Bachelor Thesis on

Cross-border Cooperation in Regional Innovation

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Executive Summary

This paper is a Bachelor Thesis on the main research question *"How is regional innovation in cross-border regions affected by informal factor to cross-border cooperation?"* This main research question is complemented by sub-research questions, which are guiding the empirical part of the thesis. The questions are explained in greater detail in section three on research questions and methodology. In a first step the theoretical framework for the analysis is put up in section two of the thesis. This framework is not only meant to provide necessary guidance for the analysis but also information on the state of the art of research in the area of cross-border cooperation for regional innovation.
In the empirical part of this thesis two examples of regions in which cross-border cooperation and regional innovation is at face value very good are analyzed with regard to the informal factors (cultural, linguistic, social, educational and economic diversity) that are existing in the regions and the amount of innovation that is produced there. The analysis of the regions will in the end enable the research to draw conclusions about the extent to which regional innovation in cross-border regions is affected by cross-border cooperation and give recommendations for future research in this area and policies initiatives in the area of cross-border cooperation and regional innovation.

1. Introduction

This Bachelor Thesis is looking at the circumstance that cross-border cooperation for regional innovation in cross-border regions within the European Union (EU) tends to be small. It is however an important concept since regional innovation is amongst others one key driver to regional development, growth and competitive advantage (cf. Asheim et al., 2011, p. 3). Regional development and growth are of special importance for cross-border regions because these are in most cases areas that are originally peripheral and lack impulses for innovation, development and growth or they are metropolitan regions, whose economic and structural development is hindered by the border due to limited space (cf. Stein, 2000).
The problem is that innovation does not occur all of a sudden but a lot of effort has to be put into its establishment. Cooperation is assumed to be a good tool to create innovation. However, the establishment of cooperation is already difficult in the national context because of different factors; it is even more difficult in the cross-border context because there are even more of them. The factors influencing cooperation result from different languages, cultures, currencies, political and legal systems, economic structures and the knowledge infrastructure. One can distinguish these factors into two types, formal (currency, political and legal system) and informal (language, culture, economic structure, knowledge infrastructure) factors. The main focus of the thesis will be on the positive or negative effects of different informal factors to cross-border cooperation.

In order to analyze cross-border cooperation for regional innovation a systemic approach is taken to make it easier understandable. The approach taken to think about innovation and development within a region is the Regional Innovation System (RIS) or more precisely the Cross-border Regional Innovation System (CBRIS) within cross-border regions. This approach is taken because it is a common way of addressing this topic, and therefore widespread and well known in literature.

Consequently, studying CBRIS, and advancing our understanding about what works and what does not, is relevant because "[T]he emergence of a cross-border RIS could constitute an increase in the exchange of goods and knowledge, labour mobility and direct investments, offering opportunities for mobilisation of synergies and shared growth effects" (Trippl, 2006, p. 12). Borders, however, create

barriers. Cross-border regions would benefit enormously from dismantling barriers and constructing an integrated innovation space. It is not only political-administrative borders that divide the two sides of the border (Trippl, 2006, p. 12). Informal barriers can be at play as well. The aim of this Bachelor thesis is to find out *"How regional innovation in cross-border regions is affected by informal factors to cross-border cooperation",* in order to give recommendations for future policies, which are meant to improve cross-border cooperation and regional innovation in cross-border regions within the next 20-30 years. Therefore, in this Bachelor Thesis three questions will be addressed: which informal factors exist in successful CBRISs, what are their effects and what is the amount of innovation produced in CBRISs?

The Bachelor Thesis is of scientific relevance because it deals with the effects of informal factors to cross-border cooperation on regional innovation in cross-border regions, which is an area that is only studied to a small extent, yet. Therefore, this thesis tries to fill a gap in the area of cross-border regional cooperation research. With regard to social relevance the topic is of huge importance. Border regions are the living place of almost one fourth of the total European population and these regions are often lacking impulses for development and growth. Through innovation these regions can develop towards core regions and get more important, not only to businesses but also to the people. Therefore, it is interesting to analyze such cross-border regions.

2. Theoretical Framework

In order to address the main research question, this thesis adopts a regional innovation systems approach, and in particular, uses emerging but still incomplete literature around CBRISs.

With the purpose of approaching the topic of regional innovation in cross-border regions the concept of region needs to be explained. In this respective case a region can be thought of as a scale of tacit knowledge transfer (cf. Weidenfeld et al., 2010, p. 23) with repeated interaction to generate knowledge and transfer it from one actor to another. The "importance of tacit knowledge for successful innovation has to be mentioned. It is now well understood that its exchange requires intensive personal contacts of trust based character which are facilitated by geographical proximity" (Tödtling & Trippl, 2005, p.3). This means people learn easier when they are able to see and particularly handle and feel the new product. People within a region tend to have a shared background, same language and culture, a common social capital, and therefore common ways of working. If this is true, then this would make a region a perfect place for working together and producing innovation because people easier understand each other due to the aforementioned factors.

Geert Hofstede already recognized the importance of culture for successful functioning of organizations. It can be said that "organizational norms and values are influenced by the values in the larger national culture" (Daft, 2010, p. 202). These findings can be extended to successful cross-border cooperation, which means that culture has a huge impact on cooperation between different actors. Additionally, due to the direct proximity of the actors involved, which means that the special distance between the actors is relatively low, knowledge spill-over are encouraged to take place. Due to the fact that when knowledge can be spread in a tacit way the transfer is easier. The concept knowledge spill-over means that innovation and knowledge generation in one area, influence thinking and production in another. Both elements, direct proximity and knowledge spill-over, are of huge importance for the emergence and development of regional innovation. Understanding the mechanisms taking place within a region to establish regional innovation and cross-border

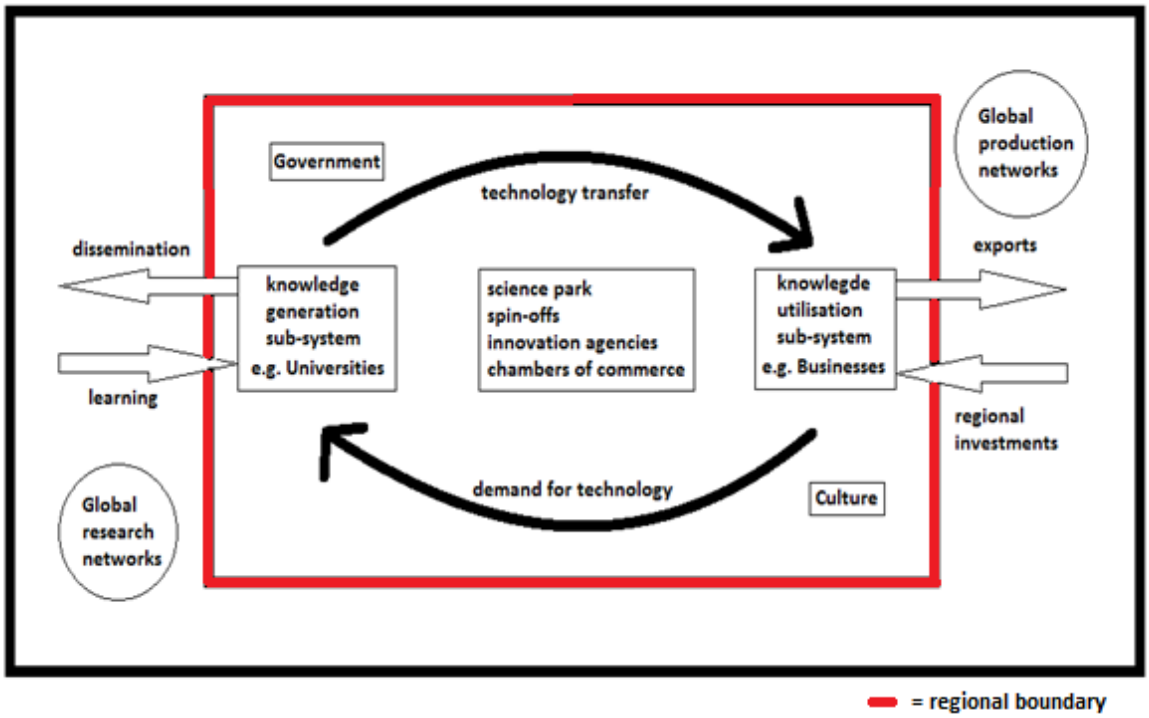
cooperation is of importance because innovation is assumed to be a key driver for regional development. Nowadays, the establishment of a knowledge economy is of huge importance as well for a region but also on a larger scale of a globalized world. The concept of a knowledge economy means that knowledge and education are treated as business products with a high profit. In the next step the theories on RISs are laid down in order to answer the defining question "What is a RIS?" This is necessary to understand mechanisms of regional cooperation for innovation, in general and on the national level.

What is a Regional Innovation System?

The description of a RIS helps understanding the relationships among the actors involved in regional cooperation. Furthermore, the characteristics that are important in the national context are also of importance for the cross-border context. Therefore, this is the first step for the explanation of CBRIS, as one need to understand RISs to better understand CBRISs.

In the following passage the concept of RIS that is described by a number of different authors, which all frame the topic in similar ways, is explained. The RIS is a concept that is used to understand the way that actors within a region interact repeatedly and create institutions that support these interactions (cf. Doloreux & Parto, 2004, p. 2). This concept is important because it helps understanding the necessity of functioning relations between the different actors for regional innovation. The RIS consists of different subsystems and dimensions, which will be laid down in the following paragraph for a better understanding of the story an illustration of a RIS can be found here.

Figure 1: Regional Innovation System



Source: Benneworth after Cooke & Piccaluga, 2004

Within the systematic, conceptual illustration of a RIS, there is at least one knowledge generation subsystem, as for instance a university or college, which is learning from the global research networks and disseminating the knowledge gained back to it. Besides knowledge generation subsystems, there are also knowledge utilization subsystems, like businesses and companies, these

are exporting towards a global production network and getting regional investments back. Within the RIS the knowledge utilization subsystems are demanding for technological knowledge from the knowledge generation subsystem and this leads to technology or knowledge transfer to the businesses. This interaction takes place via technology transfer assets, like science parks, spin-offs, innovation agencies or chambers of commerce, and these are influenced and supported by formal institutions or policy subsystems, like governments on different levels (national or regional for example) and informal institutions, like regional culture and society. The regional culture is of huge importance, due to the fact that it builds "the link between the productive system (mainly firms) and the social system [and therefore] determines the type of development in the region" (Cooke, Gomez Uranga, Etxebarria, 1997, p. 13) "because [it] shape[s] the behavior of actors and the relations between them" (Trippl, 2006, p. 10). There are of course more authors describing the innovation process of a RIS but they are very similar to each other, therefore, this approach is used to analyze RISs.

