European Planning Studies*, 19(7), 1133–1139. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/09654313.2011.573127>
- Barney, J. B., & Clark, D. N. (2007). *Resource-based theory: Creating and sustaining competitive advantage*. Oxford: Oxford University Press.
- Boschma, R. (2014). Constructing Regional Advantage and Smart Specialisation: Comparison of Two European Policy Concepts. *Scienze Regionali*, 13, 51–68. doi:10.3280/SCRE2014-001004
- European Commission. (2010). *Ex-Post Evaluation of Interreg III (2000-2006)*. Brussels.
- European Commission. (2014). *Regional Innovation Scoreboard 2014* (p. 79). Brussels. doi:10.2769/88893
- European Commission. (2015). Co-operation across borders. Retrieved February 9, 2015, from http://ec.europa.eu/regional_policy/index.cfm/en/policy/cooperation/european-territorial/cross-border/
- Foray, D., David, P. A., & Hall, B. (2009). *Smart specialisation - The concept*. Knowledge Economist Policy Brief No. 9.
- Gluckler, J. (2007). Economic geography and the evolution of networks. *Journal of Economic Geography*, 7(5), 619–634. Retrieved from <http://joeg.oxfordjournals.org/cgi/doi/10.1093/jeg/lbm023>
- Hansen, T. (2013). Bridging regional innovation : cross-border collaboration in the Øresund Region. *Geografisk Tidsskrift-Danish Journal of Geography*, 113(1), 25–38.
- INTERACT. (2010). 20 years of territorial cooperation. *INTERACT Newsletter*, (september).
- Jacobs, J., & Kooij, H.-J. (2013). Fading EUphoria at the Dutch-German Border? The Case of Avantis. *Tijdschrift Voor Economische En Sociale Geografie*, 104(3), 379–387. doi:10.1111/tesg.12034
- Klatt, M., & 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.

- Koen, C. (2011). *Collaborative Innovation in High-Technology Sectors*. Tilburg: Tilburg University.
- Lawton Smith, H. (2007). Universities, innovation, and territorial development: a review of the evidence. *Environment and Planning C: Government and Policy*, 25(1), 98–114. Retrieved from <http://www.envplan.com/abstract.cgi?id=c0561>
- Leick, B. (2012). Business Networks in the Cross-border Regions of the Enlarged EU: What do we know in the Post-enlargement Era? *Journal of Borderlands Studies*, 27(3), 299–314. doi:10.1080/08865655.2012.750952
- Lundquist, K.-J., & Trippl, M. (2013). Distance, Proximity and Types of Cross-border Innovation Systems: A Conceptual Analysis. *Regional Studies*, 47(3), 450–460. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/00343404.2011.560933>
- Lundvall, B. A., & Johnson, B. (1994). The learning economy. *Industry and Innovation*, 1, 23–42.
- Marshall, D., McIvor, R., & Lamming, R. (2007). Influences and outcomes of outsourcing: Insights from the telecommunications industry. *Journal of Purchasing and Supply Management*, 13(4), 245–260.
- Marxt, C., & Link, P. (2002). Success factors for cooperative ventures in innovation and production systems. *International Journal of Production Economics*, 77, 219–229.
- McCann, P., & Ortega-Argilés, R. (2013). Modern regional innovation policy. *Cambridge Journal of Regions, Economy and Society*, 6, 187–216. doi:10.1093/cjres/rst007
- Mccann, P., & Ortega-Argilés, R. (2013). Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy. *Regional Studies*, 1–12. doi:10.1080/00343404.2013.799769
- OECD. (2013). *Regions and Innovation: Collaborating Across Borders* (OECD Revie). OECD Publishing. doi:10.1787/9789264205307-en
- Panteia. (2009). *Ex-Post Evaluation of INTERREG 2000-2006 Initiative: 1st Interim report*. Zoetermeer.
- Perkmann, M. (2007). Policy entrepreneurship and multilevel governance: a comparative study of European cross-border regions. *Environment and Planning C: Government and Policy*, 25(6), 861–879. Retrieved from <http://www.envplan.com/abstract.cgi?id=c60m>
- Prokkola, E. K. (2011). Cross-border regionalization, the INTERREG III A initiative, and local cooperation at the Finnish - Swedish border. *Environment and Planning A*, 43, 1190–1208. doi:10.1068/a43433

- Rutten, R., Westlund, H., & Boekema, F. (2010). The Spatial Dimension of Social Capital. *European Planning Studies*, 18(6), 863–871. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/09654311003701381>
- Tödting, F., & Trippel, M. (2005). One size fits all? *Research Policy*, 34(8), 1203–1219. doi:10.1016/j.respol.2005.01.018
- Trippel, M. (2010). Developing Cross-Border Regional Innovation Systems: Key Factors and Challenges. *Tijdschrift Voor Economische En Sociale Geografie*, 101(2), 150–160.
- Van den Broek, J., Benneworth, P., & Rutten, R. Border blocking effects in collaborative firm innovation (2015).
- Van Houtum, H., & van der Velde, M. (2004). The Power of Cross-Border Labour Market Immobility. *Tijdschrift Voor Economische En Sociale Geografie*, 95(1), 100–107.
- Westlund, H. (2006). *Social Capital in the Knowledge Economy*. Berlin Heidelberg: Springer Verlag.
- Woolcock, M. (2004). Why and how planners should take social capital seriously. *Journal of the American Planning Association*, 70(2), 183–189.