Regarding RISs it is also important to mention some of the problems related to them. This is done in a comprehensible way by the authors Tödtling and Trippl in 2005. These two describe three different kinds of problematic RISs. First of all, there are peripheral regions, which are "weakly developed as there is a lack of dynamic clusters and of support organizations ("organisational thinness")" (Tödtling & Trippl, 2005, p. 7). Within these regions the level of innovation activities is low due to the fact that there are only a few innovative companies. Secondly, there are old industrial regions, which face a contrary problem. They are clustered too strong and therefore, overspecialized. This leads to "a loss of regional competitive advantage and innovation capacity" (Tödtling & Trippl, 2005, p. 8). Finally, the third type of problematic RISs is fragmented metropolitan regions. Generally, "metropolitan regions are regarded as centers of innovation" (Tödtling & Trippl, 2005, p. 9), but this is not true for all of them. Some metropolitan regions lack dynamic clusters of innovative firms and furthermore, the networks and coordination between knowledge generating and knowledge utilizing subsystems is very low. All of these different problems within RISs function as barriers or factors that hinder or even prevent regional cooperation for innovation. This circumstance is not only a problem on the national level but also on the cross-border level, which will be elaborated in the following section.

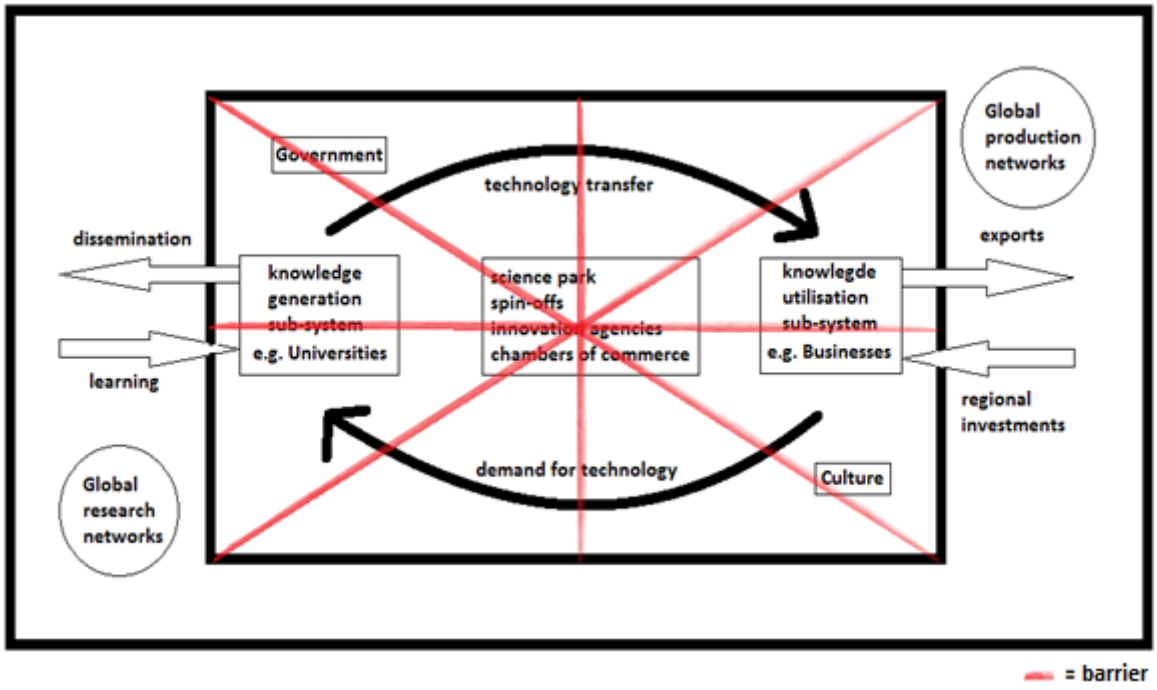
What is a Cross-Border Regional Innovation System?

On the basis of the explanation of a RIS, the next step is to define what a CBRIS exactly is.

The concept of CBRIS is of importance because it is a RIS where there could conceivably be systematic barriers the interacting partners have to face. Cross-border cooperation can encourage economic growth within a region, by establishing and fostering innovation systems. Thus CBRISs are assumed to have an added value for cross-border regions.

In general, a CBRIS has the same structure as a RIS. Within a CBRIS there are the same forms of actors as in a RIS, so there are knowledge generating subsystems, like universities, knowledge utilizing subsystems, like companies and businesses, policy subsystems, like governments and regional culture. The main difference between a RIS and a CBRIS is that there are barriers within the system which inhibit its successful functioning. This circumstance results from different national backgrounds of the involved regions. This is illustrated in the figure below.

Figure 2: Cross-border Regional Innovation System



Source: own illustration after Benneworth& Hospers (2007)

The different actors involved in a CBRIS are interrelated in the following way: knowledge generating subsystems are cooperating with knowledge utilizing subsystems according to the principle of supply and demand. Businesses are demanding knowledge and universities are satisfying this demand by doing research and providing the results, like it is the case in a RIS. This relationship is fostered by local innovation assets and influenced by different national governments and the regional cultures.
As the actors are the same and the original functioning of the systems is similar, too, the barriers within in the CBRIS are the main point to focus on. In the figure it is indicated that the barriers fragment the system, whereby it has to be taken into account that the fragmentation does not need to be along the red lines. Rather they should display that there are different types of fragmentation in different parts of the system. On the one hand, the actors can be fragmented. This means that there is no collaboration among the same type of actor (e.g. knowledge generation sub-systems) across the border, due to certain factors that are going to be explained in the following sections, which is based on the following guiding questions: "What are the factors favoring cross-border cooperation for regional innovation?" and "What are potential factors inhibiting cross-border cooperation for regional innovation within CBRISs?". On the other hand, also the mechanisms within the system (e.g. technology transfer) can be negatively influenced by the abovementioned factors. The indicated factors influencing the success of a CBRIS might not be visible or tangible ones but rather intangible and in the heads of people. They are introduced and explained in the following sections of this chapter but it can already been said that the barriers or factors result from the fact that "the different parts of cross-border regions often show very dissimilar economic histories, technological trajectories, institutional set-ups as well as different social dynamics, political visions, governance structures, modes of regulation and cultural identities" (Lundquist & Trippl, 2011, p. 3). These differences can be seen in two different ways. They can either be main source of innovation, through the new combination of old things or "major barrier for interaction and knowledge exchange" (Lundquist & Trippl, 2011, p. 3).

Having introduced the mechanisms within cross-border regions, which are related to cooperation and regional innovation and found out that there are factors influencing the establishment of cross-border cooperation for regional innovation, the following two sections elaborate on the factors favoring or hindering cross-border cooperation.

What are the factors favoring cross-border cooperation for regional innovation in border regions?

The answer to the question "What are the factors favoring cross-border cooperation for regional innovation in border regions?" is divided into five dimensions, which are the knowledge infrastructure dimension, the business dimension, the relation dimension, the socio-institutional dimension and the governance dimension. These five dimensions are derived from a study of Trippl in 2008 and are taken because they directly correspond to the actors involved in a CBRIS introduced before. Knowledge producers are relevant in the knowledge infrastructure dimension, knowledge exploiters are related to the business dimension, technology transfer is an aspect of the relation dimension, policy is clearly an element of the governance dimension and culture of the socio-institutional dimension.

Firstly, for the knowledge infrastructure dimension it could be said that a CBRIS can be favored through an advanced set-up of research organizations, educational institutions and transfer agencies and the coordination between the research institutions of the different national areas and the demands of the respective regional economy is strong.

Secondly, on the business dimension, the dominance of a 'high road' development path, which is based on continuous innovation in all areas, the region consists of strengthens a CBRIS, as well as a high level of complementarities between the industrial structures and the knowledge institutions.

Thirdly, regarding the relation dimension it could be said that, when the cross-border relationships are symmetric it is more likely that a CBRIS is facilitated as if the relationships are asymmetric.

Fourthly, a high level of cross-border knowledge interactions favors CBRISs. Minor cultural and institutional distances between the neighboring countries, as well as minor differences between the different National Innovation Systems, are the favoring factors on the socio-institutional dimension.

Finally, for the governance dimension a coherent innovation strategy of federalist political systems and a stabilized institutional governance setting is important (cf. Trippl, 2008, p. 7).

All these factors are favoring the emergence and expansion of CBRISs and thus have positive effects on cross-border cooperation and regional innovation. Concluding, it has to be kept in mind that only little is known about the dynamics of CBRISs. Therefore, through the analysis of the best practices in the second part of the research other factors might come up.

What are potential factors inhibiting cross-border cooperation for regional innovation within CBRISs?

In the following section, the contrasting factors that inhibit the development of CBRISs will be pointed out. In the end of this passage the main points of the last two sections are going to be summarized in a table. Due to reasons of simplicity, comprehensibility and comparability, also in the analysis, the same dimensions are used as for favoring factors.

Firstly, shortages regarding research organizations, educational institutions and transfer agencies and a weak alignment of the research with the demands of the regional economy are the biggest problems on the knowledge infrastructure dimension. An example for this lack of alignment and coordination would be that within a region cars are produced and the university in this area sets the

main research focus, which is subsidized a lot, at cloth production. Tödtling and Trippl (2005) frame this dimension a little more drastic, by saying it is “an underdeveloped organizational and institutional set up” (Tödtling & Trippl, 2005, p. 5), which has a “negative effect on the innovation potential of a region” (Tödtling & Trippl, 2005, p. 5).

Secondly, on the business dimension the dominance of the ‘low road’ development path, which means low wages in at least one of the areas, the cross-border region consists of, weakens the growth of CBRISs. This factor can also be an outcome of a hindered or non-existent RIS or CBRIS. Another obstacle on this dimension is a low level of complementarities in industrial structures and knowledge bases, which is an unrelated variety between business and educational institutions.

Thirdly, the dominance of an asymmetric cross-border relationship with one area of a region being stronger in various respects then the other is hindering the development of a CBRIS, as well as a low level of cross-border knowledge interactions. This means that knowledge is generated in one area and not actively supplied to others, so the border hinders the flow of information for example because of different languages. These two before mentioned factors belong to the relation dimension. Tödtling and Trippl also recognized the factor of “inappropriate or missing interaction or links between the different actors and organizations involved in the innovation process” (Tödtling & Trippl, 2005, p. 5) as an obstacle for the development of CBRISs. The authors extinguished two different problems from this factor. On the one hand, lacking interaction hinders the flow of information and knowledge, which leads to fragmentation. And on the other hand, when interaction is inadequate, through too strong ties between the direct actors and missing connections to international networks, a kind of locked-in phenomenon could arise and innovation capacities are undermined (cf. Tödtling & Trippl, 2005, p. 5).

Fourthly, CBRISs are inhibited by a significant cultural and institutional distance between neighboring regions. If people do not understand each other due to social and cultural differences, as a result of stemming from different countries; it is more difficult for them to work together compared to people with a similar social and cultural background. These factors belong to the socio-institutional dimension.

Finally, there is the governance dimension where a casual governmental cooperation could hinder cross-border cooperation in a CBRIS, due to centralized political systems lacking a special governance mechanism for specific purposes (cf. Trippl, 2008, p. 6).

All these abovementioned factors have negative effects on cross-border cooperation and regional innovation in CBRISs but they can be changed; some in the short-term others need a longer span of time. But there are also given factors, which cannot be changed like history, geography, population density and age of the population.

The following table is a summary of the key factors determining the development of a CBRIS presented in this section. The factors are attributed to the five different dimensions which are related to the various actors involved in a CBRIS. Therefore, it is expected that all factors are influencing the capacity of the network elements to interact with each other and thus affect the capacity of the CBRIS as a whole.

Table 1: Key determinants for the development of a CBRIS

	Factors inhibiting the development of a CBRIS	**Factors favoring the development of a CBRIS**
Knowledge infrastructure dimension	- deficits regarding research organizations, educational bodies and transfer agencies - weak orientation on the needs of the regional economy - exclusive adaption to the own regional/national context	- advanced set-up of research organizations, educational bodies and transfer agencies - strong orientation on the needs of the regional economy - adaption to multiple institutional context
Business dimension	- dominance of the 'low road' development path based on low wages/costs in one or more areas forming the cross-border region - low level of complementarities in industrial structures and knowledge bases (too much cognitive distance)	- dominance of the 'high road' development path based on continuous innovation in all areas forming the cross-border region - high level of complementarities in industrial structures and knowledge bases ('optimal' level of cognitive distance)
Relation dimension	- dominance of asymmetric transboundary relationships - low levels of cross-border knowledge interactions	- dominance of symmetric transboundary relationships - high levels of cross-border knowledge interactions
Social-institutional dimension	- significant cultural and institutional distance between neighboring regions - significant differences between national innovation systems (NIS)	- minor cultural and institutional distance between neighboring regions - minor differences between NISs
Governance dimension	- centralist political systems - casual cooperation for specific purposes - lack of governance mechanisms / loosely-coupled governance settings	- federalist political systems - coherent innovation systems - stabilized institutional governance settings

Source: see Trippl, 2008, p. 7

The different factors influencing the development of CBRISs mentioned in table 1 concern both formal and informal factors. The existing research on cross-border cooperation for regional innovation largely focuses on the formal aspects, as these are more tangible and relatively easier to influence. Informal factors are largely ignored in existing literature. Due to the fact that this thesis focus is on informal factors these need to be filtered out from table 1.

In order to divide the factors into formal and informal ones, aspects of formality and informality have to be clarified. Therefore, first of all, the concept of society has to be defined. A society is a group of people related to each other through sharing the same geographical territory, the same culture and being subject to the same political authority. Besides that, it has to be clearly defined what informal factors are. This is a difficult task due to the fact that up until now, research has tended to focus on those elements that are related to hard differences across the border. Those are differences in legal

systems or market definitions, and less on the way that the networks and systems on each side of the border interact, the economy or communities. Thus a definition cannot be derived from existing literature. Therefore, the definition of informal factors is "factors regulating the behavior of economic actors and define their attitude, values and expectations". This definition is taken, due to the fact that society, culture and language influence the behavior, attitude, values and expectations of economic actors.
According to my definition formal factors are related to the governmental mismatch within a region, like different political systems and incompatible governance mechanisms. Besides that, other institutional factors are formal, like national innovation systems and industrial structures, as well as wages systems. Even though these factors might be influenced by societal or cultural aspects they are formal according to our definition and therefore left out in the analysis. The informal factors that are taken into account in the analysis in chapter four are the ones that are presented in Table 2.

Table 2: Informal factors influencing the development of a CBRIS

	Factors inhibiting the development of a CBRIS	**Factors favoring the development of a CBRIS**
Knowledge infrastructure dimension	- deficits regarding research organizations, educational bodies and transfer agencies - weak orientation on the needs of the regional economy	- advanced set-up of research organizations, educational bodies and transfer agencies - strong orientation on the needs of the regional economy
Relation dimension	- dominance of asymmetric transboundary relationships - low levels of cross-border knowledge interactions	- dominance of symmetric transboundary relationships - high levels of cross-border knowledge interactions
Social-institutional dimension	- significant cultural and institutional distance between neighboring regions	- minor cultural and institutional distance between neighboring regions

With respect to the informal factors, presented in table 2, the following assumptions are formulated:
"A high proportion of positive or favoring informal factors to cross-border cooperation relatively often has a positive effect on the amount of regional innovation in a cross-border region." And
"A high proportion of negative or hindering informal factors to cross-border cooperation relatively often has a negative effect on the amount of regional innovation in a cross-border region".
In the next section it is addressed how these assumptions are explored.

3. Methodology

This chapter is meant to give an overview of the methods used in this Bachelor Thesis. First, the way of literature collection is described and afterwards case selections and analysis are explained.

3.1 Literature review

In this chapter the way of literature collection will be described. The literature in the specific case of CBRISs consists mainly of scientific articles but also regional information material. In this Bachelor Thesis a structured analysis is carried out that is based on existing literature. Therefore, a large number of articles and papers have to be collected and inspected in order to cover the whole state of

the art of research, whereby the focus is more on the quality of the articles than on the quantity. Threats to this design are that it is possible that one does not get all information necessary because they are not accessible yet or that one relies on information or studies of a certain author, who has his or her own way of seeing the topic and ignores certain aspects of the topic. Therefore, it is very important to gather as much information and as many different views as possible, in order to avoid such pitfalls.

Another possibility to answer the empirical questions would be to visit the two regions selected and interview the actors involved. But even when one does own research there is no guarantee that the information gathered is quit of personal sensitivities. And as this type of research is very costly and time consuming and would go beyond the scope of a Bachelor Thesis, it was decided to go with the secondary analysis of already existing literature as research design for the Bachelor Thesis. In fact it is hardly possible and very inefficient to read all existing material on the two given cases for the purpose of a Bachelor Thesis, therefore, it was decided to set a limit of range of 20 to 30 different academic resources per case as basis of the case analyses. Through this number of sources the diversity of opinions of different authors on the topic can be laid down, whereby the scope of a Bachelor Thesis is maintained.

As the decision was made for a secondary data analysis, which is a qualitative one, a huge drawback has to be taken into account because it could be the case that there are no scientific articles on some aspects of the research topic or even on the whole. Therefore, the following passage describes the way of literature collection on the cases.

For the literature search and collection for the empirical part of the thesis the different data bases were used, namely the isi web of knowledge, scopus and google scholar. In order to collect relevant articles the following search terms were used: Regional Innovation Systems, Cross-border Regional Innovation Systems, Cross-border Cooperation and Regional Innovation, Oresund[1], Oresund Region, Centrope[1], Centrope Region and in both cases of Oresund and Centrope Cross-border Cooperation in the region, Development and History.

The first selection of articles was then made along their headings. All articles which heading seem to fit the context are collected and afterwards their abstracts were analyzed in order to get a more detailed view on the content of the articles and decide finally whether they are usable or not. The collected literature consist mainly scientific articles. Besides that, a specific search for policy documents on cooperation policy of the two regions from the EU was conducted. Additionally, the University of Twente's library was consulted to find information, studies and policy documents on the two regions of interest, as well as the World Wide Web in general and LexisNexis, a search tool for newspaper articles.

This way of data collection has some threats, which are presented in this paragraph. Even though the search for relevant material was widely applied it some research articles might have been missed and therefore information that could have been of importance and interesting to the topic. This shortage could have arisen due to a lack in the search criteria or missing data or information bases. Besides that, it was difficult to find information on some parts of the research where no clear and definite information is available by now, therefore it had to be read between the lines of the given material and this might have led to misinterpretation of some elements.

[1] These are the cases to be studied in this Bachelor Thesis. They will be further explained in the next section.

The selected research articles were read in order to fill in the table "My adaptations of factors influencing the development of a CBRIS".
Finally, it could be said that there are three possible outcomes of the research, that informal factors affect innovation in the expected way, that informal factors affect innovation in an unexpected way and that there is no obvious effect of informal factors on cross-border regional innovation.

3.2 Case selection & analysis

In order to explore the assumptions formulated at the end of chapter 2 a case study research of two best practice examples for cross-border cooperation in regional innovation has been carried out.
The decision on the chosen examples is carried out in the following way. There are a number of cross-border regions in the European Union (EU), in which cross-border cooperation for innovation works at face value and which seem to be rather successful and are therefore understood as real world CBRISs: the Centrope region, the Oresund area, the Eindhoven-Leuven-Aachen-Triangle (ELAT) and the border region of Germany and Poland are only a few examples. Further examples can be derived from the Organisation for Economic Co-operation and Development (OECD), which is doing peer reviews on governmental policies fostering cross-cooperation on innovation and peer reviews on regions.
For the analysis of best practices for the Bachelor Thesis two prominent examples will be taken because information is easier accessible then. The first example I decided to take is the Oresund area between the Swedish Malmö-Lund and the Danish capital Copenhagen. As second example I decide to take is the Centrope region, which consists of four nation states and is located at the intersection of Austria, Slovakia, Czech Republic and Hungary. These two examples are not only taken because they are prominent regions but also because they have formal elements in place that would justify them being called CBRISs and therefore, it is interesting to find out which informal factors play a role in these two cases.
It might have been also nice to study the failure of cooperation in cross-border regions but these examples lack information. Therefore, it was decided to use rather successful ones. The major threat to this research design is that it is hardly possible to draw reliably general conclusions for other CBRIS but in order to do so two very different examples with regard to history, size and length of cooperation are chosen because they enable the researcher to provide kind of general conclusions about a larger scope of CBRIS as if two similar examples are chosen. Even though this research design has huge weaknesses with regard to generalizability, it is a first step to check what is going on and further research has to follow in order to control for the reliability of the findings.

Having explained how the cases are selected and what the threats and bottlenecks of the selection are, in the following section the way of analysis is explicated. In order to answer the main research question *"How is regional innovation in cross-border regions affected by informal factor to cross-border cooperation?"* and to draw conclusions about the independent variable of the proposed assumptions made, the following sub-research questions are proposed:

"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"

This question is meant to evaluate on the type (favoring or hindering) of informal factors that exists within the two cross-border regions of interest and to what extent or proportion these factors exist.

The evaluation of the factors will be based on the theoretical findings presented in the end of chapter two. Therefore, the following table will be filled out through the analysis.

Table 3: The guideline for the empirical analysis:

	Factors influencing the development of a CBRIS	**Region 1**	**Region 2**
Knowledge infrastructure dimension	- set-up of research organizations, educational bodies and transfer agencies - orientation on the needs of the regional economy		
Relation dimension	- balance of trans-boundary relationships - level of cross-border knowledge interactions		
Social-institutional dimension	- level of cultural and institutional distance between neighboring regions		

The factors will be evaluated and measured in the following way: When the criteria presented in the table above are to 51% or more fitting the favoring factors then they are evaluated as positive, whereas when they are fitting the hindering factors to 51% or more than they are evaluated as negative. Therefore, this sub-research question and the proposed evaluation will give hints on the independent variable of the assumptions made above.

The second sub-question is:

"What is the amount of regional innovation within the regions of Oresund and Centrope?"

It is meant to evaluate on regional innovation and thus the dependent variable of the proposed assumptions. The amount of regional innovation is going to be measured on the amount of gross expenditures spend on regional Research & Development (R&D) and are compared to the average spending of the EU. When the amount is above the EU average the amount of innovation is evaluated as high and when it is below it is evaluated as low. The relevant numbers are derived from Eurostat, due to the fact that cross-border regions do not include whole national areas the numbers are taken from analysis of NUTS 2 regions. NUTS is the nomenclature of territorial units for statistics and level 2 are basic regions for the application of regional policies (Eurostat, 03/06/2013).

4. Analysis of best practices

From the literature a framework for the analysis of the two best practice examples, Oresund and Centrope, was derived, in chapter 2. This framework is ruled out in the following two sections of the thesis, whereby each section deals with one example and in the end the findings are put together so that more general conclusions on the influence of informal factors to cross-border cooperation and regional innovation can be drawn. The two best practices are analyzed one after the other, at first, the Oresund Region and afterwards the Centrope Region. Both analyses are built up in the same way. Primary, the region is described with regard to geography, people and particular characteristics. Afterwards the analysis guided by the two sub-research questions is ruled out. At first, the regions are checked for their characteristics regarding informal factors, which will provide the answer to sub-research question one and later the amount of regional innovation is evaluated, which answers sub-research question two. At the end of each example analysis a synthesis of the findings is provided, which are put together there in order to draw conclusions on the assumptions made in chapter 3 and prepare for the overall conclusion in the end of the thesis.

4.1 Analysis of the Oresund area

The Oresund area is a transnational metropolitan region that is composed of the Swedish Malmö-Lund area and the agglomeration around the Danish capital Copenhagen. It is regarded as a region of successful cross-border cooperation; therefore it is taken for this analysis. This first section is an introduction to the region and the analysis of it.

The region has a total size of 21,203 km² and a total population of 3.7 Million people in 2010 (Oresund Network Geography, 08/01/2013). In the past, the two areas had been under one jurisdiction, due to the fact that Denmark was expanding its borders on Swedish ground. During that time the area around the Oresund was the core of the Danish nation. Only since 1658 the region of Skane belongs to Sweden again, after Treaty of Roskilde and through this adjustment of the border,"the region [of Skane] lost the central position it had enjoyed under Danish rule and became instead an area on the Swedish periphery" (OECD, 2003, p. 76). This detail is already an important aspect, due to the fact that it shows a long common history of the areas involved.

Nowadays, the two areas, which are located on both sides of the Oresund, are connected by the Oresund Bridge. "The construction of the Öresund bridge between Malmö (Sweden) and Copenhagen (Denmark) in year 2000 served to achieve a more integrated labour market with a greater critical mass and to develop stronger clusters in knowledge-intensive industries (pharmaceuticals, food processing, software, design and environment technologies, ICT, biotechnology)" (OECD, 2010, p. 25). Therefore, the bridge was of significant importance for the establishment of the Oresund Region and the merging of the different national regions. It is not only the growing together of the two countries involved, which includes the economies, the people and various governmental and non-governmental institutions. Such an enormous project as the construction of a nearly 8 km long bridge between two countries is a highlight and attracts a number of people. It not only makes tourists visit this area but also calls for attention to this region by businesses and entrepreneurs from all over the world, who might invest in the region (cf. Matthiesen, 2000, p. 2).

Even though the bridge is a huge point of attraction it is however mainly used by "local travelers who travel with a purpose" (Matthiessen, 2004, p. 6), like job, retail, services, culture or terminal access. This interaction results from many cases of people live on the one side of the bridge but for example work on the other one. This is a first sign for successful cross-border cooperation within a region.

Further factors influencing the development of cross-border cooperation are studied along the lines of the research laid down for this analysis.

Figure 3: The Oresund Region

Source: *Center for Caucasus Studies at Øresund University, 2013*

4.1.1 "Which informal factors that can be derived from theory do actually exist in the Oresund Region?"

After having introduced the Oresund Region in the following paragraphs the area will be analyzed along the three dimensions of knowledge infrastructure, relation and socio-institution. This first part of the analysis is meant to answer the first sub-research question *"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"* which was introduced in chapter 3 for the Oresund Region. Furthermore, in this part hints will be given on the independent variable of the assumptions "A high proportion of positive or favoring informal factors to cross-border cooperation relatively often has a positive effect on the amount of regional innovation in a cross-border region" and "A high proportion of negative or hindering informal factors to cross-border cooperation relatively often has a negative effect on the amount of regional innovation in a cross-border region."

The Knowledge Infrastructure Dimension

The first dimension to be analyzed is the knowledge infrastructure dimension. Within this dimension the first aspect to be studied is the set-up of research organizations, educational bodies and transfer agencies of the Oresund Region. This means the following section is going to present the current state of research set-up within the Oresund Region.

Especially after decision for the bridge in the early 1990s the cross- border cooperation and the regional development was fostered. This was done through the foundation of the Oresund Committee and further organizations dealing with cooperation matters. "The purpose of the activities of the Øresund Committee […] is to strengthen and make the region visible both nationally

and internationally, thereby creating the foundation for economic, cultural and social growth in the Øresund region" (Hall, 2008, p. 7). Already in the late 1990s, the Oresund Science Region was founded. It is a strong research-business interaction consisting of four platforms. Those are Medicon Valley Academy, IT-Oresund, Oresund Food Network and Oresund Environment (Matthiessen, 2004, p. 5). The "term 'Medicon Valley' has been coined to refer to the high concentration of biotechnology and other life science firms in the Oresund region" (Lundquist & Trippl, 2009, p. 19). The cooperation within the Oresund Science Region does not always work highly satisfying due to the fact that researchers are not aware of the way the region works and there are communication difficulties between research and business due to different timeframes for the research in a specific area. Businesses are interested in short term projects whereas universities are interested in long term ones (cf. Garlick, Kresl & Vaessen, P., 2006). Nevertheless, the agglomeration of scientific institutions of different kinds, like bio- , food- and environmental technology and life sciences, stand for high potential with regard to innovation in these scientific areas. Furthermore, it could be said that "the distribution of innovation capabilities seems to be […] balanced [;…] both parts share high innovation potentials [,…]medium high tech and high tech manufacturing, Denmark and Southern Sweden are above the EU average concerning all innovation indicators" (Lundquist &Trippl, 2009, p. 18).From the point of view of the OECD especially the area of Skane, which is the Swedish part of the Oresund region, has high innovation potential, due to strong academic research, high R&D spending, as well as a large number of researchers and a high qualification of the overall population (cf. OECD, 2012, p. 99). The cooperation between Skane and the Danish part of Oresund got easier during the 1990s because then Sweden (which is originally heavily centralized) followed the EU model of regionalization and the regional government of Skane got more powerful (cf. Coenen, 2007, p.15). The same development took place in Denmark. In 2007, a large-scale spatial and institutional reform was established, which went along with decentralization of the political system in order to strengthen the country's competitive advantage (Hansen & Serin, 2010, p. 10).
Even though cooperation for innovation is strong between the two areas involved there are some key differences, which involve patenting activities and business R&D, thereby Southern Sweden is performing better than Denmark. The key difference between the Swedish and Danish national innovation systems are that "in Sweden R&D expenditures are higher than in Denmark, the Swedish system is more based on organized R&D in large firms while the Danish system is more prone to incremental innovation and successful implementation of new technology through imitation" (Lundquist & Trippl, 2009, p. 18). This shows that the two national innovation systems are different from each other but mange to complement one another in a constructive way, even though the region could do better because there is still some overlap and substitute in research done, especially in the biotech-pharma sector (cf. OECD, 2009, p.83). Summarizing, it could be said that the set-up of research organization in the Oresund Region is very strong; there are a lot of research institutions on both sides of the Oresund. The problem with these institutions is that there is only very low level of cooperation between them. The institutions on both sides of the Oresund are strongly aligned to the national economies but not to a regional one, which does not yet exist. So, there is still space for improvement.

Not only in R&D activities there is a good set-up within the different national areas. Also the educational set-up is very strong. This could be observed at the "Oresund University, which is a union of all 12 universities in the whole area, with a total of 130.000 students enlisted" (Matthiessen, 2004, p. 5). A small secretariat with four employees coordinates the students from both sides of the Oresund. This is easily possible due to the small linguistic barrier between the two countries since the

Danish and the Swedish languages are very similar. The key knowledge generating institutions involved in the Oresund University cooperation are "in the Danish part: Copenhagen Business School, IT University of Copenhagen, Roskilde University, Technical University of Denmark, University of Copenhagen, as well as The Royal Academy of Fine Arts School of Architecture and the Royal School of Library and Information Science" (Lundquist &Trippl, 2009, p. 20). On the Swedish side the "key [educational] institutions are Lund University, Malmö University, the Swedish University of Agricultural Sciences and University of Kristianstad. The region's scientific capacity will be further strengthened in the future, when the huge material research center "ESS – European Spallation Scource" will open its doors at Lund University" (Lundquist &Trippl, 2009, p. 20). From this list of educational institutions in the Oresund Region one can see that the set-up is very good and the region already tried to align the knowledge generating institutions under the roof of the "Oresund University" in order to foster cooperation in the educational sector. This was successful in so far that the students of the universities can easily switch between the two countries. This is one form of cooperation. But with regard to cooperation for innovation, which means also the cooperation between educational institution and business, it has to be said that the universities are mainly cooperating with own national business and only a little across the border.

Regarding the orientation on the needs of the regional economy it has to be said that there is no real regional economy in the Oresund Region but the combine national economies of Denmark and Sweden build one of the core economies in the Baltic Sea area. Furthermore, it has to be kept in mind that the logistical cross-road of the Oresund is beneficial for oversea trade and international connections. According to Asheim and Coenen (2005) the overall economy of the Oresund Region is industry-based (mainly IT and biotech industries) and could therefore be categorized as an analytical knowledge based industry. But this does not mean that the two national economies are oriented in the same way as shown in the following.
Even though the author Matthiessen found out that the "harbors of Copenhagen and Malmö present one of the most advanced examples of integration after being turned into one semipublic company in 2000" (Matthiessen, 2004, p. 5) one cannot really speak about "the Oresund Economy". This is the case due to the fact that the two national economies are not aligned. Although the two economies convergence more and more during the late 1990s, due to a high number of new firms that was experienced in both the Swedish and the Danish part of Oresund (cf. Hospers, 2006, p. 7), they are not really one economy, yet. "The Swedish economy is oriented towards R&D and knowledge intensive industries followed by capital intensive industries while the Danish economy is based more on labour intensive industries" (Faugert et al., 2004, p. 65). It is important to mention that the different orientation of the two economies makes cooperation difficult, not only the business cooperation across the border but also the cooperation between universities and business of different nationalities.

With regard to the findings on the knowledge infrastructure dimension it could be summarized that the Oresund Science Region has made progress in constructing a bottom-up cross-border science region with the objective of being internationally competitive. The set-up of research and educational institutions is really good and the institutions are cooperating with each other and with businesses. This cooperation to a huge extent only takes place on the national level and very little on the cross-border dimension. However there are still obstacles in the educational and scientific cross-border cooperation, the Oresund Science Region is a big achievement up until now. Thus, with regard to the first sub-research question, the knowledge infrastructure dimension can be evaluated on the

one hand as having a high proportion of positive or favoring informal factors with regard to the advanced set-up of research and educational institutions. But on the other hand the weak orientation towards regional economy, which does not exist in the Oresund Region yet, has to be evaluated with having a high proportion of negative or hindering informal factors.

The Relation Dimension

The second dimension to be analyzed is the relation dimension. The first aspect to be studied regarding this dimension is the balance of trans-boundary relationships. The trans-boundary relationship between the different areas of the Oresund region are balanced, this means the national regions are similar to each other. This could be measured "in terms of dynamic evolution (measured by the growth rate of the GDP per capita), all three sub-areas of the Oresund region show a similar pattern of growth rates around 3 %" (Lundquist &Trippl, 2009, p. 17). Furthermore, "multiple forms of cross-border linkages between its constituent parts: labor mobility and migration, more traditional supplier links and market relationships, and FDI" (Lundquist &Trippl, 2009, p. 21) can be found within the Oresund Region. Due to the fact that the sub-regions show similar growth rate patterns and several forms of cross-border linkages one can regard the trans-boundary relationships within the Oresund Region as balanced.

Besides that, there is the aspect of the level of cross-border knowledge interactions. First of all, concerning this aspect it could be said that the "cross-border area [of the Oresund] is the largest knowledge center within Scandinavia, accommodating not fewer than 10,000 university researchers, 150,000 students and 14 higher education centers and several science parks" (Lundquist & Trippl, 2009, p. 20). This knowledge center is an example of a "strong and institutionalized form of cross-border co-operation between the knowledge organizations located in the Oresund region, the 'Oresund University'" (Lundquist & Trippl, 2009, p. 20). The Oresund University does not include all scientific institutions but it "is a consortium of 12 universities and aims at contributing to the creation of a strong cross-border science-based region by increased interaction evolving around research and education" (Lundquist & Trippl, 2009, p. 20). The already existing "cross-border knowledge linkages and innovation partnerships between researchers, firms and institutions, [provide] potentials for further knowledge generation and radically new ventures" (Lundquist & Trippl, 2009, p. 21). There are "only little communication barriers between universities and the business sector, it seems to be mainly institutional distance which hampers cross-border networking and knowledge sharing" (Lundquist & Trippl, 2009, p. 21). All in all, the knowledge interaction in the Oresund Region "exhibits an excellent knowledge infrastructure" (Lundquist &Trippl, 2009, p. 20). This is a sign for a high level of knowledge interaction between the two national areas.

Due to the fact that the trans-boundary relationship between the two nations is balanced because of similar GDP growth rates and the knowledge interaction is high because of the Oresund University, both elements of the relation dimension can be evaluated with having a high proportion of positive or favoring informal factors.

The Social-institutional dimension

The third dimension to be analyzed is the social-institutional one. The aspect to be studied in this dimension is the level of cultural and institutional distance between neighboring regions. The two countries, Denmark and Sweden, have a shared history, as well as similar cultures and institutions and therefore common or shared interests. This circumstance provides the basis for building up regional innovation and integration strategies (cf. Hansen & Serin, 2007, p. 7). Due to a shared

background and same culture and language communication is easier than among people from countries with different culture and language because they better understand each other and they used to have a common way of working. With regard to that it was found out that "cultural closeness to a large extent determines successful communication between users and producers of technology" (Coenen et al., 2003, p. 6). This every day integration, so cross-border contacts between people, business and educational institutions, trough cultural closeness has to be further encouraged.
One element to improve cooperation between Denmark and Sweden in the Oresund Region is the policy initiative "Operational Programme 'Öresund - Kattegat – Skagerrak" from 2008 by the European Union. This policy development is good and necessary due to the fact that through physical, cultural and social proximity transaction costs for knowledge transfer are reduced (cf. Coenen et al., 2003, p. 9). And as cost reduction is one of the major topic in today's businesses it makes the region attractive for new firms to invest and build a business there.
These points are summarized by the author Matthiessen, who said: a large part of "'soft' integration [is] done, [but] 'hart' integration of legal systems [is] difficult" (Matthiessen, 2004, p. 5). His assumptions are right to the extent that with regard to the integration of the legal systems nothing really happened, yet. But also the soft and cultural integration in the Oresund Region is still not fully done. The two nationalities, Danish and Swedish, are, however they have similar languages and cultures, not very well integrated. There are still obstacles like prejudice and distrust, which are strongly related to culture and history and impact the establishment of strong cross-border cooperation.
But first successes in the soft and informal integration could be recognized because people in the Oresund already start to think in terms of Oresund and call it by its name, instead of thinking in terms of Denmark and Sweden or being Danish and Swedish (cf. Matthiessen, 2004, p. 8). This is a good sign for further cooperation measures because this means that an important step in growing together of the different areas of the Oresund Region has been made with people experiencing the different national areas as one region. This is because "building cross-border social ties and a cross-border identity is a challenge in the presence of strong urban structures with each their nationally defined hinterlands and adjoin social dynamics" (Schmidt, 2005, p. 1). Thereby, it also has to be mentioned that the different nationalities (Danish and Swedish) are still varying in strength of support for the cross-border region of Oresund. Whereas the Swedes are more likely to identify with the cross-border region the Danes stay more nationally (cf. Bucken-Knapp, 2002).

Regarding the socio-institutional dimension it could be said that there is a minor cultural distance, due to the shared history of Denmark and Sweden. Therefore, the establishment of cooperation is much easier. Thus the socio-institutional dimension can be evaluated with having a high proportion of positive or favoring informal factors.

4.1.2 "What is the amount of regional innovation with the region of Oresund?"

After having elaborated on the informal factors within the Oresund Region the following part is meant to give an overview of the amount of innovation that is produced in the region, which is going to be measured by gross expenditures on R&D. This paragraph will provide an answer to the second sub-research question *"What is the amount of regional innovation within the regions of Oresund and Centrope?"* for the Oresund Region and give a clue about the dependent variable of the assumptions proposed in the beginning.
Even though the Oresund Region can be seen as one economic area financing R&D is a national matter. Therefore, the relevant regional data of Danish and Swedish R&D expenditures are derived

from Eurostat. In 2009, the Swedish government spend 4.65% of the GDP on R&D (Total intramural R&D expenditure (GERD) by NUTS 2 regions, 02/06/2013). This number is more than twice as much as the EU-27 average of 2.01% of GDP (Gross domestic expenditure on R&D, 2000-2010, 03/06/2013). In the Danish regions Hovedstaden and Zealand belonging to the Oresund Region the spendings on R&D are between 4.11% (Zealand) and 5.31% of GDP (Hovedstaden) (Total intramural R&D expenditure (GERD) by NUTS 2 regions, 02/06/2013). This huge amount of money spend on R&D makes Sweden the second most competitive economy in the world with regard to regional innovation. This was measured by the World Economic Forums Global Competitiveness Index 2010-2011. While Sweden could improve its status by two spots in comparison to the previous measurement, Denmark lost four spots and is now on the ninth, even though the expenditures in Zealand were increased from 1.22% in 2007 to 4.11% in 2009.

The abovementioned numbers show the high innovative potential in Sweden as well as in Denmark. Both countries are clearly above the EU-27 because they spend more than twice as much of their GDP on R&D than in the EU-27 average. With regard to the dependent variable of the assumptions made in chapter 3 it could be said that the amount of regional innovation is high in the Oresund Region.

4.1.3 Synthesis

After having analyzed the three dimensions of informal factors and the amount of innovation, it could be recognized that the Oresund Region is evaluated almost with a high proportion of positive or favoring informal factors and that the region is a very innovative one. This following section is meant to summarize the main findings and provide answers to the sub-research questions and to check the proposed proposition. In the following table the main findings of the analysis along the different dimensions are given.

Table 4: Findings on factors influencing the development of a CBRIS in the Oresund Region

	Factors influencing the development of a CBRIS	**Oresund**
Knowledge infrastructure dimension	- set-up of research organizations, educational bodies and transfer agencies	advanced set-up of research organizations, educational bodies and transfer agencies → large number of universities, which are aligned under the roof of the Oresund University → alignment only from the outside perspective, but inside nat. universities work on nat. topics
	- orientation on the needs of the regional economy	weak orientation towards regional economy →there is no regional economy yet as nat. economies differ → knowledge generation oriented towards nat. economy

Relation dimension	- balance of trans-boundary relationships	dominance of symmetric trans-boundary relationships → similar patterns of growth rates
	- level of cross-border knowledge interactions	high level of cross-border knowledge interaction → knowledge interaction fostered trough establishment of Oresund University
Social-institutional dimension	- level of cultural and institutional distance between neighboring regions	- minor cultural distance due to common history

= favoring cross-border cooperation =hindering cross-border cooperation

Within the Oresund Region the national set-up of research and educational institutions is really good and the institutions are cooperating with one another, as well as with companies and firms, but a huge part is only on national level and only a very small part on the cross-border level. However there are still obstacles in the educational and scientific cross-border cooperation, the Oresund Science Region is a big achievement up until now. Therefore, the region is nowadays seen as "one of the most powerful cross-border areas in Europe, displaying a strong capacity to compete in the globalizing knowledge based economy" (Lundquist & Trippl, 2009, p. 19). Whereby, "a productive collaboration between research and commerce, an efficient infrastructure and a better quality of life have been the driving forces behind the region's strong and rapid growth" (Oresund Network History, 08/01/2013).

The trans-boundary relationships between the two nations is balanced because they have similar GDP growth rates and furthermore, the knowledge interaction is high because of the Oresund University, which links Danish and Swedish universities under one umbrella organization. Therefore, the relation dimension can be evaluated positively and with being no hindering but a factor fostering cross-border cooperation in Oresund. In addition to that, the OECD territorial review of Copenhagen from 2009 says that the "scientific co-operation between Copenhagen and southern Sweden is growing", due to the fact that cooperation gets easier every day. That is why Garlick, Kresl and Vaessen (2006) have the opinion that the "region has the potential to be a significant global motor built on science, innovation and enterprise."

With regard to the socio-institutional dimension it could be said that there is a minor cultural distance, due to a common history. Therefore, the establishment and development of cross-border cooperation is much easier. However, one has to keep in mind that these are still two separate nations and that even though there are big similarities there are different approaches and points of view of certain topics, like the cross-border cooperation in the Oresund for example but this is not a huge obstacle anymore.

After having summarized the main findings of the analysis an answer to the first sub-research question *"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"* can be given for the Oresund Region. The people and institutions within the region reached a high proportion of positive or favoring informal factors that can be derived from theory. The only point that still is a problem is the orientation towards the needs of the economy. This factor results from non-alignment respectively different orientation of national economies in Denmark and Sweden, so economic mismatch. This means that the national educational and research institutions doing research and innovation mainly for their national economy, which hinders

cross-border cooperation in this respect. Therefore, the region "still underperforms its potential" (Lundquist & Trippl, 2009, p. 19) because an alignment of National Innovation Systems has not taken place. Thus, it could finally be said that within the Oresund Region informal equality is helpful to foster cooperation but it does not reach fare without the intervention formal institutions, like governments, in order to align economic and institutional factors. Due to the fact that four out of five informal factors are positive in the Oresund Region, the overall proportion of favoring or positive informal factor can be evaluated as very high.

With regard to the amount of innovation so the second sub-research question: *"What is the amount of regional innovation within the regions of Oresund and Centrope?"* it could be said that the amount of money spend on R&D, and therefore also on innovation, is very high. The Swedish, as well as the Danish regional expenditures on R&D are clearly above the EU-27 average; both regions spend more than twice as much as the EU-27 average. Thus, regional innovation in the Oresund Region can be evaluated as high.

Having gained these insights through the analysis the relation between informal factors to cross-border cooperation and the amount of regional innovation in the given case of Oresund is positive. Therefore, the assumption made in the beginning can be verified for the Oresund Region: "In the Oresund Region, a high proportion of positive or favoring informal factors to cross-border cooperation has a positive effect on the amount of regional innovation in this cross-border region."

4.2 Analysis of the Centrope region

The Centrope region is a transnational metropolitan area in the center of Europe and consists of provinces and administrative districts of the countries Austria, Hungary, Slovakia and the Czech Republic. The region is the interface of the new and old Europe and shares a long common history, which includes enormous bordering and re-bordering, due to different political situations. There have been the Habsburg-Monarchy, the Austrian Empire and the Austria-Hungarian Empire connecting the different countries in different constellations, but since the end of World War II the regions, Austria from Czech Republic, Hungary and Slovakia, were separated by the Iron Curtain. As this separation lasted for around 70 years it created barriers – "not only physically but also mentally and emotionally. In fact, it could be argued that these barriers, evident in terms of mutual antipathy and distrust, hinder promising forms of contemporary cooperation" (Haselsberger, 2010, p. 117). The "fall of the iron curtain, the transformation of former communist countries in Central and Eastern Europe into market economies and their entry into the European Union have essentially propelled the rise and development of new cross-border areas in Europe" (Lundquist & Trippl, 2009, p. 23) "and finally the Schengen Treaty has gradually but significantly decreased the functional distance between different parts of the area triggering the same kind of hope" (Lundquist & Trippl, 2009, p. 4).

The region of Centrope was established and defined through the Declaration of Kittsee in September 2003. This declaration was signed by the governors and comitatus presidents of the countries of Vienna, Lower Austria, Burgenland, South Moravia, Bratislava, Trnava and Györ-Moson-Sopron, as well as the majors of Brno, Bratislava, Trnava, Györ, Eisenstadt, St. Pölten and Vienna, in order to set up a political basis for the Centrope Region. Through this declaration the chances and opportunities for more prosperity and sustainable development should be strengthened. As a positive sign for the re-merging of the different countries observed that the cross-border flows between the different countries, especially along the Vienna-Bratislava axis, constantly increased since 1989, when the Iron Curtain fell.

Today, the region covers a total area of 54,500 km² and accommodates around 6.5 Mio. inhabitants (The Centrope Region, 13/12/2012). It consists of the two capitals Bratislava and Vienna and their agglomerations, which are only 50 km apart from each other. These two capitals are therefore called 'Twin Cities'. Besides them the region contains also the two big cities of Brno and Györ and several other towns. Among the trademarks of the Centrope region increasing prosperity, efficient and export oriented industries, globally cross-linked service crossroads and well educated employees can be found.

Nowadays, "the Centrope region is regarded as 'one of the most important transnational economic areas at the former Eastern borders of the European Union'" (Lundquist &Trippl, 2009, p. 11). Therefore, it is interesting to analyze the informal factors influencing cross-border cooperation and their influence on the amount of innovation produced in the Centrope Region.

Figure 4: The Centrope Region

Source: Suburbanisation and (re-)territorialisation in the region of Vienna,2013

4.2.1 "Which informal factors that can be derived from theory do actually exist in the Centrope Region?"

After having introduced the Centrope Region, in the following paragraphs the area will be analyzed along the three dimensions introduced in the theoretical part. Those are knowledge infrastructure, relation and socio-institution. This first part of the regional analysis is meant to answer the first sub-research question *"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"* for the Centrope Region and to give hinds for the independent variable of the propositions "A high proportion of positive or favoring informal factors to cross-border cooperation relatively often has a positive effect on the amount of regional innovation in a cross-border region" and "A high proportion of negative or hindering informal factors to cross-border cooperation relatively often has a negative effect on the amount of regional innovation in a cross-border region."

The Knowledge Infrastructure Dimension

The first dimension to be analyzed is the Knowledge Infrastructure Dimension. The first aspect within this dimension to be studied is the set-up of research organizations, educational bodies and transfer agencies. Within the Centrope Region there are 25 public universities and art academies as well as numerous extramural research facilities, universities of applied science, innovation centers and R&D-oriented enterprises (cf. Vision Centrope 2015, 03/02/2013). But these educational institutions are not yet aligned and integrated with each other. “In the case of Vienna and Bratislava, there is strong potential for integration: a solid knowledge infrastructure (although it is fragmented and under reconstruction in the case of Bratislava), good availability of expertise provided through numerous universities and advanced technical colleges” (OECD, 2003, p. 86). Even though this looks promising with regard to the knowledge infrastructure there is a slope concerning the scientific infrastructure in the region. Vienna is leading in public and business R&D and shows a good performance in patenting and high-tech services. Moreover, Bratislava appears to have good innovation potential. This potential comes from a large number of highly qualified workers and a proportionally strong attendance of high tech services. Therefore, it is not only Vienna showing high innovation potential but all different parts of Centrope. The Eastern part of region, so Southern Czech Republic, Western Hungary and Western Slovakia, mainly show this potential due to foreign direct investments (cf. Lundquist & Trippl, 2009, p. 23). But the process of catching-up of the Eastern parts has not been completed yet, so there is still a gap within the physical and educational infrastructure. This gap arises in particular in the areas of transportation and communication, which is a huge obstacle to cross-border cooperation between the individual countries (cf. Mooslechner & Gnan, 2006, p. 92). The cross-border cooperation that takes place within Centrope Region is largely based on knowledge exchange, whereas business cooperation is only taking place to a limited extent (cf. Trippl et al., 2008, p. 40). Consequently, it can be summarized that “the differences between the constituent parts of Centrope in innovation capacity are significant [and] pointing to a high degree of functional distance” (Lundquist &Trippl, 2009, p. 18).

The second aspect to be analyzed is the orientation on the needs of the regional economy. ”Vienna and Bratislava have a stronger service sector, Czech South East, Western Transdanubia and Western Slovakia exhibit a strong manufacturing base, Centrope has no lagging regions with a strong agricultural sector”(Lundquist & Trippl, 2009, p. 23). This shows that nearly the complete spectrum of economic sectors is covered in the Centrope Region. This fact is positive for the regional economy because the different sectors support and profit from each other. In addition to that, it has to be recognized that the regional context is “characterized by significant disparities regarding prosperity, economic development and dynamics” (Lundquist & Trippl, 2009, p. 23). As the different areas within the region are not yet on the same level regarding prosperity, economic development and dynamics, it is unremarkable that the different regions are strong in different economic sectors. This situation is assumed to change during the coming years and decades when cross-border cooperation is strengthened the different national economies match with each other or at least come to the same sectorial level. Therefore, it is most likely that the areas with a strong manufacturing base develop over the coming years towards service based economies. This is desirable for the people living in these countries because it increases their living standards.

Summarizing, it could be recognized that with regard to the knowledge infrastructure dimension the Centrope region is on a good way towards cross-border cooperation but has not get over all obstacles. The research and educational set-up which in the region is good already and “just” has to

be put in one line with each other and with the regional or at least the national economies. This is not possible at the moment because there is no single regional economy within Centrope, which is a hindering factor for cross-border development. Therefore, the knowledge infrastructure dimension has to be evaluated as partly favoring and partly inhibiting the development of cross-border cooperation at the moment. Therefore, the overall evaluation of the knowledge infrastructure dimension has to be that there is still a high proportion of hindering or negative informal factors.

The Relation Dimension

Regarding the second dimension to be analyzed, the relation dimension, the first aspect is the balance of trans-boundary relationships. Generally, it could be said that the different parts of the Centrope Region offer different competitive advantages, which result in different specializations. The cross-border region can be divided into two areas. Firstly, there is the central area around the agglomerations of Vienna-Bratislava, which is characterized by a service-based economy. The second area, in form of the wider Eastern hinterlands, is regarded as being an industries-based economy (cf. Zschiedrich, 2010, p. 88). This could be summarized with the "Austrian parts are by far richer than the Eastern parts" (Lundquist & Trippl, 2009, p. 16). But this circumstance needs not really inhibit the development of cross-border cooperation. This is because, the "GDP growth rates in the Eastern regions of Centrope are more dynamic than their Austrian counterparts, reflecting the general trend of rapid catching-up processes of the Central and Eastern European countries and regions" (Lundquist & Trippl, 2009, p. 16) even though this catching up process is not yet finished. After having explained general trans-boundary relationships, the following part is focusing on the trans-boundary relationships between two of the involved countries.

For a long period of time, Slovakia and the Czech Republic had been one single federal state – Czechoslovakia. In 1993, the two countries peacefully split into two separated national states. The cross-border relationships between the two states are very good by now. But of cause the two national economies are competing with each other. Regarding the balance of trans-boundary relationship it has to be mentioned that "the living standards of the Czech Republic are slightly higher than found in Slovakia. Even so, Slovakia enjoys a higher economic growth rate" (Operational Programme 'Slovakia - Czech Republic', 02/02/2013). Whereas, the Czech Republic is better off in comparison with Slovakia, the country does worse when compared to Austria.

"The Gross Regional Product (GRP) per capita in the Austrian border regions is about 132% of the EU-25 average; in the Czech border regions this amounts to some 62%" (Cross-border Cooperation Operational Programme Austria - Czech Republic 2007-13, 02/02/2013). This circumstance is not surprising due to the fact that Austria belonged to the European Union for a long time and profited from this membership, whereas the Czech Republic only joint roughly 10 years ago and still needs time for development.

Even though there is a constant process of catching up of all Eastern parts of the Centrope Region, there are still huge disparities in the levels of prosperity and development especially between the cities agglomerations of Vienna-Bratislava and the peripheral hinterland. This represent the greatest challenge to the development of a functioning cross-border cooperation within the region (cf. Austria-Slovakia Cross-border Cooperation Operational Programme 2007-2013, 02/02/2012).

Besides that, it could be realized that the border region of Austria and Hungary is really rich in natural resources, ecosystems, a large number of thermal water areas and spas, and numerous common cultural heritage sites. The flourishing economy of this area is raised by emerging tourism and an increasing of the flow of goods and people (cf. Austria-Hungary Cross-border Operational Programme 2007-2013, 02/02/2013). This is already a proper basis for a strong collaboration and cooperation for

cross-border development. Economic inequalities do not always have to be negative for the less developed side because there could also be an “uneven distribution of unemployment” (Lundquist & Trippl, 2009, p. 17) as in Centrope. And within this context Vienna as the better developed part is worse of, due to the fact that the unemployment rate is above the EU 25 level, whereas in the other regions the rate is below that level.

Regarding the level of cross-border knowledge interactions several projects in the Centrope Region can be mentioned. Firstly, there is a pilot project LABOUR. This includes extensive analyses of structures, tasks and resources in labor market relevant institutions as well as labor market strategies on regional level. Secondly, there is the pilot project MAP. This project closes the gap between the small-scale and harmonized statistical data of EUROSTAT und the large-scale and partly methodologically inconsistent statistical data of GIS- and data collection bodies of East Austrian states and foreign countries. Thirdly, the pilot project Sailing Youth. During the course of two sailing regatta in the years 2005 and 2006 on the Lake Neusiedl, which is a transnational veld-sea, 230 youngsters from East Austria, West Hungary, Slovakia and the Czech Republic came together. The cross-border connections among young people were deepened through these sailing championships. (cf. Hutter, 2009).

Even though there are huge differences between the various national areas of the Centrope Region, which could be recognized through several economic indicators like the GDP or unemployment rates, the level of cross-border cooperation initiatives and projects in different areas is high. As it could be seen through the examples given above, there are projects for the labor market and for bringing together the youth of the different areas. The relation dimension is therefore again a double-edged sword. On the one hand, cooperation is kind of inhibited by the asymmetric trans-boundary relationships between the different participating countries, due to different economic standpoints. On the other hand, the countries managed to put up a number of projects that foster knowledge interaction between the countries and therefore cross-border cooperation. Therefore, the aspect of trans-boundary relationships is evaluated as having a high proportion of negative or hindering informal factors, whereas the knowledge interaction already reached a high proportion of positive or favoring informal factors.

The Social-institutional dimension

In the social-institutional dimension the level of cultural and institutional distance between neighboring regions is studied. Regarding this aspect it has to be kept in mind that the different parts of the Centrope Region have “a long common history; it was only the political events of the 20th century that split this socially, economically and culturally integrated region into a space divided by borders” (Vision Centrope 2015, 03/02/2013). The separation by the Iron Curtain for decades made the various areas develop different languages and slightly different cultures. Otgaar et al. (2008) are of the opinion that “differences in language and culture increase the psychological distance” between the different national areas. Therefore, it is not surprising that the people within the region do not or only to a very small extent identify with the cross-border region established (cf. Leibenath et al., 2008, p. 98). The overall imbalanced and heterogeneous socio-economic conditions in the region, as well as the language barrier, deficient behavior, skepticism and prejudice between the participating national areas might slow down or even inhibit a successful development of the idea and cross-border cooperation in the Centrope Region (cf. Leibenath et al., 2008, p. 98).

Summarizing, it could be said that the cultural and institutional distances between the different national areas are high, due to 70 years of separation. Thus the socio-institutional dimension is evaluated with having a high proportion of negative or hindering factors.

4.2.2 "What is the amount of regional innovation in the Centrope Region?

After having elaborated on the informal factors within the Centrope Region, the following part is meant to provide an overview of the amount of innovation that is produced in the region, which is going to be measured by the regional gross expenditures on R&D. This paragraph will give an answer to the second sub-research question *"What is the amount of regional innovation within the regions of Oresund and Centrope?"* for the Centrope Region and give a clue about the dependent variable of the proposition made in the beginning.

Within the Centrope Region the amount of money spend on R&D differs a lot with regard to national differences. The Austrian parts of Centrope are not the leading parts with respect to R&D spendings, which was expected due to the findings from the analysis above. The spendings on R&D in Niederösterreich are at 1.36% of the regional GDP and 0.78% in Burgenland in 2009 (Total intramural R&D expenditure (GERD) by NUTS 2 regions, 02/06/2013). This numbers are below the EU-27 average of 2.01% of GDP being spent on R&D (Gross domestic expenditure on R&D, 2000-2010, 03/06/2013). In contrast to that, in the Czech Republican part of Centrope there were 1.62% of GDP spend on R&D in 2009 (Total intramural R&D expenditure (GERD) by NUTS 2 regions, 02/06/2013). In the other parts of the former Eastern Bloc countries the spendings on R&D are much lower. In the Slovakian area 0.62% and in Hungarian part only 0.59% of GDP were spend on R&D in 2009 (Total intramural R&D expenditure (GERD) by NUTS 2 regions, 02/06/2013). These numbers are clearly below the EU-27 average. The slope between the Eastern and the Western countries within the Centrope Region that pushes through the whole analysis of the region before is not that clear in this part. All in all, the amount of money spend on R&D in the Centrope Region is below the EU-27 average, which stands for a relatively low innovative potential of the whole region. By looking at the development of gross expenditure on R&D in the different regions of Centrope over the years 2006-2009, it could be said that especially in the Czech Republican part the amount increased drastically from 1.17% of GDP to 1.62%, whereas, in the other parts the increase was only slight. This development could be explained by the overall recession. Thus, the amount of innovation within the Centrope Region can be evaluated as low.

4.2.3 Synthesis

After having analyzed the three dimensions of informal factors and the amount of innovation, one could recognize that the Centrope Region has still a high proportion of negative or hindering informal factors. This following section is meant to summarize the main findings. To first give an overview of the analysis of the informal factors the different aspects are put into a table:

Table 5: Findings on factors influencing the development of a CBRIS in the Centrope Region

	Factors influencing the development of a CBRIS	**Centrope**
Knowledge infrastructure dimension	- set-up of research organizations, educational bodies and transfer agencies	Advanced set-up of research organizations, educational bodies and transfer agencies → not aligned or integrated at all

	- orientation on the needs of the regional economy	Weak orientation towards regional economy → there is no regional economy yet only nat. economies and these are really divers
Relation dimension	- balance of transboundary relationships	Dominance of asymmetric transboundary relationships → different levels of growth rates and unemployment (Austria/Vienna in front – others behind but quickly catching up)
	- level of cross-border knowledge interactions	medium-high level of knowledge interaction due to governmental projects
Social-institutional dimension	- level of cultural and institutional distance between neighboring regions	Larger cultural distance due to 70 years of separation and different developments

= fostering cross-border cooperation =inhibiting cross-border cooperation

Huber et al. are of the opinion that "in a European comparison the [Centrope] Region is a well-developed and rapidly growing economy with a stable institutional environment that – in contrast to the expectations of many analysts - has also proven to be rather resilient to the economic crisis of 2008" (Huber et al., 2012, p. 3). In contrast to that, many other analysts point out that there is "multilateral cooperation on several different scales with a weak level of institutionalization" (The Centrope Region, 13/12/2012). This point of view is supported by the findings of this research.

With regard to the knowledge infrastructure dimension the Centrope region is on a good way towards cross-border cooperation but there are still a lot of obstacles to overcome. On the one hand, the research and educational set-up is already good but has to be put in one line with each other and with the regional or at least the national economies. From the analysis above it could be recognized that the region is still missing connection between the different national regions and economies. There is no single regional economy in the Centrope Region, which is a sign for weak internal integration and cooperation. But on the other hand the region has strong external connections due to a large variety of economies within the region. This makes the region attractive for Foreign Direct Investment, which is one of the factors for development. Therefore, the knowledge infrastructure dimension has to be evaluated as partly favoring, due to the number of governmental knowledge interaction projects and partly inhibiting, due to weak internal cooperation but strong external connections, the development of cross-border cooperation. The external cooperation is assumed to be hindering the internal cooperation because it is hardly possible to meet the criteria of each possible cooperation partner. This means when you fit the criteria of the external partners you not necessarily fit the criteria of the internal partners.

Concerning the relation dimension huge differences between the various national areas of the Centrope Region can be recognized, which could be documented through several economic indicators, like the GDP or unemployment rates. The level of cross-border cooperation initiatives and projects in different areas is high. Therefore, it could be summarized that there are predominantly asymmetric relationships between the actors involved and that the innovation oriented cooperation

is relatively small, whereby both Vienna and the Eastern Centrope regions have huge potential for innovation (cf. Trippl et al., 2009, p. 17).
The socio-institutional dimension is evaluated with inhibiting the development of cross-border cooperation, due to huge cultural and institutional distances between the different national areas which result from 70 years of separation.
After having summarized the main findings of the analysis on informal factors the first sub-research question *"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"* can be answered in a complete way. Within the Centrope Region four out of five informal factors are negative or hindering informal factors. Thus, the independent variable or the assumption is "A high proportion of negative or hindering informal factors". The reason for the huge number of inhibiting factors might be that "the entire Centrope initiative seems to be a scientific or political construction rather than a naturally shaped region" (Leibenath et al., 2008, p. 98).
With regard to the amount of innovation and therefore, the second sub-research question *"What is the amount of regional innovation within the regions of Oresund and Centrope?"* it can be answered, that the amount of regional innovation measured along the amount of money spend on R&D in the region is relatively low because it is below the EU-27 average. Thus, the amount of regional innovation can be evaluated as low.
This means that the relation between informal factors to cross-border cooperation and the amount of regional innovation in case of Centrope is positive. Therefore, the assumption made in chapter 3 can be verified for Centrope: "In the Centrope Region, a high proportion of negative or hindering informal factors to cross-border cooperation results in a low level of regional innovation within the region".

5. Synthesis

The following section is meant to summarize the findings of the analysis and on the two sub-research questions *"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"* and *"What is the amount of regional innovation within the regions of Oresund and Centrope?"*
For that reason, the two tables on the main findings of informal factors are merged and presented here, as well as the findings on the amount of innovation produced in the regions. Furthermore, the two propositions "In the Oresund Region, a high proportion of positive or favoring informal factors to cross-border cooperation relatively often has a positive effect on the amount of regional innovation in this cross-border region" and "In the Centrope Region, a high proportion of negative or hindering informal factors to cross-border cooperation results in a low level of regional innovation within the region" are again picked up, in order to conclude on the main propositions. Moreover, after the summary on the answers to the sub-research questions the main research question of the Bachelor Thesis *"How is regional innovation in cross-border regions affected by informal factors to cross-border cooperation?"* can be answered and recommendations for future research and possible policy initiatives fostering regional innovation in cross-border regions can be given.
First of all, the findings on informal factors of the analysis are presented:

Table 6: Findings on factors influencing the development of a CBRIS in the Oresund and Centrope Regions

	Factors influencing the development of a CBRIS	**Oresund**	**Centrope**
Knowledge infrastructure dimension	- set-up of research organizations, educational bodies and transfer agencies	advanced set-up of research organizations, educational bodies and transfer agencies → large number of universities, which are aligned under the roof of the Oresund University → alignment only from the outside perspective, but inside nat. universities work on nat. topics	Advanced set-up of research organizations, educational bodies and transfer agencies → not aligned or integrated at all
	- orientation on the needs of the regional economy	weak orientation towards regional economy →there is no regional economy yet as nat. economies differ → knowledge generation oriented towards nat. economy	Weak orientation towards regional economy → there is no regional economy yet only nat. economies and these are really divers
Relation dimension	- balance of transboundary relationships	dominance of symmetric transboundary relationships → similar patterns of growth rates	Dominance of asymmetric transboundary relationships → different levels of growth rates and unemployment (Austria/Vienna in front – others behind but quickly catching up)
	- level of cross-border knowledge interactions	high level of cross-border knowledge interaction → knowledge interaction fostered trough establishment of Oresund University	medium-high level of knowledge interaction due to governmental projects
Social-institutional	- level of cultural and institutional distance	- minor cultural distance due to common history	Larger cultural distance due to 70 years of

dimension	between neighboring regions		separation and different developments

= fostering cross-border cooperation =inhibiting cross-border cooperation

The findings on the sub-research question *"Which informal factors that can be derived from theory do actually exist in the two regions of Oresund and Centrope?"* can be summarized in the following way: Oresund has a high proportion of positive or favoring informal factors, whereas Centrope has a high proportion of negative or hindering informal factors.
Besides that, the amount of innovation evaluated in the second sub-research question is assessed with high for Oresund and low for Centrope.
After having summarized the findings from the analysis of the two best practices the main research question *"How is regional innovation in cross-border regions affected by informal factors to cross-border cooperation?"* can be answered.
Regional innovation in cross-border regions is affected by the proportion of informal factors to cross-border cooperation to a large extent. It was found that when there is a high proportion of negative informal factors the amount of regional innovation within the CBRIS is low. Whereas, when the proportion of positive or favoring factors of cross-border regional innovation is high then the amount of regional innovation is high. This conclusion could be drawn from the analysis ruled out in this Bachelor Thesis because the findings show that in the two best practices chosen regional innovation is related to informal factors to cross-border cooperation.
Thus, the assumptions made in chapter 2: "A high proportion of positive informal factors to cross-border cooperation relatively often has a positive effect on the amount of regional innovation in a cross-border region" and "A high proportion of negative informal factors to cross-border cooperation relatively often has a negative effect on the amount of regional innovation in a cross-border region" can be verified.
Besides these main findings the analysis of the two best practices showed that even though a lot of time and money was spend by the EU on establishing regional innovation within border regions through fostering cross-border cooperation was not as successful as it was intended to be. Cross-border regions still fall short of their cross-border cooperation potential. Instead the cooperation on the national level still remains higher and more important to the countries, due to the fact that cooperation on this level is not hindered by that many factors and the alignment of research institutions and business is much stronger on the national level. This interesting observation was not directly researched but appeared during the analysis.

6. Conclusion & Recommendations

This section is meant to conclude the thesis by showing how the findings of the research contribute to a larger field of research and to the real world problem addressed.
After having summarized the findings of the analysis and being able assess the relationship between informal factors to cross-border cooperation and the amount of regional innovation in cross-border regions, as proposed in the assumptions from chapter 3 "A high proportion of positive or favoring informal factors to cross-border cooperation relatively often has a positive effect on the amount of regional innovation in a cross-border region" and "A high proportion of negative or hindering informal factors to cross-border cooperation relatively often has a negative effect on the amount of regional innovation in a cross-border region", this section is meant to conclude the thesis. This conclusion is done by demonstrating how the findings of this paper contribute to the wider research

area of cross-border cooperation in regional innovation and what the effects are for the actors involved. Besides that, recommendations can be drawn from these findings on the one hand for policy makers in the European arena and on the other hand for future research in this area.

The analysis showed that regional innovation in cross-border regions in the EU is strongly affected by informal factors, such as society, culture and language. One can say that these factors are of huge importance for the functioning of CBRISs because when the number of negative factors is too large than cooperation and thus innovation is inhibited. Thus, actors involved in a CBRIS are not able to properly cooperate with each other, for example knowledge producers are not able to exchange knowledge with other producers across the border, which has effects on the number of innovations produced. This one is low and the timeframe in which the innovation can be realized is large. Furthermore, the negative informal factors are prejudicial to the transfer of information to the utilizers in form of the businesses because generator and utilizer might not understand each other. In addition to that, the work of technology and knowledge transfer assets is much more difficult when the number of negative or hindering factors to cross-border cooperation is high.

Moreover, it could be recognized that many policies which are meant to foster cross-border cooperation for regional innovation seem to focus on formal structure, by creating a positive institutional arrangement either through collaborative activities or harmonization of regulatory, legal and market structure rather than on informal ones influencing the actors' behavior, values, norms and expectations leading to actions. These formal aspects are important to cross-border cooperation but as this research shows, the informal factors are at least equally important. Therefore, policy makers dealing with cross-border cooperation and regional innovation in cross-border regions have to focus on informal factors. Of special importance are negative or hindering ones, which is inherently very difficult. Upcoming policies or strategies can focus on building up communication channels or platforms for the actors involved, especially between knowledge producers and utilizers.

Besides these implications for future policies the findings of this paper and further research in this field could have implications on existing EU strategies and policies and their improvement. The Europe 2020 program for example is a ten year plan of the EU aiming at the strengthening of R&D through universities and life-long-learning. This element is strongly related to innovation and therefore, regional innovation as analyzed in this paper. Thus, the finding that informal factors have a huge influence on cross-border cooperation can contribute to better fitting EU policies which are meant to increase cooperation, R&D and innovation. This could perhaps be reached by introducing more and better communication channels and platforms as indicated before. Additionally, the program aims at increasing the overall economic performance of the EU. This can also be reached by fully using the economic potential of cross-border regions, which is not yet done but can be improved by taking the gained insights into account. By setting up cross-border cultural or social events in order to strengthen cultural, social and linguistic understanding, awareness and merge cross-border cooperation might be fostered. In addition to that, the EU could not only increase its economic performance through such events but also raise its competitiveness with regard to education and social integration.

Finally, a recommendation for further research is to control for the outcome of this research, so check whether in other cross-border regions, which are at face value successful in cross-border cooperation and regional innovation, the relation between informal factors to cross-border cooperation and amount of innovation is the same as found in this analysis. This is reasonable as this research is only conduced with two cases and the generalizability is therefore very low. Furthermore, from the conclusion of the thesis it could be recommended that new policy initiatives intending to foster regional innovation in cross-border regions should focus on the alignment of national

economies within cross-border regions. Thereby, the national institutional level should be focused by the policy makers too, as this is of huge importance for the establishment of cross-border cooperation because it is much more effective when cooperation is started by cooperating partners themselves then by some external institutions, like the government.

Reflection

Coming back to the scientific relevance of this Bachelor Thesis, it could be said that the above drawn conclusions show that the research and the paper contribute to a wider research area of cross-border cooperation and regional innovation, and that the findings can be used to improve current EU strategies and programs, as shown before. Besides that, the social relevance should be kept in view as well. As introduced in the beginning of the paper, 23% of the whole European population lives in border regions. Therefore, the promotion of regional innovation in cross-border regions is of importance, because people there require impulses for economic development and growth. This is necessary as border regions face difficulties with regard to economy because they either are peripheral or the metropolitan development of big cities is hindered due to the border. Thus, the findings of this research can contribute to future policies that foster cooperation and therefore innovation in cross-border regions by taking into account the informal factors that are at the moment largely ignored.

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